

The Impact of Mobile Phones on Collaborative Learning Activities

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ABSTRACT

In light of the ubiquitous nature of mobile communications technology, society is forced to rethink education. When considering the freedom of communication in terms of time and space that this mobile technology provides, educators need to understand how this ever present communications platform can be exploited to enhance collaborative learning. The central theme of this thesis is the role of mobile phones as a support for collaborative learning both in and out of the classroom. The questions asked are: What is the distinctive affordance offered by the mobile phone for collaborative learning? What is the affective relationship between student, mobile phone and homework? Does the intervention affect the relationship between students, their mobile phones and their homework? Does the affordance offered by the technology lead to more awareness of learning? What is the nature of the dialogue with the mobile phone technology? In this thesis, the methodology is designed to explore the area of collaborative learning and the use of mobile phones as a support for collaborative learning through critical reviews of the literature and a year-long exploratory multiple case study integrating both qualitative data analysis and quantitative data analysis. Qualitative exploratory interviews and surveys are combined with extensive quantitative internet log data to provide a detailed image of students' mobile use during collaborative activities. The results are triangulated, and In light of current research key issues are interpreted and discussed. The findings of the study support four key hypotheses which emerge from the theoretical framework. First, that there are distinctive affordances offered by the mobile phone for collaborative learning that increase learning opportunities. Second, that the affective relationship between students and their mobile phone has a positive influence on attitudes towards homework when the homework involves the use of their mobile phones. Third, that the intervention affected the relationship between students their mobile phone and their homework by reducing barriers between private and public spaces. Fourth, the affordances offered by the technology led to more awareness of content through an increase in opportunities for reflection. In addition, some insights into the nature of the dialogue with the mobile phone

technology are explored. These findings have implications for educational theory and practice since they provide evidence to support the incorporation of mobile devices into collaborative educational situations. This research will be of interest to those concerned with the impact of mobile devices on the area of collaborative learning specifically and the field of education in general. The contribution that this research brings to scholarship and to the educational community is an increased understanding of the ways that ubiquitous mobile technology can affect a student's mobile-based collaborative learning experience. The integration of these findings into the current body of knowledge may lead to improvements in future educational design and highlight areas which require further research.

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1. INTRODUCTION

1.1. Chapter outline

This introductory chapter provides a brief overview of the research consisting of a) the purpose statement and b) context.

1.2. Purpose Statement

The potential for change in teaching and learning to occur by implementing mobile phones in collaborative learning in higher education is great. The purpose of this research is to explore the changes to teaching and learning when implementing mobile phones for collaborative activities in a Japanese university environment.

1.2.1. Significance

This study will add to the understanding of how mobile phones impact on collaborative learning activities. For instructors struggling to determine the most-effective ways to encourage collaborative learning, it is important to consider the context of the students and the tools that are familiar to them. Students today have grown up with mobile phones, so instructors need to recognize and understand the potential of these devices in supporting collaborative learning beyond simply the ability to access resources. Instructors must acknowledge and respond to the availability of such a powerful device when considering how to improve collaboration amongst students. The affordances offered by mobile phones for learning such as anywhere, anytime communication and data gathering contribute to these considerations.

In addition, this study will add significantly to the body of research on mobile learning by identifying some of the changes that mobile phones bring to collaborative learning environments in higher education. Administrators who are interested in the implementation of mobile learning could benefit from the discussions related to the support systems required to integrate mobile phones into a course.

While the context of this study is specific to university level instruction of a majority female sample in Tokyo, Japan, some of the findings may also be transferred to other contexts where mobile phones are ubiquitous and supported by a well-developed mobile infrastructure.

1.2.2. *Research Questions*

This study will seek to answer the research question: “How do students complete collaborative learning activities with mobile phones?” This question is a broad overarching one that is answered through five sub-questions. These five questions focus on the following aspects of mobile learning for collaboration: a) affordances, b) affective, c) intervention, d) awareness, and e) dialogue.

a) “What is the distinctive affordance offered by the mobile phone for collaborative learning?” This question will be captured through mobile logs and recall interviews which together indicate the time, place and nature of the collaborative learning activity. For example, this data might show that they have more access to complete the collaborative homework assignments. In addition, the participants using “Smart” Phones might have different affordances than the older model phones, so perhaps the smart phone users will behave differently.

b) “What is the affective relationship between student the mobile phone and the homework?” In order to capture this question mobile phone logs and recall interviews will be studied for indications that participant control over the time and space in which they use their mobile phone changes their affective relationship with it. If their relationship to the technology has changed then, their relationship to the homework and education might have also changed.

c. “Does the intervention affect the relationship between students, their mobile phones and their homework?” In addition to the recall interviews and forum transcripts, a Multidimensional Scaling (MDS) analysis will be used to capture a partial image of any change in affective relationship by measuring perceived similarity to things and others at the beginning and the end of the study. Mobile learning could be a mediated means to bring learning and curriculum together so

causing education to become more appropriated into their personal space. However, no assumptions will be made concerning the intervention as the cause of any changes that occur.

d. “Does the affordance offered by the technology lead to more awareness of learning?” Again, the recall interviews and forum transcripts could give some insight into this question.

e. “What is the nature of the dialogue with the mobile phone technology?” This question is a broad question so it is not expected that this study will be able to provide a complete answer. However, the recall interviews and forum transcripts could give some insight into the question.

1.3. Context

1.3.1. *Motivation*

This study takes place at a university in Tokyo, Japan. The researcher is an instructor at this university, and the research students are native Japanese language speakers who have studied English as a foreign language for eight years. The students have been raised in the very dense urban environment of Tokyo and have owned a mobile phone for the greater part of their lives.

Motivation for this study developed after several years commuting to and from work on the Tokyo train system where it can be observed that the majority of the passengers are engrossed in their mobile phones. This observation grew into an interest in the possible educational uses of these devices. In particular, how the ubiquitous mobile phone technology might add to the education of the Japanese university students studying English by increasing their contact with the language outside of the classroom.

1.3.2. *English Education in Japan*

During the early Meiji era (from 1867), Japan ended its isolation policy and welcomed foreign visitors from countries such as Britain and the United States of America (MEXT, 2014b). The modern Japanese system of formal education was inaugurated in 1872. In the 1890’s, the government established the language education system for middle and higher secondary schools. English became the

main foreign language, while French and German were offered in universities as a second foreign language. Following World War II, English came to be seen as a tool for communication and was adopted as a subject in the educational reforms of 1947 (MEXT, 2014f). By 1956, English was adopted as a subject for the entrance examinations to high schools in Japan, so, although not required by law, English became in effect a requirement for students to enter high school.

The content of the English courses offered in government funded junior high schools is controlled by Ministry of Education, Culture, Sports, Science and Technology (MEXT) guidelines. Before 1981, state funded schools offered five hours per week of English, after which the number of hours was reduced to three. According to the guidelines, the purpose of English education is to give students a practical command of written and spoken English and to promote understanding of the cultural and social backgrounds of English-speaking peoples. Since most universities have an English section on their entrance examinations, there is an increased incentive to study English at the high school level just as the English entrance examination for high school drives English study in junior high school. Some universities today are emphasizing the communicative aspects of English, though English classes are still following a grammar-translation approach. Many teachers choose their textbooks according to their interests. In other words, MEXT has virtually no control over what university instructors do in classes. Today, many Japanese people associate English with internationalization, university entrance screening, job searches, and company promotions.

In Japan, the MEXT requires that junior high school and high school students study a foreign language, and most students choose English as a subject to meet this foreign language requirement. At the university level, an additional second foreign language is commonly studied such as French, German or Chinese in addition to English. Few primary schools have offered foreign language courses in the past, so few primary school students had the opportunity to take English classes. However, starting in April 2002, MEXT reformed the guidelines (MEXT, 2001) ordering many primary schools to start

teaching oral English as part of an initiative to improve international understanding (MEXT, 2014g). Other goals of this initiative include having 50% of junior and senior high school students achieve the target for proficiency in English based on the course of study (at graduation from junior high school: Test in Practical English Proficiency (Eiken) Grade 3 or higher; at graduation from high school: Eiken Grade Pre-2 or Grade 2, or higher)(MEXT, 2012). In addition, increasing the proportion of English language teachers, in Junior high school to 50% and Senior high school to 75%, who have achieved the target for English language ability required of English teachers (Eiken Grade 1, TOEFL-iBT 80 points, TOEIC 730 points or higher)(MEXT, 2012). The future goals of MEXT from 2014 include establishing an expert council (January 2014), establish teacher empowerment frameworks (2014-2018), revise the Course of Study by Central Education Council (2018), with a full-scale implementation timed with the 2020 Tokyo Olympics(MEXT, 2014a).

For students of English as a foreign Language (EFL), the acquisition of 5,000 base words is a well-accepted minimal requirement for understanding non-specialized English texts (Laufer, 1997; Nation & Nation, 1990). In Japanese universities, a typical class meets once a week for 90 minutes. This short period means teachers must decide how best to use that limited time to promote language learning. Since foreign language students usually only have opportunities to speak and hear the target language in the classroom, it makes sense to use as much class time as possible in communicative activities. This focus on in class communicative activities means that other kinds of practice and exposure to language must be provided at other times. This extension of learning outside the classroom is where mobile technology can help extend learner opportunities in meaningful ways.

1.3.3. ICT in Japan

In Japan, the first experimental computer network connecting three universities in Tokyo was put in use in 1984 (Okada & Matsuda, 2000). Today,

according to the MEXT (2014c) Japan has a high rate of internet adoption among its general population as seen in Figure 1 on page 17.

The Japanese government as part of its commitment to reduce the global digital divide is building an education and training system called J-Net (Moore, 2013). Japanese support for the Global Development Learning Network (GDLN) began at the time of the 2000 Okinawa G8 summit when Japan announced the J-Net initiative, with plans to establish 30 core centres around the world. The first partnering of GDLN with a regional network was with the Monterrey Institute of Technology (ITESM) in Mexico in 1999. the World Bank coordinates GDLN in a partnership of over 120 recognized global institutions in some 80 countries (GDLN, 2014).

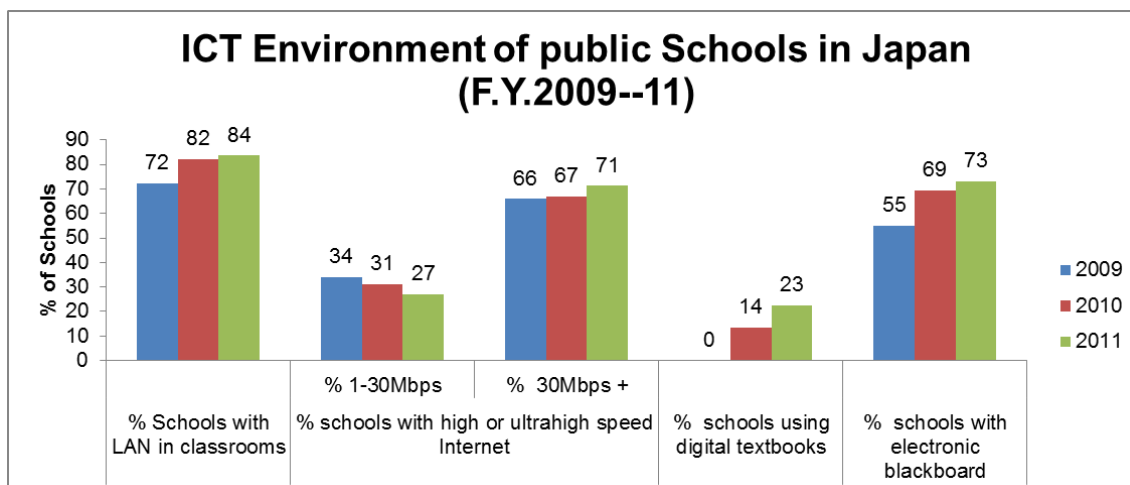


Figure 1: ICT Environment of Schools in Japan

MEXT has collected data that indicate Information and Communication technologies (ICT) are advancing in all areas of society (MEXT, 2014d) as seen in Figure 2 on page 18. They have placed an increasing level of focus on training children to use information and respond proactively to the Information Society by using ICT. In addition, they encourage teachers to use ICT to achieve easily understood lessons and work more efficiently. MEXT is actively engaged in introducing ICT into school education and implementing policies to promote the use of ICT in lifelong learning and social education to provide the Japanese population with diverse opportunities for learning (MEXT, 2014d).

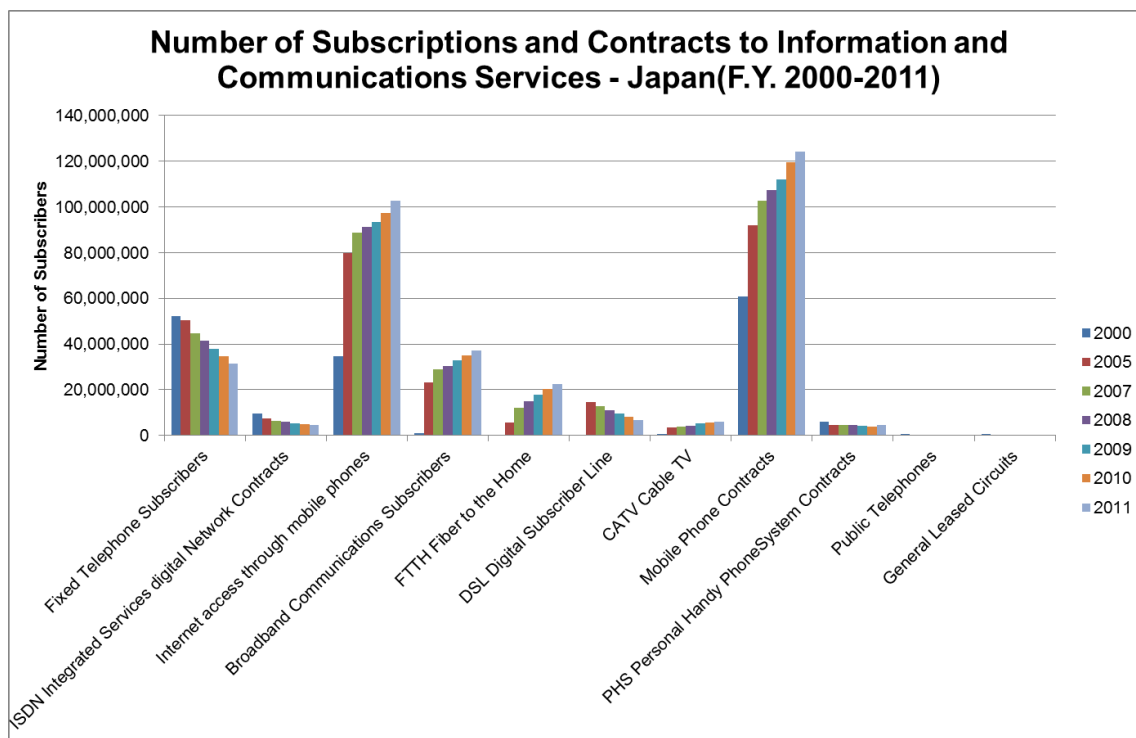


Figure 2: Information and Communication Services in Japan

Japan clearly has a well-developed infrastructure and high mobile adoption rate to support mobile learning that may be unavailable in some locations. Without this availability of mobile phones within the student population and the high-speed mobile access to the internet, the research findings may have been considerably different.

Mobile phones have become popular in societies all over the world independent of cultural habits, values and norms (Geser, 2004). Even those with a traditional aversion to technology like Italy (Fortunati, 2002a), or those that are traditionally introverted and respectful of silence in talk like Scandinavian countries (Puro, 2002). Ito (2005) describes the Japanese context as one in which mobile phone communication is restricted to text messages in public transportation and restaurants by social rules posted on signs. Even with a mobile phone the ability to stay in contact is also restricted by the everyday demands on an individual's attention such as driving a car. Geser (2004)

suggests this as one reason for the popularity of mobile phones in countries that have a large percentage of commuters using buses and trains, such as Japan and European countries, perhaps as a way to relieve boredom (Lasen, 2002).

Tokyo is a city in which many people live and commute in confined spaces, which make them reluctant to carry something as large and heavy as a laptop, but are comfortable with a small mobile phone. The population of Tokyo exceeded 12 million in the year 2000 with approximately 10 million of those being of age to participate in the labour force (Tokyo, 2013). As of 2007, the greater Tokyo area urban agglomeration measured 13,500 km² and included 35.7 million people, making it the largest such area by population in the world (UN, 2007). As of 2005, the large number of daily commuting workers from surrounding prefectures causes the daytime population to swell by 2.5 million people each day (Tokyo, 2013).

Ito (2005) describes the mobile phone in Japan as a fetishized object, highly personalized, decorated with stickers, special hand straps and antennas. The mobile phone allows students to create a private space within the parent-dominated space of the Japanese home (Ito, 2005). Meetings among friends almost always occurred in a third-party space run by indifferent adults, such as fast food restaurants, karaoke spots, or restaurants. Even for college students living on their own, their living area is so small and cramped that it is not appropriate for meeting with groups of friends. There is a sense of freedom created as the mobile provides a spatial dispersion of location coupled with freedom of communication which is opposite to the classroom with everyone sharing one physical space and little control of communication (Ito, 2005).

1.3.4. Culture and Mobile Interfaces

Interaction from students has been reported to be negatively affected by unusable software interface designs (Vonderwell & Zachariah, 2005). The Japanese, for instance, preferring to use no pictorial representations of body parts for icons (Shen, Woolley, & Prior, 2006). Traditional Japanese and Chinese

literature is written right to left, and books are read back to front but this text orientation is a rarity in electronic media, so a significant part of the culture has been ignored and could be lost because of software (Shen et al., 2006).

Emoticons are not the same cross-culturally. For example, the basic smiley is :-) in the United States but it is (^ ^) or (^ ^) in Japan where people perceive the shape of the eyes as part of smiles (Moore, 2013). The most frequently used Japanese emoticon is (^ ^;) or (^ ^;), a representation of a face with cold sweat, used when the Japanese writers are afraid they are saying something too strongly (Sugimoto & Levin, 2000).

In relation to time perception and interfaces, Hall (1973) identified two distinct notions of time, monochronic and polychronic. Monochronic cultures like to do just one thing at a time, value orderliness and sense of an appropriate time and place for everything, do not value interruptions, like to concentrate on the job at hand, and take time commitments seriously. Polychronic cultures like to do multiple things at the same time, tend to manage interruptions well with a willingness to change plans often and easily, have a tendency to build lifetime relationships, the relationship, not the task defines promptness, and objectives are more like desirable outcomes than requirements. According to Hall (1973), most Asian societies have monochronic time perception, while most European societies have polychronic perception.

In addition to national differences, cultures can be differentiated along a dimension of contextualization (Hall, 1969, 1989). Hall also distinguished between high-context and low-context cultures based on the amount of information that is implied versus stated directly in communication. High-context cultures depend on the contextual clues delivered through indirect verbal messages to extrapolate meaning while Low-context cultures obtain meaning from the information provided by the explicit code of the message. This difference in a person's need for context is especially important when communicating via a text-based online environment. Those people from low-context cultures like the United States will be able to obtain information from the code of the text while those people from high-context societies like Mexico,

Japan, or some Native American cultures will need the context to understand the message. Rogers and Steinfatt (1999) observed that in general, a low-context person often becomes puzzled and frustrated when interacting with people from a high-context culture because their messages seem incomplete and ambiguous since high-context individuals often hide their feelings to avoid hurting people with whom they disagree.

Ishii (1985) discusses differences in thought patterns that exist between Americans and the Japanese by referencing Shigehiko Toyama, who saw Anglo-Americans as thinking in a “line” while Japanese think in “dots.” Ishii (1985) extends Toyama’s idea to the concepts of the American “bridge” and the Japanese “stepping stone” which reflect the patterns of thought characteristic of each culture. Using the American “bridge” model, a speaker or writer organizes ideas and tries to send them explicitly and directly as if building a bridge from point a to point b. Using the Japanese “stepping stone” approach, the speaker or writer organizes his or her ideas and sends them implicitly and indirectly, as if arranging stepping stones from point a to point b where the arrangement is not clear, and the listener or reader must infer or surmise the intended meaning. He observes that the distinction between these two rhetorical patterns may be supported by Hall’s discussion of high-context and low-context cultures. The Japanese “stepping stone” pattern is an example of high-context communication while the “bridge” pattern is an example of low-context communication. The differences in thinking patterns can lead to misunderstanding in intercultural communication, especially when that communication takes place in a computer-mediated context, which lacks the nonverbal cues of face-to-face communication (Moore, 2013).

In Hall’s framework, Germany is a low context culture in which messages are aimed to be complete, clear, and precise while Japan is a high-context culture with messages that are multilevel and implicit (Cyr & Trevor - Smith, 2004). Interestingly, Japanese internet banners are usually static and over 90 percent of Japanese sites use Asian characters, currency, and other culturally

specific symbols (Cyr & Trevor - Smith, 2004). Japanese sites also have the highest percentage of content (71%), compared to U.S. (28%) and German sites (20%) (Cyr & Trevor - Smith, 2004). Japan is twice as likely to prefer symbolic navigation tools, while Germany and the U.S. preferences for vertical and horizontal menus are statistically significant. Germany and Japan use a “return to home” button twice as much as the U.S. sites (Cyr & Trevor - Smith, 2004).

Choi et al. (2005) proposed a set of critical design attributes for mobile data services that take cross-cultural differences into account in Korea, Japan, and Finland. Choi et al. (2005) found 52 attributes considered important by mobile data service users, and 11 critical attributes that showed a definite correlation with characteristics of the user’s culture. Most Japanese participants preferred a variety of content to avoid vagueness; however, they did not like too much content because it impeded their search for their favourite content. The researchers coded these Japanese participants as liking a variety of content from the perspective of uncertainty-avoidance and as disliking the same attribute from the perspective of individualism.

Hofstede(1984) and Hall (1973; 1989) measured cultural traits at the national level. Hofstede (1984) found Korean and Japanese societies belong to the high uncertainty-avoidance group whereas Finnish society belongs to the low uncertainty-avoidance group. Similarly, Choi et al. (2005) found that when using mobile data services, Korean and Japanese participants had a greater tendency than Finnish participants to avoid the ambiguous and to reject unusual ideas. They also found that over 90% of Korean and Japanese participants preferred an efficient layout or space usage, a large amount of information within a screen, clear menu labelling, and secondary information about contents. In their study (Choi et al., 2005), Japanese participants report the ability to predict the quality and characteristics of contents more clearly when secondary information about the contents was provided. Choi et al. (2005) concluded that providing clear menu labelling and secondary information about contents was an important element for Korean and Japanese subjects because it minimized the uncertainty

about contents. These results suggest that high uncertainty-avoidance users who feel threatened by ambiguous situations tend to prefer efficient layout or space usage, a large amount of information within a screen, clear menu labelling, and secondary information about site contents. This is because these features help users avoid uncertain conditions (Hofstede, 1984) when they use mobile device services by helping them predict the results of action before the act (Marcus & Gould, 2000). In contrast, more than 90% of Finnish subjects found such information useless since they could just use the content without the need to investigate what it was (Choi et al., 2005).

Users from a high context-culture prefer implicative menus with icons or animations over text-based explanatory menus because they can comprehend its meaning faster(Choi et al., 2005). Choi et al. (2005) also found evidence that high-context people get information about the menu from diverse font colours and sizes. They may obtain more information from an implicit menu style than low-context cultures (Hall, 1989) since font colour and font size may be one cue used to understand the relationships among menu items quickly and easily.

2. LITERATURE REVIEW

2.1. Chapter outline

This chapter provides a review of the literature on mobile devices in education and collaborative learning. This literature review will focus on the issues relevant to the use of mobile phones for collaboration in education. It is divided into six main sections. Sections one and two will focus on research into the theory of affordances and affective relationships, which are an essential part of any discussion on mobile phones and mobile devices in general. Section three explores the concepts of time, space, public and private as they are related to mobile technology in education. Section four reviews research into collaborative learning (CL) and computer supported collaborative learning (CSCL). Section five looks at current research in mobile computer supported collaborative learning (MCSCL). The final section is a summary of the main arguments from the current literature to identify gaps in current understand on mobile phone use in education and the research questions that emerged from them for this study.

2.2. Affordance

An affordance is the perceived potential for action including located perspectives, action with objects and interaction with others (Gibson, 1986). In other words, an affordance is an action that an individual can potentially perform in their environment by using a particular tool (Gibson, 1977). It is the type of action that an item appears to be able to perform, for example, a door with a handle suggests the door can be pulled outwards, whereas a plate implies the person should push the door (Norman, 1988). There are “real” affordances, known or unknown affordances latent in the environment, and “perceived” affordances which are more relational and are closely tied to perceptual capabilities which are what determines the usability (Norman, 1999). Similarly, the affordances of the mobile phone for learning are ultimately dependent on the views and perceptions of learners. So how learners perceive the possible uses of tools in the context of learning may be very different to those of the educator (McLoughlin & Lee, 2008). This is an important point to consider when think

about research because the number of possible affordances is great and may be very different for each learner. It is argued that the perception of potential action within an environment generates the experience of presence and embodiment in that environment, so phone call interactional affordances create a sense of presence and embodiment in a shared space (Rettie, 2005).

2.3. Affective

In this study, affect is defined as covering the mood, emotion, attitude and value (Oatley & Nundy, 1996). When looking for a change in affect, it is possible to look for purely individual affective changes and effects in students, reflecting changed feelings, values, and preferences (Traxler & Riordan, 2003). In addition, an evaluation may look for social changes, such as, how students work with each other and how groups of students show increased collective skills (Traxler & Riordan, 2003).

It is important to support affective development, and in particular to help learners when stressful situations might cause them to disengage and become disaffected (Picard & Daily, 2005). While removing anxiety altogether is not a realistic goal, but making it sufficiently manageable through the use of mobile devices to provide support that is just-enough, just-in-time, and just-for-me may alleviate the stress so that a learner might choose to engage rather than opt out (Rosenberg, 2001).

The affective relationship that students have with technology has been associated with learner beliefs about the ease of use and usefulness provided by the technology. There are several intention-based theories that are used to explain user technology acceptance including the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) (Ajzen, 1980) an early form of the theory of planned behavior (TPB) (Ajzen, 1991) which deals with how behavioral beliefs produce a favorable or unfavorable attitude toward the behavior. In addition to these there are the technology acceptance model (TAM) (Davies, 1986b) and social cognitive theory (SCT) (Compeau & Higgins, 1995) (Hill, Smith, & Mann, 1987). While TRA and TPB attempt to explain and predict individual behavior,

TAM is an adaptation of TRA which tries explicitly to explain computer and information technology (IT) usage behavior (Davies, 1986b).

Researchers have widely discussed the theoretical perspectives of TAM in relation to how an individual's beliefs about their abilities to competently use computers can affect actual computer use (Compeau, Higgins, & Huff, 1999), psychological origins of perceived usefulness and ease-of-use found in TAM (Karahanna & Straub, 1999), application of TAM across different countries and cultures (Straub, Keil, & Brenner, 1997), demonstrating the effect user satisfaction has on system usage (Igbaria & Tan, 1997), and demonstrating the predictive power of TRA (Sheppard, Jon, & Warshaw, 1988).

Davis (1986b) developed TAM as a way to describe the attitudes of people to computers and IT systems based on perceived ease-of-use and usefulness with the belief that these factors can directly affect an individual's attitude towards technology. Perceived ease-of-use is the level of effort required by a person using the system, while perceived usefulness is the degree to which a person believes a system will help them do their job.

2.4. Time and Space

This section will deal with the idea of time and space as it relates to mobile learning. This section is divided into three parts, including a) time, b) private and public space, and c) how these relate to learning.

2.4.1. *Time*

The traditional concept of geographical distance between two places was proportional to the time taken to travel from one to the other, but this time and distance relationship is changing with the advancement of modern communications (Rettie, 2005). Modern telecommunications is increasingly leading to a description of time as being compressed (Harvey, 1999), global (Adam, 2013), and instantaneous (Urry, 2002). Time is seen less as continuously linear and more as a multitude of individual moments (Adam, 2013) such as home, school, and work. This perception could mean very different patterns of interacting between students in collaboration through a mobile phone. The

mobile phone supports this modern view of time because it allows for communication during previously unproductive periods of time (BenMoussa, 2003; Perry, O'hara, Sellen, Brown, & Harper, 2001) such as when traveling so possibly increasing the number activities (Johnsen, 2001) like finishing homework (Virvou & Alepis, 2005). This increase provided by the mobile phone allows for better time management (Townsend, 2000), which is especially important for those students that must balance work and school life (Motiwalla, 2007). However, as people become increasingly available for communication there comes new opportunities for interaction and so a greater proportion of time allocated for communication (Gant & Kiesler, 2002). Fortunati (2002b, p. 517) says, "With the possibility of perpetual contact, the mobile phone ends, in fact, by shaping time as a container of potentially continuing connection."

Likewise space is less about localized presence as mobile technology separates space from place (Giddens, 1990). This mobility replaces the impression of being at a place for conversation with a telephone, to belonging to a network of communication (Geser, 2004).

2.4.2. Private and Public Space

Mobile devices enable people to create and carry virtual communities throughout the day while moving from location to location. These short term and long term virtual communities are embedded with traditional physical ones (Beach et al., 2008). Social networks are a popular use of mobile devices offering an entire virtual community that knows who and where the users are, allowing for increasingly complex context-aware applications (Beach et al., 2008). These mobile accessible social networking sites such as Facebook, Mixi, and Twitter are creating transient and virtual communities at the expense of traditional physical communities (Traxler, 2009b). People no longer need to travel every time they want to socialize but instead pull out their mobile phone without the need to physically meet.

These affordances of mobile devices have led to a re-evaluation of the importance of traditional boundaries in physical space. This re-evaluation has in

turn created a need to develop strategies due to the increased difficulty to create, maintain, negotiate, and manage these boundaries (Schwarz, Nardi, & Whittaker, 2000) between work or school and leisure. The mobile phone enlarges the social networks of individuals by adding communication that otherwise would not occur, such as between people who have a weak relationship or are disliked. There may be pressure from the work space to invade the leisure space or of the leisure space to invade the work space so putting added pressure on individuals to redraw some of the blurred boundaries that were previously provided by physical distance and organizational structure (Schwarz et al., 2000). There is still a need to separate work from home even though they are always connected through a mobile phone.

Fox (2001) found women use their mobile phones as 'symbolic bodyguards' when feeling vulnerable in public places – in the way that they used to use a newspaper or magazine as a 'barrier signal.' She describes this as a type of social support network of friends and family that are somehow 'in' the mobile phone so just touching or holding the phone gives a sense of being protected while signalling to others that the person is not alone and vulnerable (Fox, 2001).

Mobile phones may support tendencies towards closure rather than tendencies to open up to new people so they may be used to strengthen already existing intimate relationships, not to enlarge the social circle (Geser, 2004). This idea is supported by Puro (2002) who reports that mobile phones are most frequent among members of two-or-three-person households. Also, Fortunati (2002a) reports that mobile phones were most popular with people who kept close contact with their families. Turkle (2012) writes about how the new digital technologies of communication provided by devices such as a mobile phone offer the feeling of companionship without the demands of friendship. She goes on to talk about how the mobile phone allows people to communicate with others without intruding into their physical space (Turkle, 2012).

Mobiles afford the frequent, easy, spontaneous, casual communication that would be common in small communities where people frequently passed in

the street which ensured that everyone felt connected to his or her social and support network (Fox, 2001). It appears that the mobile phone provides a way of continuing traditional communalistic relationships under modern conditions of high geographic mobility and dispersion (Ling & Helmersen, 2000; Roos, 2001). This sense of community created through mobile technology seems advantageous in the sense that it could support a community of practice for a group of learners collaborating (Wenger, 1998).

Geser (2004) suggests that mobile phones may make it easier for individuals to tolerate being spatially very near to complete strangers such as in crowded urban areas because they provide them with a virtual exit by just contacting their friends and family. Then there are the people who make physical gestures of withdrawal in crowded areas to create a private area which Plant (2002) calls "spacemakers." She describes it as the head bowed and inclined towards the phone, and the whole body may be slightly leaning, as though into the phone or towards voice at the other end. Here again, it seems the use of the mobile phone for communication is affecting the way people communicate. In the case of Japan, people often use one hand to shield their mobile and their mouth from view to create a private space within a public space (Plant, 2002).

2.4.3. Learning

Traditionally formal learning is characterized by the two constants of time and space, in that learning typically takes place in fixed, physical spaces and is situated in rigid periods of time (Traxler, 2009b). Mobile learning has the potential to transcend these spatial and temporal restrictions (Traxler, 2009b) because it enables people to participate in different interactions at one time, and to take part in interactions at distant places (Rettie, 2005). This release from spatial and temporal restrictions means learning can leave the classroom and become more customized for the learner.

Interacting with a desktop computer takes place in a type of bubble, in dedicated times and places where the user or student is physically isolated for a substantial and probably premeditated episode (Traxler, 2009a). It should be

remembered that this is not always a negative environment for learning and may be preferable to mobile learning for some students.

The mobile phone is a personally intimate device that is held close to the body throughout the day and can be shielded from prying eyes even in the most public of places (Alexander, 2004). However, computers remain semi-public due to their size, lack of mobility, and ease of view by others. Interacting with mobile technologies is different because it is present at all times and places in a student's life. Mobile phones have created "simultaneity of place" (Traxler, 2009b), a kind of bridging of physical space, such as home, school, and work, through the creation of a mobile social space by filling the space in between (Bull, 2005). Mobile technologies transport communities and discussions into physical public and private spaces forcing people to adjust our behaviour as we learn to manage a more fluid environment (Traxler, 2009b). Private is no longer just what happens when physically alone (Cooper, 2002). A student on a crowded train may have a private moment enjoying a favourite movie or silently texting a close friend. There is a constant flickering of conversation throughout the day (Sheller, 2004). The established notions of time as a single common structure are changing, becoming more flexible. Mobile devices seem to provide a constant availability without concern for the physical location which is being discussed as "approx.-meetings" (Plant, 2002), "socially negotiated time" (Sørensen, Mathiassen, & Kakihara, 2002), "micro-coordination" and "softening of schedules" (Ling, 2004).

2.5. Collaborative Learning

Collaborative learning (CL), its theoretical base in sociocultural theories, and places students into pairs, groups or communities of learning where they work with others to form questions, discuss ideas, explore solutions, complete tasks and reflect on their thinking and experiences (Laurillard, 2009; Stahl, Koschmann, & Suthers, 2006). In CL, learning is situated in student-centred activities (Wang, 2007) in which they establish shared meanings and develop critical and reflective thinking skills. Knowledge and understanding can be helped

by collaborative work on topics that require genuine discovery together with peers that offer differing opinions for discussion (Damon & Phelps, 1989; Doise, Mugny, & Saint James-Emler, 1984; Howe, Tolmie, & MacKenzie, 1995).

In the collaborative group, the insights created and assimilated go beyond what could be managed independently (Tomasello, Kruger, & Ratner, 1993). The two terms *cooperative learning* and CL, are sometimes used as interchangeable and synonymous (Johnson & Johnson, 1989), but other times they are clearly differentiated (Stahl et al., 2006). In cooperation, the task is divided amongst the group members as sub-tasks which are then solved individually and finally assembled into the final product (Dillenbourg, 1999). So cooperative learning takes place individually, and only the collection of results is presented as a group, so learning is viewed as taking place individually (Stahl et al., 2006). Alternatively, CL is a social construction of knowledge where individuals are members of a group, but members remain engaged in a shared task using negotiation and shared meanings (Stahl et al., 2006). Social interaction between peers is fundamental to achieving learning (Dillenbourg, 1999). In a CL activity, three to five members take part in a coordinated effort to learn a specific educational objective (Dillenbourg, 1999) in a real social interaction context (Zurita & Nussbaum, 2007). The communication affordances offered by mobile phones make them particularly well suited to the latter CL activities which benefit from continuous and spontaneous interactions.

Dillenbourg (1999) describes four aspects of collaboration and their parts. The first is a *situation* that can be characterized as collaborative if all peers are at the same level, perform the same actions, share a common goal, and work together. The second aspect is the *interactions* between group members which can be more or less collaborative and are subdivided using the three criteria of *interactivity*, *synchronicity*, and *negotiability*. Collaborative situations should be quite interactive, but the degree of interactivity is not the number, but the extent to which the interactions influence the peers' cognitive processes (Dillenbourg, 1999). Synchronicity refers to doing something together through synchronous communication while cooperation is sometimes associated with asynchronous

communication. Negotiability in collaborative interactions, unlike hierarchical situations, peers will not impose their view but instead will argue, justify, negotiate, and attempt to convince. The third aspect of collaboration is that some learning *mechanisms* are more intrinsically collaborative. By learning mechanisms, he was referring to those that operate at the individual level because there are different agents involved in group interactions. These mechanisms are *induction*, *cognitive load*, *self-explanation*, and *conflict* (Dillenbourg, 1999). Induction is when pairs draw more abstract representations to integrate what was common to the representations built by each. Cognitive load refers to the idea that during collaboration the division of labour reduces the amount of processing for each person. Self-explanation is the articulation of one's ideas. Conflict is the discrepancy between the knowledge and viewpoints of peers, which leads to conflicting statements with respect to the task. The fourth and final aspect is how the *effects* of defining collaborations themselves add to the confusion of terminology.

CL takes place when interaction among people triggers learning mechanisms, but there is no guarantee that the expected interactions will occur. A primary concern, when developing such activities, is how to increase the probability that some types of interaction will occur. Dillenbourg (1999) suggests the following four categories to increase the probability of interaction occurring:

1. To set up initial conditions to increase the probability that some types of interaction will occur.
2. To over-specify the "collaboration" contact with a scenario based on rules: For example defining a clear specification of roles.
3. To scaffold productive interactions by encompassing interactional rules in the medium. The teacher may specify interaction rules for face-to-face collaboration.
4. To Monitor and Regulate the Interactions. A 'facilitator' is a role the teacher takes, not to give an answer, but to perform a minimal pedagogical intervention in order to redirect the group work in a productive direction.

Related to this, Vygotsky's Zone of Proximal Development (ZPD) states that individual learners working alone have different developmental capabilities

when compared with individual learners collaborating with others (Vygotsky, 1986). Collaboration is primarily a process of shared meaning construction. The meaning making is not assumed to be an expression of mental representations of the individual participants, but is an interactional achievement. (Stahl et al., 2006).

Computing technologies have been used to support CL for achieving varied learning goals such as language learning (Nunan, 1992a; Warschauer, 1997). The term “Computer-Supported Collaborative Learning”(CSCL) is widely believed to have been first used at an NATO-sponsored workshop in Maratea, Italy in 1989 (Stahl et al., 2006). The focus moved from what is happening in the individual learners to what takes place between and among them in interactions, which in turn required an elaboration of social theory of mind (Stahl et al., 2006). Vygotsky’s ZPD is a concept that states that individual learners working alone have different developmental capabilities when compared with individual learners collaborating with others (Vygotsky, 1986). Collaboration being a process of shared meaning construction where the meaning making is not assumed to be an expression of mental representations of the individual participants, but is an interactional achievement (Stahl et al., 2006).

Inter-subjectivity is relevant to the understand of how learning is produced within interaction, where learning is constituted of interactions between members (Stahl et al., 2006). Stahl argues that small groups are an efficient unit for the study of inter-subjective meaning making, for several reasons. First, small groups are where researchers can observe members’ methods for inter-subjective learning. Second, groups of several members allow the full range of social interactions to play out, but are not so large that participants and researchers alike necessarily lose track of what is going on. Third, the shared construction of meaning is most visible and available for research at the small-group unit of analysis, where it appears as group cognition. Fourth, small groups mediate between, individuals and community. The knowledge building that takes place within small groups becomes internalized by their members as individual learning and externalized in their communities as knowledge (Stahl et al., 2006).

The nature of computer mediated interactions supports inter-subjective meaning making. Computer tools are a standard method of fostering online collaboration known as Computer Supported Collaborative Learning (CSCL). In CSCL-environments, online asynchronous discussion groups are known as Computer Mediated Conferencing (CMC) (Gunawardena & Zittle, 1997), Computer Mediated Discussion (CMD) (Siegel, Dubrovsky, Kiesler, & McGuire, 1986), Computer Conferencing (CC) (Garrison, Anderson, & Archer, 1999), Networked Learning (NL) (Goodyear, 2005), or Asynchronous Learning Networks (ALN) (Hiltz & Wellman, 1997). In most of these environments, the students exchange messages through computers with one another through email and internet sites (De Wever, Schellens, Valcke, & Van Keer, 2006). Asynchronous text-based discussions present several advantages as compared to synchronous discussions (De Wever et al., 2006): students get more opportunities to interact with each other and students have more time to reflect, think, and search for extra information before contributing to the discussion. In addition, the communication elements are written which give the researcher a clear view into the collaboration because a transcript of these messages can be used to judge both the individual and group collaborative process (De Wever et al., 2006). So, all exchanges of information between students are stored in the discussion transcripts which can be used by students for reflection purposes, or they can serve as data for research (De Wever et al., 2006).

2.6. Mobile Computer Supported Collaborative Learning

2.6.1. *Background*

Mobile learning is defined by Sharples (2009) as learning that happens across locations, or that takes advantage of learning opportunities offered by portable technologies. It is neither the conversion of e-learning material to portable devices or the movement of classroom materials to less formal settings (Sharples, 2009). Mobile learning may take place in one fixed location or on the move, in a formal educational setting (school) or a non-formal one (museum),

use one technology or several (mobile phone, mp3 player, electronic dictionary) (Sharples, 2009) allowing access from anywhere to people and services. There are changes in the context of learning and the role of mobile technology as mediating tool which can operate across ever changing contexts and learning spaces (Pachler, 2010) as people move through their day. Instead of the world being reduced to a chapter in a textbook, the learning experience can be situated in the real world of the learner (Lave & Wenger, 1991; Pachler, 2010). However, learning across contexts poses problems for evaluation because there may not be a fixed observation position and the learning may spread across locations and times (Motiwalla, 2007; Sharples, 2009; Traxler, 2007).

Mac Callum and Jeffery(2014) found that digital literacy, ICT anxiety, teaching self-efficacy, and perceived ease of use and usefulness were critical factors for lecturers' behaviour intentions to implementing mobile learning. A different review of mobile learning projects in Asia found that the mobile phone is an attractive device with most teachers and learners because it is widely owned, ensures a wider reach than printed materials, makes content easier to update compared to printed materials, requires little training to use, the infrastructure in Asia is well developed and can easily be accessed even in remote areas, and it can be used to support teacher-learner and learner-learner communication and collaboration (Deriquito & Domingo, 2012).

In a review of the literature, Naismith et al., (2004) suggest six mobile learning activity categories. The first is behavioural activities such as delivering content, texting, and feedback response by the learners. Next, there are constructive activities in which learners create knowledge, ideas, or concepts such as creating and sharing media. Then there are situated learning activities, which take place in natural and authentic contexts such as providing museum visitors with access to mobile devices to access information on the exhibits. Collaborative activities promote social interaction and communication like texting, email, posting to websites and synchronous chat. Informal, contextual, lifelong learning activities occur in an individual's everyday life like mobile applications for language learning, bird call identification, and healthcare information. Finally,

there is coordination of learning and teaching such as mobile access to resources, schedules, assignments, data, and reports.

There have been many projects related to mobile learning, but several of them stand out as important milestones (Kukulka-Hulme, Sharples, Milrad, Arnedillo-Sánchez, & Vavoula, 2011). The HandLeR system established the concept of mobile and contextual learning outside the classroom (Sharples, 2000). The MOBIlearn Project established the viability of handheld technology to support context-sensitive learning in non-formal settings. The mLearning Project concluded that mobile learning can work, reaching places that other learning cannot and that it is best provided as part of a blend of learning activities rather than a single solution. In addition, it demonstrated that mobile learning is not simply a tool for delivering material but can be used for learning through creativity, collaboration and communication (Kukulka-Hulme et al., 2011).

The technology has also been proven as an effective channel for providing inexpensive distance education for varied purposes in Asian countries like South Korea, Bangladesh, Malaysia, and Japan (Vosloo, 2012). Boyd(1988) suggested that the impact of evolving commercial, political, and institutional interests, and their ideologies has shaped the development of technology and educational technology in particular, in the US, Japan, and the United Kingdom.

Mobile-Assisted Language Learning (MALL) with its application to foreign language instruction has been the topic of hundreds of studies. However, few of these have progressed beyond the pilot testing phase or have been the subject of follow-up reports of curricular integration (Burston, 2014). While the necessary technological base and pedagogical expertise to make MALL a central part of foreign language teaching exists, it remains marginal in terms of the number of students and courses involved, the duration of implementations, the language skills targeted, the kinds of learning activities undertaken and the methodological approach used (Burston, 2014). Byrne and Diem (2014) embedded a survey into a popular (500,000 downloads with 100,000 active users) mobile grammar application with 3,759 respondents from eight backgrounds (French, German, Italian, Japanese, Korean, Russian, Spanish and Thai). Their results showed that

the overwhelming number of respondents self-assessed their ability as beginner or elementary. They also noted that the difficulty of gathering language app data from learners not tethered to a classroom or instructor was one reason for the small amount of concrete research on autonomous mobile language learning (Byrne & Diem, 2014).

Jung(2012) found that four factors influence stress in Japanese students participating in online collaborative learning in English: Self-efficacy, Instructional Design, Technology Use and Collaborative Process. Some research findings suggest that adult learners' intention to use m-learning is influenced by their cognitive, affective and social needs through attitude (Hashim, Tan, & Rashid, 2014). Wang and Smith(2013) describes a three-year mobile phone based language-learning project in Japan. Their results indicated that the success of any mobile learning project could be dependent upon providing engaging learning materials of reasonable length, a sufficient degree of teacher monitoring, student involvement, student incentives, a respect for privacy, and safe and secure mobile-learning technical environment. Pasfield–Neofitou(2012) discusses the results of a multi-site, longitudinal study examining how second language learners of Japanese establish and maintain relationships using a second language (L2) online in their daily lives as a resource, and a way to increase opportunities for L2 use and acquisition. She found that being part of an online L2 community of authentic speakers was the most important source of motivation for language production identified by the participants in the study. Jung(2014) did an action research investigation of three scaffolding strategies for wiki-based multicultural Japanese language learning: worked examples, grouping and peer assessment. She found that the use of a template explaining the learning objectives and expected learning process was more effective than detailed worked examples. In addition, she found that heterogeneous grouping and internal and external peer review were relevant factors and that wiki-based collaborative learning can be culture laden and in conflict with traditional teaching and learning.

Kondo et al. (2012) did research at several universities in Japan explored the use of Mobile Assisted Language Learning (MALL) practices to help improve students' scores on the TOEIC Listening and Reading Tests. They concluded that the use of MALL encouraged study without teacher intervention in terms of time spent on tasks, level of satisfaction with tasks, and self-measured achievement. A study in Japan used k-means clustering technique to build a student learning frequency model, and predict the relationship between user information and frequency amongst second language learners of Japanese by first finding two similar students, and then the system recommends learning content used by the more experienced student to a new student (Ogata, Liu, & Mouri, 2014).

A Ubiquitous Learning Log (ULL) was studied in Japan as means of digitally recording what a learner has learned in daily life using ubiquitous computing technologies, and the results showed how it could be used to facilitate seamless learning (Ogata, Houb, et al., 2014). A Spanish study explored the differential effects of medium of delivery of aural input during listening tasks on learners' noticing and type of comprehension (top-down and bottom-up) of Spanish object pronouns. They compared two mediums of delivery of input: mobile assisted language learning (MALL), which is learner manipulated, and instructor manipulated language learning (IMLL). The findings indicate that learners in the MALL group demonstrated significantly higher levels of reported noticing, bottom-up comprehension, and top-down overall comprehension than learners in the IMLL group (de la Fuente, 2014). Lin(2014) studied the effects of using mobile tablet PCs in an online Extensive Reading Programs (ERPs) on adolescent English learners' online activities, reading ability and users' perceptions. The results indicated that the mobile group outperformed the PC group in online activities, reading achievement, and showed a greater appreciation of the online ERP than their PC counterparts.

2.6.2. *Mobile technology*

Research in mobile learning has a strong focus on mobile phones, or smartphones, because of their association with technological convergence, normalization of technology, and seamless integration in everyday life.

There is a convergence of services and functions into one device that is already ubiquitous amongst learners. A 2011 study estimated that 89% of people carry their smartphone throughout the day (Google, 2011). Mobile devices such as smartphones have a relatively strong computing capability for their small sizes, Internet connectivity and the availability of various types and easy-to-use mobile application software or apps (Johnson, Smith, Willis, Levine, & Haywood, 2011). Smartphones are defined as a mobile phone offering capabilities that are similar to personal computer functionality and able to download apps (Google, 2011). Mobile devices work alone without any communication with embedded computers in the learner's surrounding environment. Traxler (2010b) notes the parasitic nature of educational technology which were not intended for educational use such as desktop computers intended for corporate business customers and now mobile devices intended for individual lifestyle customers. These new uses for the mobile phone are not unusual in the history of technology (Arnold, 2003; Tenner, 1997). The mobile phone is becoming part of each person (Traxler, 2009b), and enables students to research, collaborate with others and create new content and understanding which allows for enhanced teaching strategies.

Increasing portability, functional convergence of technologies, connectivity, reduction in cost, and reduction in cost of services leads to technology becoming more central to peoples' lives, invisible, ubiquitous, and personal ownership (Pachler, 2010). Increased portability means greater penetration into everyday life which makes a diverse range of cultural resources, content, and functionality available in everyday situations (Pachler, 2010).

2.6.3. *Mobile Learning Framework*

This section explores the framework of mobile learning. Mobile learning involves three main elements which include a) personalization, b) authenticity, and c) collaboration.

2.6.3.1. *Personalization*

Personalization in mobile learning differs from personalised conventional e-Learning in that it supports learning that recognises the context and history of each learner and delivers learning to the learner at a time and place they want it (Traxler, 2007). Mobile devices allow the personalization of activities that provide greater equity, so allowing for everyone's active participation (Cinque, 2013). This increased learner agency is seen in the ability of the student to take control of their learning goals which can be in the form of control of time, control of the place, content and goals.

Mobile learning gives students more control over time allowing them to determine with whom to collaborate and when, and they may reflect on course content when it is most appropriate for them. Mobile learning gives them greater control of learning across space and time by allowing them to control the pace and time they learn, so the time spent on learning material and decisions on when learning takes place are in the hands of the learner. Learning with mobile phones is inherently motivational because of this high degree of ownership and control of learning. Learner agency in the sense of time is increased as mobile learning provides greater organization of time, continual connection, and immediate connection,

Organizing time improves as learners and instructors are better able to organize their time more efficiently by extending access to course related information, communication, and collaboration. Cinque (2013) reported an increase in self-regulation skills of students in a medical study based on the use of mobile devices.

Continual connection to others is possible because mobile devices provide more flexible access and engagement in learning and knowledge sharing with

classmates and instructors anywhere they choose. (Sharples, Taylor, & Vavoula, 2005), This is true whether it be children's learning (Shuler, 2009), teaching English vocabulary (Cavus & Ibrahim, 2008) or training teachers (Seppälä & Alamäki, 2003). This enriched communication is one factor that leads to more learner satisfaction (Liaw, Hatala, & Huang, 2010). Gikas (2013) found that students in higher education reported that the constant connectivity afforded by mobile phones allowed them to increase their productivity.

Immediate connection with peers and instructors is possible as mobile learning allows users direct communication and dissemination of information whether it be text, email or video (Motiwalla, 2007). This just-in-time learning allows the learner access at a time that is appropriate to the learner (Seppälä & Alamäki, 2003), creating seamless-learning (Kukulska-Hulme, Sharples, Milrad, Arnedillo-Sanchez, & Vavoula, 2009). Cochrane and Bateman (2010) described how the use of mobile devices in one project-based course created a sense of connectivity with students, instructors and their clients by allowing for the constant and direct connection to the Internet to blog about work progress, share photos and communicate using instant messaging or text messaging. Gikas (2013) in a study of mobile phone use in higher education found that students reported positively on the affordance of immediate access to the internet for information.

However, this increased agency can create some conflict. The increase in autonomy of communication means it is more difficult to avoid responsibility such as responding to a message. In a Finnish study it was found that teenagers usually expected answers to their text messages within 15 to 30 minutes or else an excuse was expected (Kasesniemi & Rautiainen, 2002). No matter the situation it is now assumed that one is still reachable, so highly traditional asymmetries of social power and control, such as that of teacher and student, may again be accentuated (Kasesniemi & Rautiainen, 2002).

Control of the learning place, both physical and virtual is possible because of the ubiquitous presence of the mobile device. One crucial affordance of mobile learning is that because the devices used are small and can be carried

anywhere, learning is available to the user in a ubiquitous fashion (Chen, Chang, & Wang, 2008; Churchill & Hedberg, 2008; Naismith et al., 2004). Another way to view this is to say that learning can occur wherever the learner is, because it is the learner that is mobile, rather than the technology they carry (Sharples et al., 2005).

The idea of ubiquitous computing first appeared from contemplation of the place of the computer in actual activities of everyday life, such as work (Lave & Wenger, 1991; Suchman, 1987). Mark Weiser, an important early figure in ubiquitous computing, stated that human–computer interaction would be more natural in a ubiquitous computing environment than in current computer environments (Weiser, 1993). He believed that building a ubiquitous learning environment would require a “ubiquitous” learning device accessible by every learner at all times. He predicted that ubiquitous computing would require a new kind of relationship of people to computers, in which the computer would have to become better at getting out of the way so people could just go about their lives (Weiser, 1993). Mobile phone are this ubiquitous device, allowing education to return to the home, workplace, and community (Kukulska-Hulme & Traxler, 2005). Mobile technologies enable learners in any location to find, identify, manipulate and evaluate existing knowledge (Brown, 2005).

Control of the content is in the form of autonomy over the dissemination of information whether it be text, email or video. Mobile applications allow the user to control and filter the information flow and communication through the device because it is personalized and individualized (BenMoussa, 2003).

Control of goals in both the short term and long term objectives of learning. Learners can adapt the handling of information to build their skills and knowledge to meet their educational goals (Sharples, Taylor, & Vavoula, 2007). Some researchers report that learners often find informal activities more motivating than learning in formal settings, such as schools. They report that this may be because the students have more freedom to define tasks and relate activities to their goals as well as control over those goals which mean that intrinsic motivation is likely to be high (Jones, Issoff, & Scanlon, 2007).

Customization of learning is possible with mobile devices and can be at the tool level and the activity level. At the tool level learners experience an increased feeling of intimacy and convenience when using their mobile device (Kearney, Schuck, Burden, & Aubusson, 2012). Research in mobile learning has indicated that users are more engaged with mobile devices they can use out of school (Crawford, Vahey, Lewis, & Toyama, 2002). People value data more when it is stored on personally owned devices rather than borrowed ones (McFarlane, Roche, & Triggs, 2007). Users with access to their data had a sense of control and ownership of learning (Scanlon, Jones, & Waycott, 2005). Ownership of learning has been highlighted in research on motivation (Brown, 1988). Likewise, ownership has also been identified as a key motivational feature of mobile learning (Armitage, Wilson, & Sharp, 2004; Garrett, 2011; Jones et al., 2007; Savery, 1998). Mobile devices and mobile applications increased students' perception of their confidence with course content (Heath et al., 2005).

Mobile phones lend themselves to customization by emphasizing aesthetic and interactional features such as choosing individual colours, ringtones, display images, and gender-related personality profiles (Skog, 2002). Having the appropriate mobile device and using it for appropriate activities is viewed as being a critical part of constructing an identity for young mobile users (Jones, Issroff, Scanlon, Clough, & Mcandrew, 2006). A 2010 survey conducted of 200 iPhone using Stanford University students characterized the students as digitally obsessed and addicted and further explained that most slept next to their mobile devices (Keller, 2011). Alexander (2004) describes mobile devices as prosthetics; allowing increased information collection, memory, and creativity.

However, there are some limitations on the amount of customization available on mobile devices. Small keyboards and limited document editing capabilities may limit mobile academic activities (Shudong & Higgins, 2005) which suggests that student mobile activities with limited typing requirements may be ideal for mobile learning. Waycott (2004) used an activity theory approach to analysing the way in which learners use and adapt mobile devices for activities in different settings. Her analysis revealed a two-way process in

which the user adapts the tools they use according to their everyday practice, prior expectations and preferences in order to carry out their activities and then in turn, the tools change the user's activities. For example, in order to 'fit' the use of PDAs into their every-day preferred practice and to cope with the usability constraints of the mobile device, they used it as a complement to the desktop computer so that entering text was not so difficult.

The majority of mobile learning takes place on devices that were not designed with educational applications in mind, so usability is often an issue (Keinonen, 2003; Kukulska-Hulme, 2007). However, it is a testament to the scope and use of the devices that they can expand to fulfil many emergent educational needs (Gilbert, Sangwan, & Ian, 2005).

There is also customization at the activity level with individually tailored activities leading to ownership of learning (Traxler, 2007). Learning takes place in a wider social and economic context, which means students are under a range of pressures, most obviously those of time, resources, and conflicting competing roles (Traxler, 2007). Mobile learning allows these students to exploit small amounts of time and space for learning, to work with other students on projects and discussions, and to maximise contact and support from tutors (Traxler, 2007).

2.6.3.2. *Authenticity*

Authentic learning provides real world relevance (Radinsky, Bouillion, Lento, & Gomez, 2001). It can be defined in terms of a) tasks, b) roles, and c) context (Herrington, Reeves, & Oliver, 2009).

Authentic learning implies that learning should be based around authentic tasks (Traxler, 2007) which are learning activities where students can work with problems from the real world (Brown & Collins, 1989). The authenticity of these activities is in the relations that the learner perceives between the practices they are carrying out and the use value of these practices (Barab, Squire, & Dueber, 2000). This type of learning involves real-world problems and projects that are relevant and interesting to the learner (Traxler, 2007). At the same time, they are

ill-defined so require the students to define the tasks and sub-tasks needed to complete the activity (Cinque, 2013). Inquiry Learning is an example of this in which students direct an investigation of virtual or real phenomena from which they can formulate questions, plan activities, and draw conclusions. The museum visit is a typical context for learning by inquiry (McLeod & Kilpatrick, 2001). In the MyArtSpace project, children used mobile phones to explore museums and collect audio, photo, and text notes related to museum content which were discussed later in class (Vavoula, Sharples, Rudman, Meek, & Lonsdale, 2009).

Roles of the learners are essential to authentic learning because it requires examination from multiple perspectives, and collaboration and reflection which are supported by scaffolding (Cinque, 2013). Learners should be engaged in exploration and inquiry (Traxler, 2007) which is participatory and embedded in the a community of practice (Kearney et al., 2012). Building a sense of community among students is a challenge, but mobile phones increase possibilities to engage in informal learning not tied to a particular physical location like a library, computer lab, or classroom (Attewell, 2004; Naismith et al., 2004). Community of practice are formed when individuals work together for a shared pursuit, learning by interacting with each other and the world (Lave & Wenger, 1991). Over time the collective learning results in practices that reflect both the shared pursuit and the social relations and these form a type of community (Wenger, 1998). For a community of practice to function it needs to develop a shared set of ideas, commitments and memories (Wenger, 1998). It also needs to develop various resources such as tools, documents, routines, vocabulary and symbols of the community. It involves practice that is made up of the ways of doing and approaching things that are shared to some significant extent among members.

The convergence of sources, tools, functions, and media in the mobile phone brings the world to the user so changing the context from stable to mobile (Pachler, 2010). This increase in the diversity of use across contexts supports the individualization and hinders the formation of well-established rules. Mobile phones can provide authentic, realistic, and relevant learning across context that

are physical, technological, conceptual, social and temporal (Cinque, 2013; Kearney et al., 2012; Kukulska-Hulme et al., 2011; Sharples, 2000). Mobile learning is learning across multiple contexts, through interactions that are social and content while using electronic devices (Compton, 2013). When thinking of mobile learning it is better to separate it from e-learning and think of it as seamless learning space with learning continuing across different scenarios and contexts (Looi et al., 2010).

Context is central to mobile learning as it is continually created by people in interaction with other people, with their surroundings and everyday tools (Kukulska-Hulme et al., 2011). Learning takes place in meaningful surroundings that are likely outside the classroom and in the student's surroundings or environment at a time appropriate for them (Motiwalla, 2007). This change in surroundings means that learning and information seeking activities extend into the natural, authentic, and contextual situations of an individual's personal life (Sharples, Corlett, & Westmancott, 2002).

Mobile learning is uniquely suited to support context-specific and immediate learning since mobile technologies can situate learners and connect learners (Traxler, 2007). Examples of its application are mobile technologies on field trips providing information about surroundings or in a museum to provide information about exhibits. Goh and Kinshuk (2006) used a system that adapts based on the device allowing both computer and mobile platforms. They found that mobile learning can complement e-Learning by creating access anywhere, anytime to content. This access means the learner has more options about when and what resources to access, so making the learning process more authentic and learner centred (Valk, Rashid, & Elder, 2010). Sharples et al.(2002) studied 219 seven to eleven year old students, evaluating the use of mobile devices to support children's contextual learning through capturing images, sounds, and notes about the world around them and then to create a visual knowledge map. Results suggest that mobile learning is strongly mediated by contexts such as time, location, goals, interests, motivation, peers, resources, and trajectory to a higher degree than in a formal academic setting. In addition, using mobile

learning in higher education and reinforce the concept of knowledge acquisition across contexts and environments (Ruta et al., 2010).

Learning is situated so it may take place in appropriate and meaningful contexts (Lave & Wenger, 1991). Situated learning was introduced as a concept of how learning occurs within a community of practice (Wenger, 1998). The community of practice in turn is a model of how learning may take place in a social context, with the participants who have some common aim and are working together towards those aims. The community of practice concept arose from the work of Lave and Wenger (Lave & Wenger, 1991) to understand how newcomers to a field improve their knowledge and understanding, for example, the training of apprentices. The viewpoint is that learning occurs in the same context in which the knowledge will be applied. A mobile device's suitability in this context because its portability can enable it to provide materials in almost any location the user is in. Choi and Hannafin (1995) argue that Situated learning methods encourage everyday cognition by grounding knowledge and skill in realistic contexts. So, learning activities—whether formal or informal—that embed authentic problems and contexts can be considered situated. However, defining an authentic experience is challenging since playing a video game can be just as authentic and motivating for students as studying a 'useful' topic.

Traditional classroom learning takes place in a relatively stable context in a fixed location with common resources, a single teacher, and agreed upon curriculum that is maintained from day to day. However, if these are removed, a fundamental challenge is how to form stable context to enable meaning making from the flow of everyday activity (Kukulska-Hulme et al., 2011). Luckin (2010; 2011) acknowledges that pre-fabricated learning contexts are increasingly being replaced by learner-generated contexts within which learners pull together available resources to meet their needs. The challenge, she contends, is to scaffold the creation of effective learner generated contexts. However, learning across contexts and at different times may produce fragmented knowledge and incomplete schemata (Tella, 2003; Traxler, 2010a). It is important the mobile

learning is not limited to learning on the move, but as part as a continuum of learning that combines the use of multiple devices (Cinque, 2013).

2.6.3.3. *Collaboration*

Learners have available to them shared conversational spaces mediated by mobile phones (Laurillard, 2007; Sharples et al., 2007). Students should have opportunities for social discourse (Traxler, 2007) which requires the negotiation of meaning (Vygotsky, 1978). Mobile learning enables these conditions to be met, allowing learning tasks built around collaboration and data capture since the mobile tools allow recording organizing and reflect on learning (Liaw et al., 2010; Naismith et al., 2004; Patten, Arnedillo Sánchez, & Tangney, 2006).

Vygotsky's concept of the ZPD could also be applied here in considering collective ZPD: for example, a community can help and support an individual to develop. This scaffolding, or learner support, is improved when learners can access course content, as well as interact with instructors and student colleagues wherever they are located (Cavus & Ibrahim, 2008; Kukulska-Hulme & Shield, 2008) In addition, mobile phone allow timely, personal feedback from teacher and peers (Chen, Kao, Sheu, & Chiang, 2002).

Mobile learning also provides an opportunity for reflection. Reflection is often divided into two types including reflection in action-thinking while doing the activity assigned to them- and reflection on action-thinking of their learning during the course (Schön, 1983). Mobile learning uniquely supports spontaneous reflection and self-evaluation (Traxler, 2007). It can enhance learner metacognition, creative skills and learning behaviours such as problem-solving, self-correction, critical reflection, and active seeking of meaning (Cinque, 2013). It is important to understand how this all takes place and what part the mobile phone can play in encouraging reflection.

One proposed ubiquitous learning environment scaffolds learners via context discovery activities for information perception, scheduling and interaction (Trifonova & Ronchetti, 2004). Valk (2010) found that Asian learners engaged with constant connectivity were able to receive continuous feedback and

formative guidance, which is needed in facilitating a learner-centered environment. Nearly 70% students at a university in India were surveyed and agreed that mobile learning can be an effective learning method as it can provide immediate support and bring new opportunities for education (Fozdar & Kumar, 2007). In Saudi Arabia, 50% to 60% of students at a university agreed that mobile learning could be an effective method of learning and could give direct support and bring new opportunities for knowledge acquisition (Al-Fahad, 2009). Cinque (2013) reported that students in her study of mobile learning in a medical context developed the ability to work independently while still feeling protected because they could ask for help at any time.

Mobile learning allows for mobile data collection and sharing. Mobiles support transmission and delivery of rich multimedia content and the ability to create links to this content both inside and outside the classroom. They are providing a portable means of real-time electronic information gathering and sharing among others (Kim, Mims, & Holmes, 2006; Naismith et al., 2004). It is difficult to access textual or multimedia resources while in a confined space because books and other equipment can be too heavy or bulky to carry, so mobile devices provide the necessary information in practically any environment (Cinque, 2013). This capturing and recording of events encourages recall and reflection with other students and instructors (Corbeil & Valdes-Corbeil, 2007).

Mobile phone users have access to real-time data whenever and wherever they need it, such as note taking, imaging, audio recordings, videos, teacher lecture notes, books, encyclopaedias, simulations, worksheets and others (Chen et al., 2002; Lai, Yang, Chen, Ho, & Chan, 2007; Ng & Nicholas, 2009; Savill-Smith & Kent, 2003). Mobile collecting and submitting of data as helpful for knowledge building was demonstrated in a k-12 case study where students went on a field trip and were tasked to learn properties of various plants (Evagorou, Avraamidou, & Vrasidas, 2008). Likewise, immediate access to information at the bedside has been reported in mobile medical research as providing a convenient reference source for students (Cinque, 2013). In a study of mobile learning with higher education students in the U.S., students described

the ability to collect data and interact with content immediately as they came across it in their daily lives and how this was meaningful because they were able to post messages wherever they were during the day (Gikas & Grant, 2013).

The abundance of open content and freely available sites and software would suggest that there is a motivation to share information (Jones et al., 2007). Fisher (2006) used quantitative data to support the idea that mobile learning technologies can provide a platform for active learning, collaboration, and innovation in higher education. Conventional methods of collaborative communication with mobile phones are the simple message system (SMS), learner management systems (LMS), and social network systems (SNS).

In a Japanese study on SMS use to enhance English vocabulary, university students using SMS notifications to encourage vocabulary building performed significantly higher than those using paper desktop Internet access (Thornton & Houser, 2004). A study at a UK University (Stone, Briggs, & Smith, 2002) measured the effectiveness of an SMS campaign to gain insight into educational technology by measuring quickness of the response, the quality of data collected, the impact of message complexity on the number of responses, and the quality and quantity of messages, which demonstrated that students liked using SMS, the response rates were high, the quality of the messages was superb, and responses were also much quicker than email responses. The analysis of content in 388 short message service (SMS) messages for a mobile learning experiment over five weeks shows that SMS messages are helpful for activities relating to information, supervision and feedback (Seppälä & Alamäki, 2003). SMS has been successful in enabled students to access administrative and assessment information, as well as allowing academic staff the opportunity to 'push' assessment feedback, reminders and alerts to class groups (Richardson & Lenarcic, 2008). Mobiles enable sharing of of information, for example SNS, and pictures, but this is seen as one way enjoyment. So, in relation to sharing, an essential idea is the joint construction of knowledge and the culture of sharing or possession of knowledge (Jones et al., 2007).

The SoNeCS project (Cinque, 2013) used a learner management system to enhance social networks among students to support distributed participation amongst student. They could post comments, share pictures, reflect on what they were learning and share resources. An SNS is an internet based application, built on the Web 2.0 (O'Reilly, 2009) technological foundations, that allows the creation and exchange of user-generated content (Kaplan & Haenlein, 2010). Gikas (2013) reported in his study of higher education students that they would often use SNS to share thoughts with each other because Twitter was easier to log into so allowed them a faster exchange of ideas. When anonymous discussion is provided by the mobile devices learners engage in the discussion at a deeper level, because the focus remains on the content and not on the matter of answering incorrectly (Gikas & Grant, 2013). However, there is the added concern of the laws controlling information use on these sites (Rodriguez, 2011). In addition, some students do find the mobile phones a distraction because they can access their favourite sites (Gikas & Grant, 2013). Some of the mobile learning constraints are similar to areas of e-learning, including lack of contact between students and teachers, isolation issues, and technical support problems (Fozdar & Kumar, 2007). It is important to remember that the adoption of mobile technology is no guarantee of the adoption of mobile services (Liu, Han, & Li, 2010) and vice versa.

2.7. Summary

The affordances offered by the mobile phone have been investigated, but the nature of affordances means that every time a student uses the device there is a new opportunity for researchers to gain a deeper understanding of how this device can support learning. The mobile phone is a powerful tool with potential to provide many affordances to students. What are the affordances perceived by Japanese students collaborating in a second language? How do the students differ in their use of these affordances? Do these affordances have an effect on learning? Research question one emerged from this need to identify affordances

in the mobile phone technology - What is the distinctive affordance offered by the mobile phone for collaborative learning?

There is a need for better understanding of the affective relationship between the students, their mobile phone and homework. The intimate relationship that many students hold for their mobile phones has been identified, but there does not appear to be an effort to map the position of the device relative to other aspects of their lives or how this relationship changes with use. For these reasons, the second research question focuses on the affective relationship - What is the affective relationship between students the mobile phone and the homework?

Given the importance of situated learning(Lave & Wenger, 1991) it is meaningful for researchers to understand the process by which mobile devices, such as a mobile phone, allow students to interact with course content and other students across different contexts. This greater understanding will allow for the design of course materials that maximise the advantages offered by mobile technology. Researchers have recognized the potential for mobile phones to change the nature of the relationship between physical space and social space. This change has brought with it a blurring of public and private boundaries as students exploit this new freedom. However, it is still unclear what the impact of such fundamental changes will have on collaborative learning and learning in general. In addition, researchers do not have a full picture of what motivates students to exploit this new freedom to enhance their learning experience. These are complex and important topics for investigation so the third research question attempts to understand the impact of the collaborative intervention on student private and public spaces - Does the intervention affect the relationship between students, their mobile phones and their homework?

In addition, while there is much written about the potential of mobile devices to encourage reflection, there seems to be a shortage of evidence demonstrating this in the real world setting. Adding to the body of work in this area will provide a better understand of how mobile phones can encourage students to gain a deeper awareness of learning, so the fourth research question

focuses on this issue - Does the affordance offered by the technology lead to more awareness of learning?

There are few descriptions of how mobile computing devices and social media are used by university students (Gikas & Grant, 2013). It has been noted that education absorbs technologies which were never intended for educational purposes (Traxler, 2010b). Instructors should always be on the lookout for new technologies or mobile applications which have the potential to be used in education. This adoption of technologies has been taking place with mobile phones. In order to better understand the broader implications of adopting mobile phones for education the fifth research question was designed to capture any change caused by the adoption of this technology - What is the nature of the dialogue with the mobile phone technology?

3. METHOD

3.1. Chapter outline

The main focus of this chapter is to present the design of the research process. The methodology presented here is a case study design exploring the use of mobile phones to complete collaborative activities in a university setting. This study is an attempt to understand the impact of mobile phones on collaborative learning. This chapter is divided into six sections. Section one clarifies the design of the case study. Section two introduces the participants in the study. Section three outlines the ethical concerns related to the study and how these were controlled. Section four describes the actions taken to ensure the validity and reliability of the data collected. Section five explains the theory that informed the design of the mobile collaborative intervention and the intervention. Section six is a detailed explanation of the qualitative and quantitative data collection and analysis.

3.2. Study Design

Qualitative research through an exploratory multiple case study was adopted for a period of one academic year from April 2011 to March 2012. The purpose was to gain a deeper understanding of the processes and outcomes of the completion of collaborative learning activities through mobile devices by Japanese university students. The focus of a case study is the case or unit of analysis (Yin, 2009) and has been defined by Miles and Huberman (1994) as a phenomenon occurring in a bounded context. In this study, the unit of analysis was four groups of students, and the context was their participation in mobile collaborative activities within an EFL course on the topic of translation.

One common problem associated with case study research has been that researchers often attempt to answer questions that are too broad to be contained in one study. In order to avoid this problem, several authors including Yin (2009) and Stake (1995) have suggested placing boundaries on a unit of analysis to prevent this from occurring. Some suggestions on how to bind a case include by time and place (Creswell, 2007), time and activity (Stake, 1995) and definition

and context (Miles & Huberman, 1994). In this study, the unit of analysis was bound by time and activity. The time boundary was set at one academic year, and the activity boundary was limited to collaborative activities.

The selection of a particular type of case study design is related to the study purpose which could be to describe a case, explore a case, or compare between cases (Silverman, 2009). Yin (2009) has categorized case studies as explanatory, exploratory, and descriptive. An explanatory design is used when researchers seek to explain the presumed causal links in real-life interventions that are too complex for the survey or experimental strategies. An exploratory design is used to explore those situations in which the intervention being evaluated does not have a clear single set of outcomes. Moreover, the descriptive design is used to describe an intervention or phenomenon and the real-life context in which it occurred.

Stake (1995) identifies case studies as intrinsic and instrumental. In an intrinsic case study, according to Stake, the case itself is of interest, and it is an unusual and unique situation whose results will have limited transferability. In an instrumental design, the case is of secondary interest, and it can provide insight into an issue, a particular situation and phenomenon or help to refine a theory. This study used the exploratory instrumental design because the goal at the beginning of the study was to understand how students utilize mobile technology for collaborative activities, but the outcome was unknown to the researcher at that time.

The next important aspect of the design was to determine whether to use a single case study design or a multiple case study design. Yin (2009) has differentiated between single or holistic case studies and multiple-case studies which enables the researcher to explore differences within and between cases. Stake (1995) uses the term collective to refer to multiple case studies. Single case design looks at one case within a context or environment that is unique or extreme (Baxter & Jack, 2008). This single case design gives the researcher the ability to look at sub-units that are situated within a larger case. This ability is powerful when you consider that data can be analysed within the subunits

separately (within case analysis), between the different subunits (between case analysis), or across all of the subunits (cross-case analysis). However, this design allows for only one context which would not be sufficient for a study involving mobile technology use.

Alternatively, multiple case study design has been used when a study contains more than a single case. This design is often equated with doing multiple separate experiments the results of which are then compared as separate results, but not combined to form one result (Yin, 2009). This design can have many contexts unlike the single case study with embedded units which only allows the researcher to know one unique, extreme, or critical case. Since a multiple or collective case study allows the researcher to analyse within each setting and across settings so it was considered more appropriate for the study of mobile learning use. In a multiple case study, the researcher examines several cases to understand the similarities and differences between the cases. The evidence created from this type of study is considered reliable, but it can also be extremely time-consuming and expensive to conduct (Yin, 2009).

This study used a multiple case study design because the context of the study allows for several identical case studies in parallel, and the added reliability was a great advantage when considering the qualitative aspects of the research. All participants were students in a translation studies course which was divided into four separate classes. One case study group was formed from each class to make a total of four case study groups with between five to eight members. All activities and environmental factors remained constant across all of the case study groups.

3.3. Participants

The population of interest to which the results of this study was generalized was a population of Japanese university students that were studying English as a foreign language. The students were all aged between the ages of 18 and 20 years of age, and were all living in Japan. Four groups of between five to eight participants were selected from second-year undergraduate students at a

Japanese university on a voluntary basis (Patton, 1990). The university was a four-year private university in Tokyo, Japan.

Three steps were involved in the student selection process. First, fifty potential students were introduced to the research project during two orientation classes. Interested students were asked their class to confirm that they were in one of the translation courses eligible for this study. They were also to confirm the ability of their mobile phone to access to the mobile website and perform the online task required for the collaborative activities. These activities included reading and posting messages to the website forum page.

Second, brief interviews were conducted to finalize the sampling process. The preliminary criteria for student selection were formed from a review of the literature (Song & Fox, 2008) and included: a positive attitude towards technology use to increase the chance that they would make good and frequent use of the mobile technology to complete the collaborative tasks; a positive attitude towards their academic studies to make sure that they would be motivated throughout the study; a constant presence in Japan during the one academic year of the study decreased the possibility of an interruption in data collection; nationality homogeneity focused the examination on Japanese students; experience in using the various mobile phone functions to ensure that they would be able to use the mobile website; and that the mobile phone of all participants had access to the functions required by the website. A gender balance of males and females was attempted but was not possible due to the high percentage of female students in the school. Group one contained 5 girls and 2 boys, group 2 contained 8 girls, group 3 contained 6 girls, and group 4 contained 6 girls.

One explanation for the gender imbalance in the sample caused by the small number of male students in the department can be explained by the greater tendency of Japanese males to go into technological and business related fields. This can be seen in Figure 3 on page 58 created with data from the Ministry of Education, Culture, Sports, Science and Technology (NWECC, 2013). In 2012 of the 1,134,515 students who graduated from high school in Japan, 10,994 (9,080

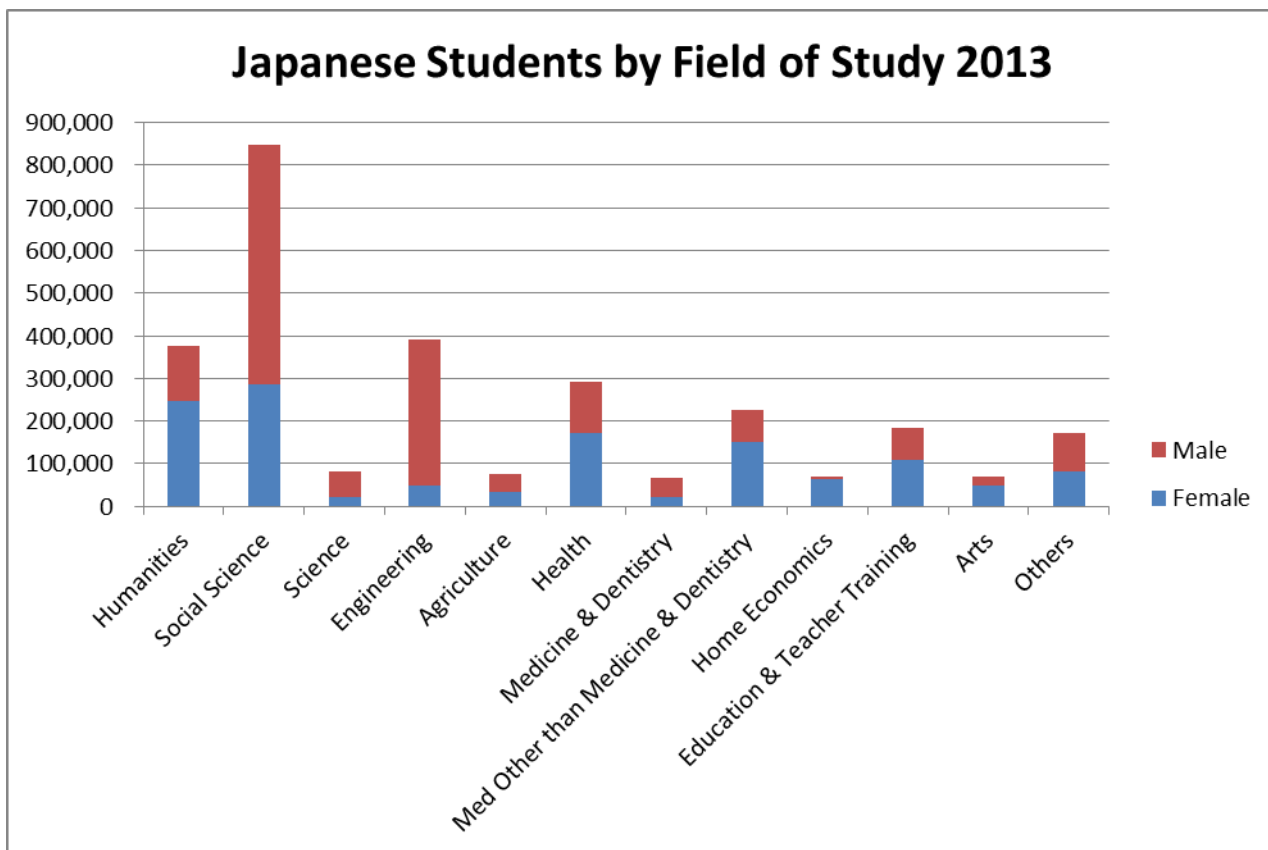


Figure 3: Japanese Students by Field of Study 2013

male and 1,914 female) went on to technical colleges, and 64,063 went on to three-year colleges (7,073 male and 56,990 female)(MEXT, 2014e). Since the students who took part in this research were all studying English as their main subject, this data suggests that it is not unusual for there to be a higher percentage of female students.

3.4. Ethical procedures

A consent letter included in Appendix I, containing terms and conditions for participating in this project was given to the participants. All participants were required to make use of their mobile phone. The participants were made aware of the mobile connection cost and only those students having fixed rate unlimited data transfer agreements with their service providers were allowed to participate. They were also advised that they may withdraw at any time without

consequences. They were informed that participation in the study had no effect on their course grades. It was made clear to them that they were allowed to access the website from a computer or mobile phone just as all non-research participants. All data was stored in an encrypted form and no personally identifiable information such as name or school were published. In the final paper, only the group and first name of the members were used where the capital letter “G” was followed by a group number and underscore and the first name. For example, Ayaka from group one was identified as G1_Ayaka. They were only told in the most general terms what the research focus was in order to minimize the chance of a participant trying to affect the results.

3.5. Validity and Reliability

There are four tests that are common to all social science research and include construct validity, internal validity, external validity, and reliability (Yin, 2009). Construct validity is the identification of correct operational measures for the concept being studied. A frequent criticism of case study research is that it fails to develop a sufficiently operational set of measures and that judgments concerning data collection are too subjective (Yin, 2009). So, it is important to define observations in terms of specific concepts and relate them to the original objectives of the study. These concepts should be matched to operational measures based on a literature review of studies that make the same matches (Yin, 2009).

This study is concerned with Mobile Learning with a focus on Collaborative Learning; the specific measure is participant observations and interviews. Here the objective of the study is concerned with mobile education. The specific concept is collaborative learning that is related to the original object of mobile learning by focusing on collaborative learning in mobile education. Mobile collaborative learning is in turn matched with the operational measure of participant observations and interviews. Construct validity may be increased through the use of multiple sources of evidence and the establishment of a chain

of evidence during the data collection period, and during the composition phase review of the draft of the case study report (Yin, 2009).

Internal validity refers to explanatory or causal studies only which seek to establish causal relationships. This validity consists of doing pattern matching and explanation building, addressing rival explanations, and using logic models during the data analysis phase (Yin, 2009). Since this case study is not an explanatory one the discussion of internal validity will be limited.

External validity is the definition of the domain to which the study's findings can be generalized. It is a common criticism of case studies that single cases are not sufficient for generalizing to a larger sample of the population. However, this analogy is incorrect because case studies rely on analytical generalization and not statistical generalization (Yin, 2009). So, case studies are generalized to a pre-existing theory which acts as a vehicle for examining other cases.

Reliability demonstrates that the operations of the study can be repeated. It represents an attempt to minimize errors and biases in the study. Reliability can be improved through the use of case study protocol and development of a research database (Yin, 2009). In this study, reliability was improved by maintaining a database of all student online activities. The data from each group was treated in an identical manner. In addition, the interviews took place in the same location and were of equal length.

3.6. Theoretical Base

3.6.1. *Socio-Cultural Theory*

According to Kuutti (1996), Hegel provided the philosophical foundation for Socio-Cultural Theory, which consists of an emphasis on both the historical development of ideas, as well as the active and constructive role of humans. In addition, the philosophy of Marx and Engels contributed the idea that as humans transform nature they are themselves transformed in the process (Kuutti, 1996). As with Marx and Lenin, Soviet psychology in general rejected the view that consciousness was present in every mental state and independent of historical

development. Instead, they saw consciousness as the highest form of reflection of reality that is not given in advance but shaped by activity and used by humans to adapt to and restructure conditions (Luria, Cole, Solotaroff, & Lopez-Morillas, 1976).

Many of the key ideas that led to the development of Socio-Cultural Theory came from a Russian psychological researcher by the name of Lev Semyonovich Vygotsky, who lived in Russia from 1896 to 1934 (Kozulin, 1998). Vygotsky distinguished between the Internal (mind) and the external (physical) dimensions (Kaptelinin & Nardi, 2006; Vygotsky, 1986). He proposed that there are '*natural psychological functions*' such as perception, memory, and attention common to all animals, as well as '*higher psychological functions*' which are unique to humans. In addition, he demonstrated through experiments that there is a process of '*internalization*' that progresses from these natural psychological functions through to the higher mediated psychological functions and finally to internalized mediation. Vygotsky's third key concept was that of the '*Zone of Proximal Development*' (ZPD), which represents the distance between assisted performance and unassisted performance.

The metaphor of scaffolding has been used to describe the way in which more knowledgeable teachers and peers provide tools and assistance to support learning (Lipscomb, Swanson, & West, 2001; Stone, 1998; Wood, Bruner, & Ross, 1976). Here more knowledgeable means someone who has a better understanding or a higher ability level than the learner with respect to a particular task, process, or concept (Berge & Muilenburg, 2013; Lipscomb et al., 2001). The goals of scaffolding are the teaching of specific knowledge and skills, developing intellectual habits, and developing motivational and effective outcomes (Hogan, 1997). Until recently, scaffolding has only been used in face-to-face learning because it required one-to-one communication that was just-in-time, just-enough, just-for-me, and just-in-case help (Ozan & Kesim, 2013).

Vygotsky (1986) claimed that human behaviour, or acts, could be divided into "*natural forms*" and "*artificial forms*." He saw natural forms of behaviour as "lower level" natural mental processes such as will, memory, attention, and

perception which are common to all humans (Kozulin, 1998). Moreover, which develop as a result of maturation, practice, or imitation (Kaptelinin & Nardi, 2006). These natural mental processes represent the direct associative connection of stimulus to response where the stimulus can play the role of the object (Vygotsky, 1986). Alternately, “artificial” forms of behaviour, or psychological tools, develop through social interaction and in their external form can include such things as signs, symbols, language, formulae and graphic devices (Kozulin, 1998). These psychological tools, as he called them, (Vygotsky, 1986) are an intermediate link inserted into the behavioural act transforming it into an intellectual operation.

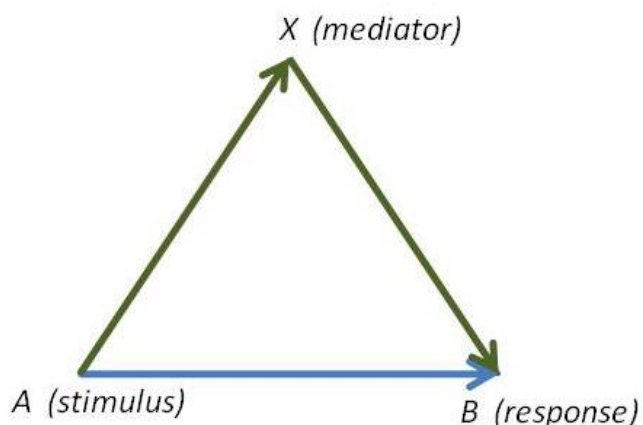


Figure 4: Vygotsky's Simple Mediation Model

Mediation or *mediated action* in Vygotsky's theory refers to the idea that human beings' interactions with their environment are not direct but instead are mediated through the use of tools and signs (Vygotsky, 1986). This concept is typically expressed using the basic mediational model Figure 4 on page 62. This model is in the form of a triangle with the points labelled as "A," "B," and "X". It represents Vygotsky's original model of activity where "A" represents the stimulus and "B" the response in a simple stimulus-response system which Vygotsky called the natural psychological functions (represented by an arrow from A to B in Figure 4 on page 62). The "X" represents Vygotsky's concept of a mediator as introduced above, which is placed between the stimulus and the response. The mediator is any tool or artefact unique to humans which act to mediate natural

psychological functions (represented by the arrows from A to X to B in Figure 4 on page 62) in a cultural environment (Kaptelinin & Nardi, 2006). So what was at first a natural mental process is transformed into an instrumental act (Vygotsky, 1986), which is a mental process that is mediated by culturally developed tools or artefacts. These mediated mental processes are higher mental functions. Humans have developed an enormous number of tools or artefacts to mediate their relationship with the world, and they can be either physical or psychological. Physical tools are easily recognized, for example, a hammer, and mediate external activities that are intended to affect things directly. While, psychological tools, such as maps or language, are intended to affect others or ourselves (Kaptelinin & Nardi, 2006). Psychological tools are further subdivided into physical artefacts, such as art or maps, and symbolic artefacts, such as language or number systems. (Kozulin, 1998).

Vygotsky (1986) performed empirical experimentation using double-stimulation and found that when people used externally mediated tools for a task they eventually stopped using the tool but at the same time their performance increased. It is this transition from no mediation to external mediation and finally to internal mediation that he called internalization (Kaptelinin & Nardi, 2006). Due to internalization, the previously external process now takes place internally in the mind. These internal activities can impact the world only through external activities. Kaptelinin et al. (2006) use the example of a child who at one time used her fingers to count, and then due to the internalizing of calculations in her head, discovers one day while shopping that due to the limited amount of money in her pocket she must buy fewer candies than originally planned.

However, Pachler et. al. (2010) recognize the need to reconsider Vygotsky's view of child development and the internalization of cultural products in order to match learning with meaning-making in disparate and fragmented situations. They refer to these new situations for meaning making as Socio-Cultural Milieus (Pachler, 2010) where students are also encouraged to draw, write, talk to others or talk to themselves in order to help move them toward

being independent learners. Tools that persist in the lives of students such as calculators and mobile phones provide a continuous form of scaffolding.

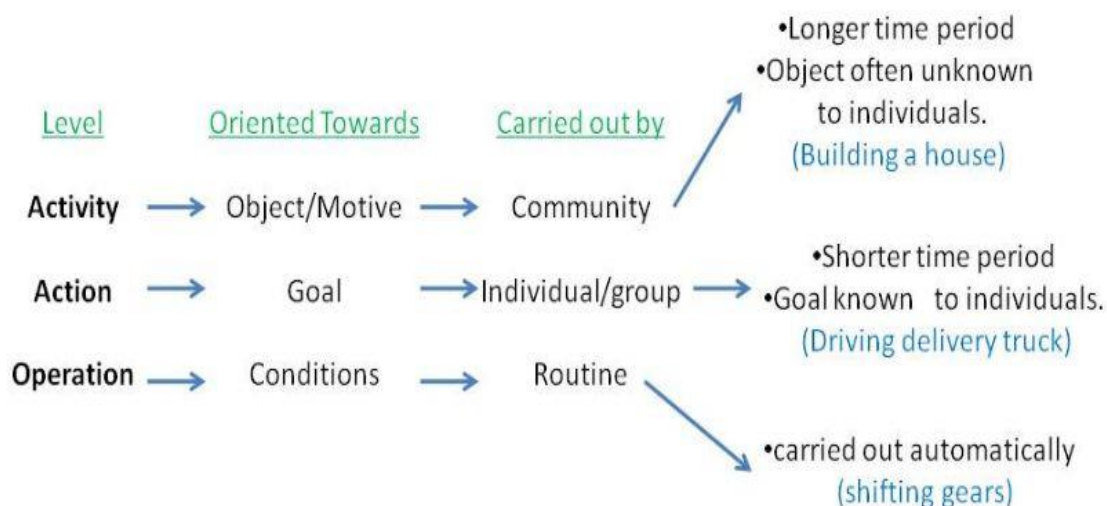
3.6.2. Activity Theory (AT)

These ideas from Vygotsky were then reformulated into Activity Theory in which the unit of analysis is refocused upon the activity instead of the individual (Nardi, 1996). Activities are a form of doing directed at an object, so they are distinguished from each other by their objects (Kaptelinin & Nardi, 2006; Kuutti, 1996). Leont'ev (1978) who was one of the architects of AT (Nardi, 1996) expanded on Vygotsky's triangular basic mediation model (Figure 4 on page 62) and created a hierarchical model for analysing an activity that became the well-known three-level model of activity. The "A" and "B" of Vygotsky's model have been replaced by *subject* and *object* in the expanded model. An activity is composed of a subject, object, and a mediating tool. Here, the subject is usually plural in activity theory such as a group engaged in an activity. An object represents the objective held by the subject, and transforming the object into an outcome is considered the motivation for the action (Kuutti, 1996), providing it with a definite direction. Mediating tools, as in Vygotsky's original model, could be physical tools or psychological tools. One of the strengths of AT is its emphasis on the object-oriented nature of education where the object represents the curriculum that the teacher has a responsibility to deliver (Wegerif, 2007). Wegerif argues that education is not only object-oriented, for example examinations, so he is critical of AT when applied to the whole of education.

Leont'ev (1978) further extended the theory to better separate individual action from collective action. As earlier, Leont'ev described an activity as being composed of subject, object, and tools, but he also adds a distinction between *activity*, *actions*, and *operations* (Nardi, 1996).

This distinction forms three levels of activity (Figure 5 on page 65), the first level consisting of *activity* and *motive*, the second level *action* and *goal*, and the third level *operation* and *conditions* (Kuutti, 1996). The first level activity, as mentioned above, is the basic unit of analysis which includes the minimal meaningful context for individual actions (Kuutti, 1996). In the next level, actions

Figure 5: Leont'ev's Three Levels of Activity



are goal oriented and are required to fulfil the object (objective) of the activity. In order to better illustrate this level, Leont'ev (1978) uses the example of a primeval hunt including a subject consisting of beaters and hunters. Both the beaters and the hunters share the same activity (level 1) which is the hunt, one object of which is to get food. However, the beaters' action (level 2) is to scare the animal away which is not immediately directed at obtaining the object of the activity (food). So the goal of an action does not directly coincide with the object of the activity (Leonti'ev, 1978). This coordination indicates a shared meaning of the actions by the participants and therefore a conscious division of its social nature (Tolman, 1994). The third level, operation, is an aspect of actions that refers to the way in which they are actually carried out. When the goal of an action can no longer be discerned by the subject because it has become an unconscious routine through practice, then it becomes an operation (Leonti'ev, 1978). In other words, when the action has been practiced enough, the

orientation or planning phase will fade, and the action moves to the level of operation.

These constituents of Leonti'ev's activity theory include an overall activity motivated by an object, an action directed towards a goal, and operation that depends on the conditions. It should be noted that all of these three levels can move up or down (Leonti'ev, 1978). Kuutti (1996) uses as an example the construction of a house to illustrate the three levels. First, the activity level has the motive or objective of building a house. Second, the action level has the goal of completing the roofing or transporting bricks by truck. Finally, the operation level includes the unconscious action of changing the gears of the delivery truck carrying the building materials.

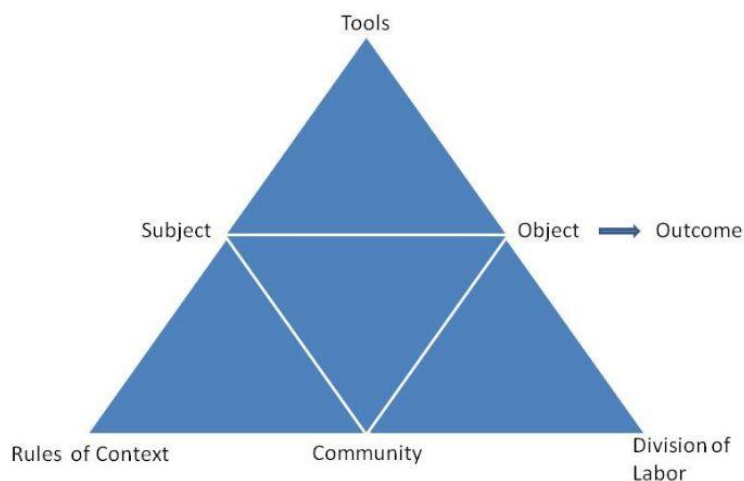


Figure 6: Engeström's Expanded Activity Theory Model

Engeström (1987) further expanded the Leont'ev activity triangle model and emphasized the importance of analysing breakdowns or contradictions in the interactions of elements in an activity system as a means of expanding and transforming the system and developing human practices (Figure 6 on page 66). His idea of learning as transformation and expansion is explicitly dialectical and is appealing to many because it places learning in real changes in communities and practices, rather than in the heads or habits of individuals (Wegerif, 2007). His development of the Activity Model added three additional nodes; *Rules*, *Community*, and *Division of labour*. His theory of expansive learning or learning

through participation in joint activities involves collaborative questioning and analysing of existing practices to allow generation of new possibilities (Engeström, 1987).

Engeström's dialectic view which asserts that change, learning and creativity are necessarily caused by prior contradictions brings it into conflict with the dialogic perspective. Where the dialectic starts with an initial non-contradictory identity (thesis) within which a contradiction (anti-thesis) appears calling for a new form of harmonious or non-contradictory (synthesis) identity (Wegerif, 2007). However, from a dialogic perspective any identity has inner contradictions but these are viewed as normal and something with which people must learn to live (Wegerif, 2007). Wegerif argues that education is more than is represented in Leontiev's hunter analogy – it is not mediated object-oriented activity, but an end in itself which has no need for synthesis.

Engeström's model contains three mutual relationships between *subject*, *object*, and *community*. These relationships are mediated; subject and object are mediated by *tools*, subject and community are mediated by *rules*, and object and community are mediated by *division of labour* (Kuutti, 1996). Kuutti (1996) describes these three mediators as follows: A tool can be anything, material or mental, which is used in the transformation process from object to the outcome. Rules are the explicit and implicit norms, conventions, and social relations in the community. Division of labour is the explicit and implicit organization of all those related with the transformation of the object into the outcome.

A criticism of this system is that it assumes in advance that the ontological categories of any activity system are participants, objects, tools, augmented by rules, communities, and division of labour, but this model of reality may not be shared by all participants (Wegerif, 2007). While these categories have been found to be relevant in work-based settings, in social contexts the imposition of this system may be seen as forced. Participants may have their own distinct and hard to translate division of reality, such that subject, tools and objects may have little meaning to them (Wegerif, 2007). In order to illustrate this point, Wegerif (2007) uses the example of a Tibetan priest becoming possessed by the spirit of

a god. The participants may have thought that the god was the subject and the priest the tool, but an activity theorist would see it the other way around. In summary, AT can be explained as, a subject uses mediating artefacts (psychological tools), which are either physical (embodied) or symbolic (conceptual) and either enabling or limiting, with the motive of transforming an object in order to achieve an outcome. The Subject is influenced by rules of context which include explicit and implicit norms, conventions and social relations. The community and division of labour represent the explicit and implicit organization of the community in relation to the transformation of the object into an outcome.

In AT the notion of 'context' is the activity itself, enacted through an activity involving people and artefacts, so what takes place in the activity system composed of objects, actions and operations is the context (Nardi, 1996). "Context is not an outer container or shell inside of which people behave in certain ways...People consciously and deliberately generate context" (Nardi, 1996).

Based upon Vygotsky's socio-cultural psychology and Leontiev's developmental psychology (Pachler, 2010), AT posits that conscious learning emerges from the activity, not as a precursor to it. This idea provides an alternative way of viewing human thinking and activity (Jonassen & Rohrer-Murphy, 1999). AT is not a methodology but a "...philosophical framework for studying different forms of human praxis as developmental processes, both individual and social levels interlinked at the same time" (Kuutti, 1996) AT is a powerful and clarifying descriptive tool rather than a strongly predictive theory (Nardi, 1996).

3.6.3. Activity-Oriented Design Methods

Activity-Oriented Design Methods (AODM) was designed as an analytical and practical approach for applying fundamental concepts of AT (Nwanza-Simwami, 2009). This method is made up of four methodological tools designed to support the design of systems. In this study four AT based methodological

tools are used to identify some of the weaknesses of the procedure of the homework collaborative activities. The four parts of the model (Nwanza-Simwami, 2009) include:

1. Eight-step model: used to translate the various components of the Engeström model of activity theory in terms of the situation being studied.
2. Activity Notation: reduces complexity in activity analysis by facilitating the modelling and decomposition of activity systems through the production of sub-activity triangle models.
3. Technique of generating research questions: used to operationalize sub-activity triangles to support data gathering and analysis.
4. Technique of mapping operation processes: used to interpret and communicate research findings

The first AODM methodological tool is the Eight-Step-Model and is used to translate the various components of Engeström's model in terms of the situation being examined (Nwanza-Simwami, 2009). This model entails working through a table to gather and analyse data that will provide initial information about the activity and the context. This chart consists of eight steps each of which identify one part of the activity. Step 1 is the activity of interest that in this study is the education of the students. Step 2 is an object or objective of the activity that motivates the activity, which in this study is to allow the students to collaborate face-to-face and to share their answers with the group in order to increase their confidence in using English. Step 3 is the subject or who will be carrying out the activity that in this case means the members of the groups involved in the activities. Step 4 is the tools by which the participants perform the activity and includes tools such as mobile phone, computers and electronic dictionaries. Step 5 is the rules and regulations such as cultural norms, and rules or regulations governing the activity. In the case of this study the rules are that the students must work together in small groups communicating only in English to share answers in order to produce a single group. Step 6 is a division of labour, meaning who is responsible for what part of the activity. In this study the roles are administration provided by the university, activity infrastructure is maintained

and organized by the instructor, the topic flow is organized by the instructor, the research is the responsibility of the instructor, and the completion of the activities are the role of the students. Step 7 is the community that is the environment in which the activity is carried out and in this study includes university administration, instructor, researcher, and participants. Step 8 is the desired outcome from carrying out this activity, which is that the participant students will gain a greater sense of confidence in using English.

The second methodological tool is Activity Notation. This tool enables the decomposition of the main activity system into sub-activity triangles that reduce the cognitive complexity when analysing an activity system, facilitates the analysis of relationships within and between the various components of the main system so as to identify contradictions, and facilitates a detailed and more focused analysis by generating questions based on sub-activity triangles (Nwanza-Simwami, 2009). This tool can be seen as having two parts, each corresponding to either participant of the activity or the community of the activity. Both participants and community can have three possible links through the mediators, which include tools, rules and division of labour, through to the objective. This tool gives the following six paths to the objective:

subject	– tools	– objective
subject	– rules	– objective
subject	– division of labour	– objective
community	– tools	– objective
community	– rules	– objective
community	– division of labour	– objective

The third methodological tool is the generation of questions. The technique of generating questions is used to operationalize sub-activity triangles resulting from the decomposition process to support data gathering and analysis. The first question template in this tool is “What *tools* do the *participants* use to achieve their *objectives* and how?” In this study, the tools consist of the mobile phone and any affordances they provide. The participants are the students doing the activity, and the objective is the formulation of an answer to the assigned question through collaboration.

The fourth AODM methodological tool is Mapping Operational Processes (Figure 7 on page 71). This tool allows for a clear view of the entire activity system and to identify any conflicts that occur between the sub-triangles (Nwanza-Simwami, 2009). This step is done after the activity; once the research questions have been answered. Conflicts are indicated by arrows connecting the sub-triangles that are in conflict that allows the researcher to make the necessary changes needed to minimize the conflict.

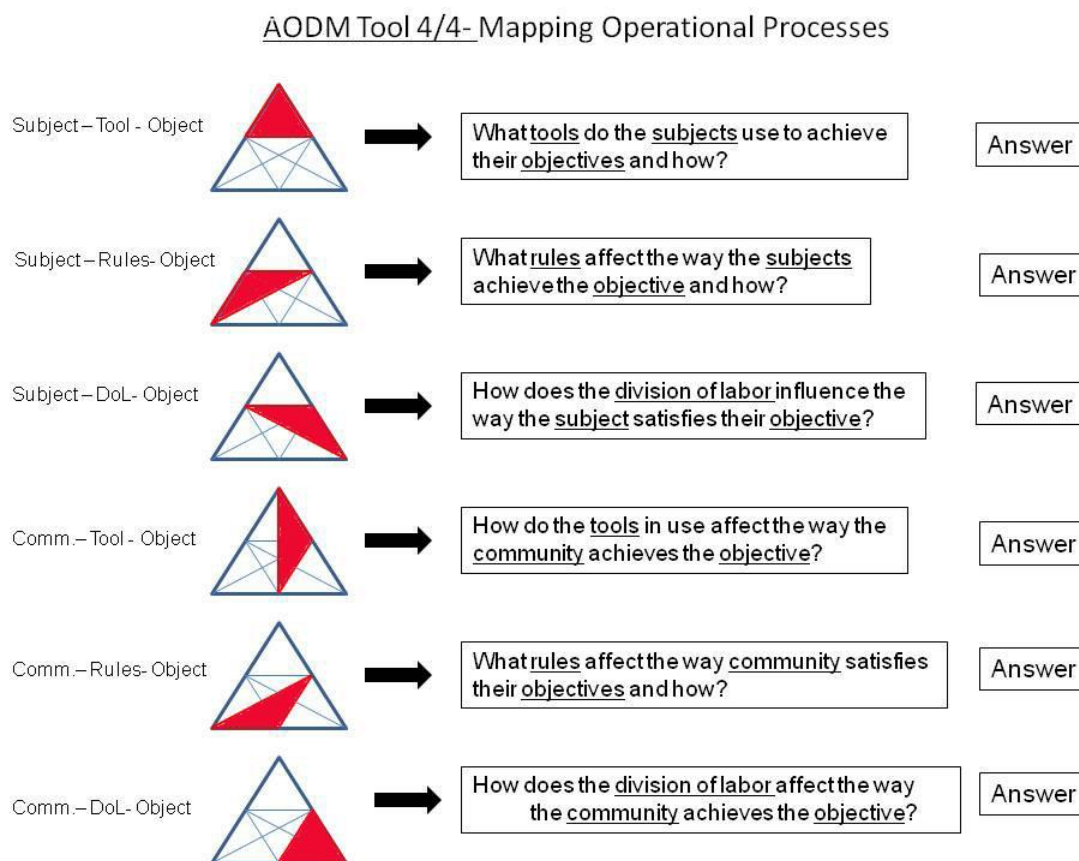


Figure 7: AODM Tool 4- Mapping Operational Processes

This analytic framework highlighted three types of conflict that occurred in this research with respect to the use of the model in section 3.7.1 on page 73. The first conflict is represented by the second triangle in Figure 7 on page 71: Subject, Rules and Object. Here the students went outside of the website to discuss the homework answers using their native language of Japanese instead of the target language of English as discussed in section 4.4.5.8 on page 189.

The second conflict is represented by the third triangle in Figure 7 on page 71: Subject, Division of labour, and object. Some students became frustrated because replies were not sent promptly by other students as discussed in section 4.4.4.4 on page 174. The third and final conflict is represented by the fourth triangle in Figure 7 on page 71: Community, Tools, and Object. Here the students some difficulty typing on the small keyboard of the mobile phones due to its small size as discussed in section 4.4.2.1 on page 161. Also, the students found that the depth of communications between students was less with a mobile phone than with face-to-face communications as discussed in section 4.4.4.5 on page 175. Some students also found the mobile phone a distraction from study due the multitude of entertainment options offered by the device as discussed in section 4.4.3.2 on page 171.

Identifying specific, current features of mobile learning from a sociocultural perspective provides a potentially useful lens for analyses of pedagogical approaches (Kearney et al., 2012). The mechanisms of collaborative growth have presupposed Vygotsky's (1978) view of collaborative learning as knowledge developing on the social level in the form of collective insights which are more than could be created independently, and then on the individual level when these insights are assimilated by the individual.

This theoretical perspective suggests that learning is affected and modified by the tools used for learning and that reciprocally the learning tools are modified by the ways that they are used for learning (Wertsch, 1991). Learning is a situated, social endeavour, facilitated and developed through social interactions and conversations between people (Vygotsky, 1978), and mediated through tool use (Wertsch, 1991). When considering the entire social context adopting an activity system approach is a productive way to view the tensions in activity systems and the stability of activities over time (Engeström, Mietinen, & Punamäki-Gitai, 1999).

3.7. Intervention

This section details the design and creation of the intervention. The intervention consisted of weekly collaborative activities related to that week's class topic. These activities could be accessed by computer or mobile phone. This section is divided into three parts including a) the framework of the intervention design, b) implementation of that framework, and c) a summary of the intervention activity.

3.7.1. MCSCL Activity Design Framework

It has been proposed that there are three components of a collaborative activity framework (Dillenbourg, 1999; Jonassen & Rohrer-Murphy, 1999) consisting of *network*, *roles and rules*, and *collaborative activity*. Roles and rules include the elements the group members must follow to complete the activity. Network components are the connections formed between the individual members of the group. Collaborative activity component defines the group objective of the activity.

Separate from these three components, Jonassen and Rohrer-Murphy (1999) also proposed a framework for the design of CL activities based upon Activity Theory. Their six steps are listed below:

1. Clarify the purpose of the activity system, and understand the subject and the relevant context in which the activities occur. (AT nodes: subject, object)
2. Analyze the activity system, defining in depth the components, for example, subjects, objects, community, rules and division of labor (AT nodes: rules, subject, community, outcome, division of labor)
3. Analyze the activity structure, defining the activity by decomposing it into types of components and operations (AT node: object)
4. Analyze the tools, focusing on those that provide direct and indirect communication among subject, community and object (AT nodes: tools, rules)
5. Analyze the internal subject-driven context bounds that are essential to the dynamics that exist among the components of the AT framework (AT node: subject)
6. Analyze the AT dynamics, which requires stepping back from the system described and assessing how components affect each other, for example analyzing the interrelationships that exist within the components of the

system (AT nodes: subject, object, tools, rules, community, division of labor)

Later, Zurita et al. (2007) expanded on both the three components and the six-part framework detailed above to create an original framework for designing MCSCL activities (Figure 8 on page 74). In Figure 8 on page 74 is a diagram of this MCSCL framework based on Engestrom's expanded Activity Theory Model

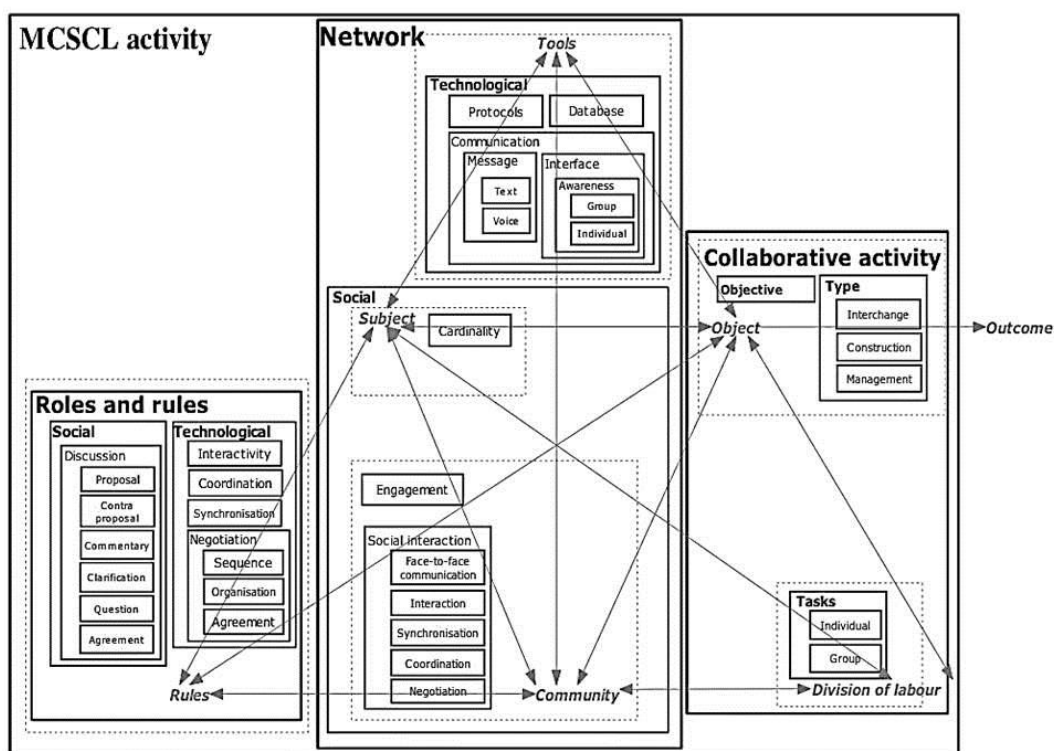


Figure 8: The MCSCL framework

from Zurita(2007) page 217. This framework was used to design the collaborative activities in this case study research. In their framework, they divided into subsection the original three components of the collaborative activity framework which included a) network, b) roles and rules, and c) collaborative (Dillenbourg, 1999; Jonassen & Rohrer-Murphy, 1999).

The original a) *network component* was subdivided into social components and technological components. The *social network component* included the social interactions within the community and the social environment in which the

CL activity took place. It was here that the social interaction and necessary group member engagement was created. The social interactions were established through the *interaction, synchronization, coordination* and *negotiation* among the group members. The *technological network component* contained the tools that the participants used to perform the CL activity. The *Protocol component* represents all communication protocols necessary for communication between the individuals and the mobile devices as well as between the mobile devices themselves. All data is stored in the *Database component*. The *Communication component* represents the way in which the group members are informed of the status of the activity and was divided into *Interface* and *Message components*. The Message component depends on the features of the mobile device and can include text, graphics, video, or voice. The Interface component contains the *Awareness component* which allows individuals and the group to know what each member were doing by allowing the necessary support of social interactions, synchronization, coordination, communication, interactivity, negotiation, and discussion. This component also provides the individual responsibility and mutual support factors required for effective CL.

The original b) Roles and Rules component consisted of any individual or group norms that controlled the activity and was divided into social roles and rules components and technological roles and rules components. Social roles and rules regulated the group member's conversational and social skills which included first the proposals to start an activity, the contra-proposal to put forward an alternative proposal or modified proposal, the commentary on some other conversational unit, the clarification in response to a question or asking for more information, and the agreement of the entire group. The Technological roles and rules component included the functions that the mobile network played in the activity. The mobile network helped the group's members to achieve the necessary levels of interaction, coordination, and synchronization.

The final original component was the c) *Collaborative Activity component* which defines the CL activity. This component was divided into activity objective, activity type, and tasks. The activity objective was the reason for the activity. The

activity type consisted of the *management, construction, and interchange* of the CL activities which encouraged social interaction amongst group members. The tasks sub-component defined the individual and group division of labour required for the CL activity.

3.7.2. Implementation of Framework

In order to implement their framework, Zurita et al. (2007) developed a methodology for implementing their framework to design activities. This methodology consisted of six steps, which need to be completed in order. These six steps are detailed below with direct reference to this study. The steps include a) characterizing collaborators, b) defining objectives, c) establishing interaction skills, d) defining activity, e) defining activity tasks, and f) defining roles and rules.

The first was to a) *characterize the collaborators* who are the participants that will carry out the activity. Characterize refers to the need to describe the age, sex, educational level, cardinality, and criteria for selecting members. The participants in this study were described in detail in the “Participants” section on page 56.

The next step was to define the group’s b) *educational objective of the activity* to ensure that it is appropriate to the social and cognitive characteristics of the group members. In this study, the educational objective of the CL activities was to have the students practice using English translation terminology and theory then for them to apply both to Japanese to English translation problems found in the real world.

After this, it was necessary to establish the desired c) *social interaction skills* through activities such as face-to-face communication, discussion, consensus, coordination, and negotiation building. In this study the social aim was to practice discussion, interaction, coordination, and negotiation among group members in their second language - English.

Step four consisted of choosing the type of d) collaborative activity. These activities could be either interchange activities, construction activities or management activities. Interchange activities are where members exchange

objects under a given set of rules to achieve a goal. Construction activities are where members construct the common goal from pieces each member receives. Management activities are where each member receives the same objects, and they must all agree upon a subset of those objects. In this study, the members completed Management type activities. All members of the group received the same object in the form of a translation problem with a written description in Japanese and English to minimize any confusion over procedure. From this object, or translation problem, the group had to collaborate on producing an accurate and ordered list of their answers.

The next step required the defining of e) activity tasks for both individuals and groups. The individual tasks are defined as those performed by individuals whose goals coincide with those of the group goal. The individuals in this study had to produce an answer to the translation problem and then, using a mobile phone or computer, post their answer to the website forum in order to share it with their group, resolve any difficulties with the answer, and agree upon the best answer. These tasks had to be performed as a group in a coordinated way and included interchange, construction, and management tasks. In this study, group members had to be able to communicate with each other to share and comment on answers or difficulties, as well as agree upon the one best answer.

The final step in the methodology was f) *defining roles and rules* to define productive interactions. The social roles and rules can include tutoring of one member by another, cognitive conflict due to divergent views, and social interdependency where members share group goals. In this study, the social role for each member was to carefully consider other members opinions and work towards a single goal. The social rules for the members included coming to a single answer agreed upon by all, supporting any members who are having difficulty, and negotiating with other members to resolve conflict. In terms of technology roles and rules, the following are included: working together in a group to organize and assign tasks, mediation of group work through question formation and activity management, initiation and redirection of collaborative efforts, and monitoring of members performance. In this study, technology had

the task of enforcing organization by initially distributing to all group members the weekly collaborative homework activity. The technology also acted to coordinate group members by allowing them to monitor, through the forum post, the other members. In addition, it controlled the actual receiving and sending of material through interconnection protocols. Finally, the technology provided a negotiation space in which members were able to have discussions.

3.7.3. Summary of the Intervention

The intervention used in this study was in the form of small group collaborative learning activities consisting of weekly modules that were accessible on private class website by either mobile phone or computer. These activities consisted of homework questions related to translation issues that are relevant when moving between the Japanese and English languages. The workflow of all homework assignments was identical and is shown in Figure 9 on page 79. Prior to each of these activities, the topic of the activity was discussed in the classroom and included theoretical concepts, terminology, and practical examples. The homework activities were all collaborative in the sense that they required the individual members of each group to find and upload their answers to the class website and then to decide upon the single best answer from their list of group answers. The members of each group communicated with the group as a whole by uploading a text message with or without some other media such as photographs to the website forum.

The website contained all relevant information related to the current activity in both Japanese and English such as detailed instructions and deadlines. The participants used either a computer or mobile phone interface to the Moodle website forum to discuss the question in their groups of 5 to 8 students. Each of the four research case study groups received the same homework assignments as the non-research participant groups. This approach was done to reduce the chance of research participants experiencing any additional effects on their academic performance as compared with the non-research participants.

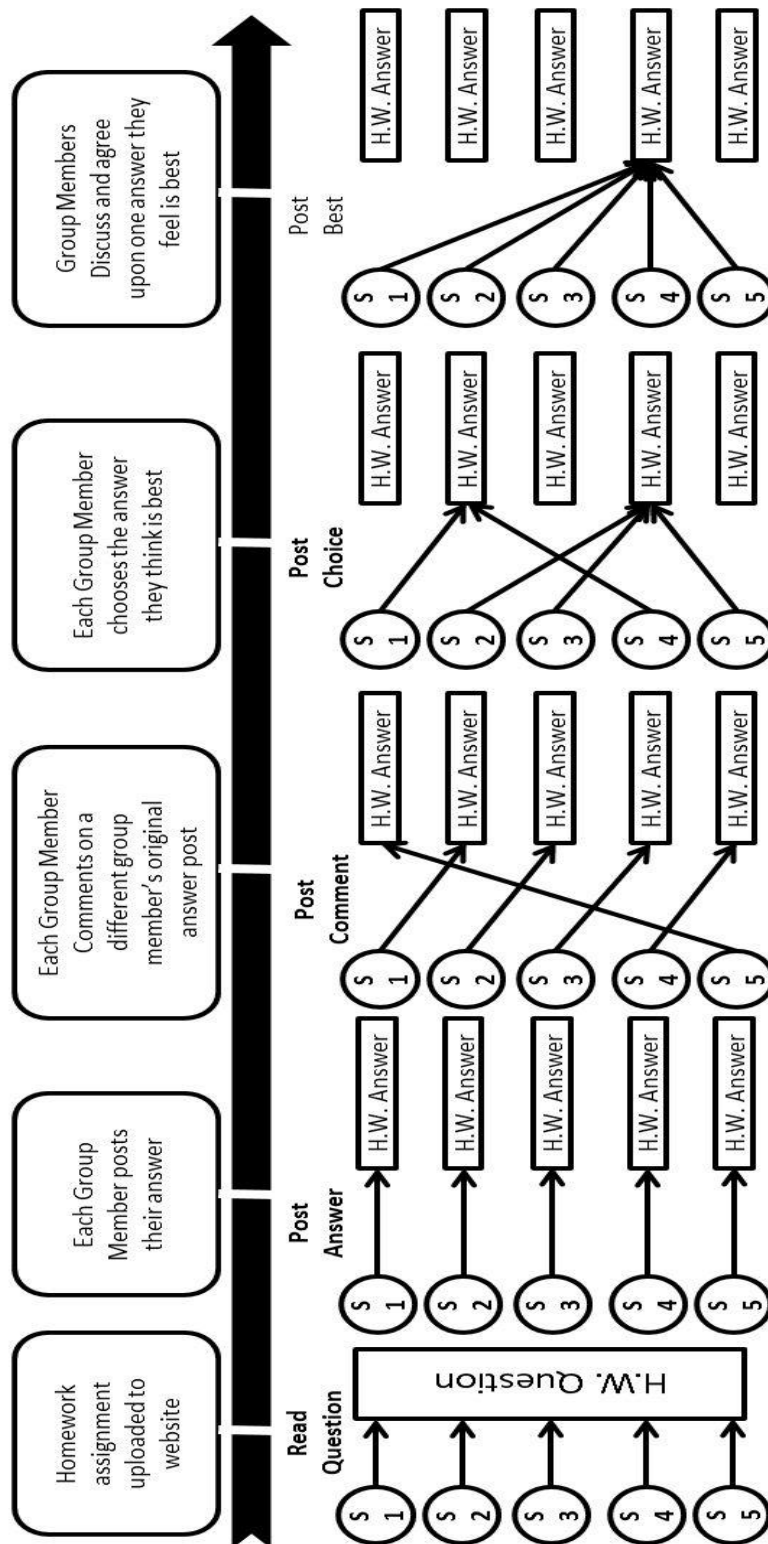


Figure 9: Homework Workflow

Each participant was required to post a minimum of three website message posts for each of the weekly homework activities; the first was their answer, the second was a response to another participant's answer, and the third was their

opinion of which is the best group answer. Each post to the forum gave the students a homework point from three, passing grade, to a maximum of ten points. The format of the homework assignments was the same throughout the research period, so only the question changes weekly while the procedure remained the unchanged. A detailed explanation of this procedure was given to the students in the classroom, and both a Japanese and English copy of the procedure was accessible at any time on the website via mobile phone or computer. This procedure and the homework questions are included in Appendix C: Homework.

3.8. Data Collection and Analysis

3.8.1. *Section summary*

This section of the methodology deals with the data collection and analyse stages of this research. Due to the methodology used in this study this section is dense and includes several types of data, data collection systems, and data analysis techniques. This section is divided into seven sections. The first section discusses issues related to data. The second section details the data collection process used in this study. The third section describes the process of coding used in this study. The fourth section describes the use of triangulation which was the main motivation for using several different types of data. The fifth section explains the analysis of the qualitative data and section six details the analysis of the quantitative data. The final section discusses the resources used for the data collection and analysis used in this study.

3.8.2. *Data*

Evaluating how mobile devices are used is challenging because of the wide variety of usage patterns (Trinder, Roy, & Magill, 2009) and different locations and circumstances in which they are used make it impractical to follow the user around. Van 'T Hooft (2009) suggests that the following quantitative research data should be considered for collection with mobile devices: a) Spatial data indicating where the device is being used (GPS), b) Temporal data indicating

when the device is being used, c) User data indicating what they are being used for, d) Learner data indicating what content is being accessed, e) Connectivity data recording whom the learner communicates with, and f) Assessment data that deals with how the learners know that they are learning and what they are learning.

The collection of a) spatial data was included in this study through a brief survey answered during a mobile login, but no specific location data was collected. The website logs did record b) temporal data of website entry and activities, but was not able to measure the exact time spent online. The online time was included as an interview question to gain an approximate understand of how long the participants spent online during each section. The c) user data was collected on the actions of the participants while logged into the research website to give a clear picture of how they go about completing the activities. The d) learner data was recorded and included all responses and artefacts related to the collaborative activity. The e) connectivity data was collected only for the forum posts, but any communication outside of the website was not collected in the website logs. The students did have the option of reporting the type of communication methods used during the week by filling out their weekly E-Journal. The f) assessment data included the forum answers but was not part of this study because the researcher wanted clearly to separate any grading of student participants and the research.

Qualitative data usually consists of attitude surveys, interviews and questionnaires. One drawback of these methods is that they rely on memory after the event, and usage diaries typically take more time than the activity itself. The steps of data collection and data analysis were for the most part integrated. Simultaneous data collection and data analysis used the qualitative inductive method for building theory and interpretations from the perspective of the people being studied, so allowing them to shape the analysis in a fundamental way (Ezzy, 2002). Theoretical questions and answers were continuously reshaped in an on-going dialogue with the experience of the participants being studied. This flexibility allowed for the shifting of interview questioning and the modification of

research questions which give a much more sophisticated understanding of the experience under study (Ezzy, 2002).

Qualitative data analysis is an interpretive task where interpretations are not found, but created through social processes, so data collection and data analysis are not easily separated (Ezzy, 2002). Most qualitative research does not begin with a complete knowledge of the research questions before data collection, so additional research questions can only be discovered by conducting data analysis (Ezzy, 2002). Data collection, whether interview data or other types, should continue until a point of saturation has been reached where the researcher does not find anything new (Glaser & Strauss, 1967). This approach requires that the researcher be analysing the data as it is collected otherwise it would be difficult to identify the point of saturation. This description of qualitative data collection and analysis accurately describes those used in this study.

In this study, there were several qualitative data collection techniques used that were compatible with the idea of concurrent collection and analysis of data mentioned previously. These include participant interviews, participant weekly E-Journals, the immediate transcription and coding of data, the checking of interpretations with the participants, and the writing of researcher memos.

3.8.3. Data Collection

Student electronic journals (e-journals), student artefacts, face to face interviews, and online collaboration log data were the principal means of data collection over the period of one academic year. A diagram of the web site data collection is shown in (Figure 10 on page 83). Retrospective interviews were also carried out based on the questions raised from student e-journals, artefacts submitted such as posted comments to the website, and online log data from collaborative activities. The researchers were able to triangulate the uses of the mobile phone mentioned by students in their e-journals, online discussions log, interviews, and artefacts. Triangulation was used to confirm the validity of

findings by comparing data from these different sources and observing when they converged (Mathison, 1988) on the same result.

3.8.3.1. Website Logs

As mentioned above, several computer logging systems were used to monitor the participants' use of a mobile website. These logging systems, as shown in Figure 10 on page 83, gave the researcher an opportunity to identify interesting usage patterns that were investigated further during the interviews so informing the interview questions.

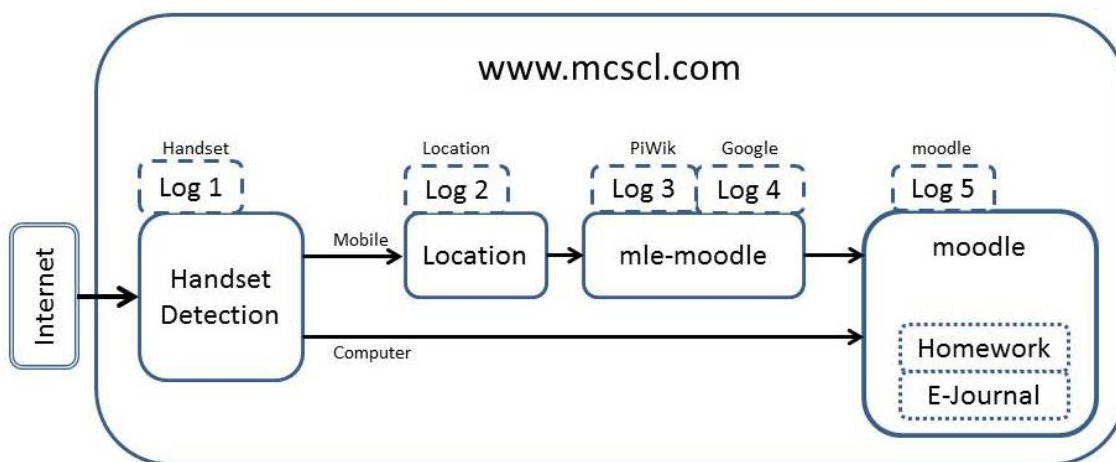


Figure 10: Web site layout

The variety of data collected from these logging systems is shown in Figure 11 on page 84. When these logs are combined using matching data points, a detailed picture of the on-line activity can be produced. For the purposes of this

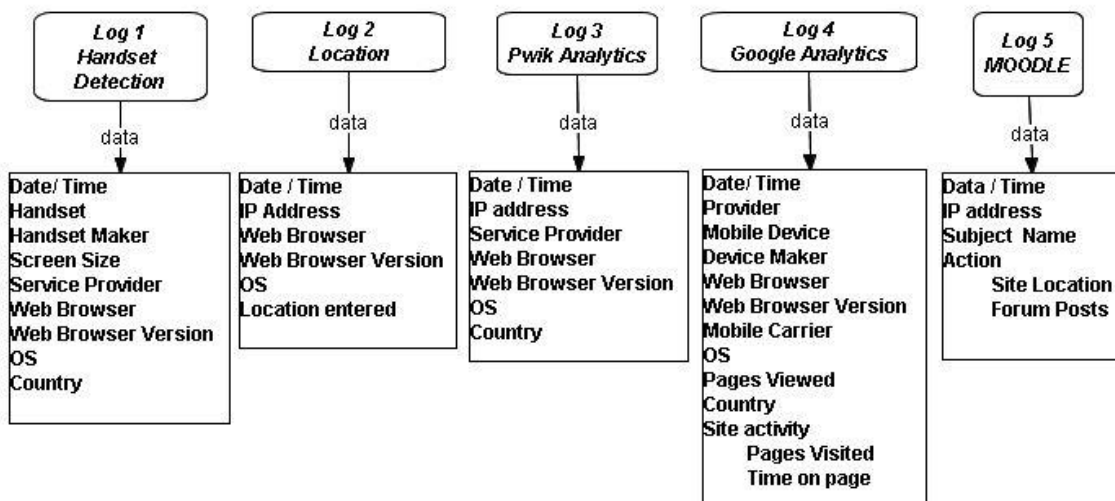
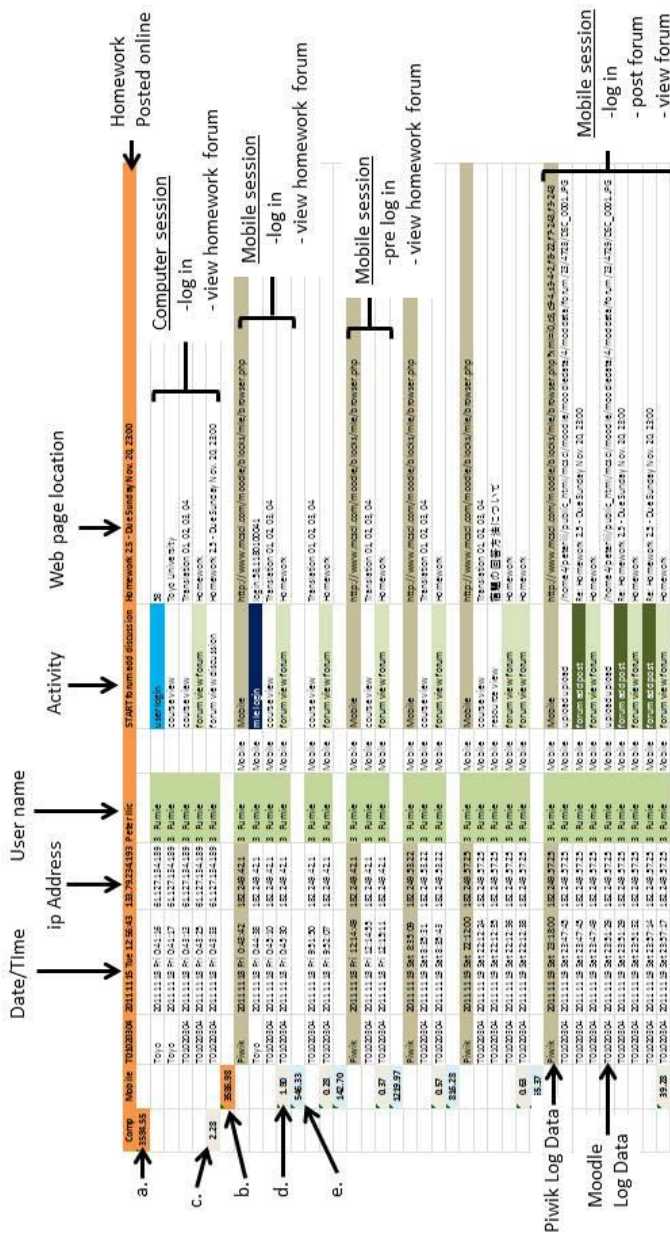


Figure 11: Log Data Collected

study, it was not technically practical or ethical to geolocate a mobile user by their IP address, so there was no attempt to isolate the exact location of the participants in this study (Balakrishnan, Mohamed, & Ramasubramanian, 2009). In Figure 12 on page 85, the data from the Moodle logs and the Piwik logs were combined using the shared data points of date, IP address, and web site page location to synchronize the data into an excel file for further analysis.

The main purpose of the logging system was to understand the mobile phone access patterns of the students. This understanding required an accurate method of separating mobile phone access data from computer access data. The ability to cross reference Moodle internet activity logs with the Piwik internet activity logs reduced the chances of confusing the two device types. While computer IP addresses are relatively stable over a period of days, mobile IP addresses can fluctuate by a few digits over a period of minutes (Balakrishnan et al., 2009) which makes it necessary to cross reference the logs to accurately follow the students online activities. This cross-referencing was a very time consuming process which consisted of locating mobile logins in the Moodle logs

with the “MLE” tag then the IP address was matched with the Piwik logs using the shared data points of time, IP address, and the mobile entry page address of the entry location survey (<http://www.mcscl.com/mobile/m.html>) or the initial entry page of MLE-Moodle (<http://www.mcscl.com/moodle/blocks/mle/browser.php>). Once identified and matched the two log entries were spliced together in an Excel spreadsheet allowing an accurate time stamping and count of initial website entry times.



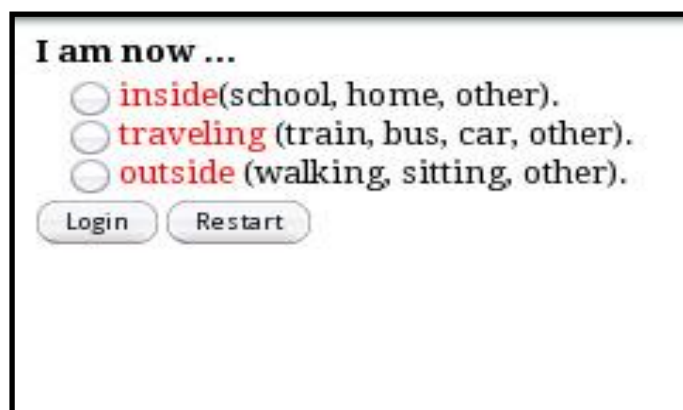
- a. Time from initial homework posting to first access with computer (minutes).
- b. Time from initial homework posting to first access with mobile device (minutes).
- c. Time online with computer (minutes).
- d. Time online with mobile (minutes)
- e. Time off-line between mobile sessions (minutes).

Figure 12: Log data example

Along the left side of Figure 12 on page 85 the letters “a” through “e” identify the

timing data collected. The letter “a” marks the beginning of a computer session and “c” marks the end of that session. The letter “b” marks the beginning of a mobile phone session and “d” marks the end of the session. The letter “e” marks the time interval between mobile sessions. The time interval between computer sessions was also recorded but is not shown in this figure.

An excel formula was used to calculate the approximate time spent on-line and the time in minutes between visits that are shown in Figure 12 on page 85. The formula used was $(A-B)*1440$ where “A” represents the cell that contains the start time and “B” the finish time. Since modern smartphones can buffer websites for offline viewing, it is difficult to calculate the exact time spent viewing



I am now ...

inside(school, home, other).

traveling (train, bus, car, other).

outside (walking, sitting, other).

Login Restart

Figure 13: Mobile Device Location Survey

information on a particular webpage using only log data because the students could log on, download the webpage, and then log off to view that saved page for as long as they needed. For this reason, the time spent online was not a primary focus of the log data collection but instead was included in the interview questions. However, it was possible to obtain an accurate image of the login times and the time between logins. By cross-referencing the activities of each student from the time of login to log out, or until their actions timeout. If the time between activities in the Moodle logs was more than one hour, it was considered to be a timed log out, and the timestamp of the last activity was used as the log out time. In addition to these logging systems, the participants that log into the research Moodle system with mobile phones were required to complete a short three question survey before logging in (Figure 13 on page 86). This survey has

three options of inside, travelling, and outside. These choices gave an insight into where the participants were when they accessed the system. The aim of this survey was to gain a picture of where the students were located when accessing the website.

3.8.3.2. *E-Journals*

The e-journals provided a means to collect the students' reflection about their exploration and use of the mobile phones in their collaborative activities throughout the year. A detailed explanation and demonstration were provided on the writing of e-journals to the participants before the beginning of the study.

Figure 14: Weekly Reflective e-journal

These e-journals were intended to be used as 'introspective tools' in the research, as they could give the researchers access to 'the student's voices' (Nunan, 1992b). Students were asked to submit their reflective e-journals, which were accessed through the research Moodle online learning management system, once a week for a year (Figure 14 on page 87). The first information included on the e-journal interface is the identification of the participant, which allowed for follow-up questions during interviews. Second they were asked to indicate how they communicated with their group members throughout the week

to complete the intervention activity (Table 26 page 267). The possible answers for this section were communication by face-to-face, voice phone call, e-mail, class website mobile version, class website computer version, other social websites such as face-book, and an option for other means of communication. The third section of the e-journals was a text area in which the students could write in their native language any feelings that they had concerning the homework from the past week.

3.8.3.3. Student Artefacts

Artefacts in this research refer to the text, video, picture, audio, or any other files that students made while using their mobile phone. The primary artefact was the forum comments submitted by each student during the homework activity. Collecting student artefacts was considered an unobtrusive way for obtaining information about how students use the mobile phone (Savenye & Robinson, 2004). From the artefacts that students submit, the researcher was able to triangulate the uses of the mobile phone that students mentioned in their e-journals, online discussions and interviews, and this enabled researcher to trace the changes in students' mobile phone use over time (Hodder, 2000). Some educational research studies of the use of handheld devices have employed this technique as a means of data collection (Crowe & van't Hooft, 2006).

3.8.3.4. Interviews

Two semi-structured individual interviews were conducted over one academic year. The first was held at the end of the first semester; the purpose was to collect information on participant attitudes to the use of mobile phones and to ensure that they were completing the weekly activities without difficulty and inform them of the second interview and at the end of the second semester.

The analysis of the interview data helped the researcher to gain a better understanding of how the mobile phone was used by the students and their perceptions of their mobile phone use. A list of usage patterns emerges from each of the student interviews which then inform the production of probing and

follow-up questions. The interview was recorded, transcribed and checked by the participants for their agreement on the accuracy. The mobile phone use identified from the individual interviews was validated through triangulation with the students' reflective e-journals, online transcripts, log data, and any other available artefacts. Unclear descriptions or illustrations from the students' were clarified through retrospective interviews via email, the end of year questionnaire, or face-to-face discussions.

The purpose of qualitative research interviews is to see the world from the participants' point of view in order to collect the meaning of their experiences. (Kvale & Brinkmann, 2009) The research interview is a professional conversation, or inter-action, between an interviewer and an interviewee which produces knowledge on a theme of mutual interest before theorizing (Kvale & Brinkmann, 2009). This type of interview is also called an *unstructured* or *non-standardized* interview because there are few standardized procedures for conducting them (Kvale & Brinkmann, 2009). However, since the researcher defines and controls the situation by introducing topics and critically following up on answers the research interview is not a conversation between equals (Kvale & Brinkmann, 2009). It is important for the interviewer to know how to listen while avoiding interruptions or the giving of advice to the interviewee as these might cut-short their answers.

In this study, the purpose of the interviews was to obtain empirical knowledge of the participants' experiences using mobile phones as a tool for completing collaborative activities in order to investigate the use of the mobile phone as a tool for learning. Exploratory interviews seem well suited to this purpose with their minimal preplanning and open structure. However, the conceptual and theoretical understanding of the topic under investigation is required to ensure that any new knowledge will be added and integrated. (Kvale & Brinkmann, 2009) This understanding is developed during the literature review stage of the research.

The interviews were 30 minutes long and face-to-face involving one interviewer and one subject at a time. After each interview had been completed,

the results were analysed so that any new knowledge could be accumulated and used in the following interviews. This feedback is common with exploratory interviews because the interviewer may learn throughout the investigation as the interactions with the participants and analyses of material alter their understanding. This process leads to improved interview questions as the researcher learns more about the topic (Kvale & Brinkmann, 2009).

In order to record this process of researcher learning, Kvale et. al. (2009) suggest a *work-journal* be kept to record insights, altered understands of previous experiences and reflections of the research process. During this entire interview process, the research questions provided a boundary and a focal point to minimize the chances of the researcher being drawn away from the central line of enquiry. In order to reduce the chance of interview problems, that tend to appear during the analysis phase after the actual interview is completed, it was important to clarify the meaning of the participants' statements through the use of control, follow-up, and probing questions (Kvale & Brinkmann, 2009).

The relationship between the interviewer and interviewee in this study was well established before the interviews took place because the interviewer was the class teacher of the interviewees. However, it was still important to ensure that the interviewee was comfortable enough to talk freely and discuss their experiences. This positive atmosphere was aided by the interviewer listening attentively, and showing interest, understanding and respect for what the subject says (Kvale & Brinkmann, 2009). In addition, the beginning and end of the interview were important for defining the interviewer's relationship with the subject. At the beginning of the interview, the researcher took time to explain the purpose of the interview and the use of the recording equipment. Then at the end of the interview the researcher took the time to ask, "I have no further questions. Is there anything else you would like to talk about?" This opportunity allowed the interviewee to mention any issues they were worried about in relation to the interview (Kvale & Brinkmann, 2009).

The interview questions were of both thematic and dynamic dimension (Kvale & Brinkmann, 2009). The thematic dimension of the question relates the

research topic and analysis of the interview. The dynamic dimension relates to the positive interaction between the interviewer and interviewee required to keep the conversation going. The use of semi-structured questions allowed for some focus on specific research questions while giving room for unexpected answers from the interviewees. The flow of the questions was maintained by ensuring that the questions are easy to understand. This rule was particularly important in this study because the interviews were done in English, which is the interviewees' second language. The features of Japanese culture were also considered when interviewing so that any social and cultural norms are respected.

In order to ensure both the thematic and dynamic dimension in interview questions it is often necessary to translate the original abstract wording of the research questions into an easy-going interview question form which provides thematic knowledge and contributes to the dynamic of the conversation (Kvale & Brinkmann, 2009). The base research questions used in this study are included in appendix B, but again the answers to these questions informed the follow-up questions.

All audio of the interviews was reordered on computer directly which had several advantages. The researcher was free to concentrate on the subject's answers and so was less likely to miss the necessity for clarification through follow-up questions. All the features of the subject's responses were saved and could be reviewed at a later date. Recording directly to the computer ensures a high-quality recording that is easily studied and imported into transcription software such as NVIVO, which was used for this study. The use of computer recordings also increased the reliability and validity of the data.

Since the meaning of the participants' statements was of more interest in this study than the linguistic content, highly detailed linguistic transcription was not necessary. Instead, the interview was transcribed word for word and coded throughout to give an insight into the participants' thoughts as related to the research questions.

3.8.4. Coding of Data

The coding for this research was done in NVIVO and can be seen in Table 1 on page 92. A form of thematic analysis and coding (Ezzy, 2002) was used.

Thematic analysis refers to the identification of themes or concepts that are in the

Table 1: Interview Nvivo Coding Results

Coding Nodes	Sources	References		
Interview Data	64	13395		
Research Questions	64	13395		
1. How do students complete Collaborative learning activities with Mobile Phones (Main)	64	13395		
A. What is the distinctive AFFORDANCES offered by the mobile phone for collaborative learning	52	1447		
Affordance	52	1447		
Mobile (- Affordance)	24	152		
Mobile (+ Affordance)	51	1067		
Non-Mobile (+Affordance)	16	143		
Non-Mobile(-Affordance)	12	57		
B. What is the AFFECTIVE relationship between STUDENT the MOBILE PHONE and the LEARNING ACTIVITY	61	3020		
Affective Relationship	59	2710		
_Attitude to HW Changed (Mobile)	36	580		
Private and Public	43	881		
Relationship to Homework	40	440		
Relationship to Mobile	47	754		
Devices used by students	20	310		
Computer	4	53		
Mobile	19	225		
Other Device	2	6		
C. Does the intervention affect the relationship between STUDENTS the MOBILE PHONE and the LEARNING ACTIVITY	61	8486		
Communication	48	1784		
Communication Changed (Mobile)	26	306		
Mobile Comm	40	804		
Non-Mobile Comm	46	666		
Context	58	3642		
_Opportunity Created(Mobile)	39	944		
Frequency of use	24	290		
Length of Time	22	331		
Speed (Mobile)	11	70		
When	44	904		
Where	48	1103		
Group Members	48	1213		
_Relationship Change (Mobile)	8	35		
Conflict	21	161		
Outside Group	6	31		
Peer Examples	26	238		
Peer Opinion	15	146		
Peer Tutoring	6	68		
Posting Order	8	39		
Sub-groups	37	462		
Homework (Procedure)	59	1847		
_Procedure Changed (Mobile)	43	503		
Homework (Misunderstanding)	10	48		
Reading and Posting	41	661		
Website Limitations	31	198		
D. Does the affordance offered by the technology lead to more awareness (REFLECTION) of learning	37	351		
Reflection	37	351		
E. What is the nature of the DIALOGUE with the mobile phone TECHNOLOGY	12	91		
Dialogue	12	91		
Dialogue (Mobile)	11	89		
Dialogue (Non-Mobile)	1	2		

data, the building of a systematic account of what has been observed, and the emergence of a theory through the coding process. This way the coding links the

data to the emergent theory. This kind of analysis is more inductive than content analysis because the theme categories are not decided prior to coding the data, but are induced from the data. This sequence means that the research could lead to issues and problems that were not anticipated. All interviews were transcribed immediately following the interview. The transcription process served as a preliminary form of data analysis in that it allows for researcher reflection on the issues (Ezzy, 2002).

The coding process in this study was made up of two coding cycles. The first cycle coding was the use of methods during the initial coding and recoding of the data, where the data was initially coded through a process of studying the interview transcripts word-by-word or line-by-line looking for in-vivo codes and looking for similarities and differences (Ezzy, 2002). Then, second cycle coding required the researcher to classify, prioritize, integrate, synthesize, abstract, conceptualize, and build theories. The main goal of second cycle coding was to develop a sense of categorical, thematic, conceptual and or theoretical organization from the first cycle data (Saldana, 2009).

The first stage of coding is referred to as *open coding* and consisted of the naming and categorizing of phenomena through the close examination of the data in order to generate an emergent set of categories and their properties (Ezzy, 2002). The next step was *axial coding* that is the integrating of codes around the central categories by specifying a category in terms of the conditions that created it; the context in which it is embedded; the interactional strategies by which it is managed; and the consequences of those strategies (Ezzy, 2002). Finally, *theoretical coding* involved the identification of the core category around which the analysis is focused. The coding process was finished when the researcher believed that the data was saturated, so the analysis could produce no new codes or categories, and all the data was accounted for in the core categories.

3.8.5. *Triangulation*

In the Social Sciences one of the earliest references to triangulation was used in a discussion of the validity of measures and the importance of multi-method and multi-trait approaches (Campbell & Fiske, 1959), which use more than one method in the validation process to ensure that variance is that of the trait, not the method used. Triangulation was first introduced as a research concept in relation to unobtrusive methods (Webb, Campbell, Schwartz, & Seacrest, 1966). Then four types of triangulation were distinguished by Denzin (Denzin, 1970):

1. Data triangulation, which is the gathering of data from several sampling strategies, so that data from different times and situations and a variety of people is gathered.
2. Investigator Triangulation, which is the use of more than one researcher to gather and interpret the data.
3. Theoretical Triangulation, which is the use of more than one theoretical position in interpreting data.
4. Methodological Triangulation, which is the use of more than one method for gathering data.

Triangulation is a research approach that combines more than one research strategy in a single research investigation. Triangulation techniques are suitable when a more holistic view is sought, where a complex phenomenon requires further clarification, or when a conventional method produces a distorted picture. (Cohen, Manion, & Morrison, 2007)

Many of the projects, such as this one, which investigated mobile learning have utilised interviews, questionnaires, diaries and focus groups to collect information (Sharples, 2009). With these techniques, there is some doubt in the reliance on the memory and honesty of participants (Traxler, 2007; Wali, Oliver, & Winters, 2009) and it may take longer to write the describe the use of the device than it does to complete the task being investigated. (Traxler, 2007). In addition, when alternative means of material delivery is provided for those not wishing to use a mobile phone, as in this study, it dilutes the intervention (Van't Hooft, 2009). An additional problem with this reliance on users to articulate how they have used the device is that they may not possess the necessary language

skills required for reporting their experiences. These weaknesses were the main motivation for using triangulation in this study.

The aim of using more than one approach is to compensate for the weakness of one method by drawing on the strength of another, so giving some assurance of the completeness of the research. In addition, it can confirm the validity of findings when data from different sources or methods converge (Mathison, 1988) on the same result. However, researchers might find that the different approaches used in the triangulation obtain conflicting results, which would indicate that they need to collect more data. In addition to the convergent and inconsistent results, there is the possibility that the different approaches used in a triangulation could obtain results that do not support the research question, which would mean that the researchers need to rethink their initial question.

It has been suggested that *data triangulation* can be of three types (Denzin, 1989) including time, space, and person. When using these approaches to collect data, the researchers collect data at or from multiple times, locations, or human sources respectively. Examples for time data triangulation are longitudinal studies or cross-sectional studies. Space data triangulation might be an investigation of a number of schools in an area or across a country in the same way. Moreover, person data triangulation would be the examination of several individuals or groups in the same way. When used, these forms of data triangulation are thought to give a more accurate description of factors that are shared across different time periods, spaces, and people.

This research is a longitudinal study collecting data samples from four separate case study groups many times over a one-year period, so both time and person data triangulation is used. Investigator triangulation occurs when multiple researchers from different backgrounds come together on the same research study. This type requires that each researcher have a significant role to play in the research and that the final results are discussed, and a single conclusion is reached. This study will be conducted by an individual researcher so this type of

triangulation is not relevant. In addition, Theoretical triangulation that uses more than one theory to interpret a single set of data will not be used in this study.

There are two levels to methodological triangulation: between-method and within-method (Denzin, 1989). Between-method refers to method triangulation at the initial design level and often entails a combination of qualitative and quantitative method above the data collection level. Here more than one method is used to enhance convergence, and so validity, between independent measures of the same objective (Cohen et al., 2007).

In this study, the completion of collaborative activities through mobile phones was studied through qualitative interviews and observations of participants while at the same time quantitative comparisons of log data and survey data. The focus always remained that of the use of mobile phones for collaborative activities, but the mode of data collection varied. Multiple and independent measures, if they reach the same conclusions, provide a more certain representation of the studied phenomenon (Jick, 1979). Denzin (1989) saw this approach as having more value than the within-methods approach because the flaws of individual methods can be overcome by combining the strengths of those same methods.

The within-method is performed at the data collection level and entails the use of more than one data collection technique from within the same research tradition. The goal here is the replication of a study to check the reliability and confirm the theory.(Cohen et al., 2007) In this study, this is represented by in the participant observations which are in the form of multiple case study groups to develop more confidence in the emergent theory” (Jick, 1979).

Several shortcomings of triangulation research studies are identified by Jick (1979). First there is the difficulty of replication due to the subtle idiosyncrasies in multi-method designs and the inherent difficulty of recreating qualitative research in general. Second, the theoretical and conceptual quality of the research question will ultimately determine how satisfactory the final result will be, regardless of how many methods are used. Third, if qualitative and quantitative methods are used, then they should both be significantly represented

otherwise the analysis will be biased in favour of the researchers personally preferred method. Finally, the strengths and weaknesses of each method used need to be explicitly stated and justified in order to gain the full advantage of the triangulation.

In addition, to these points Mathison (1988) notes that Denzin himself felt that the within-methods approach to methodological triangulation was of limited value, because no matter how many approaches are used the research is still affected by the limitations of a single research tradition. As reported by Blaikie (1991), Silverman (1985) suggests that data triangulation is inherently positivistic since data triangulation assumes that a single unit can be measured more than once. It has also been suggested that having multiple data sources, particularly qualitative data, does not ensure consistency or replication (Patton, 1980). Also, there have been doubts raised that one investigator can corroborate another in investigator triangulation and that no two theories can give a complete explanation of a phenomenon (Guba & Lincoln, 2005).

3.8.6. Qualitative Data Analysis

Unique in comparison to other qualitative approaches within case study research, investigators can collect and integrate quantitative survey data, which facilitates reaching a holistic understanding of the phenomenon being studied (Yin, 2009).

Both Yin and Stake recognize the importance of efficiently organizing data. The advantage of using a database to accomplish this task is that raw data are available for independent inspection. Using a database improves the reliability of the case study as it enables the researcher to track and organize data sources including notes, key documents, tabular materials, narratives, photographs, and audio files can be stored in a database for easy retrieval at a later date (Wickham & Woods, 2005). In addition categorizing and contextualizing strategies help to analyse the data collected at different stages (Maxwell, 1996)).

The data analysis will be in two stages. First, content analysis will be used to categorize the data collected, within *NVIVO analysis software*. Student data sources will be coded on the broader themes: mobile phone use for collaboration, other uses, and collaborative learning. Coded themes of data will be recoded according to sub-themes. A constant comparative analysis on the data will be conducted to find sub-themes that initially emerged from student perceptions of their mobile phone use and their collaborative activities. A final list of sub-theme codes will be placed in matrices by student names along with excerpts from student semi-structured interviews, e-journals, and online transcripts. Afterwards, student artefacts and retrospective interviews will be coded and put into the matrix by themes and sub-themes and student names in order to triangulate data. The triangulated sub-theme data will be further analysed for common themes that described everyday practices and thought among the members within the cases on using a mobile phone for their study. The sub-themes that emerge across cases could include common uses, common perceptions, as well as sub-themes for each of the broader themes of mobile phone use for collaboration, CL, and other applications. Following this step, a second more descriptive phase of data analysis will be adopted to contextualize mobile phone uses in each case in order to better understand these in relation to the themes and sub-themes.

3.8.7. *Quantitative Data Analysis*

At the beginning and the end of the data collection period the participants were given an on-line word association questionnaire to complete and the results were analysed using a Multidimensional Scaling (MDS) technique. MDS is a method for capturing efficient information from observed dissimilarity data by representing the data structure in lower dimensional spatial space. A more detailed description of the technical aspects of MDS is included in Appendix H: MDS.

Multidimensional Scaling is a well-known group of data analysis techniques which represent the data's structure in a spatial fashion to make

easier to assimilate. The following are some examples of research studies which have utilized MDS for building, comparing and ranking, and visualizing data in many areas of research. MDS has been used to build an effective speech corpus (Nagino, Shozakai, Tomoki, Saruwatari, & Shikano, 2008), a typology of negative mentoring experiences (Simon & Eby, 2003), and a model of serial rapist behaviour (Kocsis, Cooksey, & Irwin, 2002). In addition, it has been effective for comparing and ranking interpersonal adjective Scales (Adams & Tracey, 2004), motives and causes for absence from school. (Bimler & Kirkland, 2001), test item similarity ratings (Sireci & Geisinger, 1992), cross-cultural satisfaction with friends in Japan (Maeda & Ritchie, 2003), types of aggression at crime scenes. (Santtila, Canter, Elfgrén, & Häkkänen, 2001), fear and confidence of university women relating to crime (Hughes, Marshall, & Sherrill, 2003), perceptions of ethical role responsibilities (Pang et al., 2003), cross-cultural values for women and men (Struch, Schwartz, & Van Der Kloot, 2002), and juvenile' world views (Gillham, 1983). Several researchers have used MDS for visualizing data such as cultural proximity matrices (DeJordy, Borgatti, Roussin, & Halgin, 2007), item response data for the TOEFL test sections (Oltman & Stricker, 1990), interests of native American college students (Hansen, Scullard, & Haviland, 2000), social distance among multi-ethnic groups (White, Kim, & Glick, 2005), library and information science research (Moya-Anegón, Herrero-Solana, & Jiménez-Contreras, 2006), team mental models (Mohammed, Klimoski, & Rentsch, 2000), children's representations of their peer group (Lease, McFall, Treat, & Viken, 2003), and the relationship between values family firm's founders (García-Álvarez & López-Sintas, 2002). MDS has been used to identify preferences in urban signscapes (Nasar & Hong, 1999), of educators for youngsters with disabilities and their treatment (Garvar & Schmelkin, 1989), of subjective response to interior lighting (Houser & Tiller, 2003), in the position of perceived peer group organization (Lease & Axelrod, 2001), in vocational rehabilitation services (Kosciulek, 2003), in attitudes toward cultural practices (Gasser & Tan, 1999), in the role of mentoring and elite contacts in women's promotions (Memoli, 2004).

In this study, the purpose for using MDS was to gain a picture of the participants' relationship to school, homework, and the technology of mobile phones. It was hoped that any shift in participant perception of a change in relational position of the words could be observed visually through the MDS analysis of this word association questionnaire.

The data is numerical and in the form of symmetric similarity data consisting of student perceptions of the similarity among the following 25 English words:

Afternoon	Home	School
Alone	Homework	Speaking
Computer	Listening	Text
Dictionary	Mobile-Phone	Traveling
Discussions	Morning	Video
Education	Night	Voice
English	Outside	Writing
Evening	Picture	
Groups	Reading	

The word associations formed a 25 x 25 matrix of all possible word pairs. The students were asked to enter a value from 0 to 5 in the box at the intersection between each set of words that represented their perception of the strength of the relationship between the words. The participants were given the following number to meaning relationships as a reference:

- 0 = NO relationship
- 1 = very distant relationship
- 2 = distant relationship
- 3 = close relationship
- 4 = very close relationship
- 5 = extremely close relationship

In order to reduce the chance of confusion, the participants were given several example word pairs and asked which number they would choose. The first example included the words "apple" and "apple" as an instance of a value 5 relationship. For the second example, the words "pencil" and "book" were given which most students gave a value of 3. After the participants had completed the

data entry form, the total marks for each word intersection over all of the participants were added. So each number in Table 21 on page 263 (semester one) and Table 22 on page 263 (semester two) represents the total of all values given by the students for each row word and column word pair. A higher number indicates a greater number of participants thought there was some amount of similarity between the word pairs. This type of data is known as proximity data which consists of measures of similarity or dissimilarity between objects of interest (Everitt & Rabe-Hesketh, 1997). In this case the objects of interest are the row words and the column words.

The output from MDS is in the form of a plot of all the objects (words), and the distance between them indicates the value of dissimilarity. In other words, the closer the words appear visually in the plot, the higher the perceived similarity. The advantage of MDS is that it represents the data spatially in order to allow a visual interpretation of the distances between the points plotted in two dimensions, so the interpretation of distance is a visual one. In this research, there are two sets of data: one from semester one and one from semester two. These two data sets were combined into a super matrix which allowed any change in perceived similarity reported by the students to be represented by a movement in the second set of plotted points. The first set of data points is represented by the number of the word as seen on the left side in Figure 34 on page 131, followed by the letter "a," so all numbers followed by the letter "a" are from the semester one response data. Likewise, the second set of data is the number of the word followed by the letter "b," so all numbers followed by "b" are from the second semester responses. The arrows were added later to indicate any change in the movement of the points that represent a change in the perceived similarity of the words amongst all the students. Therefore, when a word is reported as moving closer to another word, it means that the second semester data point has moved closer to another second semester word, which may suggest that those two words are perceived as more familiar by the students in the second semester than they were by the same students in the first semester. This information combined with the other data sources in this research

strengthens the triangulation and could be significant when correlations amongst these data sources are found.

3.8.8. Resources

The *NVIVO qualitative analysis software* (QSR, 2010) was the main data collection and analysis tool for this case study. This software allowed for continuous analysis and collection of qualitative data in a format that increases the possibility of identifying patterns.

The MCSCL activity is presented around a computer based content management system called Modular Object-Oriented Dynamic Learning Environment (Moodle) (Dougiamas, 1999). Moodle is an Open Source Course Management System (CMS), also known as a Learning Management System (LMS) or a Virtual Learning Environment (VLE). It has become very popular among educators around the world and has been translated into many languages. Moodle was hosted on a private webpage that was accessible only by the researcher which ensured that any log data remained secure.

This CMS was initially designed to be accessed by a desktop or laptop computer (Figure 15 on page 103); however, there has recently been a mobile-learning plug-in which allows the system to be accessed from a mobile phone (Figure 16 on page 104). This mobile learning environment enhanced interface for Moodle, or MLE-Moodle, is an effective mobile CMS. The system can be accessed directly through the mobile phones web browsing software, or a Java program can be downloaded to the phone. However, the Java feature was not used for this research because it was incompatible with the majority of participants' mobile phones.

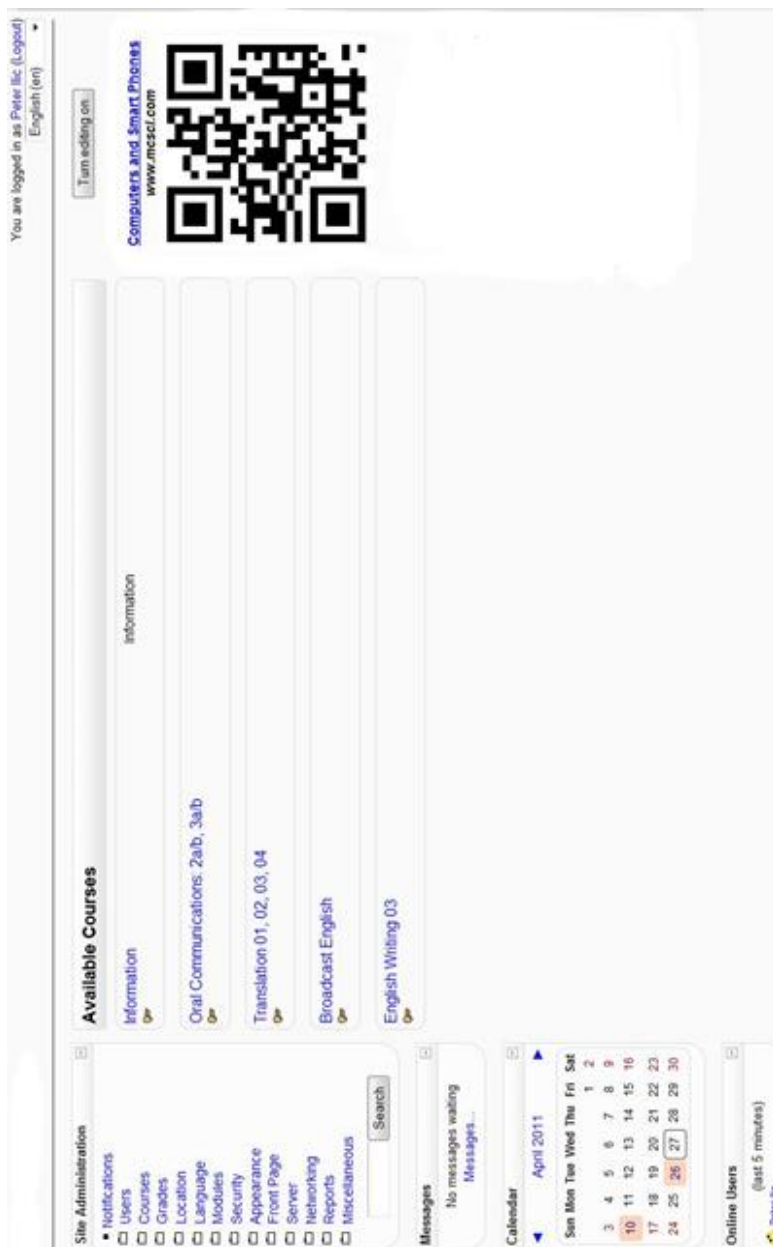


Figure 15: Moodle computer view



Figure 16: Moodle mobile view

Moodle is capable of hosting chats, forums, journals, glossaries, wiki pages, quizzes, and surveys. The full version of this software allows students to edit and read of these activities. However, MLE-Moodle allows the students to read forums, glossaries, wiki pages, quizzes, and surveys via mobile phones, but it was only possible for them to edit forums, surveys, and quizzes, while chat and journals were not accessible. Both versions allowed for the uploading of assignments, in the form of audio, video, images or plain text. Another advantage of this system was that it allowed for the creation of groups that are independent of each other while still accessing the same resources. The isolated group function in Moodle was used to isolate and form the case study groups used in this study.

4. RESULTS AND ANALYSIS

4.1. Chapter outline

This research study explored the impact of mobile phone use on collaborative learning activities. Specifically, this research explored the following main research questions 1. How do students complete Collaborative learning activities with Mobile Phones? This is broad overarching question was divided into five more specific research questions; a) What is the distinctive affordance offered by the mobile phone for collaborative learning? b) What is the affective relationship between student the mobile phone and the homework? c) Does the intervention affect the relationship between students the mobile phone and the homework? d) Does the affordance offered by the technology lead to more awareness of learning? e) What is the nature of the dialogue with the mobile phone technology?

In order for the research questions to be answered, data were gathered from a number of qualitative and quantitative sources and are included in separate sections below. The quantitative section (4.2) contains a description of the quantitative results but does not include the coding of these results. The detailed coding of these results has been integrated with the qualitative results and is included in the coding (section 4.4) below. The qualitative data was considered to be the main focus of this study, and the results are described in the section (4.3) below. The coding section includes the coding of all the data both qualitative and quantitative and a detailed explanation of how these two results support the main coding themes that emerged from the research.

The research focus is on the effects of mobile phones for collaborative activates. The data collected from the four case study groups is summarized in Table 2 on page 108. Groups one through four consist of 7, 8, 7, and 6 members respectively. The data collected on these participants was drawn from three main sources as described in the data collection and analysis section of the methodology chapter and included interviews, log data and on-line forms. These

three sources were then broken down into smaller and more meaningful sets of data represented in Table 2 on page 108.

Table 2 on page 108 is only meant to give an overview of the amount and type of data collected from each student. In Table 2 on page 108, the first data source is from the interviews. The "Interview" section is divided into "Interviews" column and "Mobile Device" column. The mobile device column is in the interview section because the type of mobile phone used by the students was one of the interview questions. The interviews were performed twice so the source of interview data can be collected a maximum of two times. The "Interview" column contains the number zero, one or two according to the number of interviews each student had from a possible minimum of zero to a maximum of two. The "Mobile Device" column shows the number of different mobile devices each student used throughout the study. A zero indicates that no information was collected on the mobile phone model used by the student. As can be seen in this column, some students used two mobile phones which in most cases were because the student bought a new model phone during the study.

The second section in Table 2 on page 108 is the "Log Data" section which represents all the data collected from the log data. This section is further broken down into "Access Days," "Access Hours," "Read-Write Count," "Time Online," and "% of homework answered with Mobile phone." In the "Log Data" section of the table, columns one through four represent the semesters in which the data was collected from each student. A zero means that that student did not participate, so no data was collected from first or second semester. The number one means that that student was only available for one semester, so their data collection period is limited to a single semester. The number two means that that student was available for both semesters and data was collected on them over the entire study period. The final column, "% Answered with mobile phone," shows the percentage of answers submitted by mobile phone as opposed to a computer. So zero indicates that the student never used a mobile phone, and 100 indicates that the student used no device other than a mobile phone.

The last section of Table 2 on page 108 is "On-line" which contains all data sources collected from on-line web surveys or e-journals. This section is broken down into "Entry Location," "E-Journal Communication," "E-Journal Comments," "Final Survey," and "MDS Data." The numbers in columns one through four indicates the number of individual submissions of each type of data by each student. The final column indicates the MDS data collected which could be a maximum of two times; once in semester one and once in semester two. A zero in this column indicates that that student did not submit the first or the second MDS survey. A one indicates that the student submitted only one of the MDS surveys so their data could not be used for the final analysis which required two samples. A two indicates that that student submitted both MDS surveys and so their data was used in the final MDS analysis.

In Table 2 on page 108, a clear picture of the amount of data collected from each student across each data source can be quickly understood. While all of the participants volunteered to participate in the research at the beginning of the data collection phase, not all participated equally and some not at all. In group one there were 7 members during the first semester but two of those (Chieno and Takashi) left the study after the first semester to take part in an overseas study program. Of the 8 members in group two, all of them stayed for semesters one but one (Asaka) left in semester two; however, there was a considerable variation in the level of participation given by each subject. Group three started with 7 members, 2 of which left early in the first semester (Rika and Yurina), and one was not available for the final interview (Akiko). In group four all 6 members participated throughout the year, but one (Yuan) was not available for the second interview.

Table 2: Summary of Data Sources Collected

		Interview		Log Data					On-line				
		Interviews (2 times)	Mobile Device (# Recorded)	Access days (2 Semesters)	Access Hours (2 Semesters)	Read-Write Count (2 Semesters)	Time On-line (2 Semesters)	% Homework Answers with mobile	Entry Locations (# recorded)	E-Journal Comm. (# recorded)	E-Journal Comments (# recorded)	Final Survey (# recorded)	MDS Data (2 semesters)
G1	Atsumi	2	1	2	2	2	2	100	1	7	13	1	2
	Chieno	1	0	1	1	1	1	19	4	0	0	0	1
	Chika	2	1	2	2	2	2	79	47	2	3	1	2
	Erika	2	1	2	2	2	2	85	59	6	11	1	2
	Mai	2	1	2	2	2	2	81	33	7	10	1	2
	Takashi	1	0	1	1	1	1	97	34	2	4	0	1
	Toshinao	2	2	2	2	2	2	16	125	14	20	1	2
	Total	12	6	12	12	12	12		303	38	61	5	12
	G2	Asaka	1	1	1	1	1	1	7	8	0	0	0
Ayaka		2	1	2	2	2	2	42	72	4	9	0	2
Eri		2	2	2	2	2	2	100	91	7	12	0	2
Hikaru		2	2	2	2	2	2	30	0	2	3	0	2
Hitomi		2	1	2	2	2	2	100	99	0	0	0	2
Lulu		2	1	2	2	2	2	2	0	3	6	1	2
Yuka		2	1	2	2	2	2	0	38	1	1	1	2
Yuuri		2	2	2	2	2	2	89	40	0	0	1	1
Total		15	11	15	15	15	15		348	17	31	3	14
G3	Akiko	1	1	2	2	2	2	67	5	11	16	1	2
	Ayaka	2	2	2	2	2	2	43	39	2	4	1	2
	Eri	2	1	2	2	2	2	25	5	9	15	0	2
	Fumie	2	2	2	2	2	2	61	14	14	22	1	2
	Yui	2	1	2	2	2	2	44	8	5	9	1	2
	Yurina	1	0	1	1	1	1	0	0	2	4	0	2
	Rika	0	0	0	0	0	0	0	0	0	0	0	0
	Total	10	7	11	11	11	11		71	43	70	4	12
G4	Asako	2	1	2	2	2	2	58	40	4	8	0	2
	Eri	2	1	2	2	2	2	47	2	7	13	0	2
	Midori	2	1	2	2	2	2	33	24	0	0	0	1
	Saori	2	1	2	2	2	2	26	0	6	9	1	2
	Yuan	1	1	2	2	2	2	58	14	3	5	0	2
	Yuri	2	1	2	2	2	2	49	6	9	15	1	2
	Total	11	6	12	12	12	12		86	29	50	2	11

4.2. Quantitative Results

4.2.1. Section Outline

This section details the quantitative data that was collected for this study. There are 10 sections. The data in this section was derived from the log data collected throughout the study and includes website access days and hours, number of posts and reads, percentage of mobile access over all frequency of access for each group, number of homework answers, mobile device entry locations, inter-group communication methods, mobile phone models, and the MDS result. This section contains a description of the quantitative results, but the detailed coding of these results has been integrated with the qualitative results is included in the coding section 4.4 below. Since the qualitative data was considered to be the main focus of this study it is highlighted and the qualitative data is used to triangulate the themes discovered.

4.2.2. Log Data: Web site access days and hours

The log data, in Appendix D: Log Data, includes group one access hours (Table 6 on page 256), group one access days (Table 7 on page 256), group two access hours (Table 8 on page 256), group two access days (Table 9 on page 256), group three access hours (Table 10), group three access days (Table 11), group four hours (Table 12 on page 257), group four days (Table 13 on page 257). These tables contain the statistical information that was used to create the graphs in this chapter.

In this chapter, the graphs are included to allow for a more visual and intuitive view of the data results. This information is represented visually in the graphs below (Figure 17 on page 111). The data was formed by combining the Moodle and Piwik network logs, (Figure 12 on page 85) which allowed for the recording of day and time, as well as the separation of mobile and non-mobile activity. Access means participants who enter the homework website for any reason using a mobile device, indicated by the blue bars, or a non-mobile device, indicated by the red bars. While this research is mainly concerned with the

participants' mobile use, the collection of non-mobile access data was added in the hopes that it would provide contrast to highlight patterns of mobile access.

The graphs made from the data in Table 6 on page 256 through Table 13 on page 257 were used in the interviews in order to provide a visual reference when eliciting explanations for student access patterns. All four groups seem to have similar hourly access patterns during the day. However, the access counts for days of the week are similar for groups 1 and 2, which shared the same Thursday deadline for homework, and similar for groups 3 and 4 which shared the same Monday deadline. The different spikes in use between groups 1 and 2 and groups 3 and 4 could be due to the students racing to complete the homework before their respective deadlines. Similarly, groups 1 and 2 both show spikes in mobile use from 10 pm to 12 am that are larger than groups 3 and 4 mobile activities during the same time period. One reason for this difference could be the homework deadline which was on Thursday for groups 1 and 2 so they would have a weekday deadline which meant that the day before they were occupied with classes during the day reducing the daylight hours available for collaboration. However, groups 3 and 4 had a Monday deadline so the day before they had a weekend to submit the homework answers giving them the option of collaborating during the daytime.

A full year of activity data was collected for all the participants in group one except G1_Chieno and G1_Takahashi, who were only recorded for one semester. In group two, only one semester was recorded for G1_Ayaka. G3_Yurina from group three was only recorded for a short time during semester one. Finally, all the members of group 4 were recorded for the entire year. These results are referenced as support in section 4.4.1.2 on page 139 and section 4.4.1.3 on page 144.

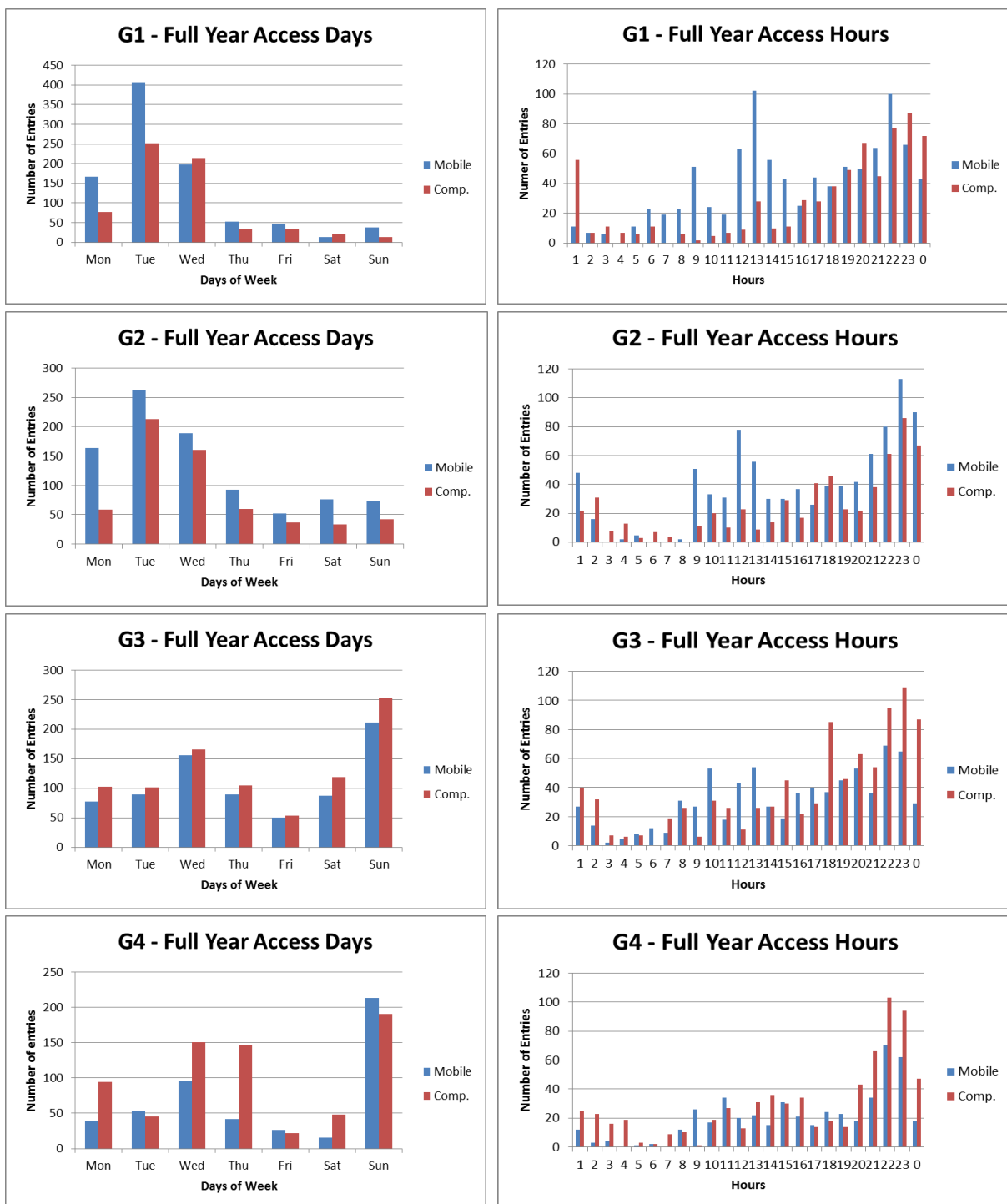


Figure 17: Log Data Access Days and Hours

4.2.3. Log Data: Count of the number of access to post or read

All groups post and read to forum count (Table 14 on page 258) were built from the Moodle logs and the PiWik logs (Figure 12 on page 85) and is represented visually in the graphs below (Figure 18 on page 113). Since this data was formed from the same information as the access times, the number of semesters collected for each student is also the same as the access count. The columns in the graphs show the number of times each participant, indicated by colour, entered the homework website and read a post or added a post to the homework forum. The individual graphs are divided into pairs by group and further sub-divided by mobile or non-mobile access. While the basic homework requirements remained the same throughout the year (Appendix C: Homework), the individual questions did vary in the specifics such as where the participants were to look for examples. Again the mobile counts are placed beside the computer counts to highlight any pattern differences which were followed-up in the interviews. Any differences that appeared are included in the coding section (4.4) below. These results are referenced as support in section 4.4.1.3 on page 144 and 4.4.1.5 on page 153.

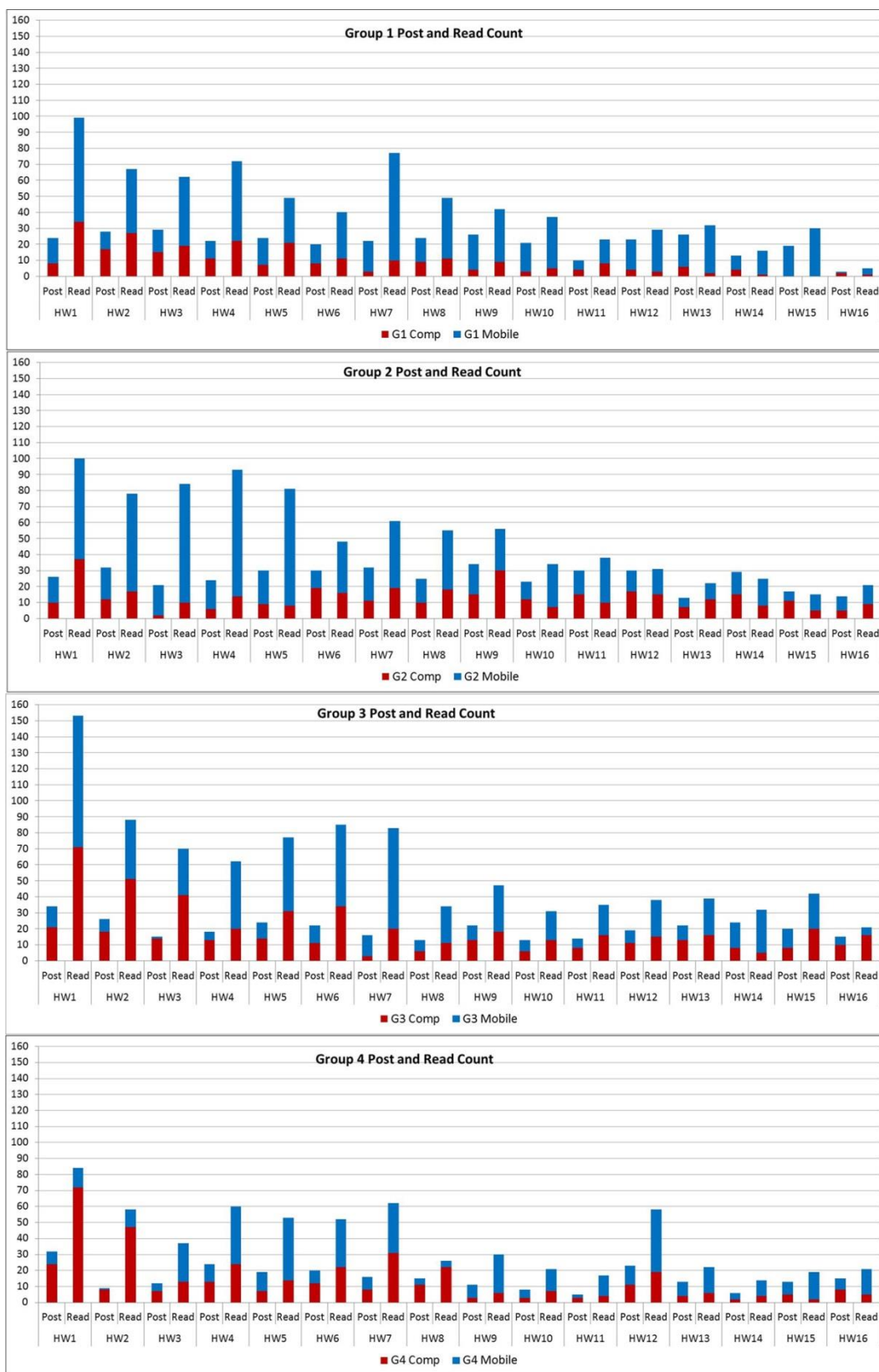


Figure 18: Log Data Post and Read Count:

4.2.4. Log Data: Percentage of mobile access

Using the data from the Moodle logs and the PiWik logs (Figure 12 on page 85), the graph in Figure 19 on page 114 was created to represent the percentage of the posting or reading website accesses by the participants with a mobile phone for each homework assignment. In this figure, the four groups are represented: group one is red, group two is green, group 3 is blue, and group 4 is orange. The trend line has been added to each group's line graph to indicate any differences in the overall trend throughout the year.

Group one and group two have an opposite tendency; as the experience of the groups increases group one has an increase in the number of mobile accesses while group 2 has an equivalent decrease. In addition, group one and group 3 three appear to have the same tendency; however, group 3 always has a

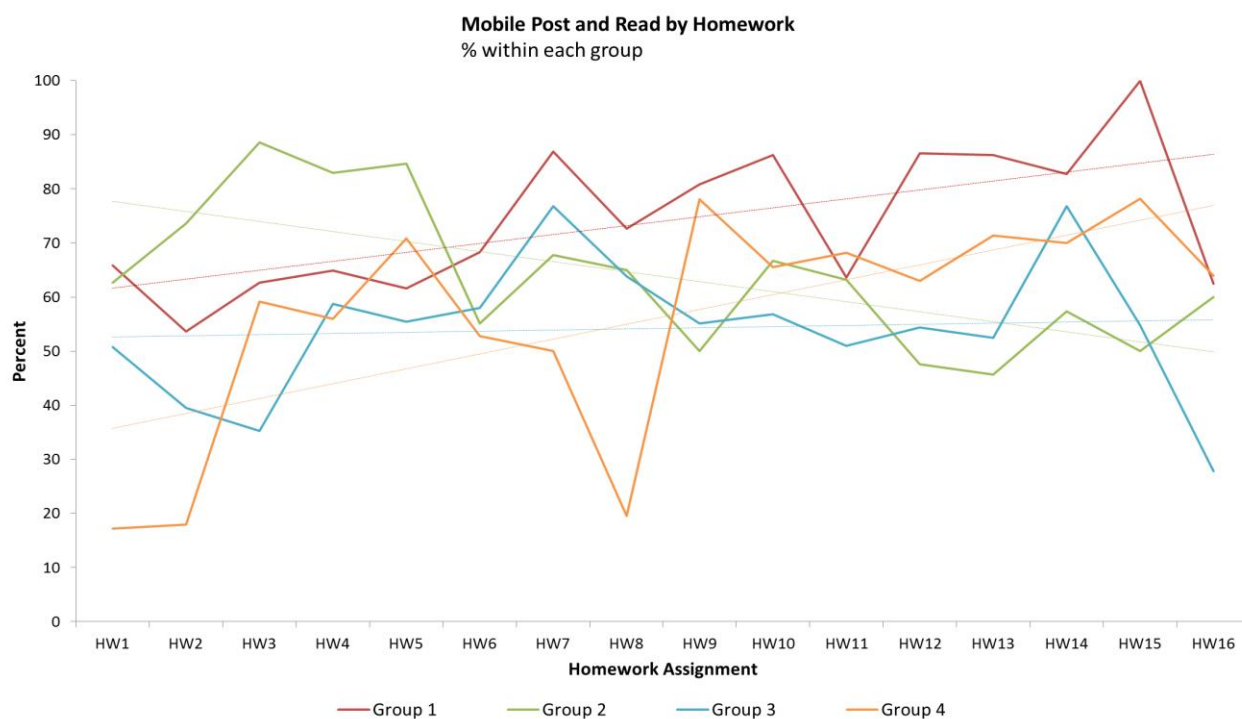


Figure 19: Mobile Post and Read by Homework

lower mobile use than group one. Group four has a sudden drop in mobile use at homework assignment 8, which is the first assignment of semester two. These

results are referenced as support in section 4.4.1.2 on page 139, section 4.4.1.3 on page 144, and 4.4.1.5 on page 153.

4.2.5. Log Data: Frequency of access for each group

All groups time on-line (Table 15 on page 259) and all groups login count (Table 16 on page 260) represent the frequency of access for each group and again were formed from the Moodle logs and the PiWik logs described in Figure 12 on page 85. The information from these tables has been combined to produce the graphs below (Figure 20 on p.117, Figure 21 on p.118, Figure 22 on p.119, Figure 23 on p.120, Figure 24 on p.121, Figure 25 on p.122, Figure 26 on p.123, Figure 27 on p.124).

These eight graphs graphically represent the times that the students logged into the homework website with mobile phone and computer. The mobile logins are represented in Figure 20 on page 117 for group one, Figure 22 on page 119 for group two, Figure 24 on page 121 for group three and Figure 26 on page 123 for group four. The computer logins are represented in Figure 21 on page 118 for group one, Figure 23 on page 120 for group two, Figure 25 on page 122 for group three, and Figure 27 on page 124 for group four. The x-axis of each graph represents the total time for one homework period in minutes. The left most number 0 represents the uploading of the homework assignment to the class website and the first access the students have to the homework assignment. The y-axis represents the individual homework assignments given to the student throughout the academic year. Homework assignment 1 is at the bottom of the y-axis, and the assignments proceed upwards to assignment 16 at the top. Each homework assignment is abbreviated by the letters “HW” followed by the number of the homework assignment, so HW1 is the first homework assignment of the year, HW2 the second and so on through to HW16. Each dot represents one login to the homework webpage for any reason and the space between the dots represent the time between logins. Each homework assignment has several rows of black dots because each row represents one of

the group member's login activities. The red lines represent the soft deadlines for each homework assignment. Soft deadline means the official deadline given at the beginning of the homework assignment, but sometimes the participants would need more time to complete the homework, so they were allowed to post past this deadline. This is why some of the access times appear beyond the soft deadline represented by the red lines. Semester one homework assignments are below the red dotted line in the centre of each graph and semester two is above it. The size of the dots roughly represents the duration of the login session; however, this duration information is not considered completely accurate due to the mobile devices being able to buffer website information.

The participants pass the soft deadline often during the first semester but much less during the second semester. This is probably because the homework assignments were kept online past the soft deadline during the first semester to give the participants time to get use to the system. Then during the second semester the deadline was strictly enforced, so the homework was closed to access immediately once the soft deadline had past. Again, a detailed analysis of the coding of this data is integrated into coding section (4.4) below. These results are used as support in section 4.4.1.3 on page 144, section 4.4.1.5 on page 153, section 4.4.6.1 on page 191, and section 4.4.6.4 on page 196.

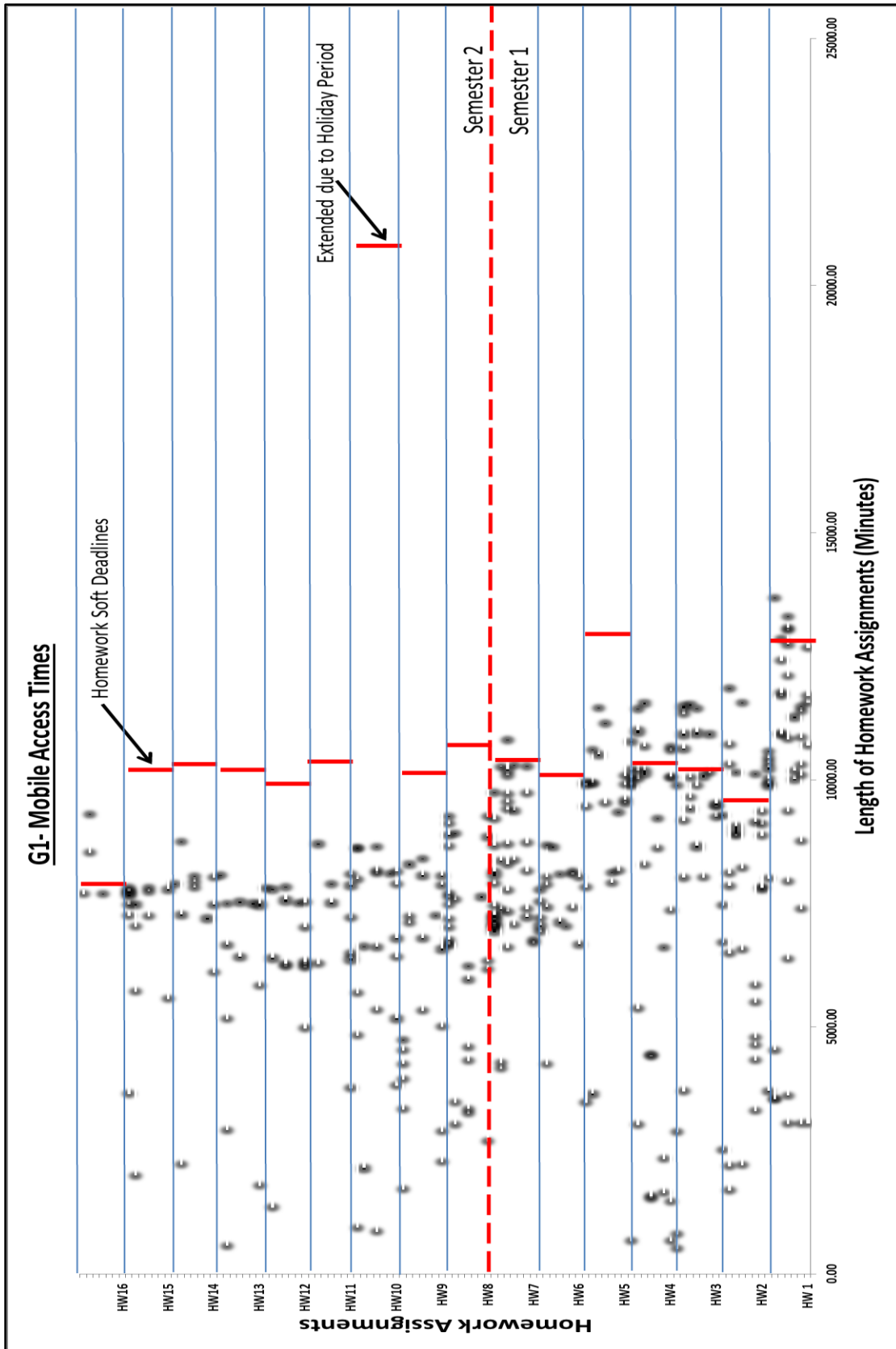


Figure 20: Group 1 Mobile Web Site Access times

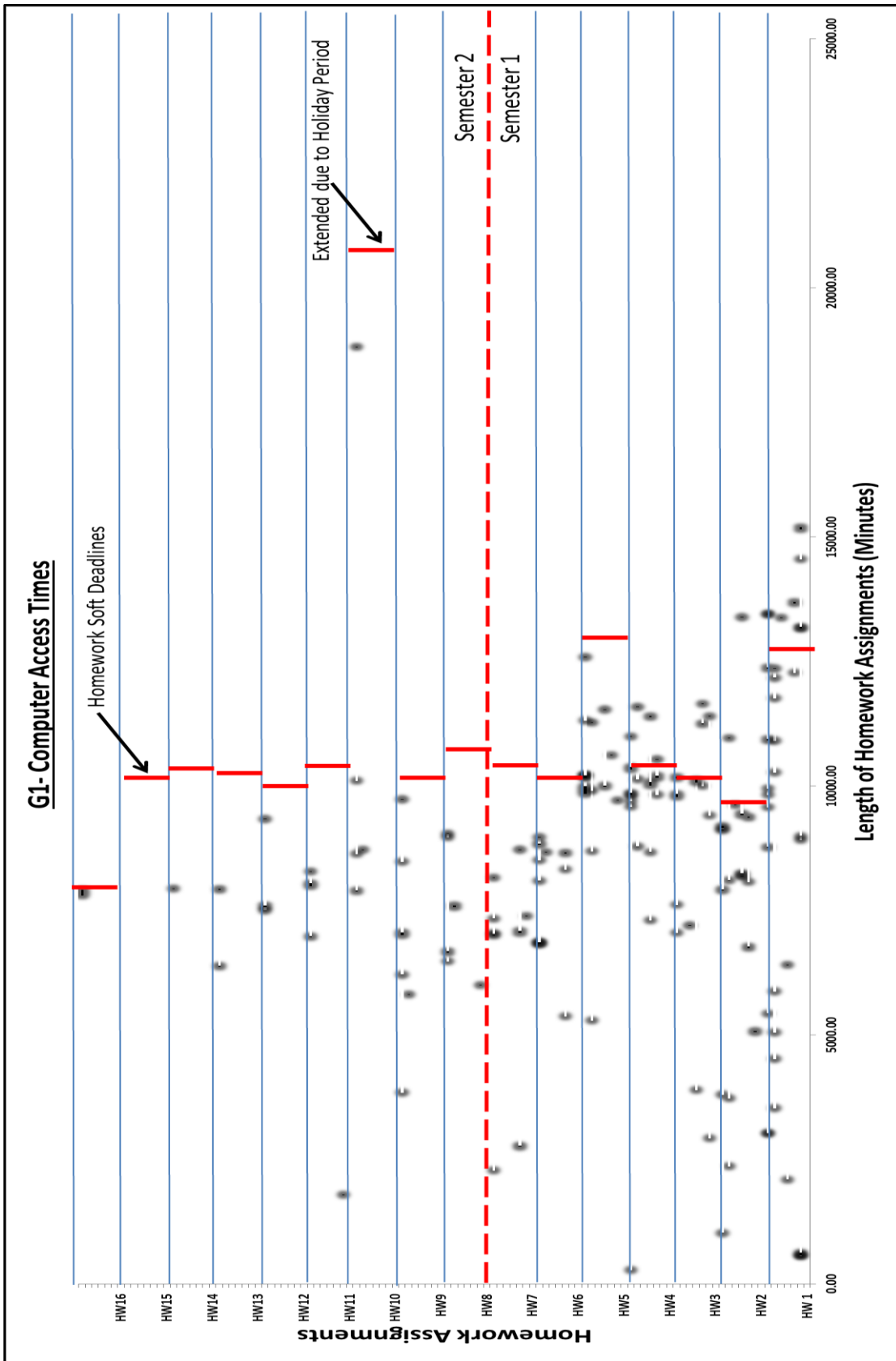


Figure 21: Group 1 Computer Web Site Access Times

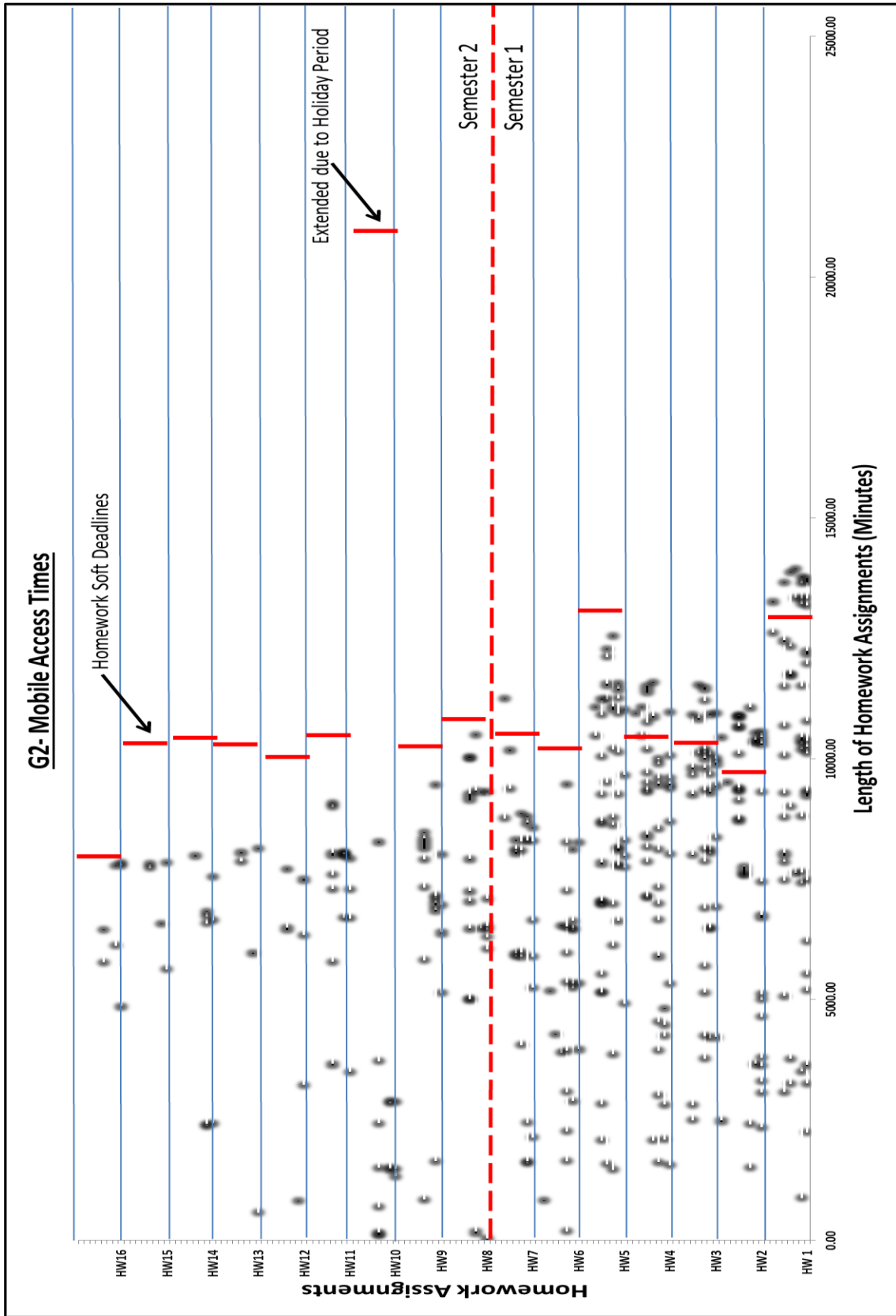


Figure 22: Group 2 Mobile Web Site Access Times

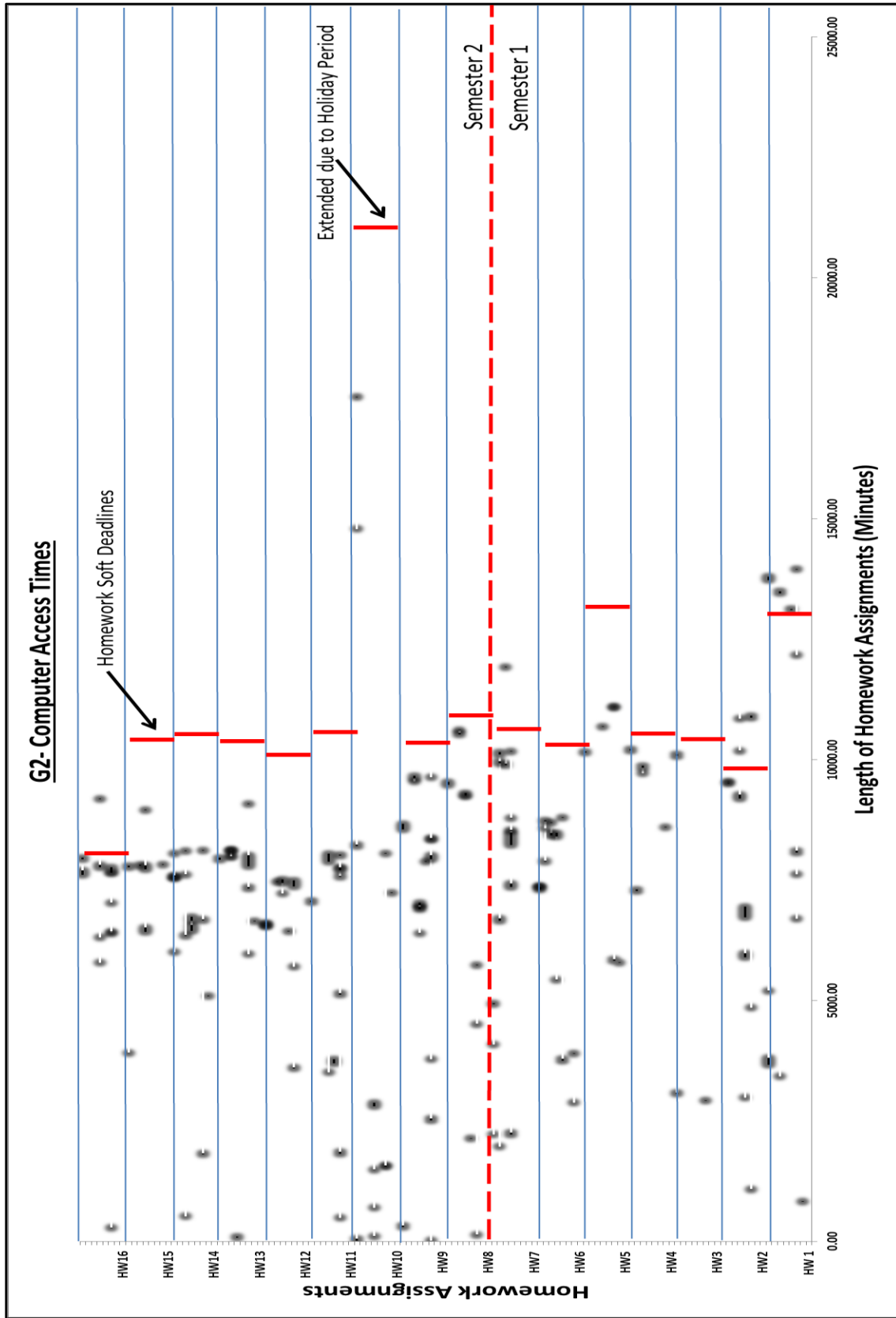


Figure 23: Group 2 Computer Web Site Access Times

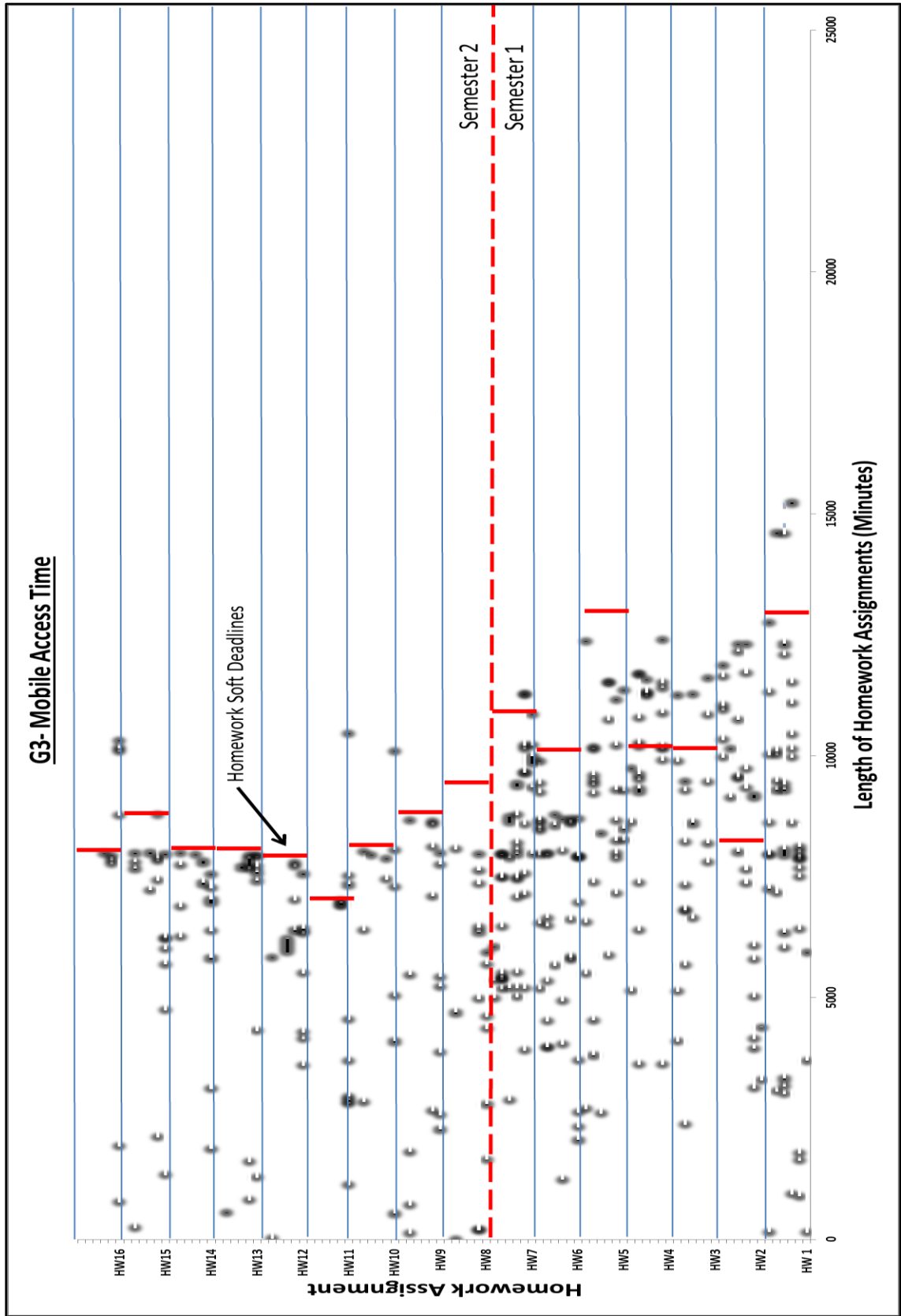


Figure 24: Group 3 Mobile Web Site Access Times

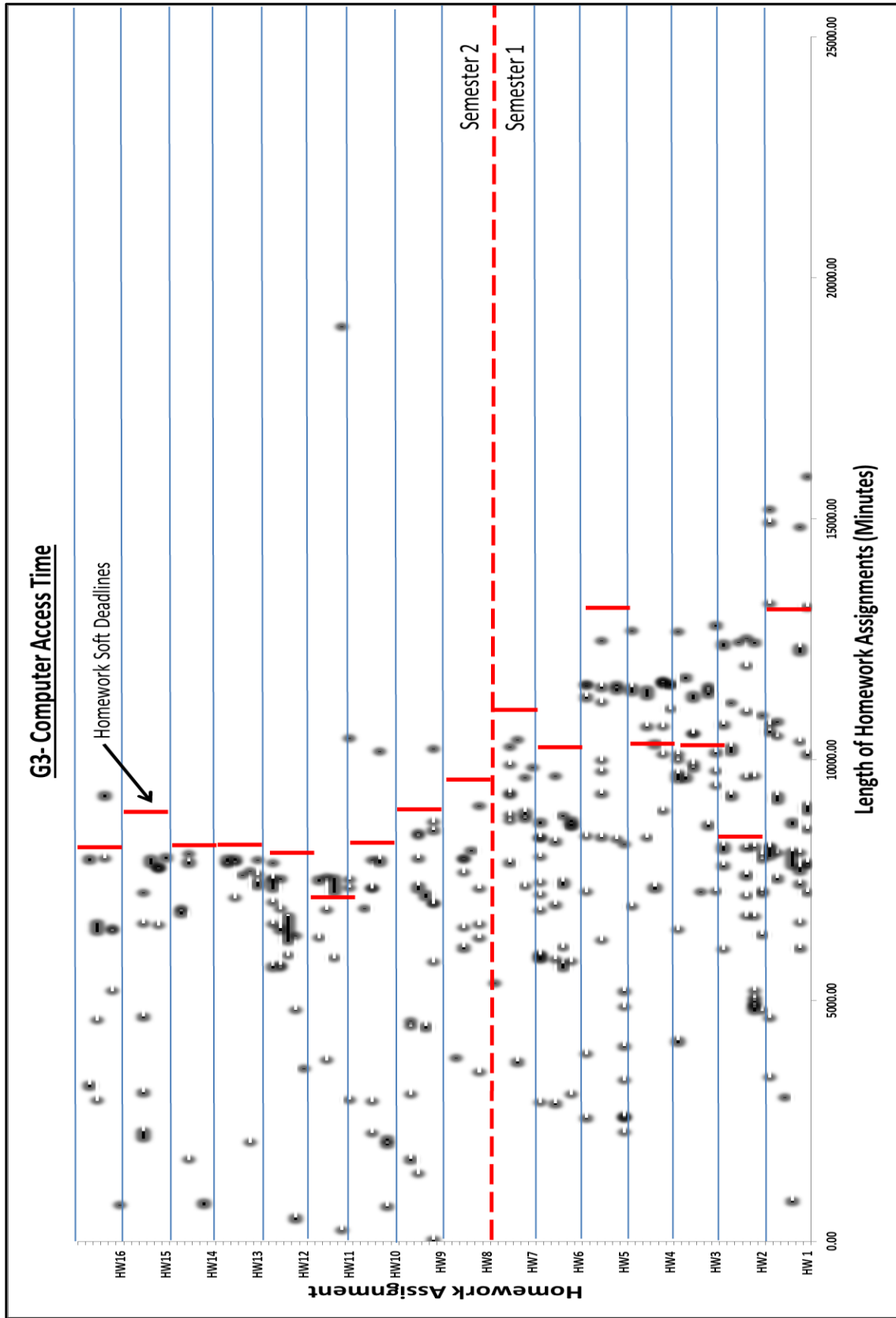


Figure 25: Group 3 Computer Web Site Access Times

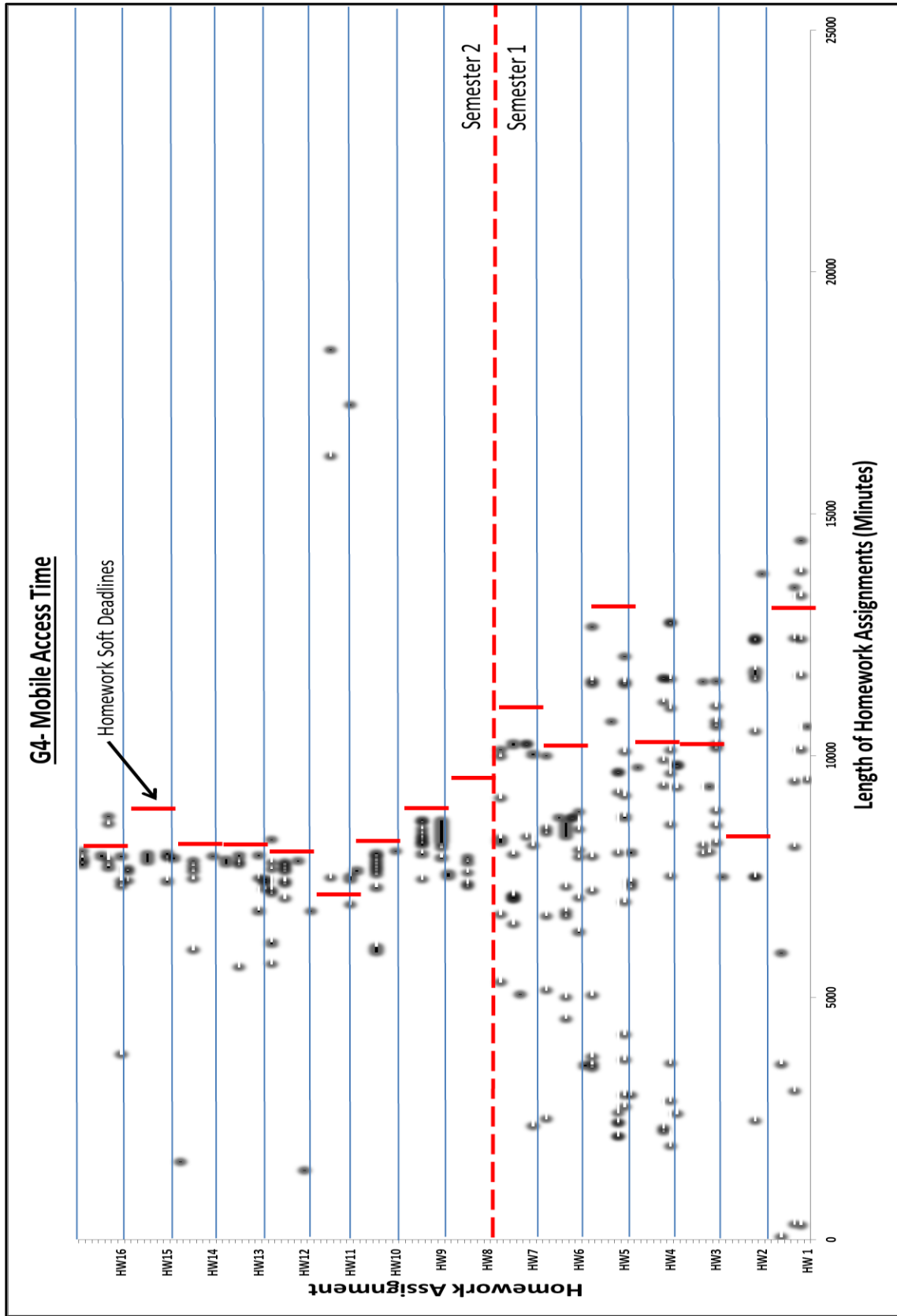


Figure 26: Group 4 Mobile Web Site Access Times

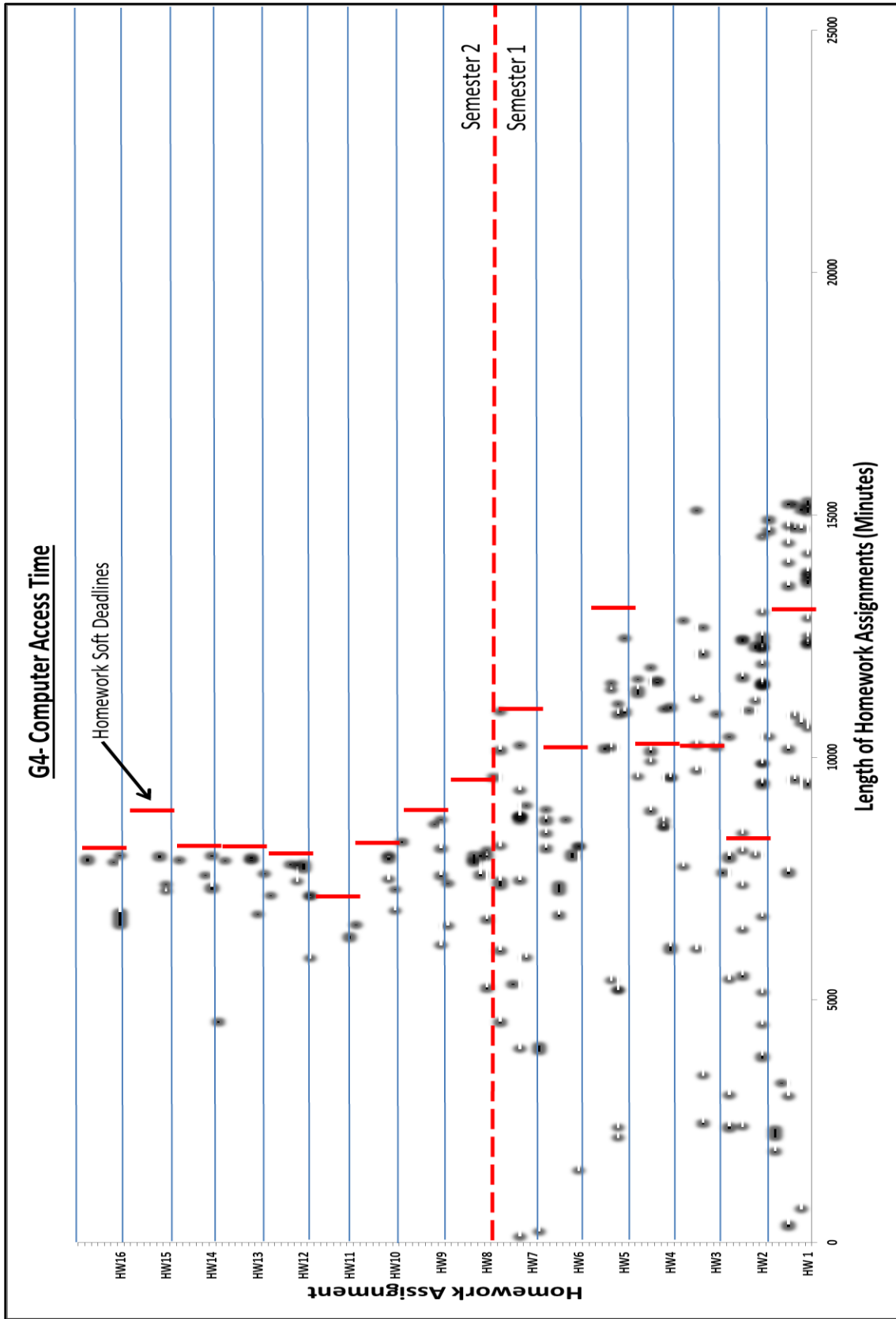


Figure 27: Group 4 Computer Web Site Access Times

4.2.6. Log Data: Homework answers

The number of characters and words were counted and divided by mobile

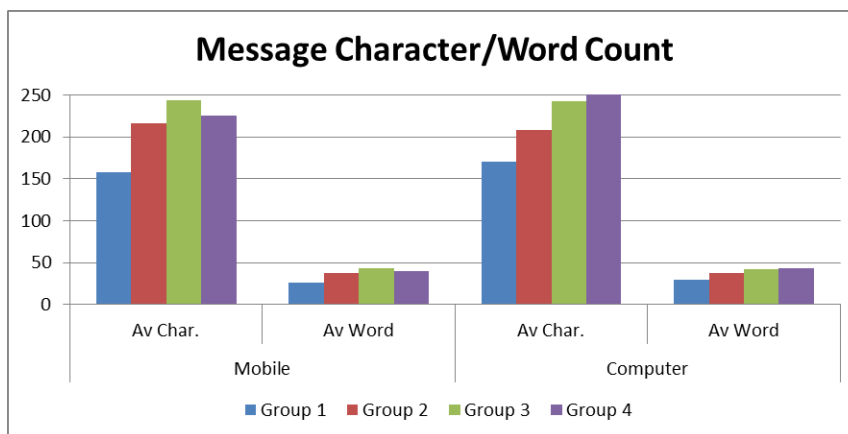


Figure 28: Message Character/Word Count

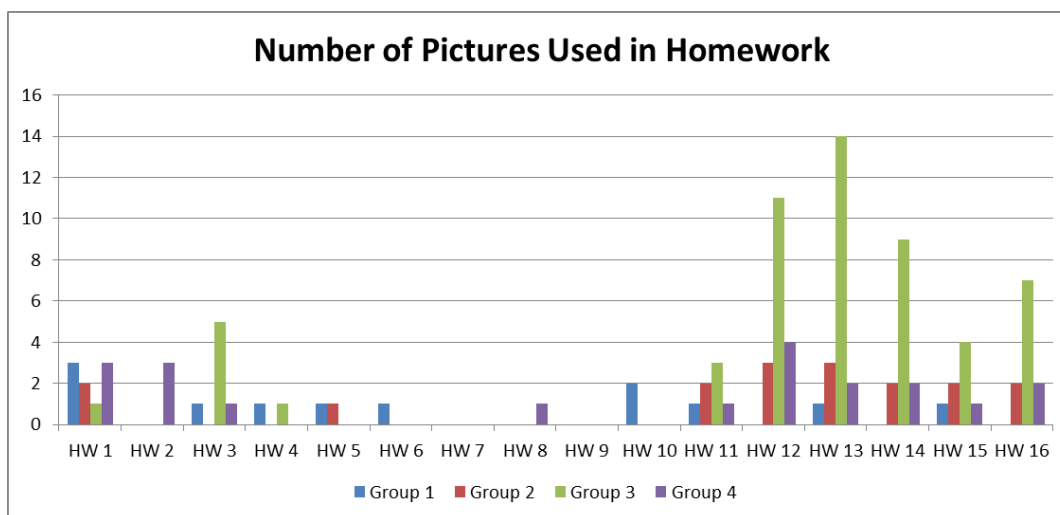


Figure 29: Number of Pictures in Homework

messages and computer messages. This data is included in Table 19 on page 262 and shown in Figure 28 on page 125. In Figure 29 on page 125 is a graph of the number of images used in each homework assignment divided by group. This graph was created with the data in Table 20 on page 263 which was created by going through the message posts and manually counting the pictures. This graph does not include all use of the participant's mobile cameras as many of them used the camera to collect information only and not to post the pictures as discussed in coding section (4.4) below. Of the 16 homework assignments, 8 of

them required students to find examples. These included assignments 2, 3, 4, in semester one and assignments 11, 12, 13, 14, 15 in semester two. This could be a possible explanation for the peaks observed in the picture count which appear during those times. During the interviews, several of the students mentioned having technical problems uploading their pictures to the website when using an Apple branded device. This problem was never resolved as it was discovered near the end of the research, and it did not affect any other model of phone. This could explain the low number of pictures uploaded from some groups. Again, a detailed analysis of the coding of this data is integrated into coding section (4.4) below. These results are referenced as support in section 4.4.1.3 on page 144, and section 4.4.1.5 on page 153.

4.2.7. On-line Data: Mobile device entry locations

All groups' mobile device entry locations (Table 17 on page 261) entry location information is represented graphically below (Figure 30 on page 126).

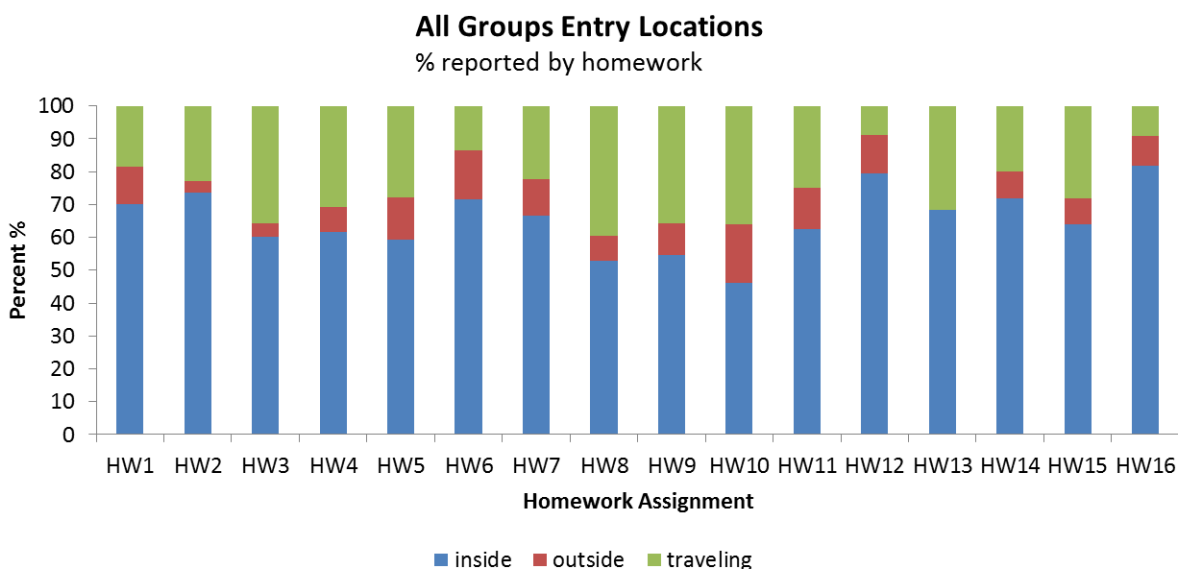


Figure 30: Mobile Entry Locations

This information collected from the first on-line survey that appears on the entry page to the website (Figure 13 on page 86). When entering the website with a

mobile device the participant is asked to choose an appropriate description of their current location. They may choose from inside a building, outside a building, or in the act of traveling to another place. Dates used to determine the homework assignment and then the IP address and time codes were used to match entries to group members in the Moodle data. This data is represented here as the percentage of the total locations reported across each of the 16 homework assignments. There is a clear drop of in the number of reports around homework assignment 8 which is the first assignment of the second semester.

These results are used as support in section 4.4.1.3 on page 144.

4.2.8. On-line Data: Inter-Group Communications

Inter-Group Communications data collected from the e-journals (Figure 14 on page 87) that participants were asked to complete after each week of homework. This data (Table 26 on page 267) is shown in the graph in Figure 31

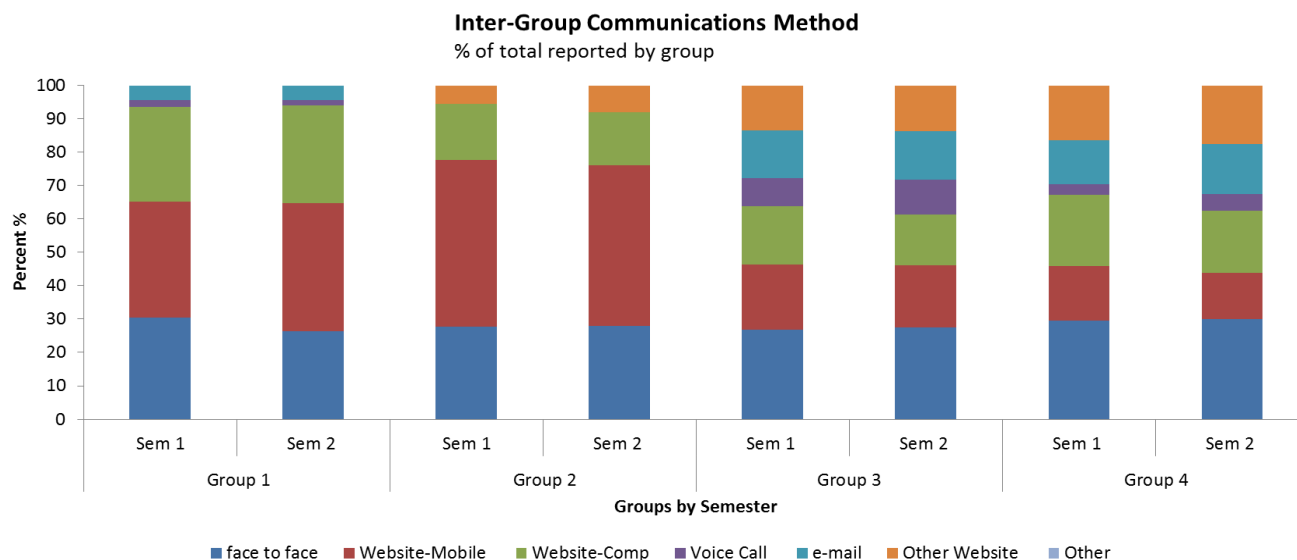


Figure 31: Inter-Group Communications

on page 127. Again, a detailed analysis of the coding of this data is integrated into coding section (4.4) below. These results are used as support in section 4.4.1.5 on page 153, and section 4.4.1.6 on page 157.

4.2.9. Mobile phone models

During the pre-selection, the participants were asked about the model of phone they were using. Also, later during the research interviews the participants were asked again about the mobile phones that they had used during the year. This information was then compared to the data collected through Google Analytics which was able to identify many of the mobile phone models accessed the research website. The mobile phone models are listed in Table 18 on page 262 of the appendix. A prerequisite for being included in the study was that each participant have a mobile phone which is internet accessible, but the mobile phones did vary in several ways: case style, screen dimensions, and keyboard.

In Figure 32 on page 128 there is a representation of the different display resolutions in pixels with the largest being the iPhone 4s with 640 x 960 pixels (px) at 3.5 inches from corner to corner. There were three mobile phone case styles used by the participants which included flip-open, slide-open, and touch-screen. The flip and slide open models had a standard 12 button alphanumeric keypad for typing while the touch screen models had a full keyboard accessible through the touch screen. There were six participants who used the flip open models: two from group one, one from group two, three from group three. The screen resolution in px on five of the flip open models was 480 px width x 854 px height and remaining phone was 240 px width x 427 px height. G1_Toshinao in group one was the only participant to use a phone with 240 x 427 px during semester one but then changed to a newer slide design phone with a 540 x 690 px display in semester two. In

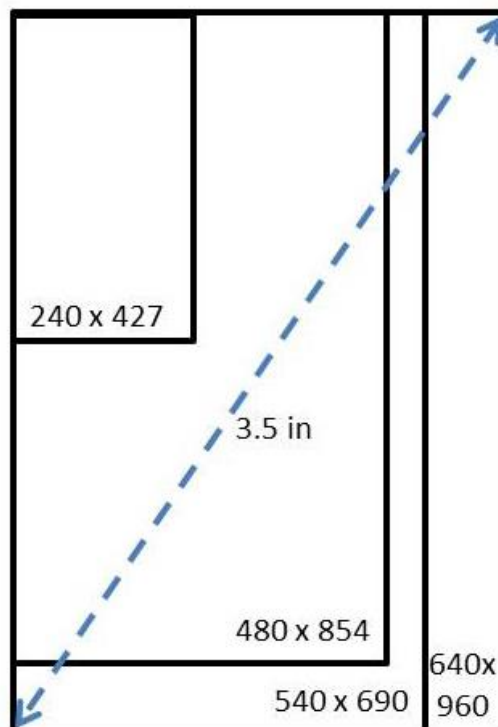


Figure 32: Display Size

addition to G1_Toshinao in group one, there were two members of group four whose phones used slide designs which had 480 x 960 px displays. All of the other participants had either a 480 x 854 px or 640 x 960 px display touch screen designs. While Table 18 on page 262 shows that the majority of the participants used a single mobile phone throughout the year, there were several who used two devices or switch devices during the year. In group one, G1_Chieno and G1_Takashi did not report on their device type, so it was difficult to be sure of their mobile phone model. G2_Eri, G2_Hikaru, and G2_Yurri in group two used two mobile phones during the year. G2_Eri switched from an older model to an iPhone model in November and G2_Hikaru upgraded from an older Sony phone to a Toshiba Regza touch screen model in September. G2_Yurri used an iPhone for most of her work but also occasionally accessed the site with her other flip model. In group three G3_Ayaka did most of her work with an ipod touch equipped with a mobile internet access adapter which works much like a mobile phone in that it can connect from any location. She used the ipod in combination with her Sony flip model phone. In the same group, G3_Fumie used her Regza touch screen for the entire year except for 1 month when her phone was being repaired. Group four members used a single model mobile phone throughout the year. Again, a detailed analysis of the coding of this data is integrated into coding section (4.4) below.

4.2.10. *On-line Data: Multidimensional Scaling Result*

Multidimensional Scaling (MDS) is a method for capturing efficient information from observed dissimilarity data by representing the data structure in lower dimensional spatial space. A detailed description of MDS analysis is included in the Quantitative Data Analysis section of the Methods chapter. MDS analysis data from first questionnaire results of semester one in April of 2011 (Table 21 on page 263) and the second questionnaire results of semester two in January of 2012 (Table 22 on page 263) is shown as a plot in Figure 34 on page 131. Since this was a comparison of two results, one from semester one and the second from semester two, Data from only those participants who in both

questionnaires could be used in the final analysis. Answering both were 5 participants from group one, 6 from group two, 6 from group three, and 5 from group four. So there were a total of 22 out of a possible 28 response sets that were used for the MDS analysis comparing semester one and two. The fitness of the MDS result was 0.088 which indicates that the multiple dimensions of the data fit very well to the two dimensions of the plotted result.

Concerning the movement, most of the points seem to be moving towards

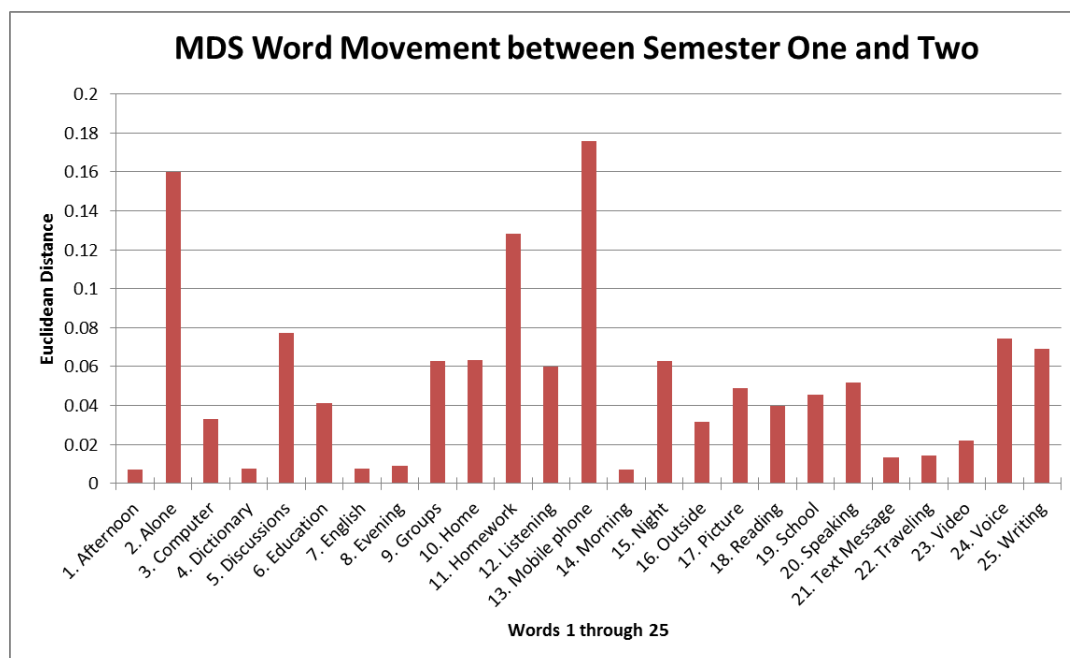


Figure 33: MDS Word Movement

the centre. In order to show the relative movement of the words, Figure 33 on page 130 represents the movement of each of the 25 words between semester one and semester two. The movement distance is represented in Euclidean distance and corresponds to the MDS plot points in Figure 34 on page 131. The largest relative changes were “mobile phone,” “alone,” “homework,” “discussions,” “voice,” and “writing.”

Overall, the larger movements included 5, 20, 9, 17 moving straight up, 1, 8, 14, 16, 22 up and right, 18, 15, 10 directly right, 2, 12, 13 down and right, 6, 11, 25* straight down, 3, 4, 21 down and left, none directly left, 19, 24 up and left, and 7, 23 with little change. The largest changes were seen in the words “alone”

(2), “homework” (11), “mobile phone” (13), “outside” (16), “text message” (21), and “writing” (25).

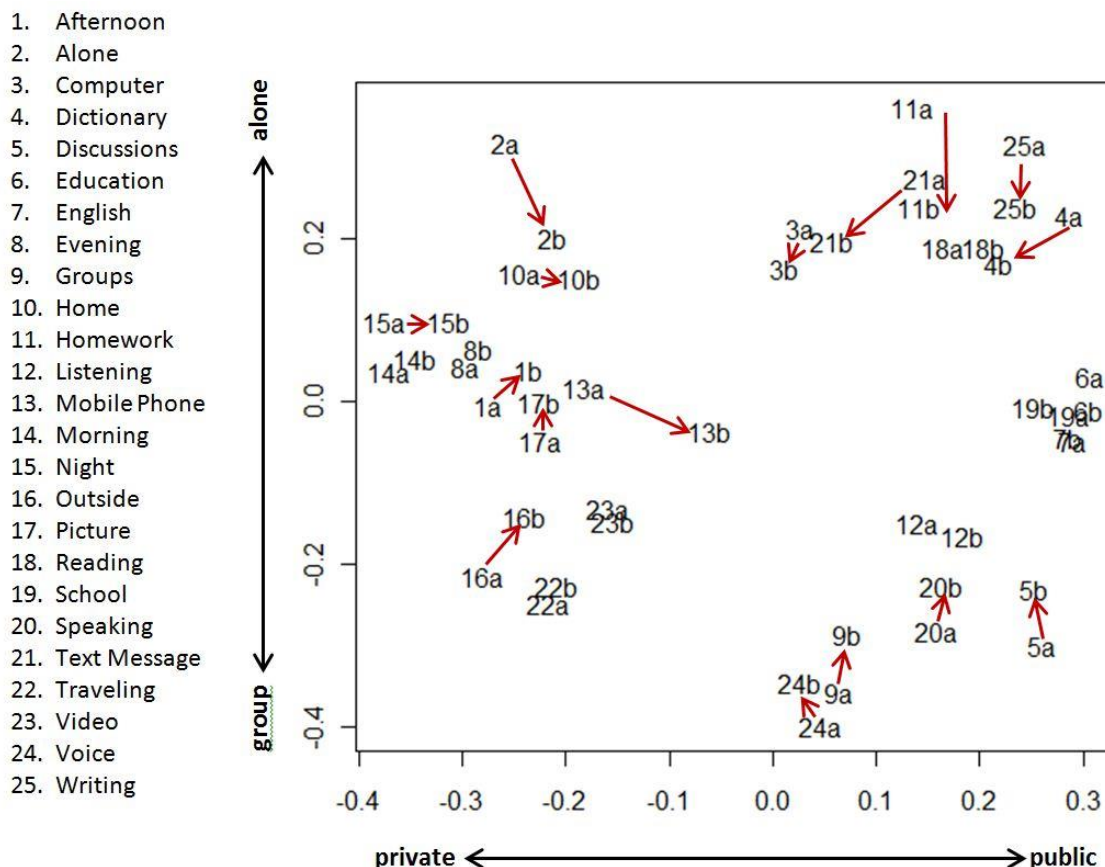


Figure 34: MDS Plot All Groups

After reviewing the placement of the words a possible description of the two dimensions becomes noticeable. At the bottom of the plot, the word “groups” (9) appears and at the very top is “alone” (2), so the vertical dimension is interpreted as representing the movement from words related to a group of people to words related to being alone. On the far left side the words “evening” (8), “morning” (14), and “night” (15) appear which are times that are often spent at home in private. While at the far right side appear “education (6), English (7), “groups” (7), and “school” (19). Since the participants are all students attending school to study English, this cluster can be interpreted as all relates to very public activity.

Because of these placements the horizontal dimension was interpreted as representing a change from private life to public life. Following this interpretation, the lower right corner cluster including “outside (16), “traveling (22), and “video” (23) which are all things a person can do privately while surrounded by a group of people. The cluster at the right middle made up of “afternoon” (1), “evening” (8), “mobile phone” (13), “morning” (14), “night” (15), and “picture” (17) could be seen as private times and places when you are surrounded by one or two people. An example might at home in the morning eating breakfast with their parents. This interpretation is supported by the close proximity of this cluster to the word “home” (10). The cluster at the bottom right includes “discussion” (5), “groups” (9), “listening” (12), “speaking” (20), and “voice”. These are all related to things you would do in public with several people. An example might be English language students in a classroom working on an assignment. This interpretation is supported by the close proximity of the small cluster made up of the words “education” (6), “English” (7), and “school” (19). Finally, in the top right corner appears “computer” (3), “dictionary” (4), “homework” (11), “reading” (18), “text message” (21), and “writing” (25). These were interpreted as words relating to things done alone that are related to their public life. An example is a student at home alone in their room using a dictionary to write the answers to a homework assignment for school. Again, a detailed analysis of the coding of this data is integrated into coding section (4.4) below.

The MDS results are referenced as support in section 4.4.1.1 on page 138, section 4.4.1.2 on page 139, section 4.4.1.4 on page 150, section 4.4.1.5 on page 153, section 4.4.1.6 on page 157, section 4.4.2.1 on page 161, section 4.4.4.2 on page 172, section 4.4.5.1 on page 178, section 4.4.5.2 on page 179, and section 4.4.5.3 on page 181.

4.3. Qualitative Results

4.3.1. Section Outline

This section gives a description of the qualitative data that was collected. As with the quantitative section (4.2) above this section will only provide a brief

description and the detailed coding is included in section (4.4) below. This section includes interview data, weekly E-Journal data, and final online questionnaire data.

4.3.2. Interview Data

Participants were asked to participate in two interviews. The first was at the beginning of the Japanese school year in April followed by a second at the end of the same school year in January. As seen in Table 2 on page 108, some of the participants were unavailable for their first or second interview. At the end of the year, group one had completed 12 interviews; group two had completed 15 interviews; group three had completed 10 interviews; group four had completed 11 interviews. This made a total of 48 interviews which averaged 30 minutes in length for a total of 1440 minutes. These interviews were transcribed and then coded.

4.3.3. Weekly comment submissions

Participants were asked to complete weekly E-journals (Figure 14 on page 87) which were online and allowed the participants to report on various aspects of their use of mobile phones as related to the homework activities. This was not a requirement, but the participants were encouraged to complete one each week. Each e-journal recorded the participant's identity, the inter-group communication methods used during that week's collaborative homework assignment, and provided a text field in which they could comment on any aspect of the homework assignment. The e-journals for semester 1 and 2 are included in Appendix F: e-Journal Data. As summarized in Table 2 on page 108, members of group one completed 61 comment submissions by all but one participant submitting. In group two, 5 of the 8 members submitted 31 comments over the entire year. Group 3 submitted a total of 70 comments with only 1 member not participating. There were 50 comments submitted by 5 of the 6 members of group 4.

4.3.4. Final online questionnaire

The results of the final on-line questions are included in Appendix G: End of Year Final Questions. This was a set of open-ended questions that the

participants were asked to answer after the last interviews were completed. They were encouraged to use their native language of Japanese in order to allow them to express their views without the hindrance of dealing with a second language as in the interviews. The hope was to give them a last chance to communicate their thoughts on the research that they felt they could not accurately communicate to the researcher during the interviews. Some of the participants did not feel the need to express themselves again not all of them answered the final questions. In total the answers included 5 from group one, 3 from group two, 4 from group three, and 2 from group four. The answers that were submitted in Japanese were translated into English before including them in the coding process.

4.4. Coding

The interpretive commentary identifies to the reader those elements that are most salient for the author. I made judgments about the data as I analysed, organized and reported them in a relevant and meaningful manner. Judgments were made through thematic analysis which refers to the identification of themes or concepts that are in the data, the building of a systematic account of what has been observed, and the emergence of a theory through the coding process. This required the data to be organized in one place which was done using the NVIVO software. In order to judge a theme in the data as relevant or meaningful to the research questions, the emergent codes were put through a two cycle inductive process. The first cycle coding was the use of methods during the initial coding and recoding of the data, where the data was initially coded through a process of studying the interview transcripts word-by-word or line-by-line looking for in-vivo codes and looking for similarities and differences. Then, second cycle coding required the researcher to classify, prioritize, integrate, synthesise, abstract, conceptualize, and build theories. The main goal of second cycle coding was to develop a sense of categorical, thematic, conceptual and or theoretical organization from the first cycle data. A more detailed description of this process can be found in section 3.8.4.

The following themes emerged from the data; a) affordances of mobile devices, b) feelings towards homework, c) feelings towards mobile device, d) feelings towards other students, e) private and public space, f) reflection and g) dialogue.

A summary of the findings is provided in Table 3 on page 135 to aid in navigation. Quotations used within each theme indicate verbatim remarks by the participants. Quotations considered important but not essential were indicated by endnote numbers and included at the end of this study. Few grammatical and mechanical changes were made in order to maintain the authenticity of the participants. When translation was required, the original Japanese appears beside the English translation. Each of the six main subsections concludes with a summary, and a brief conclusion ends the chapter.

The data was addressed narratively focusing on the themes that emerged from the coding highlighting any changes in understanding, attitude and behaviour over the research period.

Table 3: Summary of Coding Themes

Themes and Sub-themes	Summary
<p>Affordances of Mobile Phones</p> <p>a) Carried at all times</p> <p>b) Availability increases opportunity</p> <p>c) Ease and speed of use</p> <p>d) Increased control</p> <p>e) Increased information collection</p> <p>f) Social context</p>	<p>Physical characteristics of the device allow it to be carried at all times.</p> <p>Increased availability of the mobile device allows for more opportunity for homework.</p> <p>Ease and speed of use allows for greater contact with homework.</p> <p>Increase control of when, where, and how they communicate.</p> <p>Increase information collection related to homework such as photos.</p> <p>Social context of Japan makes mobile communication attractive because does not pressure others to reply immediately, and able to communicate in crowded public places where noise is not acceptable.</p>

<p>Feelings towards Homework</p> <p>a) Mobile feelings transfer</p> <p>b) Mobility changes attitude</p> <p>c) Homework more convenient</p> <p>d) Feel more involved</p> <p>Feelings towards Mobile device</p> <p>a) Mobile homework new</p> <p>b) Mobile as distraction</p> <p>Feelings towards other Students</p> <p>a) Method of communication</p> <p>b) Inter-student communications</p> <p>c) Peers as teachers</p> <p>d) Conflict</p> <p>e) Depth to communication</p>	<p>Positive feelings related to the mobile and its general use can positively affect a student's feelings towards the homework.</p> <p>Mobility increases feeling of freedom of place that changes the attitude to homework especially when examples are required.</p> <p>Ease of use makes homework feel more convenient.</p> <p>Increased access to others opinions can change student's beliefs about homework, makes them feel more involved.</p> <p>Mobile used for homework is a new idea for to the students so changed their traditional view of this relationship.</p> <p>Mobile as distraction is an issue with some students who feel it is not good to spend too much time communicating through the mobile.</p> <p>Type of student communication, mobile, computer, or face to face, changes depending on the location and relationship between the students.</p> <p>Frequency of inter-student communication increases the feeling of "closeness" between students.</p> <p>Student peers as teachers and sources of information.</p> <p>Conflict created when an expected immediate reply does not come, or the replies are too varied.</p> <p>Lack of personal or depth in communication seen as a limitation which is why some students use face to face for complex problems.</p>
<p>Private and Public Space</p> <p>a) Mobile in private space</p> <p>b) Homework moves to private space</p> <p>c) Friend and non-friend boundaries</p>	<p>Mobile is in the private space of most participants.</p> <p>Position of the mobile phone in a private space affects motivation toward homework by eroding the student's pre-existing negative public association with homework in general.</p> <p>Friends and non-friends boundaries bridged as increased contact with allows more students to be added to the personal space as new friends.</p>

d) Collaboration in the home	Home becomes more public as the ease of access allows them to use previously unavailable periods of home time for homework such as breakfast time, before bed, etc.
e) Work and homework	Work becomes more public as their otherwise separate work and school life are bridged by the affordances of the mobile that allows them to access the homework from work during break periods.
f) Private mobile websites	Private mobile access websites were slowly incorporated into the public homework.
g) Homework and non-homework activities	Homework encroaches into private time that would otherwise be used for non-homework related activities because of the ease of switching between applications on the mobile.
h) Language	Japanese language as private and English as public means that their choice of communication method, mobile or face to face was partially motivated by which language they wanted to use because the homework was meant to be completed using only English.
Reflection	
a) Short, fragmented visits	Short, fragmented visits are seen by some students as having positive affect on learning because it allows them to think between visits.
b) Peers as teachers	Access to peer's comments is easy with the mobile, and so receive new ideas regularly which increases the consistency of thinking about the homework.
c) Freedom of location	Freedom of location provided increases the reflection of students to the homework.
d) Mobile as reminder	Just the presence or use of the mobile for non-homework related activities remainder them that they had homework and started them thinking or searching for an answer.

4.4.1. Affordances of Mobile Phones

Physical characteristics allow it to be carried making it always available. The ease and speed of use possible with a mobile phone give the user a higher level of control than is possible with other communication methods. The mobile is an excellent data collection and storage device making possible example collection activities. The flexibility of use possible with a mobile device allows it to

fit any social situation. This section is separated into six sections a) carried at all times, b) availability increases opportunity, c) ease and speed of use, d) increased control, e) increased information collection and d) social context. A summary of the coding is included at the end of this section.

4.4.1.1. *Carried at all times.*

Despite it being obvious that the size of the modern mobile phone affords it a place as a constant companion to the students, it was important to identify that this was indeed the case because this affordance is central to the idea of mobile learning and touches upon most of the coding in this research.

The compact size of the mobile phone that allow it to be carried by the students at all times of the day and make it ideal for the environment of extreme overcrowding experienced every day by the students on the commuting trains in Tokyo. The MDS plot in Figure 34 on page 131 indicates the participants in general perceive “mobile phone” to be very closely related to the times of the day, with “afternoon” being the closest followed in order by “evening,” “morning” and “night”. This suggests that the mobile phone does play a role in their lives throughout the day. Of all the mobile phone models used by the students, the largest and most common among the participants was the Apple iPhone at 640 mm by 960 mm (Table 18 on page 262) which was the model used by G1_Atsumi who described it as “very thin”¹ and easy to use with one hand²- leaving the other hand to brace herself on the train. G1_Mai mentions in interview one that her mobile is easy to carry³, and G1_Erika says it is because of this compact size that she is able to check her homework on the train⁴. G2_Ayaka in her weekly comments also wrote that the mobile phone size allowed her to use it even when she could not sit down on the train⁵. G3_Eri also likes to use her mobile on the train, and she explains that even when the train is too crowded for her to use her writing notebook the mobile is small enough⁶ to use. G2_Ayaka in both interviews one⁷ and in interview two, also finds the size allows her to carry the device in extremely crowded situations.

Interviews\\Time 2\\G2_Ayaka

I: If you did not have a mobile phone on the train, what would you do?

G2_Ayaka: Maybe I would read a book, but the train which I use is the [Chioda Line] and Chioda Line is very - I have to stand. I cannot sit on the seat, so it is difficult to read a heavy book.

The size of the phone also overcomes the problem of privacy in crowded situations. G2_Yuuri in interview one⁸ explains that she bought her iPhone specifically for the homework and then in interview two⁹ she reports discovering that its compact size created a feeling privacy while on the train because no one can see what she is doing¹⁰.

4.4.1.2. *Availability increases opportunity*

This code developed after the second round of interviews in which the students began talking a lot about increased amount of time that the mobile gave them to do the collaborative homework and how this was a sharp contrast with other classes that did not offer this option. There was a definite increase in places that the mobile is used from the start of the research, when access was common on the train, to the conclusion when it had spread to locations such as a home, shops, train stations, classrooms, on the street among others. Most of these places and times had been unavailable to them before the mobile phone access was provided.

All the groups, except group two, show an overall increase in the percentage of mobile message read and post access to computer access over homework activities 1 to 16 (Figure 19 on page 114). This suggests that they are continuously finding more opportunities to access the homework with their mobile phones. The MDS analysis results in Figure 34 on page 131 indicate the participants perceived a very strong relationship between "homework," "reading," and "writing," which is an expected result, but these three are also placed a relatively big distance away from the "mobile phone." However, the change in perceived distance shown by the red arrow indicates that these three are now perceived by the participants as having come closer. In interview one G3_Ayaka¹¹ states, that having her mobile while traveling on the train opens that time up for the collaborative homework. Then in interview two, she expands on her statement, saying that she uses her mobile phone for homework everywhere

which she feels increases the time she has available to devote on doing the homework and thinking about the homework¹². She also mentions that she started working during the second semester so she would use her computer at home on weekends and started doing homework on her mobile at her workplace during her break time¹³ where there is no other way to do the homework available to her. Her access hours do show and increase in mobile activity at 5 pm (Table 10 on page 257) and an increase in weekend computer activity (Table 11 on page 257) during the second semester. Also, she uses the mobile for homework while on the train which she finds very helpful because it increases the time she has available to do her homework.

Interviews\\Time 2\\ G3_Ayaka

G3_Ayaka: Yes. So I could only [do homework] after class, working place or train.

I: So after class, working place, train, mobile is very useful for that?

G3_Ayaka: Yes, for me it's really helpful.

I: After class, work, train, only times - so if you - so mobile lets you - if you did not have mobile it would be - would it be difficult for you to do homework at these times?

G3_Ayaka: Yes, yes, if I have no mobile phone. I mean, this time [work] and this time [train] is getting time to do homework.

G1_Atsumi in interview one comments that the year before the study she did not have the ability to do her homework on the train because mobile phone access was not provided by other instructors, so the travel time was very boring, but that now she thinks it is very important to be able to use her mobile phone for homework while on the train¹⁴. Later, in interview two, she still feels that she and the other students could not access the homework on the train without a mobile phone¹⁵. G1_Erika in interview one mentions that she usually uses the mobile phone to access the homework while she is traveling to and from school because it is a very convenient way to get it done¹⁶.and she continues in interview two restating her positive feelings towards the mobile access during her 30-minute train ride which is time that would not be available without a mobile phone¹⁷. The mobile phone entry location information described in Figure 11 on page 84 and

the results (Table 17 on page 261) show a consistently high rate of mobile homework access while traveling.

Many of the students in interview one commented positively on the increased time they gain from being able to use their mobile phone to access the homework website throughout the day, which one can expect. G1_Toshinao¹⁸, G2_Ayaka¹⁹, G3_Eri²⁰, G3_Yui²¹, G3_Fumie²², and G4_Midori²³ all comment in interview one that they briefly thought this was a positive change from the previous year. However, in interview two their answers became much more detailed, showing that they were now speaking from a position of experience having used the system for several months. G1_Toshinao now used it at school in the cafeteria during lunch, in the classroom and in the library between classes. He also said that he would have just given up doing the collaborative homework without the mobile phone access option²⁴. This trend of doing the homework during lunch seems to be popular as the mobile access count can be seen to increase dramatically around 12 pm in groups one and two, and a smaller increase in groups three and four (Figure 17 on page 111). This difference in number of mobile accesses during 12 pm between groups may be explained by the deadline times. Groups one and two deadlines were on Wednesday, and groups three and four deadlines were on Monday. So the students in groups one and two had several school days just prior to the deadline which can be seen in the increased activity on Tuesday, the day before the deadline, in Figure 17 on page 111. On the other hand groups three and four had non-school days, Saturday and Sunday, prior to the deadline day which can be seen in the increased activity on Sunday, the day before their deadline also seen in Figure 17 on page 111.

G2_Ayaka talks about the increase in the frequency of contact she has with the homework from using her mobile on the train and during lunch that she feels helped her to learn²⁵. G3_Eri described using her mobile to do homework while eating at restaurants, traveling in trains and buses, walking down the street, and working at her part-time job. She adds that, for her, this access would not be possible with a computer alone and that having access in all of these situations

helped her to complete the homework²⁶. G3_Yui comments on accessing the homework during shopping, at school, at work, on a train and a bus, and while walking²⁷. G3_Fumie tells of checking her group's answers and looking for homework examples in the train station, on the train, and in the shops on the road home²⁸. G4_Midori view the comments; on the train, in school at lunch²⁹, out with friends and even in the toilet³⁰. Again the location data supports this as it shows mobile access location inside, outside, and traveling across all four groups (Table 17 on page 261).

G2_Hitomi³¹ and G4_Asako³² comment in interview one and G3_Yui³³ in the final questionnaire, that without the availability of the mobile phone they would be limited to doing their homework on the computer during the time they are present at home, so they would not be able to post their answers immediately at the time and place they thought of them as they have become accustomed to doing with the mobile phone. There is some support for this view of homework on a computer as being something that is usually limited to the home. The MDS result in Figure 34 on page 131 indicates that the participants perceive both "home," "computer," and "homework" closely with the idea of being alone. In addition, the MDS plot suggests that "home" is seen as very private and "homework" as very public with "computer" midway between them. Similarly, there was a sense of frustration that appeared in several student interviews at the idea of having to go back to using only a computer for their homework. G2_Hikaru now posts comments on the train³⁴ and in the classroom³⁵ but "must" go home every time she wants to use her computer³⁶. G2_Yuuri has developed a routine of checking her collaborative homework with her mobile on the train, at work and even at home -where she has computer access³⁷-, but says she can only do the homework from other classes when at home on the computer³⁸. G4_Yuri does the homework on the train³⁹ and has also started using her mobile at home when her home computer is not available⁴⁰. In fact, all the groups show an increase in mobile homework access between 8 pm and 11 pm (Figure 17 on page 111) which is when they would usually be at home. This spreading of mobile use into the traditional computer space of the home is discussed on page

later in this section. G4_Yuan in interview one indicates that her opinion has changed and that she now feels the mobile phone is very useful and would be an improvement for other courses because she is able to do her homework while at work and other places without the need to go home⁴¹.

When asked what they would do without mobile homework access G2_Eri, who mentioned doing the mobile homework on the train in interview one⁴², said that she would spend the time sleeping instead⁴³. G3_Akiko says in interview one that without the presence of the mobile phone she would not do any homework while traveling on the train but would instead sleep⁴⁴.

G1_Takashi says in interview one that he is only able to do the collaborative homework while commuting to school in the morning because the mobile phone allows him to contact the website anywhere at any time without the need to limiting himself to a scheduled time and place⁴⁵. A spike in his mobile activity does occur between 8 am and 9 am (Table 6 on page 256) and is limited to the weekdays (Table 7 on page 256). G4_Eri in her first interview also mentions the constant presences mobile phone allows her to access the homework comments anywhere which would otherwise be impossible with a computer due to what she describes as her busy schedule⁴⁶ and traveling time⁴⁷. G3_Fumie⁴⁸ in the final questionnaire write about how the mobile phone increased the amount of time and number of places that she spent studying the homework.

The integration of the mobile phone into a student's life affords constant access to the device (see page 138) which allows them to participate in the collaborative activities in places and during activities that are impractical for computer use. In Figure 34 on page 131 this is supported by the positioning of "traveling," "outside," and "school" a considerable distance from "computer" and "homework". This suggests that the participants' traditional view is of homework being done in a static position on a computer and that this mobile homework is new to them. This opens up previously unavailable pockets of time for homework and affords an immediacy of contact that further integrates the mobile into their lives. This immediacy is possible because of the ease and speed of

communication afforded by the mobile phone which is discussed in the following code.

4.4.1.3. *Ease and speed of use*

The modern mobile phone affords the ability to communicate quickly with little effort. This code was created to capture the effect of this on the students' perception of the homework. These started out as separate codes but were combined because they consistently appeared together. When one student mentioned ease of use, a reference to the speed of the mobile was often included. For G1_Atsumi, the mobile phone offered a simple and fast method of keeping contact with the homework. During the first interview, she said that she preferred the mobile phone over a computer because of this speed and ease of use.

Interviews\\Time 1\\G1_Atsumi

I: If you had a choice of only one, then which one would you use more for your homework?

G1_Atsumi: Ah...mobile phone.

I: Why?

G1_Atsumi: It is useful. Simple but yeah.

I: Simple is a big word, can you tell me what is useful?

G1_Atsumi: It is very fast to log in to the internet on a mobile phone than on a computer, I think.

Her opinion remained unchanged at the end of the year when in the second interview she again states her preference for the mobile phone over the computer for homework. Her preference for mobile phone over the computer can be seen in Table 14 on page 258 which shows that she did not use a computer for any of the homework assignments throughout the year. She describes the computer as "lazy" to wake up and how the mobile phone allows her to shorten the amount of time needed to complete the homework assignment.

Interviews\\Time 2\\ G1_Atsumi

I: If you had a choice would you still use mobile phone all the time?

G1_Atsumi: Yes because iPhone - and now I have iPhone and to wake up - my computer is really lazy to wake up, take time, so long but is really short time to wake up and to check internet, so I use iPhone recently only. I don't need to spend so much time to homework because I - no, from the PC, of my PC I think internet is really take long time; I don't know why but

just so the reason I use mobile phone, iPhone is that I want to make the time short for the homework only.

She estimated the average length of time needed to access the homework was between one and two minutes, which was very similar to time mentioned by other participants⁴⁹. This allowed her to access the homework while doing other activities.

Interviews\\Time 2\\ G1_Atsumi

I: So you're on for a few minutes, you're off for a few minutes, on, off; what's happening here?

G1_Atsumi: Doing other things.

I: Are you thinking about homework at all here?

G1_Atsumi: Not all time but several times.

This pattern of short access times is seen as a benefit by her because it allows her to utilize these small moments of time to answer other students' comments at the moment they post them. It is at similar times that she reads the other group members' comments, posts her comments and uploads her examples to the website⁵⁰. The website log data does indicate a greater frequency of individual access attempts for groups one through four throughout the year (Figure 18 on page 113). This increase in frequency did not come at a great cost in message length as can be seen in Figure 28 on page 125. It is this quick and easy access that is a key affordance provided by the mobile phone which she feels is not possible with a computer. This affordance allows her to increase the number of times she comes into contact with the homework and allows it to integrate into her everyday life without causing her to devote a single, large block of time which would be necessary with a computer. She explains how the much longer amount of time needed to start the computer makes her want to do all the homework at one time. This can also be seen in Figure 20 on page 117 and Figure 22 on page 119 where in both semesters one and two the distribution of the mobile entrance times does appear to be more spread out over the week than those of the computer. This suggests that doing homework in a single sitting with a computer would limit replies to only those comments that were posted prior to that one period of time that she had allocated for homework, so missing

the comments directed at her or others that were posted afterwards. Alternatively, she could wait until the final homework deadline to comment with her computer, but this would also diminish the collaborative effect in the sense that there would be little time for her to make a meaningful contribution to the collaboration process. On the contrary, the multiple short access times afforded by the mobile allows her to comment to all the group members' posts as they happen which creates a more active collaboration.

Interviews\\Time 2\\ G1_Atsumi

I: If you did not have a mobile phone would you do it the same way, short time off, short time on, short time, if you had to use a computer?

G1_Atsumi: No because for me waking up the computer is really troublesome, so if I open the computer I want to finish my homework in one time, so I don't do that like this.

This suggests that the mobile access allows turn taking, similar to face to face collaboration, so allowing a more natural flow of input and responses from participants. In Figure 18 on page 113, it is clear that for groups one and two the mobile phones, shown in blue, are in most cases entering the website a greater number of times than the computers across the homework assignments. While groups three and four start out with computer access times greater in the early part of semester one this changes to more mobile access for the remained of the year.

This affordance allows periods of time to be used that would otherwise be considered too short or otherwise impractical for homework use. G1_Chika in her first interview agreed that the mobile phone was much faster⁵¹ and then in her second interview explains how she took advantage of the speed when communicating face to face with her group members. If she meets one of her group members and they ask about their posted comments, G1_Chika⁵² would immediately log on with her mobile phone and then read the post while she discussed it face-to-face. She also used the affordance of speed when she was at school and had to complete the homework quickly before class while eating lunch with her group members. This can be seen in Table 8 on page 256 which shows that G1_Chika's most common mobile access times were between 1 pm

and 2 pm in the afternoon. Similarly, Figure 17 on page 111 shows that this increase in mobile access around lunch time appears across groups one, two and three. She reported taking advantage of very short periods of time as small as a few minutes which she explains would not have been possible using a regular laptop computer because of the length of time needed to turn it on and find a wireless connection.

G4_Eri mentions in her second interview that she has not used a computer to do the homework since she bought her iPhone because it is much easier to use than a computer⁵³ although Table 14 on page 258 indicates that her computer use was slightly higher than mobile use over the entire year. G1_Mai in interview two states that the mobile phone allows her to use the short time between classes for homework and that she would just give up on doing the homework without this mobile access⁵⁴. A greater or equal frequency of use of mobile access by each group during the school hours can be seen in Figure 17 on page 111 and the most frequent mobile phone access location across all groups, shown in Figure 30 on page 126, was inside a building such as a school. G2_Hikaru agreed in the first interview that the mobile phone was useful for its speed which allowed her to take advantage of small periods of time around 10 minutes in length during her break times which otherwise she would not be able to use for this homework⁵⁵. During the second interview, she went on to say that she used it in the mornings before going to school because she did not have enough time to use a regular computer⁵⁶ this pattern can be seen in Table 8 on page 256 which contains no computer access times for her between 5 am and 9 am. G4_Midori uses her mobile phone to access her social networking sites because it is easier to use than a computer, and it is this ease of use that allows her to check the homework site when she wakes up in the morning; something she says she would probably not do if she needed to use a computer^{57 58}. G2_Hitomi also mentions in interview two that the speed afforded by the mobile phone is the only reason she is able to access the homework in the morning⁵⁹. This early morning use of her mobile phone to access the web site is shown in

Figure 17 on page 111 where there is a clear spike in mobile phone access for group 2 at 9 am.

G2_Yuuri in interview one explained how she did not usually use a computer because she does “not have time to use a PC” but instead uses her mobile phone to access her favourite web sites for frequent short periods of time⁶⁰. Then in interview two she now feels it is an advantage for her homework to be able to use her mobile phone in a similar pattern, as her non-homework related mobile phone activities. She explains that for her without mobile phone access it would not be possible to do the homework during her 15 minute break at work⁶¹; a place that she previously has always only used her mobile for contacting friends. This pattern of mobile homework use can be seen increasing from semester one in which her mobile use spikes around 11 pm and midnight to semester two where the spike expands to between 7pm to midnight (Table 8 on page 256).

The ease of connecting with a mobile phone seems to reduce or even remove the need to prepare the environment to start the homework. G1_Erika explains that this feeling of ease of use increased over time so that she became so use to using her mobile phone for homework that she no longer thought about using her computer even when she was at home⁶² where the need to use a mobile phone is removed. This can be seen in Table 14 on page 258 where the percentage of mobile access for G1_Erika increases by 7% during the second semester and her computer access stopped altogether from homework assignment 11 to the end of the year. In Figure 19 on page 114 this same increase is indicated by the trend lines which show the mobile access percentage of total mobile accesses increasing for groups one, three, and four from semester one to two. G3_Eri in her e-journal mentions that the mobile phone makes homework “easy” to do⁶³.

G3_Ayaka in interview one comments on how the only way such collaborative homework is possible is with the ability to read group members comments as soon as possible after posting without the need to be face-to-face which is provided by the ease and speed of a mobile phone⁶⁴. G1_Toshinao also

considered it an advantage provided by the mobile phones to be immediately informed when a group member posted a comment⁶⁵. G3_Yurina also mentions in interview one that she prefers to use her mobile because the speed allows her to access the internet at the exact moment she wants and that this ability increases the number of times she contacts the homework⁶⁶. G3_Yui writes in her final questionnaire that the mobile phone allows her to post an answer right when she wants⁶⁷. G3_Fumie in her final questionnaire writes that the ease of the mobile phone allowed her to keep consistently up with the homework by dealing with it quickly, so it did not build up⁶⁸. In interview two, G3_Ayaka goes on to explain how she recently started to use her iPod touch with a mobile phone access device modem like a regular mobile phone. She uses this device as her main source of entertainment on the internet because it allows her to switch quickly between web sites including the homework site. This ease and speed make it easier for her to do the homework⁶⁹ at the same time as she is doing other things on her mobile. G4_Saori in interview two believes that her study time would decrease without the use of a mobile phone because having to connect without its speed she would have fewer opportunities to check the website⁷⁰.

G2_Ayaka in interview one explains that she feels the mobile phone increases her learning opportunities by allowing her to access the homework for short periods of time from anywhere so giving her more opportunities to understand and formulate answers⁷¹. This idea of increased reflection time will be discussed in more detail in the section on research question 4 on page 191. Then in interview two she goes on to restate her opinion that these short visits are valuable to her learning and that they would not be practical with a computer alone⁷². G4_Asako likes the ability to post a homework comment or example easily as she thinks of one, which is possible with her mobile phone⁷³. In a later interview expresses her belief that the mobile phone allows her to access the website much more frequently than if she only used a computer⁷⁴. G3_Akiko in her weekly e-journal comments that the mobile phone is very useful for homework that continues over several days because they allow her to check the status of her group's posts during short periods of time between larger busy

periods of time⁷⁵. Later she goes on to say that this ability to check with the mobile phone access is “great”⁷⁶ and a convenient way to do homework⁷⁷.

G4_Yuan in interview one also mentions how the ability to enter the homework website almost instantly with her mobile increases the number of times she enters it⁷⁸.

The instant-on connection with the internet afforded by the mobile phone a considerable speed advantage when compared to the boot up and connect time of a computer. This makes available the student's periods of time that were too short to utilize for homework before the mobile option was available. It also allows them to switch quickly between applications on their mobiles which allow them to remain in the collaboration process without having to devote a large isolated block of time exclusively for that purpose. It affords the ability to continue a collaborating naturally over different contexts. In other words, the mobile makes it possible to bridge the gaps in time and space created by moving locations. This in turn creates the impression of the homework being easier and taking a shorter amount of time than with alternative communication methods. The ability to efficiently control and bridge these small periods of time gives the participants a greater level of control over when and how they do the homework which is discussed in the next code.

4.4.1.4. *Increased control*

The mobile phone puts more autonomy in the hands of the students by giving them greater control over the flow of the collaboration process. They are better able to control when, where, how, and how much information they send to the group.

G1_Atsumi⁷⁹ and G3_Akiko⁸⁰ feel that the mobile phone gives them the ability to communicate immediately with their group at a time or place they choose whether it is in her room, when she wakes up, at the table eating breakfast, traveling to school. The MDS plot in Figure 34 on page 131 does indicate that between semesters one and two, “groups,” “homework,” and “mobile phone” all moved towards the centre of the plot and so reduced the distance from

each other. This shift suggests a reduction in the perceived difference of those three words as perceived by the students.

She goes on to mention that this control allows her to come in contact with the homework more than if she only had a computer and that she feels this increased contact helps her to understand the homework content.

Interviews\\Time 2\\G3_Akiko

I: Okay. Does that help you to learn if you can look at it a lot, many times? Does it help you to understand?

G3_Akiko: Mmmm. I think so.

I: Okay so if you did not have a mobile you'd probably look at home.

G3_Akiko: Hmm, maybe if I don't have a mobile, I did my homework only at home.

G3_Ayaka in interview two also mentions that this affordance of being able to communicate when she chooses increases the amount of time she contacts the homework so increases the time she is thinking about it which she strongly feels helps her to learn⁸¹.

G1_Toshinao agrees that the mobile allows him to communicate with people anytime without the need to adapt to their schedules so he can just get to the point without any constraints on time^{82 83}. In the final questionnaire, G3_Yui mentions how it gives her the ability to contact people at her own convenience⁸⁴

G1_Erika and G2_Yuka⁸⁵ both mention that the mobile the ability to decide when they want to communicate with group members who are not physically present⁸⁶.

G1_Chika in interview one explains that mobile communication gives her control over when she does the homework, so she does not need to meet other group members as would be a requirement with face to face collaboration⁸⁷.

G2_Yuka also mentions in interview two how the mobile phone gives her the ability to check the homework at unusual times such as lunch or breaks which would not be possible otherwise.

Interviews\\Time 2\\G2_Yuka

I: Again at 12 and one o'clock a lot of people are using a mobile phone. Why do you think this, lunchtime?

G2_Yuka: Lunchtime because of lunchtime we don't have a class and maybe we think someone write comment before the lunchtime like this time maybe. We think we need to check on other people's comment.

I: If you did not have a mobile phone would you check homework at this time?

G2_Yuka: No.

G3_Akiko⁸⁸ and G3_Fumie⁸⁹ writes in their final questionnaire that they like the control over when they need to reply because it allows time to think about the answer, and form a well thought-out response. On the other hand, G1_Mai⁹⁰ and G4_Soari⁹¹ both write in their final questionnaire that prefer to send a message to group members knowing that the recipients can respond when they are ready and since a mobile notice sent out by the website every time a group member posts a message, so she does not need to check the website for new posts regularly⁹². G2_Yuuri in interview two mentions that because they are all using the same system she does not need to know the people in her group personally because this form of communication on the web site allows her to post her message knowing that the others will see it at their own convenience⁹³.

The mobile allows the students to control the amount of information they expose to the other participants such as emotion and facial expressions. Both G1_Chika⁹⁴ and G1_Atsumi⁹⁵ restate this in the final questionnaire where they write that mobile text communication is far easier when meeting someone face-to-face is difficult or when she wants to send extra information such as a picture in order to provide the other group members with a deeper understanding of their comments. However, it also gives the ability to reduce the amount of information they are sending as G2_Yuka in her final questionnaire writes that the use of text messages lets her hide her feelings and physical expressions that might be embarrassing¹¹⁹. This sense of controlling the communication to protect themselves is seen in G1_Atsumi's comments in interview one.

Interviews\\Time 1\\G1_Atsumi:

G1_Atsumi: It is very...it may be strange but I want to write my idea after I see the comments from others. I am really afraid of making mistakes and others thinking my comments are really bad. So I don't [like being] the first one. But this is not a good idea.

She clearly recognizes that this fear of making mistakes is not a positive thing for her, but she does have an awareness of it. G1_Takashi in interview one

comments that using the mobile for homework offers another path for communication⁹⁶.

4.4.1.5. *Increased information collection*

This code was created to capture the data collection affordances offered by the mobile phone and media capabilities in general to understand better how the participants would find uses for these affordances such as the collection and transmission of a considerable variety of information.

During interview one G4 Yuri talked about how she uses her mobile phone to search Google or other search engines for information while riding on the train. Her answer was a familiar one as many students mentioned using their mobile in this way.

Interviews\Time 1\G4_Yuri

I: How do you look on the train?

G4 Yuri: About Google. "Google it".

Then in interview two her answer changed from using a mobile phone to search simply for information, to using it to collect real world examples to share with her group and as a digital notebook to take memo notes of homework related ideas she had throughout the day. She carries the mobile phone more often than a pen and paper notebook and this greater availability allows her to "just" record the homework examples which she would otherwise have to try just to remember⁹⁷, which she feels is less effective.

Interviews\Time 2\G4_Yuri

G4 Yuri: If I find some good examples I just take a photo, or take memo, yes.

I: So, take a photo with your iPhone?

G4 Yuri: Yes.

I: How do you take a memo? Pen and paper or iPhone?

G4 Yuri: iPhone.

I: Is that more convenient than paper, iPhone memo?

G4 Yuri: Yes, I think so. I find Apple is more convenient for me.

I: Why?

G4 Yuri: If I don't have pen or paper, I can take a memo everywhere and anywhere.

I: Do you carry iPhone more often than you carry pen and paper?

G4 Yuri: Yes.

G2_Hikaru⁹⁸, G2_Yuka⁹⁹, and others found taking pictures a convenient way to collect examples while traveling unlike a notebook which was impractical to carry all the time and of little use on a crowded train¹⁰⁰. It was common for the participants to discuss examples from the train advertisements as answers for the translation homework, especially for questions like assignment number three; “Find an interesting, funny, or unusual collocation.” in Homework Questions. This ability to collect examples throughout the day as opposed to one dedicated period of time made them more aware of the layers of meaning in words and language that they previously had given little thought to.

Another example of change is G1 Erika, at the beginning of the year, only used her mobile phone to see class information on a non-mobile website¹⁰¹ but by the time of the second interview, she was also saving images of the web page containing the homework instructions to view and think about while offline¹⁰². After saving the instructions, she logs out to think about the homework then logs in again to post her answer which she sometimes collected by taking photographs with her mobile phone camera which was also reported by G3_Fumie¹⁰³. G1_Erika’s reactions were very positive to the idea of posting photographs of her examples as she found them around the city¹⁰⁴. Group one did have a consistently higher percentage of mobile reads and posts than those on the computer, as seen in Figure 18 on page 113, and the trend line in Figure 19 on page 114 for this group shows a definite increase in both mobile reads and posts. This pattern of using a mobile phone throughout the week as a notebook or an example collection tool could be one reason for the difference in the distribution of mobile access and computer access of all four groups (Figure 20 on page 117 through Figure 27 on page 124) which shows a wider distribution of access times over the week for mobile phones.

The students’ attitude to this new way of collecting information can also be seen in the MDS plot (Figure 34 on page 131), where the perceived distance between “outside,” “homework” and “picture” all appear to have moved. “Outside” has moved closer towards “mobile phone” in the second semester than in the

first. “Homework” has moved towards “mobile phone” also, but its path is straight down indicating it is now closer to the “group” end of the dimension at the left side of the plot. This suggests that the students see homework as more of a group activity than they did in the first semester. On the other hand, “picture” moved in the opposite direction towards “alone” on the same dimension indicating that they perceived pictures as more of a solitary activity than they did at the beginning of the research. These three movements support the image of a student collecting examples for homework while commuting to and from school.

Relative to most of the other word movements “mobile phone” and “outside” did have a large shift in position. It is this larger distance of shift relative to the other smaller shifts in position of other words that are combined with supporting interview data from G3_Fumie and G1_Erika, increased post and read counts in Figure 18 on page 113 and Figure 19 on page 114, and the access times in figure 20 which make it significant.

G2_Eri¹⁰⁵ and G3_Eri both enjoyed using their mobile phone to collect homework examples and finding it an easier way to collect homework examples. The ability to collect examples in picture form with a short written description helped them to explain their ideas to the other group members.

Interviews\\Time 2\\G3_Eri

I: You found a lot of examples around Tokyo?

G3_Eri: Yes.

I: So when you found an example, what did you do?

G3_Eri: I take a picture. It's easy to do homework; picture is easy to understand what I wrote about the homework.

I: So second semester, a lot of the homework you could do pictures and write. You liked that?

G3_Eri: Yes.

I: So that helps you to understand?

G3_Eri: Yes. So other my research members also upload pictures so I can understand very easily too.

The mobile phone was more convenient than the camera that G3_Eri usually carried with her as a member of the photography club at school because she could upload a photo directly to the web site without the need for a computer¹⁰⁵. The MDS plot in Figure 34 on page 131 indicates that the participants see

“picture” as being extremely related with “mobile phone” which suggests that this is a natural extension of mobile use for them. As discussed above on page 125, of the 16 homework assignments 8 of them required students to find examples. These included assignments 2, 3, 4, in semester one and assignments 11, 12, 13, 14, 15 in semester two. This could be a possible explanation for the peaks observed in the picture count which appear during those times in Figure 29 on page 125. When the homework required examples, G3_Yui changed her homework routine by increasing her mobile phone use in order to take advantage of the picture data collection affordance¹⁰⁶. When doing homework, G3_Ayaka uses her mobile phone primarily as a data collection tool to record examples as she travels around the city but usually waited until the weekend to post her examples to the web site¹⁰⁷. There was an increase in both her mobile and computer access times on the weekends between first and second semesters (Table 11 on page 257). This combined use of a computer to upload pictures seemed unusual during the interviews so when asked several of the students mentioned have technical problems uploading their pictures to the website when using an Apple branded device which she did use (Table 18 on page 262). This problem was not resolved as it was not discovered until the end of the research, and it did not affect any other model of phone. This does not draw away from the use of the camera as a data collection tool since the continuation of this use by participants shows the popularity of this affordance even when having to go home to upload pictures. Although this was not ideal for the collaboration, she felt this affordance created more opportunities for her to collect a broad range of examples¹⁰⁸ which she feels would be impossible without the mobile phone¹⁰⁹.

In addition to collecting information with search engines, reading web site information and taking pictures, G1_Mai gathered information on her group’s activity through third party online mobile web sites¹¹⁰. Members of groups two, three and four frequently incorporated third party websites to communicate with their homework group members (Figure 31 on page 127). These were social network sites such as Twitter, Facebook and the Japanese equivalent called Mixi. By far the most popular way of entering these sites was through their mobile

phones. There was not one participant who mentioned using a computer for these social network sites.

The ease by which today's mobile phones capture information as text in a digital notebook, picture, or some other media type, was very familiar to the participants before the research. They eagerly folded this mobile affordance into the homework making their mobile phone a central database of information collection and storage. This allowed the students to continue looking for examples and saving them throughout the day so keeping them involved in and developing a deeper awareness of the homework.

4.4.1.6. *Social context*

This code was created to catch any social aspects of the mobile phone use that might be particularly relevant in the Japanese social context. It is not the goal to in any way imply that these points are unique to the Japanese society, but instead that they are relevant. The flexibility of the device is an acceptable presence in the community.

The mobile phone gives affords greater control over communication as discussed in the section dealing with the increased control code above. This flexibility of the procedure allows the device to fit different social contexts through the adaptation of its use. The idea of doing homework by speaking in a group, as opposed to alone in writing, seems to be very unusual for most participants which suggest that they may be more cautious of how they proceed. This can be seen in the MDS plot (Figure 34 on page 131) which indicates a very large perceived distance between the cluster of words including "groups," "speaking," "voice," "discussion" and the cluster "homework," "writing," "dictionary." Perhaps this increased demand of working on collaborative homework creates a higher level of stress which the mobile can reduce by providing distance while still allowing students to meet the group's responsibilities.

A sense of responsibility to the other group members is clearly shown by the participants. G1_Mai in interview two expresses her belief that the mobile phone is a valuable tool which allows a student to reply to another student's

comments promptly because the group members relied on each other to finish the homework¹¹¹ in time. At the same time, it is also important not to put too much pressure on others to reply before they are ready. She goes on in her final questionnaire answer to explain that one reason mobile text message is so popular in Japan is because it allows people to answer at their own convenience¹¹². G1_Toshinao in his final questionnaire also mentions that the mobile phone text message allows people to communicate without “putting constraints” on other group member’s time¹¹³. G3_Ayaka in her final questionnaire writes that she feels mobile text messages allow stress-free communication without causing inconvenience to other people¹¹⁴. Here her term “stress free” is referring not to her stress but that of her group members. G1_Chika in the final questionnaire also comments on the mobile phone affordance of being able to fit with the other group member’s schedules¹¹⁵.

G1_Erika in her final questionnaire describes her opinion that Japanese society values times of peaceful mentality so sending a text message can allow you to finish your responsibility by sending a message so they can relax¹¹⁶. G1_Atsumi, also in the final questionnaire, explains that Japanese society puts a great deal of importance on considering other’s feelings and the mobile phone text message allows them to consider their answer carefully to avoid potential conflict¹¹⁷. G1_Chika also the mobile affords the ability to choose words carefully so as not to say the “wrong thing” in a particular situation¹¹⁵.

Following social norms is essential when you live in a city like Tokyo of over 30 million people, and even more important when these people have to move through rush hour packed together into trains. G2_Yuuri makes the point that, in her opinion, the mobile phone is a good fit for Japanese society because during the often long commuting times on crowded trains it is unusual for someone to use a laptop computer so she is hesitant to use one since people will watch her and what she is doing.

Interviews\\Time 2\\ G2_Yuuri

G2_Yuuri: There are not many people to use PC on the train so I worry about - I don't like to use PC but mobile phone, in the case of mobile phone, many people use mobile phone so it's easy to use.

I: So easy means the feeling is easy?

G2_Yuuri: Yes. I don't care about others watching.

G1_Toshinao in his final questionnaire answer, comments that talking loudly on a mobile phone or face-to-face while taking public transportation is not acceptable behaviour in Japan, so the mobile text messages does not conflict with this social rule¹¹⁸.

While G2_Yuka describes Japanese people as “shy” by nature, so this is why using text is preferable to actually speaking over the phone or talking face-to-face¹¹⁹. Along the same lines, G4_Yuri in her final questionnaire calls Japanese people “introverts” and feels that this is the reason that mobile phone based communication is so widespread in Japan¹²⁰. So she is again implying that the mobile phone offers some sort of protection. Both G3_Akiko and G4_Saori in their final questionnaires state their opinion that Japanese people in general are just poor at communicating their ideas “directly” so the mobile phone is a superb tool for this type of indirect communication^{121 122}. These characteristics of Japanese society are indicated in Figure 31 on page 127 which shows that the inter-group communication is very rarely in the form of voice calls when using a mobile phone and, when not face-to-face, it is most commonly in the form of a text message which is through a mobile phone, computer or email. To highlight the increased weight given to this idea in Japan as compared with other countries it would be informative to ask the same question to a participant who did not grow up in Japan. G2_Lulu is a Chinese exchange student, and in answer to this question she writes that she thinks text message use is popular in Japan because mobile phones are easy to acquire and relatively cheap in the country so everyone has one¹²³. She does not mention anything related to the answers received from the Japanese students.

4.4.1.7. Summary

The evidence presented in this section demonstrates that the affordances provided by mobile phones have a significant impact on the collaborative learning that took place within the four groups.

The fundamental construction of the device is such that it has become an ever-present companion for the participants, allowing it to hold a very personal position in their lives. (This position in participants' private and public lives will be examined later in this chapter.) This availability allows for a remarkably high potential level of collaborative communication, suggesting the creation of a continuous link amongst the group members and thus stronger connections with the homework tasks being undertaken in their minds.

This linking of participants demonstrates the device's power to enable communication in places and at times that would be impractical for other technologies. This connectedness allows participants, by linking together smaller, previously unused fragments of time, to extend the time they spend on homework activities. This allows them to move between the separate pockets of time traditionally reserved for homework. This is made possible by the devices' ease and speed, which enables immediate communication with little effort.

The participants have greater control over how they collaborate by using a familiar channel of communication previously unavailable for the purpose of homework.. Each person gains control of the personal distance in the communication, thus allowing a greater level of protection for individual participants than in face-to-face communication. Additionally, the device allows for the collection and transmission of a considerable variety of information, as discussed in the next section.

The participants were excited to move towards using this mobile technology and its communication, data collection, and storage services, which allowed them to integrate their homework into their lives as closely as they do their mobile phones. The mobile phone provides students with control over how they communicate, providing a way to collaborate with group members that can accommodate the culture's social norms.

4.4.2. Feelings towards Homework

Section one explores changes in participant feeling towards the homework as a result of using their mobile phones to complete that homework. This section

is subdivided into four subsections including a) mobile feelings transfer, b) mobility changes attitude, c) homework more convenient, and d) feel more involved.

4.4.2.1. *Mobile feelings transfer*

This code was created to capture any change in feelings towards homework that occurs after using the mobile phone for the collaborative activities. In particular any positive feelings that are pre-existing in the participants towards the mobile phone technology that might influence a change in a positive direction towards the homework. It is interesting to note that the majority of these examples come from the second semester interviews and questionnaire which suggests that they are new attitudes that have formed since semester one.

The students have all owned a mobile phone for five or more years so they have a clear set of feelings towards their devices. Many of the comments suggest that the participants are leverage the affective attitude that they hold towards their mobile to reduce any pre-existing resistance they may have developed towards doing homework in general.

G2_Lulu in interview one describes using the mobile phone for homework as relaxing¹²⁴ while G1_Atasmi called it comfortable¹²⁵ because they mix homework with other mobile activities as she is falling asleep. G2_Ayaka in interview two also mentions that the comfortable feeling she gets using a mobile phone makes the homework easier¹²⁶. G3_Fumie in the final questionnaire writes that she began to feel happy when she started doing the homework using her personal mobile phone that she felt so comfortable with¹²⁷. G4_Yuri in her final questions mentions that she feels the mobile phone is good because it is such a familiar tool for Japanese people¹²⁸. G2_Hikaru explains in interview two that the mobile phone brings with it a comfortable feeling that helps to reduce the nervous and stressful feeling that she gets from thinking about doing homework. She still knows she must do it, but the feeling is very different between the mobile homework and other homework.

Interviews\\Time 2\\ G2_Hikaru

G2_Hikaru: If I sit down in front of the PC, I feel I must do homework but if I use mobile phone to do my homework, I feel...

I: Can you say in Japanese? You can say in Japanese.

G2_Hikaru: Not nervous if I use mobile phone.

I: Can you say in Japanese what you just said? So, PC, mobile, could you say in Japanese? It may be easier for you to say in Japanese.

G2_Hikaru: [*Yara na kya naranai to omoukedo ketai wa kincho shinaide kataku narazu ni dekiru.*] Although I have to do it, I can do more causally and relaxed using a mobile phone.

I: Okay, there's a difference in feeling?

G2_Hikaru: Yeah.

I: Okay. Which feeling do you like better? Doing homework with PC or with mobile? Which is more comfortable for you?

G2_Hikaru: Mobile.

Similarly, G2_Yuka in interview two explains that she likes the homework more since using the mobile phone because using the mobile replaces the feel that she needs to do homework with the feeling she gets when just visiting a website¹²⁹. G4_Yuri in interview two also comments on how the feeling of “duty” connected to homework is changed to a feeling closer to “fun.”

Interviews\\Time 2\\ G4_Yuri

G4_Yuri: Many students think homework is a duty. So, duty and – sorry, troublement. But, even if homework is doing on a website. So, I think this way is more fun, yes. Your homework feels good [compared] to another way to homework. For example, writing a report, or preparing presentations.

I: Is that because of the homework question or because you can do it with mobile phone? Because the homework questions you like?

G4_Yuri: No, mobile phone homework, I like that.

She was a very open and honest student and was eager to share her feelings towards the use of mobile phones and here she makes a clear distinction between regular homework, meaning non-mobile, and the mobile collaborative activities. At first it seems like the activities are what is causing this split but at the end of the segment she is asked if it is, in fact, the homework style or the homework on a mobile and she stresses that it is the mobile phone.

G1_Erika in interview two said that using a mobile phone made the homework “fun” for her. In particular, the affordance of information collection

posting pictures from around the city as examples and watching another group's member's picture posts made the homework much more enjoyable than doing it with computers¹³⁰. She writes later in her final questionnaire, about how this changed her view of homework in general because it allowed her to find some fun in each homework question¹³¹. In the same interview, G1_Mai talks about how the mobile phone made it easier for her to start doing the homework when compared with a computer, not because of the technological affordance but, because the feeling was similar to sending "email to a friend"¹³² and in her final questionnaire she adds that this made it possible for her to do the homework without any "sense of burden."¹³³ Several students compared the feeling of homework with the mobile phone to playing a mobile game. G2_Yuuri in interview two describes how she was impressed by the way the homework became a little fun and enjoyable when done on a mobile phone in contrast to feeling like work when the same activity was done on a computer¹³⁴. This view of the mobile phone as a game was shared and mentioned by G3_Eri¹³⁵ and G4_Asako¹³⁶ in interview two. G3_Ayaka in interview two that she usually uses her mobile phone for entertainment such as music or movies, so this feeling of enjoyment carries over to the mobile homework in the sense that it makes it a little easier to motivate herself¹³⁷.

G3_Fumie in her e-journal writes how she enjoyed checking the posts from group members on her mobile because it reminded her of her mobile social network chats¹³⁸. G4_Eri in interview two mentions that it is a similar pleasant feeling she gets when accessing social network sites, fashion sites and shopping sites on her mobile phone when doing the homework on a mobile phone¹³⁹.

G4_Eri in interview two explains that she feels the mobile phone is very different from the alternative method available to answer the homework, the computer. She describes the idea of sitting down and doing homework at the computer as a heavy feeling or burden¹³⁹ which she contrasts with the nice feeling she gets from using her mobile.

One participant did express a negative feeling towards the idea of using a mobile phone for this homework. G1_Toshinao in the final questionnaire writes

that the mobile phone made the homework more inconvenient to complete for him¹⁴⁰. He was however using an older model phone which, while having the ability to run software and having a full hardware keyboard, was limited in the size of the screen. The fact that he used this older mobile phone instead just using a regular computer suggests that it was less the idea of mobile homework and more his mobile phone that he was displeased with. In addition, he has some positive things to say about the mobile experience which will be highlighted throughout this section.

These examples do strongly suggest that the participants are transferring some of their affective positions that they hold for their mobile phones on to the mobile homework activities. The positioning of the mobile phone in their private lives as a tool for entertainment and strongly associated with their friends appears to lower the barriers to starting the homework turning it into a game or just another chat session with their friends. This is unlikely to be explained as attraction to a new technology because they have grown up with the devices since they were young children. If this is a transfer of positive feelings to the homework, then there may well be a transfer in the opposite direction from homework to mobile. This transfer is suggested by the MDS results in Figure 34 on page 131 where we can see that the mobile phone changed position radically over the course of the year, but the direction was to the centre putting in the middle of the other words.

4.4.2.2. *Mobility changes attitude*

This code captures how the affordance of movement (page 138) provided by the mobile phone affects the attitudes of the participants towards the homework. Most of the comments are from interview two so indicates that these ideas might have developed over the course of the year.

G1_Erika in interview two says that she feels the ability to collect examples “close to her” as she moves around and then upload the pictures to the website created in her a greater sense of “familiarity” or closeness with the homework topic.

Interviews\\Time 2\\ G1_Erika

G1_Erika: Oh, right, because by thinking about, no, by finding examples around close to me I could understand the topic more closely. I felt that translation is - how can I say - translation is familiar with me more than I expected and with PC also I can easy to upload or easy to do homework, but take picture is only, taking picture. With PC I can't take picture, so using mobile phone is better, much better to close to translation.

It is interesting that she adds in the last sentence of this example that it brought her closer to the translation, which is the topic under study. This suggests that there has been a positive change in her attitude towards the course study – translation - not just the method of study –mobile phone collaboration.

G1_Atsumi in interview one, comments that the mobile phone is good for homework and filling her free time during her commute¹⁴¹. Also, in her e-journal she feels that the examples she finds moving around with the mobile are more interesting¹⁴². Then in the final questionnaire she explains that using the mobile changed the way she thought about homework because the mobility restrictions of a computer are removed which created a feeling of “loosening the restraints” on the homework¹⁴³. Here she makes two distinctions. The first distinction being the sense of freedom of the mobile phone compared to that of restraint with the computer. The second distinction is between the examples she collects with her mobile phone while moving around the city and other homework.

G1_Chika in interview two explains that the mobile homework required her to find examples in different contexts around the city which is something she had not thought about before which she restated in here e-journal¹⁴⁴. She started to think about the advertisements she was using for examples instead of just thoughtlessly looking at them as she did before¹⁴⁵. She goes on to describe the feeling of doing desk homework as boring and creating a feeling of wanting to escape which she does and compares it to the mobile homework which she can't escape since it is all around her forcing her to think about the homework more.

Interviews\\Time 2\\ G1_Chika

I: What do you think differently about desk work homework and looking on the street, for examples, homework? How do you feel differently about them?

G1_Chika: To tell you the truth desk work homework is so boring. I think, escape -thinking and doing that. Yes of course sometimes desk work homework I can do that when I want.

I: You can escape it?

G1_Chika: Yes, yes and looking outside homework I have to think about homework when I'm walking the street, so I can't escape thinking about homework like this is good example and this is not good, or something. That's different I think.

I: You think about your homework more?

G1_Chika: Yes.

I: Does that help you learn?

G1_Chika: Yes.

In her final questionnaire, she comments further that this ability to do her homework without sitting at a desk, created in her a sense that the homework was a challenge she could accomplish¹⁴⁶. This feeling was echoed in G2_Yuuri's final questionnaire comments in where she writes that the mobility allowed her to do the homework throughout the day which created a desire to do the homework¹⁴⁷. G3_Akiko also comments on this in her final questionnaire writing that she had to do her homework sitting at a computer before this course, but now she feels she can better use all her time to do the homework¹⁴⁸.

4.4.2.3. *Homework more convenient*

This code captures the connection between the affordance of ease and speed and the feeling of comfort it creates, and whether this feeling transfers to the homework. The participants make it very clear that they feel the mobile phone is much more convenient to use than a computer.

G2_Yuka describes in interview two how the effort and time needed to log into the website with a computer now seems very inconvenient when compared to the ease of a mobile phone¹²⁹. Chika in interview one also comments on how easy using a mobile phone is to check the homework¹⁴⁹. G1_Mai says in the final questionnaire that although the mobile method was less familiar to her she came to feel it made that part of her life much easier¹⁵⁰. G2_Yuka in the final questionnaire writes that her opinion has changed and that the new convenience provided by the mobile access has increased her "desire" to do the homework¹⁵¹. G1_Atsumi explains in interview two that the way she does her homework has

changed because the mobile access means that she no longer needs to deal with “troublesome” computers.

Interviews\\Time 2\\ G1_Atsumi

I: Before my class did you do all of your homework on a computer?

G1_Atsumi: Yes.

I: And you did all your homework at one time, like this?

G1_Atsumi: Yes.

I: So mobile phone has changed the way you do your homework?

G1_Atsumi: Yes, very much.

I: Do you like this?

G1_Atsumi: Yes, I like that.

I: Why do you like this way?

G1_Atsumi: Because computer was really troublesome for me. Mobile phone is - you can see any time in anywhere, in one time, it's really easy.

G2_Ayaka in interview two uses this same term when she says that the homework no longer seems “troublesome” to her like the computer homework did and that this convenience has the effect of increases her motivation¹⁵². G2_Eri in interview two also talks about how the increased convenience of using a mobile over using a computer makes her want to do the homework, and, she feels, helps her to learn more¹⁵³. G4_Saori in interview two confesses that at the beginning of the study she did not believe the mobile phone would be suited to homework, but now she feels it is a very comfortable way to study and communicate with her group¹⁵⁴. Then in the final questionnaire she restates this and adds that this is the first time she has done homework with her mobile phone, and she feels it is good to adopt this method for internet related homework¹⁵⁵.

Both G1_Erika¹⁵⁶ and G2_Hitomi¹⁵⁷ in interview one say it is the ease of accessing a mobile device that she always has available which creates a feeling of convenience when doing the homework.

4.4.2.4. *Feel more involved*

This code captures the effect of increased interaction with students that is afforded by the mobile phone on the participants perceived level of involvement.

Many felt, as G3_Yui did in her final questionnaire, that it is a new experience to be able to do homework that was not in the form of a report, but

instead required discussion through her mobile phone¹⁵⁸. G1_Toshinao in interview one expresses a strong positive feeling to being able to have access to others comments because they act as motivation and challenge some of his preconceptions.

Interviews\\Time 1\\G1_Toshinao

G1_Toshinao: I think it's good, I think in my opinion, I think it's a good way to know other students' way of thinking. It's a good chance to know other students' way of thinking....It stimulates my motivation to study English. It may affect my barriers - in Japanese [ka chi kan] the values and viewpoint;(principal, belief, more consistent than just an idea).

G2_Eri in her e-journal comments that the ability to see various opinions made it challenging to come to a consensus¹⁵⁹. G3_Akiko in her final questionnaire writes that the ability to contact others in her group with the mobile phone creates the feeling of more freedom and involvement in the homework¹⁶⁰. G3_Fumie in her final questionnaire writes that the mobile homework changed her negative image of homework in general because she was able to work with friends anytime, and their responses motivated her to reply right away¹⁶¹. G4_Yuri in her e-journal also wrote that she felt the ability to exchange opinions was a good experience for her¹⁶².

In interview one, G1_Erika explains that when she is uncertain of her answer she can get a sense of confidence by checking the answers of others often and on a regular basis¹⁶³. Then later in the year in the final questionnaire that this access to others opinion's changed her in that she worked harder to do the homework¹⁶⁴. G2_Lulu writes in her final questionnaire, how her fear¹⁶⁵ of having an incorrect answer was alleviated by being able to read the comments of other group members and how it also increased her feeling of understanding¹⁶⁶.

4.4.2.5. Summary

These examples strongly suggest that participants are transferring their affectionate attitudes for their mobile phones to the mobile homework activities. The mobile phone's position in their private lives as a tool for entertainment that is strongly associated with their friends appears to lower the barrier to starting

their homework, thus turning it into a game or just another chat session with their friends.

The examples in this section contain many references to homework as restrictive and something from which the participants wish to escape; in contrast, mobile homework is referred to as giving a sense of closeness and freedom. Interestingly, at the same time, the mobile homework cannot be escaped: it is everywhere the mobile goes, which is everywhere the participant goes. The freedom of movement without loss of contact that is afforded by mobile devices seems to weaken many participants' views of homework as 'oppressive.'

The examples collected in this section suggest that participant' feelings towards homework change when it is done via a mobile phone. This shift seems to be associated with a feeling of convenience created by the mobile phone's ease and speed. In particular, the device's speed, ease of use, and constant availability are amongst its most-commonly quoted benefits.

These examples suggest that increased exposure to other students' opinions both mentally and physically increases a student's level of involvement. It mentally increases their involvement by challenging their preconceived ideas on the topic of discussion and increasing their sense of motivation. Physically, it shortens their response time and possibly increases response frequency. The novelty of doing homework on a mobile phone creates a new relationship between student and homework. Students now understand that they have a new tool with which to achieve their goals.

4.4.3. Feelings towards Mobile device

Section two explores the changes in attitude towards that mobile phone after using for a year. This section is subdivided into two subsections including a) mobile homework as new and b) mobile as distraction.

4.4.3.1. Mobile homework is new

This code captures the newness that the participants felt towards the idea of using their mobile phones for homework and how this interacts with their image of the mobile phone reinforcing its image as modern and trendy. None of

the students had used their mobile phones for anything beyond checking information related to their school life, and this was usually on a non-mobile website. So, before this research they had never done collaborative activities through mobile phones. This section is shorter than the previous ones; however, it is important to understand this new position that the mobile is taking in relation to the participants' school life in order to understand the discussion that follows in this section.

Most of the participants mentioned that while they were very familiar with the technology, but that this research was the first opportunity for them to use a mobile to do homework on a mobile website and that this experience was a positive one and that they hope it will be adopted in other classes; G1_Erika¹⁶⁷, G1_Atsumi¹⁶⁸, G1_Toshinao¹⁶⁹, G1_Mai¹⁷⁰, G2_Eri¹⁷¹, G2_Hikaru¹⁷², G2_Ayaka¹⁷³, G3_Ayaka¹⁷⁴, G3_Akiko¹⁷⁵, G4_Asako¹⁷⁶, G4_Yuan¹⁷⁷, G4_Saori¹⁷⁸.

G3_Fumie in her final questionnaire talks about how she sees the mobile phone as a modern technology and that this mobile approach was great because it took advantage of this "modern" technology¹²⁷. G3_Ayaka in the final questionnaire also refers to the mobile phone as a modern technology and that using this for study is an extremely "effective" way of doing things¹⁷⁹.

There was an increased sense of usefulness connected to the mobile. For G3_Fumie, the mobile phone for homework was a new and positive experience, as she mentions in interview one¹⁸⁰. Later in the study in her final questionnaire she talks about her new image of the mobile as a useful and pleasant method of doing homework¹⁸¹. Others in their final questionnaire answer mention new uses they discover from using the mobile for homework: G1_Atsumi¹⁸² gained a strong impression of convenience; G1_Chika¹⁸³ developed the feeling that it could be a tool for collecting information; G2_Lulu¹⁸⁴ now sees it as a new way to do homework faster; G3_Yui¹⁸⁵ has learned that it is a useful way to submit homework; G4_Yuri¹⁸⁶ now sees many new possibilities for the use of mobiles for homework.

4.4.3.2. *Mobile as distraction*

This code captures some of the negative comments that appeared in the examples. The mobile is seen as a tool that allows students to fill their free time. G1_Atsumi¹⁸⁷ and G1_Erika¹⁸⁸ in interview one say it is good for “killing time” and for G3_Yurina in the same interview it is something to use when you have nothing to do¹⁸⁹. G2_Yuuri while positive towards the idea of mobile phones for homework, in the final questionnaire, mentions a worry she has concerning the increased amount of time people spend on them is similar to an addiction¹⁹⁰. This is seen in views of students such as G2_Yuka who in her final questionnaire notes that mobile phones are “incredible convenience of using her mobile makes it increasingly hard to put it down.”¹⁹¹

4.4.3.3. *Summary*

While there are many positive aspects of technology in general and mobile phones in particular, there are undoubtedly some negative ramifications. Mobile technology brings students closer together in one sense of connectedness, offering additional avenues for communication at increased frequency. However, the participants are still physically separated and can use a mobile to increase the amount of separation further.

4.4.4. *Feelings towards other Students*

This subsection explores any evidence of a change in the relationship between participants that may be due to the use of mobile phones for communication. It is divided into five subsections including a) method of communication, b) Inter-student communications, c) peers as teachers, d) conflict, and e) depth to communication.

4.4.4.1. *Method of communication*

The increased control afforded by the mobile phone allows the participants more freedom when choosing how they communicate. This code explores the evidence that the participants are using this power to switch communication methods depending on the level of closeness they feel towards the other person.

When she needs to ask a question about how to do something or to solve some problem G3_Akiko explains in interview two that she will ask a small number of students that she knows well in a face-to-face setting. However, when she is commenting on another group member's answer which is not a close friend she uses the mobile website.

Interviews\\Time 2\\ G3_Akiko

I: ...Who do you communicate with most of the time?

G3_Akiko: Fumie, Kana, Yui

I: That's about it. How do you communicate with these people?

G3_Akiko: Face to face.

I: Face to face. How do you communicate with the other people?

G3_Akiko: On the website.

I: What's - do you talk about different things with these people and these people?

G3_Akiko: I talk of - "I don't understand this homework do you? " with Fumie, but others on mobile just "Nice example...".

When asked why she does this, her reply is that the participants of communication face to face and that of mobile website communication are different, and she would not like to put those types of questions on the class website because she sees the website as only for submitting answers¹⁹². She also says it is easier to ask these questions to her friends face-to-face because they are always around her, but she does not usually have a chance to meet the other students¹⁹³. Her friend that she is referring to here, G3_Yui in interview two shares the same opinion saying that, for friends, she prefers to communicate face-to-face, but for the rest of the group communicates just on the website¹⁹⁴. G1_Atsumi¹⁹⁵, G1_Mai¹⁹⁶, and G2_Ayaka¹⁹⁷ often combine these separate communication methods when they come together at lunch while eating they speak with their friends in the homework group and at the same time check the comments of those other group members on their mobile phones.

4.4.4.2. *Inter-student communications*

The increased opportunity for communication that is afforded by the mobile phone seems to create in some participants an increased sense of closeness to the other members of their group.

The mobile website allows for the students to increase the amount of communication between group members and for G2_Lulu in interview two, she feels this has created a feeling of “closeness” that was not there at the beginning of the research¹⁹⁸.

The mobile phone offers a way for students who would not normally communicate to have some level of contact. G2_Eri in interview two says that she communicated with her friends face-to-face and through the mobile phone website. She feels that the mobile site allowed her to communicate with people she would otherwise not have had any contact with¹⁹⁹.

Interviews\\Time 2\\ G2_Eri:

I: If you did not have mobile phone website, how would you - would you communicate with these people you don't know?

G2_Eri: I have to talk with them.

I: Would you talk with them?

G2_Eri: No.

G2_Hitomi in interview two also says that communication with her friends was done for the most part face to face because they have many opportunities to talk, but through the website she was able to communicate with people she would feel very uncomfortable talking to face to face²⁰⁰. G3_Fumie in the final questionnaire says that the mobile website gave her the opportunity to discuss the homework with people she was not personally close to⁴⁸. The MDS analysis in Figure 34 on page 131 does suggest that the perceived distance between “homework” was reduced during over the course of the research which also suggests a smaller perceived distance between homework participants.

4.4.4.3. Peers as teachers

While the mobile phone affords the ability to create barriers to others) it also allows participants to contact their peers more frequently allowing them to benefit from the shared intelligence of their group when they feel they need it, so increasing their understand, chance to receive corrections and other support on homework matters.

G1_Takashi²⁰¹ in interview one and G3_Akiko²⁰² in her e-journal both commented that the ability to frequently view the answers of other group

members allowed them to understand the topic slowly and so proceed with the homework. G2_Yuuri in interview one mentions that she likes to correct other students' answers on-line and feels this is an important part of the discussion²⁰³. Then in interview two, G2_Lulu from the same group says that she is very grateful to those students who correct her mistakes on the website and that having this peer check makes her feel comfortable²⁰⁴.

G3_Ayaka in interview one explains that she uses her mobile access to social network sites to ask her group members questions about the homework²⁰⁵. G4_Eri in her e-journal also uses the site to ask her group for support with the homework²⁰⁶.

4.4.4.4. *Conflict*

The affordance of control gained from the mobile phone which suggests that there will be some disagreement of how, and how often, this communication should take place. The availability of communications with mobile makes it almost a necessity to reply to another student's comment because there is no excuse for not being able to reply. This puts stress on students to answer which has positive and negative effects which should be explored in the discussion section.

Mobile creates expectation of immediate answers, but when it does not come it can cause tension within the group. G1_Atsumi in interview one explains that she started to feel upset when there were no comments posted from her group because without the feedback provided by the comments she is not sure of the correctness of her answer²⁰⁷. G4_Eri in interview one finds it hard when day after day no one comments because she cannot proceed with the collaborative activity²⁰⁸. G4_Asako in interview one also feels frustration when there is no activity from her group which forces her to stop proceeding in the activity²⁰⁹. G3_Fumie in her e-journal comments that while her group worked well together, she had heard that the lack of participation in some groups made it difficult for them to proceed²¹⁰.

Mobile allows members to ask many questions which could be seen as bothersome by some group members. G2_Asaka in interview one mentions her reluctant to ask too many questions to her group members and that this sometimes feels more comfortable with face to face communication²¹¹. This issue of too many comments appears in the e-journals of G2_Ayaka²¹², G2_Yuka²¹³, and G3_Yui²¹⁴, where the students talk about how challenging it was to take all of the ideas and form a final single group answer. G1_Chika in interview one felt that dealing with all the different opinions of her group members was too confusing for her so she started just communicated with her one friend face to face²¹⁵ this change can be seen in the drop in the frequency of her website visits during semester two (Table 6 on page 256).

4.4.4.5. *Depth to communication*

Many times the mobile communication option is the only one available to the students, but when there are other options such as face to face communication available many choose face to face communications. In interview one, G2_Ayaka mentions three of the most common limitations of the mobile website observed by the students, which included difficulty in discussing detailed or complex topics, the considerable length of time needed to have a conversation, the inability to understand the other person's feelings.

Interviews\\Time 1\\G2_Asaka

G2_Asaka: I don't like using e-mail or social network. It takes me a long time. Yuuri and I are in same class, same course so we have a lot of opportunities to meet face-to-face. So we can have a lot of time to talk with each other.

I: Why do you like face-to-face talking so much?

G2_Asaka: It's easier to communicate and in details. It doesn't take long time and...

I: Why doesn't it take long time?

G2_Asaka: I'm not good at using the machine like PC, mobile phone, so that's why. I don't understand well what they are feeling if I communicate with PC, like social network, e-mail.

I: What about mobile?

G2_Asaka: I don't catch their feeling well with mobile.

G2_Hikaru²¹⁶ in interview one and G3_Fumie²¹⁷ in the final questionnaire both face to face as better for understanding someone or explaining something to someone. G1_Erika²¹⁸ and G2_Yuuri²¹⁹ in the final questionnaire write that they feel face to face is superior to mobile communications when giving very specific information or instructions on how to do something. G2_Lulu²²⁰, G2_Yuka²²¹, and G3_Yui²²² in the final questionnaire comment on the difficulty of expressing complex ideas in a text message.

G1_Takashi²²³ in interview one, and G4_Saori²²⁴, G3_Akiko²²⁵, and G4_Yuri²²⁶ in their final questionnaire wrote that if possible the ability to communicate face to face replaces the need to type a long message with simply walking over and having a short conversation with the person.

The importance of understanding a person's emotion during communication was obviously critical to the students because many of them commented on the lack of this information. G1_Atsumi²²⁷, G1_Mai²²⁸, G1_Chika²²⁹, G1_Toshinao²³⁰, G3_Fumie²¹⁷, G3_Akiko²²⁵, and G3_Ayaka²³¹ in the final questionnaire all write that it is difficult to express feelings and to understand the feelings of others when using only a mobile phone so they cannot see the subtle nuances of behaviour which limit misunderstanding.

While the mobile phone affords more communication in quantity it still appears to have some limits in quality and depth of information exchange. The design of the collaborative activities took this into consideration, but the examples suggest the participants are still having difficulty when they need to discuss detailed information.

4.4.4.6. *Summary*

The evidence in this section suggests that different participants use different communication methods. It also appears that the type of relationship, especially the level of friendship, is one of the factors determining this communication choice. This suggests that the mobile increases the number of participants with whom an individual can easily collaborate: without the mobile,

they might communicate solely with those participants with which they already have a relationship.

The increased opportunity for communication that is afforded by the mobile seems to create in some participants an increased sense of closeness to the other members of their group. This evidence suggests that the participants have an increased chance of communicating with people with whom they would not usually collaborate if face-to-face communication were the only option. The increased ease of communication provided by mobiles could amplify this effect beyond that possible via use of computers.

While the mobile phone enables creating barriers to others, it also allows participants to contact their peers more frequently. This allows them to benefit from the shared intelligence of their group, thus increasing their ability to understand, receive feedback, and obtain support on homework-related concerns.

Some conflict is inevitable between students who desire to finish early and others who need more time to prepare their answers. Working in a group is bound to foster some tension when things do not proceed as intended. Further, there are some difficulties in discussing detailed or complex topics via mobile texting, the length of time needed for this type of conversation is considerable, and there can be difficulty understanding other people's feelings when expressed via mobile communications.

4.4.5. Private and Public Space

What is perceived as public private to the students is suggested by the MDS data result. So school, work and other are the three main spaces to position in public or private. This section is divided into eight sub-sections including a) mobile in private space, b) homework moves to private space, c) friend and non-friend boundaries, d) collaboration in the home, e) work and homework, f) private mobile websites, g) homework and non-homework activities and h) Language.

4.4.5.1. *Mobile in private space*

The mobile phone is positioned in the private and public lives of the participants so it can act as a bridge allowing the homework to enter into the private space. This section discusses the position of the mobile phone in the private space of the participants how this position allows for the homework to play a greater part in their private world.

The mobile phone has been a part of the participant's private lives for many years. In interview one, they were asked when and why they first owned a mobile phone and the answers varied from the age of 9²³² to 15²³³ years old. When asked the reason for getting their first mobile phone the answers given all said it was given to them so that they could contact their parents²³⁴ and friends²³⁵. This shows that the mobile phone has had a prominent place in the personal lives of the participants. In Figure 34 on page 131 the perceived similarity between "home" and "mobile phone" at the beginning of the research was very close indicating that the participants still see the mobile phone as having an active connection with their private home life.

G4_Midori in interview two mentions that contacting her family and friends is still an important reason for having her mobile²³⁶. G2_Ayaka in interview two also mentions that she uses her mobile outside of school to contact friends and that this is easier for her to start doing the homework through the mobile phone¹²⁶.

The mobile can also create a private space within a larger public space. G2_Yuuri in interview one²³⁷ explains that she bought her iPhone specifically so she could use it for the homework and then in interview two she discovered that it created a feeling of privacy while on the train because "no one can see what she is doing."²³⁸ The MDS analysis in Figure 34 on page 131 does show movement of "homework" closer to "mobile phone" which suggests the participants perceived similarity between these two was increased.

4.4.5.2. Homework moves to private space

The ability of the mobile phone to switch effortlessly between the private websites and the public homework website seems to draw the mobile homework closer into the private space of the students. G1_Erika in interview two described this ability as allowing her to “understand the topic more closely” so the homework became more “familiar” to her which is something she did not experience when using a computer for the homework¹³⁰.

G4_Asako supports the idea, in interview two, that the computer does not share this ability to bridge private and public spaces when she explains that the computer is for “typing” while the mobile is for “communication and playing games.”²³⁹ G2_Hikaru clearly separates the two in interview two.

Interviews\\Time 2\\ G2_Hikaru

G2_Hikaru: Different feeling.

I: How?

G2_Hikaru: If I sit down in front of the PC, I feel I must do homework but if I use mobile phone to do my homework, I feel...

I: Can you say in Japanese? You can say in Japanese.

G2_Hikaru: Not nervous if I use mobile phone.

G2_Yuka has a similar opinion in interview two.

Interviews\\Time 2\\ G2_Yuka

I: If you like mobile phone then doing homework on mobile phone does that help you to like homework a little bit?

G2_Yuka: Yes a little bit because use mobile phone, I don't have a - if I use mobile phone I don't feel that I have to do homework, or something like that, just go website. But if I don't have a mobile phone, oh my god, I have to use computer...

The MDS plot in Figure 34 on page 131 supports this idea of the mobile as having a stronger position as a bridge between the private and the public space of the participants than computers. In this plot, “mobile phone” began the year in the private space midway between “alone” and “group” suggesting it is a personal device frequently used when alone, for example, for entertainment and when contacting others. This is further supported by the comments of participants stating that they commonly used their mobiles to watch videos on the train which is again supported in the MDS plot by the close position of “mobile

phone” to “traveling” and “video” in Figure 34 on page 131. Then at the end of the year “mobile phone” has made a considerable movement of position to the direct centre of all the terms suggesting its perceived position in the students’ minds had changed while “computer” has moved very little.

G3_Yui in her final questionnaire also writes that the mobile phone is already well established in the private space of most Japanese people as a tool they commonly use to text friends in their free time²⁴⁰. When contacting friends or family they often use mobile social network websites that are not associated with the homework, but instead are used for their own enjoyment. G4_Eri in interview two explains that it is the sense of distance between these private mobile websites and the homework website along with the mobile affordance of being able to switch quickly (section 4.4.1.3) between each website that creates the impression of them all being on the same “network.” Her mobile social network site (Mixi), shopping and fashion sites are all “collected” together with the same “nice feeling.”²⁴¹ Unlike a computer, she goes on to describe, her mobile phone is a “tool of play” and even more telling as an “extension of play” which helps her to get over her dislike of homework²⁴². G4_Midori in interview two also mentions that when she uses her mobile phone to contact friends through Twitter, Facebook and her Blog, it is common for her to switch to the homework site. This mixing of private mobile use and public mobile homework makes the homework more fun but only for the mobile homework²³⁶. G4_Yuri in interview two also uses the same sites with her mobile as well as playing mobile games all of which she describes as her entertainment that is just for fun. She agrees that the switching between these private sites and the homework makes it easier to start the mobile homework, but she stress that it is only the mobile homework she likes²⁴³. G3_Ayaka also uses her mobile phone for private entertainment or what she calls her “hobbies”; communicating with friends on social networks, listening to music, watching movies, and reading manga (comics). She switches between these private sites and the mobile homework site frequently because her mobile makes it easy to use all of these at the same time, and it is this shared presence on her mobile that makes it more likely for her to move between these private

entertainment sites and her public homework¹³⁷. G3_Akiko in interview two also talks about how it is easy for her private websites and public homework to come together at the same place, in the mobile, and at almost the same time because of the almost instant switching between the two spaces²⁴⁴. G4_Yuan describes this idea well in interview one.

Interviews\\Time 1\\G4_Yuan

G4_Yuan: Of course when I do my homework I check. But after my homework, I think, if I -because I usually go to websites by my phone, when I want to go on internet- I will first screen is your website so I check it. After that I can do something else.

The mobile phone is not only a part of the students' private world but is often used in all aspects of their lives which provide the opportunity for the homework to enter those private periods through the device. In interview two, G2_Eri talks about her habit of doing homework with the mobile phone in bed around 11 pm at night²⁴⁵. G2_Lulu in interview one talks about how it is her "custom" to "play" with her mobile phone in bed while comfortably going to sleep at night and at that time she starts to upload her homework answers¹²⁴. G1_Atsumi was asked in interview two why she frequently enters the homework site with a mobile between 10pm and 12 am. She explained that it was "great" that she could do her homework while lying in bed¹²⁵. Here the comfortable private atmosphere of not only their bedrooms but their beds too. Again, this suggests the mobile is acting as a bridge between the public homework and this private place.

4.4.5.3. *Friend and non-friend boundaries*

This section discusses the boundaries between the participants' friends and those they consider in a more public relationship such as classmates and how this boundary is blurred by use of the mobile phone for the collaborative homework.

In interview one, G2_Lulu was very positive towards the collaborative style of homework because it increased the amount of communication, so allowed her to become friends with more people than she would otherwise²⁴⁶. Then in

interview two she is still positive and adds that the increased communication she mentioned earlier, that allows her to gain more friends, is still true even when she cannot meet them face to face, but must read the comments on the website. Participants have commented that the frequency of website access goes up when they use their mobile phones, so it suggests that this increase has a positive effect on the number of other participants they get to know personally.

Interviews\\Time 2\\ G2_Lulu

I: Why are you closer second semester than first? Why did you become close?

G2_Lulu: I think after doing the homework for many times, we exchange the idea many times, we can get familiar with other people. Although in the class, of course, we cannot meet everyone, but from the comment I can feel some characters of them.

I: So you get better friends with them.

G2_Lulu: Yes.

G3_Fumie also felt that the mobile site increased the opportunity to discuss how she felt about something with friends whom she was not so close to, which is something she would otherwise not be interested in doing⁴⁸.

In interview two, G2_Eri felt more comfortable communicating with students she does not know or does not like, but she felt that homework without mobile phone access would mean not communicating at all with those less familiar students²⁴⁷. There is some support for this in the MDS result in Figure 34 on page 131 which shows a large movement of "mobile phone" towards the cluster of words including "groups," "discussion," "speaking," "voice" and "listening". G4_Saori in interview two says that she feels shy communicating with people she does not know so using a mobile social network sites like Twitter and Mixi lets her communicate with them²⁴⁸.

G2_Hitomi in interview two says that friends have more time to meet so are more likely to use face-to-face, however, for communicating with non-friends the homework website is more convenient because they don't usually have a chance to meet each other, and she feels uncomfortable talking with people she does not know well. In Table 8 on page 256 and Table 9 on page 256 we can see that she only contacted the website with her mobile phone so it is the mobile

access that she is referring to here which allows her to increase the chance of communicating with people she would not otherwise have the opportunity to get to know better²⁴⁹. This face-to-face with friends and mobile website communication can occur at the same time as G3_Akiko explains in interview two. She often discusses the homework with her friends in the cafeteria while eating lunch and at the same time as they talk they are reading the comments on their mobile phones of group members that they would not otherwise have contact with in that place, so people they do not know well are being pulled into the time spent with close friends.

Interviews\\Time 2\\ G3_Akiko

I: So you talk face to face and do you look at the mobile?

G3_Akiko: Mmmm.

I: Why do you look at the mobile? Why are you looking at the phone?

G3_Akiko: Your homework is difficult. We're looking for answer, so sometimes we don't understand about that, so we [so dan suru] consult with someone.

4.4.5.4. *Collaboration in the home*

In this section, we discuss how the mobile phone increases the opportunity to access the collaborative homework while in the home which is a very private place. This means that the collaboration with the group continues into the private home.

G2_Hikaru also mentions in interview one that it is the speed and ease of access afforded by the mobile phone that is the main reason she uses it to access the collaborates from home²⁵⁰. G3_Akiko describes in interview two how the mobile phone allows her to do the homework in the morning while "moving" around her house getting ready to go to school, which she feels would not be possible for her with a computer²⁵¹. G4_Midori in interview two also explains that she can access the homework early in the morning right after waking up, something she feels would not happen without a mobile access option.

Interviews\\Time 2\\ G4_Midori

I: What's happening there at 5:00 and six o'clock in the morning, only mobile phone?

G4_Midori: No reason. It is difficult to open my PC. When I wake up in the morning, first I check my mobile phone so I check [unclear] website.

I: If you did not have mobile phone would you check the website?

G4_Midori: Morning, maybe not.

I: Okay. So using mobile in the morning it allows you - it helps you to check the homework?

G4_Midori: Yes.

G4_Eri in interview two in her comments says that she uses her mobile to access homework everywhere including her bed without making any indication that this incursion of the homework into her time is a negative thing²⁵².

4.4.5.5. *Work and homework*

The mobile phone allows the students to bring their homework into their working lives, which is usually not possible due to the limited amount of time available. G1_Erika in interview one explains that the ease of using a mobile phone to do the homework was what allowed her to do it at work²⁵³ and again in the final questionnaire writes that she started using her break time at work to do her homework²⁵⁴. G2_Hikaru in interview one explains that the mobile allows her to use her break time at work to complete her homework²⁵⁵. G2_Yuuri in interview two speaks about how she also is able to use her short break time at work to access the homework with her mobile phone, which she feels would not be possible without her iPhone.

Interviews\\Time 2\\ G2_Yuuri

I: Now at work, when do you use the mobile phone at work?

G2_Yuuri: Rest time.

I: Break time. How long is your break time?

G2_Yuuri: 15 - from 15 to 30.

I: So at work on break time you use iPhone to look at website? Now again, imagine, no mobile phone. At the same time what would you be doing?

G2_Yuuri: I don't do anything - I can't do my homework.

Also, G3_Ayaka in interview two says that she usually used a computer for her homework except for when she was at work. She started to use her mobile for homework at work during the second semester because her free time was

reduced due to work²⁵⁶. This suggests that the amount of time she spent collaborating with her group would have been reduced without the mobile option.

4.4.5.6. *Private mobile websites*

The mobile social networks commonly used by the students were Twitter and Mixi, which were both accessed through their mobile phones. The websites were firmly in the students' private space and not for homework as shown by G3_Atsumi's comments in interview one clearly state that her mobile social network sites are private and just for her entertainment, so she strongly dislikes using them to talk about homework²⁵⁷. G2_Ayaka²⁵⁸, G2_Lulu²⁵⁹, G3_Yurina²⁶⁰, and G3_Fumie²⁶¹ all echoed these feelings about their mobile social networks being personal and separate from homework. G4_Yuri in interview one explains that even though these social networks are open to public viewing they hide their meaning so only her "friends" can understand the meaning²⁶².

However, some of the students did start to use their private mobile social networks to help keep track of when their group members posted a message. G3_Yui explains in interview one that her group used Mixi the mobile social network to let each other know that there were new comments on the homework website²⁶³. This desire for more notification of any updates to their group comments suggests that these third party sites were increasing the quality of the collaborative experiences by reducing the delay between responses. The homework website did have a mobile notification system that emailed participants after a message post, but the students were allowed to turn this off at any time. Since she turned this notification off and instead checked her mobile social networks she may have wanted more control over the notifications. This use of these sites to keep track of homework changes continued to increase in the second semester with G3_Eri²⁶⁴ in interview two describing her use of these mobile social network sites which she did not mention during the first round of interviews in semester one. For her these sites allowed her to reach out to friends who were not in her group, or not even in her school and to ask them for advice on the homework. This is evidence that these sites provided more

information on the topic of discussion than would be available to her without them.

G4_Saori shows a definite change in attitude concerning the private and public space in which her mobile social networks belong. She explains clearly in interview one that the social network sites that she access only with her mobile are separated from her school life. When asked why she separates the two she explains that one is for her private things and the other is her study space.

Interviews\\Time 1\\G4_Saori

I: So does your group use Twitter or Mixi to talk about my homework?

G4_Saori: No. Actually we don't talk about the homework...

I: Why do you think that is?

G4_Saori: Mm, I haven't thought that idea [laughs], so I have no idea why that - we think about its private space, so maybe your website is homework study space so we divide into space; study or private.

I: Okay. Do you think most students do that?

G4_Saori: Mm [laughs], maybe I think.

I: What's the difference between study space and private space?

G4_Saori: We only do homework things in your website. If we can want other communication - so the space is - can be the - like social communication space.

Here she is clearly identifying a "homework space" and a separate "private space." This example suggests that most students see the homework website, what she calls "your website," for everyone to use and mobile social networks for those people she socializes with. However, in interview two when asked about these same websites she says that her group did start to use them for the homework when they were close to the deadline.

Interviews\\Time 2\\G4_Saori

I: Do you use it for homework a little?

G4_Saori: A little.

I: When?

G4_Saori: When [pause] we are near deadline of homework.

I: Why?

G4_Saori: I want to check my group member did it.

I: You don't check my website?

G4_Saori: I did it - I do it sometimes but Twitter is more [pause] useful to check it because Twitter is [pause] - many people see Twitter many times.

They were for the most part not using the sites for discussion, but to post status updates on Twitter and Mixi because they knew that all their friends were constantly monitoring these sites with mobile phones, so it was the best source of real-time information updates on the activities of other groups members.

Students are self-motivated and actively trying to remove any barriers that exist to their way of doing. It appears that Mixi, Twitter and other sites were used to overcome the limitations that the students felt existed with my site.

Interviews\\Time 1\\G4_Yuri

I: Okay. Do you think Mixi and Twitter is easier to use than my website?

G4_Yuri: [Laughs] Yes....Difference. Difference is Twitter is more - Twitter or Mixi is more simple, about using. Using it's simple.

Here she is referring to the interface for the mobile site used in this research which required mobile users to choose their location (Figure 13 on page 86) before entering their password. Twitter has a much simpler design which the students were used to using so they may have been discouraged by what they saw a too many steps.

The evidence in this section suggests that homework communication on mobile leads to these previously private mobile communication paths being hijacked for homework. Social network sites seem to be providing an alternative information stream which is a mixing of public homework and private social spaces through the mobile. Mobile has fewer barriers for the students than computer communications but some barriers still exist, especially due to design of the interface. There are many more interview examples supporting the students feeling of these barriers. Just as face to face was used to increase depth and quality of communications for some; mobile social network sites were used to overcome the limitations of my site. Students do everything they can to make the communication more efficient so increasing collaborative quality which should have a positive effect on richness of learning.

4.4.5.7. *Homework and non-homework activities*

Private time used for some non-homework related activity is often interrupted with short periods of public mobile homework because of the ease in

which the mobile device allows students to switch between applications.

G3_Akiko describes her free time in interview two as time spent traveling, eating or enjoying entertainment.

Interviews\\Time 2\\ G3_Akiko

I: Right. How do you get time? Give me an example of free time you use the mobile.

G3_Akiko: Free time, travelling is also my free time, after I eat lunch or dinner, watching TV also free time.

I: So at those times you like to use your mobile phone?

G3_Akiko: Hmm. Because mobile is - I can bring mobile everywhere.

The time spent on the train commuting is often seen as free time for the students in which they can do something for entertainment on their mobile phones or just sleep. G1_Erika echoes the statements of many of the participants when she talks about using the mobile as a way to occupy here free time²⁶⁵. G3_Fumie in interview one clearly identifies her the time she spends on the train commuting to and from school as her free time, and she goes on to say that it is a very good idea to make the homework accessible through mobile phones at this time²⁶⁶. In interview one G1_Atsumi talks about how she uses her mobile phone on the train during her personal free time to do fun things on her mobile phone²⁶⁷. Then in interview two she goes on to say that it is the first time to have the ability to use a mobile phone for homework during this time on the train and that she likes it very much. So does not mind the public homework entering into her private time on the train which she would usually use for sleeping²⁶⁸. Now that she has the ability to do homework with her mobile phone, G3_yurina in interview one says that she uses the time in the train for homework which is time she would usually use for nothing in particular²⁶⁹.

G3_yui now interrupts her private shopping trips to check her group's comments

Interviews\\Time 1\\G3_Yui

I: Okay, so why do you watch on the mobile phone?

G3_Yui: Many students reply every time, so I don't have computer always so I want to watch members comment. When I want to watch members comment I use mobile phone.

I: When do you enter website and watch other people's comments? When or where?

G3_Yui: Always outside. Far away from home. I go shopping and school - in school or...

In interview two, G1_Mai when asked about her access times explains that she often uses her mobile to check the homework site during lunch time with her friends. This is something she feels she would not do without the affordance of mobile access²⁷⁰. G3_Eri also mentions in interview two of sometimes using her mobile during lunch with friends to check the homework²⁷¹. However, G2_Hitomi in interview two explains that she decided to stop using her mobile for homework during the lunch break because she preferred just to enjoy the time with her friends²⁷².

G3_Ayaka²⁷³ and G3_Eri²⁷⁴ explain in interview two that she started to look for homework examples with their mobile camera in the street while walking or in the toilet which are both personal spaces. Some students began to check homework comments while out with friends at night because of the affordances of the mobile device. G2_Eri in interview one mentions that she often accesses the homework while waiting to meet her friends²⁷⁵. G3_Yui²⁷⁶ in interview one and G3_Eri²⁷⁷ in interview two used their mobile social networks to ask their friends, who were not members of the class, for advice on the homework. So they brought their public homework into their private communications with friends through the mobile phone. G4_Eriⁱⁿ interview two mentions that she often uses her mobile for homework while in restaurants²⁵². G4_Midori in interview two explains how she commonly uses her mobile to access the homework on Saturday nights while out with her friends or early in the morning if she stays out all night²⁷⁸.

4.4.5.8. *Language*

The language used by the students is also a division between the public homework in English and the private life in Japanese. This is one reason the students used face to face instead of the website because the website is public so they had to follow the homework rule of using only English, but just talking

they could use Japanese. G3_Yui in interview one explains that she used Mixi, her personal mobile social network site, to communicate with friends in her group about the homework.

Interviews\\Time 1\\G3_Yui

I: Oh okay. Good. When you talk about or chat about homework on Mixi, why don't you do the same thing on my website?

G3_Yui: I think it's homework, so [Seikakuna bunsyou] correct sentences. I should do [Shinken ni Majime ni Yarubeki...] I should do seriously. So I chat long thing on Mixi, but [that] I can't say on the homework page.

I: Okay. Why can't you?

G3_Yui: Mixi is Japanese but homework is English, so I don't have vocabulary in English, so Japanese is easy, maybe I think (Added to questions)]

I: All right, so you don't use English on Mixi?

G3_Yui: Yes.

This suggests the choice of communication methods is very much influenced by the type of language they wish to use and the purpose of communication. If they had to discuss a complex topic, they might choose to do it in Japanese so they would choose one of the communication methods which provided this such as face-to-face or a private mobile social network site.

4.4.5.9. *Summary*

The mobile phone is positioned in both the private and public lives of the participants, so it can act as a bridge allowing homework to enter into an individual's private space. The mobile phone can switch effortlessly between private websites and the public homework website, and this seems to draw the mobile homework closer into the students' private space.

Boundaries differ between the participants' friends and those with whom they have a more public relationship, such as classmates; these boundaries are blurred by using a mobile phone for collaborative homework. Mobile phone speed and ease of use make it more attractive than alternative communication methods. This increases individuals' ability to access collaborative homework while in the home, a private place.

The limited amount of time during work breaks was not enough for students to use for homework until the mobile allowed them to do so. Mobiles

thus entered into the participants' working space. The evidence in this section suggests that homework communication via mobiles leads to these previously private mobile communication paths being hijacked for homework. Social network sites seem to be providing an alternative information stream, which intermixes public homework and private social spaces through the mobile. The mobile poses fewer barriers to students than do computer-based communications, but some barriers still exist, particularly due to the inefficient design of the interface. Private time used for non-homework related activities, like playing games on the train, is often interrupted with short periods of public-facing mobile homework because of the ease with which the mobile device allows students to switch between applications, Japanese is private, and English is public, so the choice of communication methods was influenced by which language the participant wanted to use.

4.4.6. Reflection

This section is subdivided into four subsections including a) short fragmented visits, b) peers as teachers, c) freedom of location, and d) mobile as reminder.

4.4.6.1. Short fragmented visits

G1_Erika in interview one believes that the more times she can access the website to read other group members comments, the more it helps with her homework²⁷⁹. Then in the second interview she explains that when using a computer she tends to enter the site once, completing the homework in one sitting. However, when she enters the website with her mobile phone, she divides the time into several smaller periods of time.

Interviews\\Time 2\\ G1_Erika

I:...you finish the homework, then leave, one time; or do you go do a little, leave, go back, do a little, leave, go back?

G1_Erika: Ah, yes. Not one time.

I: Okay, so several times.

G1_Erika: Yes, several times.

I: If you did it with computer would you do it one time or several times?

G1_Erika: I think I can do one time.

When asked what she does between these short periods of time on the mobile website, she explains that that is the time when she “thinks” about the homework and checks her notebooks²⁸⁰. This pattern of many visits for reading, thinking, and then followed by a single posting of a comment is supported by the data displayed in Figure 18 on page 113 which shows that for all four groups the number of message reads is significantly larger than message posting times. When looking specifically at G1_Erika’s read and posting ratio in Table 14 on page 258 it shows that over the research period out of a total of 155 mobile visits, 70% were for reading only. This percentage is similar when compared to the computer where 77% of accesses were for reading, but there were a much smaller 35 total computer accesses. Additional support can be seen in Table 6 on page 256 which shows G1_Erika as making 91 mobile and 47 computer accesses in semester one then 97 mobile and 14 computer accesses in semester two. So the ratio of mobile to computer access appears greater throughout the year and shows a sharp rise in the second semester suggesting she found the mobile increasing more appealing to use. If she is using the time after reading her group post for reflection on the homework, then these examples and data suggest she will have a greater number of reflection times with a mobile phone when compared to a computer.

G2_Eri in interview one describes the same pattern of mobile use with many frequent short visits separated by periods of thinking or reflection on the topic²⁸¹. G2_Ayaka in interview one when asked about her website entry logs (Table 14 on page 258) which showed her entering the mobile website many times to read, but a much smaller number of times to post comments. She describes entering the website frequently with her mobile to read or reread the comments of others then leaves to think about the comments²⁸². This she feels is made easier with a mobile phone because it allows her more time to think.

Interviews\Time 1\G2_Ayaka

I: Because mobile phone you can go to website many times in day, going many times, does that help you understand the homework?

G2_Ayaka: Yes.

I: Can you tell me example how?

G2_Ayaka: I have more - I can have more opportunity to think about the homework, so I can have more time to understand or more time to come up with opinion or answer, so - helpful.

This pattern of increased visits with the mobile phone is supported in Figure 22 on page 119 and Figure 23 on page 120 which show her group, group two, had many more mobile visits, and that these visits were much more consistently spread than the computer access times.

In interview one G4_Yuan says that she feels it would not be possible for her to maintain her habit of entering the website many times using only a computer because the mobile allows quick access²⁸³. She goes on to say that this pattern of frequent access through the mobile gives her the impression that she is always “thinking” about the homework.

Interviews\\Time 1\\G4_Yuan

I: Does it have an effect on your homework? So you log in more times to read.

G4_Yuan: I think yes. If I login often, also I see my partner's answer frequently and then maybe if I have submit my homework I will think about maybe I have some - I have written it - the words I have written it's wrong or oh my partner's opinion is good, it's better than me, yeah I always think about it I feel.

In the second interview, G2_Hitomi speaks about the ease of connecting to the website with her mobile and that this allows her more time to think and collect examples²⁸⁴. G4_Asako in interview two feels that the mobile allows her to read the comments more often allowing her to think about them more and so helps her to learn²⁸⁵. G3_Yui explains in interview two that each visit to the website with a mobile, which she prefers, is half the time of a computer visit and that when she uses a computer she tries to finish in one time but the mobile uses several shorter periods. It is between these visits that she does her thinking and preparation of answers²⁸⁶.

G2_Lulu²⁸⁷ in interview two also thinks that for her situation the mobile can only be used for short periods of time of about 15 minutes each, as opposed to 30 minutes for the computer, because of her schedule. She is alone in thinking that these short periods are unfavourable because it increases the time she

spends on homework that she would rather finish quickly. Computer is generally considered a way to do homework at one time. So there is not the idea of dialogue between students but instead the student just wants to log on and post three comments then finish, so this does not encourage communication or collaboration. This suggests that the computer is convenient for reading and typing and answer, but it does not encourage the multiple entries to the site that are required to have a true collaborative activity.

4.4.6.2. *Peers as teachers*

G2_Yuuri²⁸⁸, G2_Asaka²⁸⁹, G2_Lulu²⁹⁰, and G1_Atsumi in interview one explain that having access to other students' opinions and answers allowed them to develop a better understanding of the homework because they could compare their answers to others. G1_Chika²⁹¹ and G3_Eri in interview one explain that they first read the other student's posted answers, and this helps them to think about their answer.

Interviews\\Time 1\\G3_Eri

I: So when you log on and read other students' comments you're thinking about their comments?

G3_Eri: Their example is good for me to think about homework. When I log in this website I see the other comments and sometimes I don't have the time to do the comment or post my idea, so I check these other members' comments then I log off.

G1_Chieno²⁹², G4_Eri²⁹³, and G2_Hikaru²⁹⁴ in interview one both talk about how much they like seeing the other student's answers because it allows them to have a discussion and so exposes them to many more ideas than in a tradition homework assignment.

G1_Mai in interview one also mentions that it is the ability to see others' comments that gives her a better understand of how her group members are feeling and allows her to consider the opinions of others towards her answer²⁹⁵. G1_Takashii in interview one says he feels that the collaborative activities are better because the exposure to more opinions forces him to think more and in new ways because he gets more information and examples of methods from others²⁹⁶. G1_Erika in interview one holds a similar opinion that the ability to see

other answers helped her to “re-think” her answer and she feels the more times she does this, the better²⁹⁷. G2_Eri expresses this same feeling in interview one.

Interviews\\Time 1\\G2_Eri

G2_Eri: Yes. But I don't have long time, just only one time, so I read - I check the mobile phone, I check the website many times, and after that I think about what should I write to other people - others. After that, I do the homework, so I check, check, check, check, check many times and after that I answer.

G3_Fumie in interview one explains that when she sees the posts of other students it highlights for her the specific areas of weakness in which she lacks knowledge so motivates her to study more to compete²⁹⁸. G4_Yuri²⁹⁹ and G4_Asako³⁰⁰ in interview one say they learn new words and concepts from reading the other members posts which they then look up and uses at other times. G3_Akiko in her e-journal writes that she learned many new things about her own language, Japanese, by reading the comments of other students and that this motivated her to study it more³⁰¹.

4.4.6.3. *Freedom of location*

Several of the homework questions required the students to find examples and post them to the website. The mobile phone provided a constant link to the website, and so became a useful tool for this example gathering activity and stimulates thinking about the topic because it is all around them.

G2_Hitomi³⁰² and G4_Asako³⁰³ in interview two both comment on the freedom of the mobile phone to record examples anywhere, unlike the lack of mobility provided by a computer, allowed them to continue looking for examples all day. G3_Ayaka in interview two talks about how she must go home to use her computer but using her mobile phone allows her to increase the time “thinking” about the homework³⁰⁴.

G1_Chika in interview two explains that the homework requiring examples makes her look outside for examples while she is walking so she cannot “escape” thinking of the homework³⁰⁵. G1_Erika in interview two says that she is always looking for examples with the mobile, never stopping, which she believes increases the amount of time she spends thinking about the topic³⁰⁶. G3_Eri in

interview two feels this homework has changed her thinking and now she is always looking for examples³⁰⁷. G4_Midori in interview two mentions that she started to look for examples on the way home and now thinks about it every day³⁰⁸. G3_Akiko³⁰⁹, many students used advertisements as examples of interesting language. G4_Yuri³¹⁰, and G4_Yuan³¹¹ in their e-journals mentioned that once they started looking they realized how interesting the language in advertisements around the city were and started to think about the hidden meaning that they had never noticed before.

4.4.6.4. *Mobile as reminder*

G2_Yuka in interview two explains that she knows she can do homework on her mobile, so the mere presence of the mobile phone reminds her that she has homework to do on it. She feels this would be different without a mobile phone because after she remembered the homework she would probably have forgotten it by the time she arrived home to her computer.

Interviews\\Time 2\\ G2_Yuka

I: Does the mobile phone help you remember you have homework?

G2_Yuka: Yeah. If I have a mobile phone just I remember, oh I have to do homework and go to website and try to remember the topic and think about this. But if I don't have a mobile phone I suddenly think about, oh I have to do my homework but after go home maybe forgot that.

I: The mobile phone for homework helps you to remember that you have homework?

G2_Yuka: Yeah.

This pattern can be seen in Figure 22 on page 119 and Figure 23 on page 120 which show that her group had a greater frequency of visits that were spread more evenly throughout the week. This is compatible with the idea of her checking when reminded by seeing her mobile. G1_Chika in interview two also comments that the presence of her mobile phone has itself become a reminder of her homework, so it is a constant reminder that she has homework which she feels increases the amount of time she spends doing the homework³¹². G3_Fumie in interview two says that the constant presence of the mobile phone has become a reminder of the collaborative homework, and this is true even when she forgets non-mobile homework from other classes³¹³. She continues in

her final questionnaire writing that she feels only the mobile phone could act as such a reminder because of it is with her everywhere she goes¹⁶¹.

G2_Yuka in her final questionnaire writes that every time she reads her mobile social network site and sees someone “grumbling” about the homework, she is reminded that she needs to do it¹¹⁹. In interview two, G2_Ayaka really liked being reminded of the homework on her mobile when she receives the automatic notification from the website informing her that someone has posted an answer because she carries her mobile all the time³¹⁴.

Also in interview two, G2_Hikaru explains that she has bookmarked the website in her mobile browser so every time she accesses the internet with it she can see the bookmark and so is a reminder that she has homework³¹⁵. G2_Yuuri in interview two says that she saved the top screen of her iPhone as the homework site so she is constantly reminded to think about it³¹⁶. For G4_Yuri, as mentioned in interview two, her mobile phone schedule application that reminds her of the homework, without which she feels she would just forget about it³¹⁷.

4.4.6.5. *Summary*

Mobile use increases the number of visits, so this code shows that the time between visits is creating more chance of reflection. Frequency is linked to reflection: a greater number of times visiting the mobile homework interface exposes individuals to greater numbers of peer comments, helping to encourage reflection.

The mobile phone provided a constant link to the website, and so it became a useful tool for this example-gathering activity and stimulated thinking about the topic, which surrounded the participants. The presences of the mobile phone itself became a reminder of the homework because students began to associate the phone with the homework.

5. DISCUSSION

5.1. Chapter outline

This chapter situates the findings with the mobile learning literature and the impact of the mobile phone on the collaborative activities. The chapter is divided into five sections, and each section will deal with one research question.

5.2. Research Question 1

What is the distinctive affordance offered by the mobile phone for collaborative learning?

The research findings suggest the mobile phone offers several clear affordances for collaborative learning. The themes were examined further and from this analysis and discussion the following were identified as affordances offered by the mobile phone for collaborative learning. These include a) quantity of communication, b) quality of communication, and c) control of communication.

5.2.1. Quantity of communication

The students were able to use a mobile phone to increase the frequency of contact with the homework and their collaborative group members, creating an opportunity for seamless learning. This change in the quantity of communication was due to the physical size and constant availability of the mobile devices.

The compact size of the mobile phone allows it to be carried at all times of the day and in all conditions providing a constant, uninterrupted means of communication (section 4.4.1.1 on page 138). Even when conditions are so crowded that they will not allow the use of books and notebooks. The mobile phone's compact size provides some privacy when contacting others. The keyboard makes it possible to type with one hand when the other is needed to hold the hand strap on the train.

The mobile phone increases the overall amount of collaborative time available to the students. Collaboration was possible in small pockets of time that occur throughout the day. These small pockets of time were impractical for

other technologies to utilize. The ability to access the homework at more times led to an increase in the frequency of visits to the website. However, a mobile visit was reported as shorter than the average visit using a computer.

The constant availability of the mobile phone allows students to use previously unproductive periods of time (section 4.4.1.2 on page 139) for learning such as when traveling and use them for educational activities (BenMoussa, 2003; Gant & Kiesler, 2002; Johnsen, 2001; Perry et al., 2001). For a device to be available anytime and anywhere that the learner needs it, it must be small enough to be conveniently carried even in the most crowded of conditions (Alexander, 2004; Chen et al., 2008; Churchill & Hedberg, 2008; Geser, 2004; Naismith et al., 2004). The mobile phone has changed the idea of time as it relates to learning from separate moments of learning to a continuous learning experience where resources, content, and communication is available throughout the day (Fortunati, 2002b; Pachler, 2010). With this constant mobile connectivity comes an increase in productivity (Gikas & Grant, 2013). This ability to use these small moments of time provides a seamless learning space allowing the students to maximise the contact and support they have with group members (Adam, 2013; Looi et al., 2010; Traxler, 2007).

5.2.2. Quality of communication

The mobile phone is a powerful data collection and storage tool that is able to fit any social environment which allows for rich collaboration. This change in the quality of communication came in a variety of forms and included data collection and social correctness.

The mobile phone allows the students to use photographs along with text messages, to increase the clarity of their messages (section 4.4.1.5 on page 153). The mobile phone is a collection tool that can store examples that are found throughout the day. These examples were frequently in the form of photographs or just digital notes saved on the mobile phones. The constant presence of the device means that there is more opportunity to find, record, and share examples with other students

The mobile phone is able to fit social situations allowing the student to abide by social norms (section 4.4.1.6 on page 157). The strict rules of not using a mobile phone on Japanese trains relates for the most part to voice communication but does not prohibit text messages. The asynchronous nature of text message allows the student time to formulate a message that will cause the least amount of conflict with other collaborative group members. Showing respect for others when communicating is an important social rule in Japan. In addition, the continuous presence of the device allows replies to be prompt so that the other group members do not need to wait when time is an issue.

The mobile phone provides the students with a powerful data collection, organizing and sharing tool (Cochrane & Bateman, 2010; Kim et al., 2006; Naismith et al., 2004). This data collection can take place in real-time whenever, wherever, and in whatever form the student needs (Chen et al., 2002; Ng & Nicholas, 2009; Savill-Smith & Kent, 2003). The ability to conveniently collect, access, and share data is helpful for knowledge building, knowledge evaluation, and developing a feeling of meaningfulness towards the activity (Brown, 2005; Cinque, 2013; Evagorou et al., 2008; Gikas & Grant, 2013). The Tokyo metropolitan area is a densely populated city with a large percentage of those people commuting every day on crowded trains (Tokyo, 2013; UN, 2007) so adhering to the strict social rules, while still communicating, is only possible with a mobile phone (Geser, 2004; Ito, 2005; Puro, 2002).

5.2.3. Control of communication

The students have more control over their collaboration when using a mobile phone alone or in addition to other communication methods. This increased control supports them whenever they choose to participate in the collaboration. This increased control of communication came in a variety of forms and included ease of use, speed of use, and flow of information.

The ease of using a mobile phone allows the student to make contact with other group members effortlessly (section 4.4.1.3 on page 144). This effortless communication reduces the chance that the student will decide not to contact the

homework website when they have something to share. Unlike other devices, the mobile phone does not require the initiation of a wireless connection each time it connects to the internet. Also, the simple interface does not require an elaborate process of scrolling through menus and loading programs like a computer. However, some students did feel that the homework website could have been made simpler to use by reducing the menus even more. This could be related to cultural preferences in interface design features. During the initial stages of the study, cultural design attributes of the mobile interface did not consider cross-cultural differences, such as high-context and low-context cultures (Hall, 1969). The interface in this study used simple drop-down menus that are popular in low-context cultures, such as the United States and Germany. However, it has been reported that users from high-context cultures, such as Japan, prefer icons and animations over text-based explanatory menus because they can comprehend its meaning faster (Choi et al., 2005).

The speed in which the mobile phone can connect to the homework website allows for the use of very short periods of time and creates a more natural timing of communication. The device allows a student to monitor the activities of other group members and reply whenever they want to respond to comments or add their own. The constant connection with the internet provided by mobile phones allows immediate access without the need to wait find and then establish a wireless connection. In addition, the always on nature of the mobile device means there is no need to boot up the phone like a normal computer. All of this means that the student has instant access at the time and place they choose.

When using a mobile phone to collaborate, the students are able to control when, where, how, and how much they share with their group members (section 4.4.1.4 on page 150). The anytime and anywhere communication provided by the mobile phone means that students can share ideas and respond to others at the moment they have an idea or some new information they wish to share. When the mobile phone is added as a communication path alongside computers and face-to-face communication, they have more choice when deciding how they can

best collaborate at any given time or place. In addition, the separation provided by the mobile phone allows the student to control the type and amount of information they want to share unlike with face-to-face communications.

The mobile phone provides the student with a means of immediate, flexible access and engagement in learning so they may collaborate and reflect on course content when it is most appropriate for them (Motiwalla, 2007; Seppälä & Alamäki, 2003; Sharples et al., 2005) in many different teaching situations including language learning (Cavus & Ibrahim, 2008; Seppälä & Alamäki, 2003; Shuler, 2009). Mobile phones can complement regular stationary computers or face-to-face communication by creating access to content anywhere at any time (Goh & Kinshuk, 2006).

This control extends the student's access to course related information, communication, and collaboration which leads to increased time management and improvement in self-regulation skills (Cinque, 2013; Kearney et al., 2012; Townsend, 2000). This increased control over communication leads to more learner satisfaction (Gikas & Grant, 2013; Liaw et al., 2010). This is especially true for those students who need to balance work and school life (Motiwalla, 2007).

The personal nature of the mobile phone allows the students to control and filter the flow of information through the device giving them a greater sense of autonomy over the level of contact they have with others (BenMoussa, 2003; Turkle, 2012). In addition, the increased options available to the student as related to the resources accessed and when makes the learning process more authentic and learner centred (Valk et al., 2010).

5.3. Research Question 2

What is the affective relationship between student the mobile phone and the homework?

The research findings suggest that there is an affective relationship between the student, the mobile phone, and the homework. The themes were

examined further and, from this analysis and discussion, the following were identified as types of affective relationships. These include a) student feelings towards the homework, b) student feelings towards the mobile device, and c) student feelings towards other students.

5.3.1. Student feelings towards the homework

The students' use of the mobile phone allowed the popularity of the device to influence their feelings towards the homework. The increased access to the opinions of others gave them a greater opportunity to question their own values and preferences. The relationship that the students have towards the homework can be seen in a variety of forms and includes the student using the mobile phone to complete the activities and the group using the mobile phone to complete the activities.

The popularity of the mobile phone, along with the freedom and convenience it offers, can make homework seem more attractive when done through a mobile phone than other means of communication (section 4.4.2.1 on page 161). The mobile phone is a very popular device with students so it is associated with positive feelings which may transfer to other activities done on the mobile, such as homework. In some ways, the use of the mobile phone as a tool has changed the feelings of the students toward the activities.

The mobile nature of the device gives the students a sense of freedom when doing the homework which is not there when they are sitting at a computer or forced to meet face-to-face at one location (section 4.4.2.2 on page 164). The ease with which the students can communicate and share information on the mobile creates a feeling of greater convenience which makes it less of an effort to participate in the collaboration activities (section 4.4.2.3 on page 166).

The nature of mobile phone communication increases the likelihood that the students will be exposed to the opinions of their group members, thereby increasing the chance that those opinions will have an effect on the way they feel about the homework (section 4.4.2.4 on page 167). This increased exposure allows them to consider opinions that they would otherwise be less likely to come

into contact with through one extended visit with a computer. These new ideas may make them aware of a perspective that they would not have considered if allowed to communicate face-to-face with only those group members that they knew well.

When a tool is used for an activity, that tool can in turn change the user's activities (Waycott, 2004). Students often form an intimate relationship with their mobile phone which in the case of Japan it has been called a fetishized object (Ito, 2005). The many statements referring to the mobile phone as easy to use and useful by the students in the results chapter above are indicators of strong positive feelings towards the device according to the Technology Acceptance Model (TAM) (Davies, 1986b). Students are more engaged in learning and have a greater sense of ownership and confidence in learning when they can use their own mobile device rather than one provided for them because it has feelings of intimacy and convenience associated with it (Crawford et al., 2002; Heath et al., 2005; Kearney et al., 2012; McFarlane et al., 2007; Scanlon et al., 2005).

The mobile phone allows the student to participate in the activities, not at a dedicated time or place with a computer at a desk, but with a personal, intimate device that is free to go where the student chooses to go (Kukulka-Hulme & Traxler, 2005; Traxler, 2009b). This sense of freedom of location and communication is very different from the traditional classroom which is in one place where communication is controlled by the teacher (Ito, 2005). This gives the students more freedom to define tasks and relate activities to their own goals so increasing motivation as compared to a more formal setting (Jones et al., 2006). This increases their opportunity to meet their own educational goals by building on their skills and knowledge (Sharples et al., 2007).

The students were studying a foreign language and so were always looking for ways to increase their exposure to the language of study (Laufer, 1997; Nation & Nation, 1990). For Japanese students, this means 90 minutes a week in the classroom. The mobile collaborative activities exposed the students to the English language by encouraging them to seek out language data that could be discussed in the target language.

5.3.2. *Student feelings towards the mobile device*

The students' use of the mobile phone as a tool for collaboration changed the perceived value of the device. The feelings towards the mobile device were observable when they used it for homework and included some negative feelings.

This research was the first time that the students had used a mobile phone to complete a collaborative homework activity or any homework activity, so this had the effect of making the students re-evaluate the way they viewed their mobile phone (section 4.4.3.1 on page 169). Using a mobile phone for homework meant that it was now seen as having a new use for the students. The students had viewed the mobile phone as just a way to communicate or as an entertainment device. The idea of using a mobile phone for homework appealed to some students because it seemed a modern and progressive way to complete the activities.

The use of the mobile phone for homework did concern some students because of the addictive and entertaining functions of the device (4.4.3.2 on page 171). The mobile phone has become very popular and has been incorporated into all aspects of our lives. This leads some to question whether the addictive nature of mobile games and media delivery is a positive step. Now that the mobile phone has gained a place as a means to do homework, this only adds to these worries, with some students asking if this will increase the addiction of mobile use amongst students and possibly distract them from learning. However, few students saw this as a danger with most appreciating the affordances that the mobile phone brings to education.

The ability to use their mobile phones for homework increased the perceived usefulness of the devices to help them complete their homework (Davies, 1986b). The mobile phone is another example of an educational technology that was not designed for educational use however successfully expanded to fill an emergent need (Gilbert et al., 2005; Keinonen, 2003; Kukulska-Hulme & Pettit, 2007; Traxler, 2010b). The fact that the mobile phone

is one of the students' principal entertainment devices does pose the problem of distraction from learning (Gikas & Grant, 2013). The popularity of the mobile phone does give the impression that some university students are addicted to using them (Keller, 2011).

5.3.3. *Student feelings towards other students*

The students began to change the way they saw other students in their group after using the mobile phone for collaboration activities. The changes towards the other students came in a variety of forms and included relationship, support, and some negative feelings.

The ability to communicate at any time increased the feeling of closeness between the students by allowing them to communicate with more students (section 4.4.4.2 on page 172). The constant link that is made possible by the mobile phone reduces the perceived distance between the group members. The increase in the frequency of visits to the website allows them to develop a better understanding of the other students.

The mobile phone allowed the students to communicate with group members that they did not know and so would not have spoken to face-to-face (section 4.4.4.1 on page 171). Face-to-face communication was usually reserved for group members who were already well known to the student. However, the mobile homework website was used to post answers and to communicate with those students that were less well known. This face-to-face interaction involving friends sometimes occurs simultaneously with the mobile communication involving lesser known group members thus adding the views of friends and non-friends.

The increased contact with group members created an atmosphere where peers became teachers (section 4.4.4.3 on page 173). The access to examples of others and the ability to see the homework question from the perspective of another helped to increase the students' understanding of the topic under discussion. This support was available at any time of the day because it only required a quick ever-present mobile connection to access the answers of others.

There were some negative aspects of this increased contact which included delayed responses and lack of depth in communication (section 4.4.4.4 on page 174). Since the mobile phone allows for immediate posting of messages, there developed the feeling of expecting a quick response from other group members when a post was made to the website. This can sometimes lead to frustration with those group members who do not participate in the collaboration as frequently as the others. The website allowed text and picture uploads to be used by the students to convey their ideas to the other group members. While this was popular, it did not allow for the representation of complex feelings that are communicated through body language and facial expressions (section 4.4.4.5 on page 175). In addition, when detailed explanations of a topic were required, text and pictures were sometimes impractical as they required a considerable amount of typing which some students do not see as a strong point of mobile phones.

The mobile phone increases the social network of individual students by adding a communication path to people with whom they have a weak relationship or are disliked by which is similar to findings in distance education research (Schwarz et al., 2000). The mobile phone allows students to keep contact with group members they do not see often while they continue using face-to-face communication for those with whom they already have a friendship. The device provides a way to frequently communicate in a spontaneous and casual way that is similar to greeting someone you pass in the street in a small community (Fox, 2001). Students usually expected an answer to their posts soon and became critical of others when they did not respond (Kasesniemi & Rautiainen, 2002). This consistent communication can increase the chances of forming a feeling of connectedness with other students (Cochrane & Bateman, 2010). The students are able to maintain a community relationship even when physically distant from some members (Ling & Helmersen, 2000).

Using the mobile phone the students are able to access course content and interact with the instructor and group members providing continuous feedback and guidance (Cavus & Ibrahim, 2008; Kukulska-Hulme & Shield,

2008; Seppälä & Alamäki, 2003; Valk et al., 2010). The students came to value mobile collaboration for its timely and immediate support of learning and for the feeling of safety this provided (Al-Fahad, 2009; Chen et al., 2002; Cinque, 2013; Fozdar & Kumar, 2007; Gikas & Grant, 2013; Trifonova & Ronchetti, 2004).

5.4. Research Question 3

Does the intervention affect the relationship between students the mobile phone and the homework?

The research suggests the collaborative intervention did affect the relationship between the students, the mobile phone, and the homework. The themes were examined further and, from this analysis and discussion, the intervention affected the relationship between the students, the mobile phone, and the homework in several ways. These include a) time of collaboration, b) space in which collaboration takes place, and c) method by which collaboration takes place.

5.4.1. *Time*

The mobile phone encroached on private time that would otherwise not have been used for homework collaboration. These times included that spent commuting, doing daily activities, and socializing.

The mobile phone made it possible for the students to continue the homework activities while commuting to and from school, thereby increasing the available time for the activities (section 4.4.5.7 on page 187). While traveling in trains or walking in the street, the students used the mobile phone to do the homework collaboration and data collection activities. Before this research, the students used their train time to sleep or to do some form of entertainment on their mobile phones. There was a very positive response to the opening up of this previously free time to homework activities. They could now use this time to read and reply to their group members. The students also reported that they began recording homework examples with their mobile phones as they walked around the city.

The mobile phones' constant presence allowed the students to continue the homework while shopping in stores. Some students used their mobile phone to check the group comments while shopping or in restaurants. Since there were many group comments during the day, this mobile access allowed them to keep on top of the group activity.

The students started doing the homework while they were with their friends at lunch or socializing out at night. Many of the students began checking the website during lunch time with their school friends. Some students also started to check the homework site while out at night with their friends. This was reportedly quite common when the homework deadline was approaching. However, G2_Hitomi eventually decided to stop using the mobile phone for homework during lunch time because she decided to just spend that time with her friends.

The mobile phone has changed the students' use of time so that now they do not have as great a need to coordinate exact times for communication. Instead they can use brief moments that are only approximately aligned with their group members' schedules (Ling, 2004; Plant, 2002; Sørensen et al., 2002). The students created moments of temporarily stable contexts commuting and walking around by searching for and collecting examples. This allowed them to enable meaning-making within the flow of everyday activity (Kukulka-Hulme et al., 2011).

5.4.2. *Space*

The students began bringing the homework into places in which they had either rarely or never done this type of collaborative homework. This change in the spaces in which collaboration took place was observable in a variety of forms and included mobile as a private device, home as a place for homework, and work as a place for homework.

The mobile phone is considered a private and very personal device to the students. All of the students in this research received their first mobile phone from their parents when they were around 10 years old so that they could keep in

contact with their family. The most common reason reported was that they needed a way to contact their family if there was some type of emergency. As university students, they still report that contacting their family is one of the main reasons they have the mobile phone. Another commonly reported reason is for entertainment while traveling. The mobile phone seems to allow them to create a private space even when in a crowded train. In this private space, they are able to comfortably interact with the homework website, check social network sites, play games, or view videos (section 4.4.5.1 on page 178).

Through the mobile phone, homework has gained a stronger foothold in the home (section 4.4.5.4 on page 183). The speed and ease of using a mobile phone was attractive to many students because it allowed them to check the homework without the need to sit at their desk with a computer. In the morning while preparing for school, they would check the website for updates to see if anyone had commented on their posts. For some students, the mobile phone was the first thing they reached for after waking up. The device stayed with them as they moved around from the bedroom to the kitchen table and out the door to the train station. At all of these times, the students regularly checked the homework website. Then, after returning home, they would commonly reply to their group while lying in bed before going to sleep, even as a computer is available. This mobility afforded by the mobile phone allowed the homework to move into these small but very personal spaces in the students' homes.

The mobile phone allowed the collaboration to continue into the workplace of the students (section 4.4.5.5 on page 184). Many of the students have part-time jobs which take up a significant amount of their out of school time, often running late into the night. The mobile phone access allows them, for the first time, to immediately connect with their group's webpage and contribute to the discussion, even during a short 15 minute break. Without this mobile access option, there would be less time available to the students for homework.

The mobile phone allows the students to separate the idea of a learning space from a physical space so that it is less about being at a place and more about belonging to a network of learning (Geser, 2004; Giddens, 1990). This

network exists through the mobile phone which means that the learning can continue as the student moves to and from physical locations such as the school, home and work and even into bed (Beach et al., 2008; Keller, 2011; Sharples et al., 2005; Traxler, 2009b). However, as this process continues there is the possibility that the instructor's constant presence within the network will restore the traditional power structure that exists in a classroom environment (Kasesniemi & Rautiainen, 2002).

The mobile phone has blurred the traditionally clear boundaries between school, work and home allowing one to invade another as observed with work at home company workers (Schwarz et al., 2000).. Now, even when physically alone at home the students can enter into a virtual public space discussion with their group members (Cooper, 2002; Sheller, 2004). This allows the learning to be situated in the everyday environment where the students will most likely be using their translation skills (Lave & Wenger, 1991).

The mobile phone can act as a type of private space within a public space. When in a crowded train female students can immediately connect with friends so that just holding the mobile phone creates a feeling of safety like they are physically present (Fox, 2001).

5.4.3. Method

The role of the mobile phone as an essential communication tool and the ability to switch effortlessly between the private websites and the public homework website it affords, places the device as a bridge between the public and private life. These changes in the communication method used for collaboration were observable in a variety of forms and included feelings towards mobile device, non-friends, private websites, and language.

The mobile phone has drawn homework into a more central relationship with many aspects of the students' personal lives. The close personal connection that the students have with their mobile phones affects the feelings that they have towards the homework. When using their mobile phone in place of a computer, they feel a greater sense of familiarity with the homework. This

familiarity brings them closer to the topic under discussion. In addition, it reduces their nervous feelings that were associated with homework done through other non-mobile methods (section 4.4.5.2 on page 179).

The mobile phone affords the ability to switch quickly and easily between mobile applications whether they are for entertainment or homework. This creates a greater sense of closeness between these two separate aspects of their lives – the private entertainment and the public homework- so that they all seem to be in the same space or shared presence on a network. This feeling of a shared presence of entertainment and serious homework reduces both the perceived distance and the physical effort required to switch between them, so reducing the motivational barrier needed to start a homework session.

The boundary between friends and others is blurred by the mobile phone so possibly increasing the development of close relationships (section 4.4.5.3 on page 181). The mobile phone use for homework allowed the students to communicate more with their group members because the phone is always present and removes the need to meet face-to-face. While the students were happy to discuss the topic face-to-face with friends, they did not like the idea of meeting face-to-face with group members that they did not already know. They mentioned that they would not talk with them at all if the homework was just face-to-face. However, the same students felt that the mobile phone offered a comfortable way to communicate with those students that they would otherwise not speak with, resulting in an increased chance of getting to know them better.

Mobile social network sites that the students previously used only for very private friends, began to be used as another channel for communication (section 4.4.5.6 on page 185). Mobile social network sites, such as Twitter and Mixi, were clearly identified by the students as something they would not like to use for homework. Some students strongly expressed a need to keep some part of their lives private from school so that they would have a way to relax. The social network sites were identified by many students as that private place in which homework is not allowed. However, this attitude changed over the year as the students started to incorporate their mobile social networks into the collaboration

process. They used these systems as secondary notification channels by which their friends in the group could request an immediate and private comment on their posted homework message. These requests were seen by friends who were not in her group or even in her school so she was able to get feedback and advice. In addition, the students used the mobile social networks as a way to overcome the limitations of the homework site. Some students started to use their social networks because they found the interface to be much simpler than that of the homework website.

The students clearly placed their first language (Japanese), into their private world of communication while their second language (English), was used for public communications (section 4.4.5.8 on page 189). When communicating face-to-face, texting, or on their mobile social network sites, the language of communication was usually Japanese. Alternatively, the homework website, which can be seen by everyone including the course instructor, is an all English language environment. They are allowed short Japanese examples of a few words when explaining a translation but otherwise everything must be in English. This public forum for their language was difficult for those students who lacked confidence in their English ability. In order to reduce the chances of a potentially embarrassing public mistake, they used their private mobile communication channels to check their ideas with friends and others with which they felt more confident.

The students began to fit the mobile learning activities on their mobile phone into their already existing preferred practices (Wolcott, 1994). They accessed the homework website while they were playing a game or reading their social network site, switching rapidly between entertainment and education as a way of relieving the boredom of the commute (Lasen, 2002). Static learning contexts like the classroom are increasingly being replaced by learner-generated context in which students determine the resources they need (Luckin, 2010; Luckin et al., 2011).

The mobile phone allows students to participate in two different interactions at the same time (Rettie, 2005). The students would often enter their

private social network sites to share thoughts on the homework in Japanese because it allowed them an alternative channel of communication (Gikas & Grant, 2013). These private websites would allow a deeper level of communication because they were using their first language and it was not being monitored by the instructor (Gikas & Grant, 2013).

5.5. Research Question 4

Does the affordance offered by the technology lead to more awareness of learning?

The research suggests that the affordances offered by the technology do lead to more awareness of learning. The themes were examined further and, from this analysis and discussion, the following were identified as suggesting an increase in awareness of learning. These include a) opportunity, b) information, and c) reminders.

5.5.1. Opportunity

The increased opportunity for reflection was due to the ability of the student to use short fragments of time which were previously unavailable (section 4.4.6.2 on page 194). The mobile phone communication was made of many short visits which allowed the students more time to think and form their answers. The mobile phone website visits are divided into several short visits for every one computer visit. In the case of the computer access, it is reported by many as being one long visit to the site in which they finish all of the homework. This suggests that the multiple access times will provide the students with more information to reflect upon and so develop a better understanding of the homework topic. G2 Ayaka explains it this way:

I: Because mobile phone you can go to website many times in day, going many times, does that help you understand the homework?

G2_Ayaka: Yes.

I: Can you tell me example how?

G2_Ayaka: I have more - I can have more opportunity to think about the homework, so I can have more time to understand or more time to come up with opinion or answer, so - helpful.

Several students reported similar patterns of entering the site with their mobile phone during any short periods that became available throughout the day. Then, between these visits, they would think about the other students' posts that they had read. This gave them the impression that they were always thinking about the homework.

5.5.2. Information

The students have a continuous link to information provided by the instructor and their peers which supports the development of understanding, encourages discussion, exposes them to new opinions, challenges them, and increases reflection.

Access to information anytime and anywhere they need it provides a continuous level of support. The multiple short mobile phone visits allowed the students to contact the information many times over the entire week, increasing the number of different opinions that they would be able to read. This allowed the students to see a greater range of answers which they felt developed a better understanding because they could compare their answers to those of others (section 4.4.6.1 on page 191).

Unlike the mobile visits, a single computer visit, which was common for those using computers, meant that they were likely to see only those comments and examples posted before their single visit, but not those posted after. In addition, they would be unable to see or reply to any group responses to their posts because they would not log on again to see them. Exposure to more ideas through the mobile will increase the chance of an extended discussion forming with comments, responses, and negotiation of meaning instead of just a single period of responses on a computer. It seems that the computer is convenient for entering once or twice to read and type their answers, but it does not encourage multiple entries to the site which is required for a collaborative activity.

They reported that the exposure to more opinions gave them a better understanding of how the group felt about the topic and forced them to think

more and in new ways. When reading their answers, it helps them to re-think or reflect upon their own answers. This allows them to become aware of the specific areas of weakness that they may have and so motivate them to improve these areas.

5.5.3. Reminders

The students reported that the mobile phone as a tool for collaboration became a constant reminder of the homework. The reminders made possible by the mobile device came in a variety of forms and included freedom of location and the mobile device itself.

The freedom to collect examples any time during the day led some students to continuously think about and look for examples (section 4.4.6.3 on page 195). The mobile phone is not tethered to any one physical place like a computer is, so they do not need to go home to use it. When the students were required to find examples to post to their group webpage, they became very excited about finding the best examples for their group. Some students report that they were always looking no matter where they were. Since the mobile phone became the primary tool for collaboration, its constant availability made them feel that they could not escape the homework. After looking for examples in their own life as they travelled around, they started to gain a greater interest in the language samples they were finding in advertisements and posters which they previously had not thought about.

Once the students had realized that they could do the homework on their mobile phone, the mere presence of the device served as a physical reminder of their responsibility to contribute (section 4.4.6.4 on page 196). The constant reminder that the mobile phone is tends to increase the amount of time they spend thinking about the homework. However, non-mobile homework from other classes is often forgotten. Also, it was common for the students to bookmark the homework site on their mobiles allowing them to see the site as the top page. This meant that every time they started to access the internet with their mobile phone, the first page they would see is the homework page. This served as a

powerful reminder that there was homework to do. In addition, they might see someone commenting on the homework in one of their mobile social network sites or have a reminder sent to them through a mobile scheduling application.

The affordance of the mobile phone to connect immediately makes it uniquely suited to spontaneous reflection (Traxler, 2007). This reflection took the form of both reflection-in-action and reflection-on-action (Schön, 1983). The students would reflect-in-action when they checked other students' answers or searched for examples. Reflection-on-action occurred when their understanding had increased through collaborating with their group.

The website notification system alerted the students when there was a message from a group member. These messages acted like reminders to the students of the homework which has been shown to improve vocabulary learning in second language course (Richardson & Lenarcic, 2008; Thornton & Houser, 2004).

The students had positive comments for the activities that required them to collect examples of translation problems from around the city. The students could understand the practical value of these authentic activities as they relate to their goals because they were situated in the real world of language use (Barab et al., 2000; Brown & Collins, 1989; Lave & Wenger, 1991; Traxler, 2007).

5.6. Research Question 5

What is the nature of the dialogue with the mobile phone technology?

The research suggests that there is a dialogue with the technology and that it is characterized by a change away from the traditional view of homework held by the students. Although very familiar with the mobile phone the students found the idea of using them for homework very surprising (section 4.4.3.1 on page 169). The mobile phone like many technologies in the past was designed with a particular purpose in mind. However, the device does much more than follow a single linear path from affordance to single purpose, but instead this path separates into many directions to accomplish goals well beyond that envisioned

by the designers. Many of the students commented on how the affordances of the device made the collaboration activities a richer learning experience. In each case they also expressed surprise at finding this out because they had assumed the only use for the mobile phone was contacting friends and family (section 4.4.5.7 on page 187). The MDS plot (Figure 34 on page 131) suggests the embedded position of the mobile phone in the lives of the students, and yet even with their intimate knowledge of the device and its affordances they are surprised at finding new ones. This indicates a repositioning of the students' educational boundaries that has come from the use of mobile phones as a mediating tool for the collaborative activities in this study. The mobile phone seems to have opened a new perspective on learning and perhaps at the same time changed the answer to the question "What is learning?" The mobile phone is not just a means to complete a homework activity; it changes their understanding of homework. This is seen reflected in the many comments in which working together on a mobile homework activity is described as making the student feel that homework could be an enjoyable and rewarding experience instead of a painful one. In addition, the ability to interact with the world and others to complete activities helps the students to see that homework is not just something done alone at a desk.

The mobile phone is a technology that has ironic and paradoxical uses that its designers had never considered (Arnold, 2003; Tenner, 1997; Traxler, 2007). Arnold (2003) paraphrases Heidegger's technological frames (Heidegger, 1966) when he writes that technology does not provide a more effective or efficient method for doing a certain activity, but it changes what it is to do the activity. Traxler (2010b) notes the refers to the pattern of education absorbing technologies which were never intended for educational purposes as parasitic in nature. In activity theory there is an expectation that learning is affected and modified by the tools used for learning (Wertsch, 1985).

6. CONCLUSION

6.1. Chapter outline

This chapter attempts to present a summary of the key findings and to foreground these findings against the research questions and theoretical framework of this study. The research outlined in the literature review will be revisited in light of the findings of this study. New knowledge that emerged from this study and recommendations for policy implementation to improve teaching and learning will be presented. The chapter concludes with suggestions for further research.

The main purpose of this study was to explore the impact of mobile phone technology on collaborative learning. In responding to the research questions of this study: What is the distinctive affordance offered by the mobile phone for collaborative learning? Does the intervention affect the relationship between students, their mobile phones and their homework? Does the affordance offered by the technology lead to more awareness of learning? What is the nature of the dialogue with the mobile phone technology?

6.2. Contributions to knowledge

The mobile phone does offer several clear affordances for collaborative learning, including an increased quantity, quality and control of communication. The compact design of the devices has allowed it to be embedded into the lives of individuals giving them a constant uninterrupted means of communication, so increasing the opportunity for contact and support. It is able to blend with social rules because of the unobtrusive way it switches communication modes from voice to text and the powerful data collection it provides for storing data that is authentic and meaningful. The students have total control over the device allowing them to effortlessly communicate only the information they want to share at a pace that is natural and at the moment their thoughts are fresh.

There does appear to be a complex affective interrelationship between the student, the mobile phone, and the homework. The popularity of the mobile phone with students as an entertainment device seems to influence the view of any activity they perform on the device by associating the pre-existing positive feelings with the new activity. Homework may be seen more as an enjoyable activity when done on a mobile than a computer. The sense of freedom that comes with such a portable device gives the students a greater feeling of convenience and a new sense of ownership of where and when they do their homework. The greater chance for communication with others brings with it exposure to new ideas that can stimulate interest in topics that had previously seemed uninteresting.

The students' view of the mobile phone formed over many years was changed with the knowledge that they could use it to complete their homework. However, there was some concern that the addictive use of the device may increase even more with this new use. The constant communication can strengthen the pre-existing links while simultaneously creating new links with people so developing a feeling of closeness and support. However, this constant connectivity brings with it the expectation of immediate response which when not forthcoming can lead to some negative feelings towards others. Also, the limitations of mobile phones to communicate complex feelings can be frustrating when topics are complex.

The collaborative intervention did affect the relationship between the students, the mobile phone, and the homework, including time, space and method of collaboration.

The need to coordinate exact times loses much of its importance when using mobile phones. For most students using the mobile phone meant that the collaboration began to encroach into even the most private moments of time that had previously been off limits to the very public homework. However, some students attempted to resist this colonization of their private time by designating periods in which they refusing to look at the homework.

Like time, space also lost much of its relevance as the mobile phone removed the need for students to be in one designated place for homework such as sitting at a desk. The constant presence of this personal device meant that the collaboration could continue uninterrupted as the student moved freely between home, school, and work. The mobile phone blurred the boundaries, so now in public spaces the mobile phone allowed the student to create a small private space and in private spaces they created virtual public space discussions.

The ability to immediately switch with ease between private mobile activities and more public homework activities created a type of shared space or network in which all the students were present. Students who would under normal conditions not communicate face-to-face found themselves sharing this space so increasing the number of people they collaborate with. Commonly used mobile SNS were drawn into the collaboration acting as a separate channel for to communicate in their private language of Japanese. This appears to have reduced their motivational barriers to the homework by providing support for their public use of English by reducing the potential for embarrassing mistakes. This has clear implications for curriculum design such as language learning where students are hesitate to show mistakes.

Affordances offered by the technology do lead to more awareness of learning, including opportunity, information, and reminders.

The mobile phone was ideal for making short frequent visits to the website giving students the opportunity to break the pattern of completing the activities in a single sitting. This more dispersed pattern of website visits increases the variety of comments they can read which provides them with both an increased diversity of material for reflection and the time between visits to reflect on this material. This continuous link to information provided by the instructor and their peers which supports the development of understanding, encourages discussion, exposes them to new opinions, challenges them, and increases reflection. The ever-present link to the collaborative website meant that the mobile phone became a reminder of their objectives and led some students to exploit this

connection by staying alert for more and better examples throughout the day which were uploaded more frequently for others to reflect upon.

The relationship with the technology was characterized by a change away from the traditional view of homework held by the students. Although very familiar with the mobile phone the students found the idea of using them for homework very surprising. The students' traditional relationship with the mobile phone was changed by the introduction of this new use for such a familiar technology which led some to re-evaluate their views of homework in general.

6.3. Implications for policy and practice

The following recommendations for policy and practice are based upon the results of this study. The results will be briefly positioned in the literature to better highlight the relevance of these findings and how they may influence future debate and discourse. The extent to which the results can be applied in other contexts is dependent on the reader. The following is a discussion of the results in light of broader system-wide policy implications and specific problems of practice facing teachers and learners.

The very personal nature of an affordance means that it is dependent on an individual's interactions with an object and their ability to perceive and determine its usability (Gibson, 1986; McLoughlin & Lee, 2008; Norman, 1999). Much of the current research has identified the affordances of mobile devices in general to link separate moments (Pachler, 2010) that might otherwise be unproductive (BenMoussa, 2003; Gikas & Grant, 2013).

Physical size allows constant availability of the communication affordances offered by the mobile phone. These findings suggest that instructors may be able to increase the quantity collaborative involvement amongst students by creating activities that leverage this increased collaboration to provide more opportunities for second language learners to practice their target language. The powerful data collection ability afforded by the mobile phone meant that students could capture data that was both authentic and meaningful to them. Findings can be used to develop targeted activities for students so they can situate learning in

an environment that has meaning for learners so making a connection between course content and their environment. In the case of this study, the students frequently go on to work at companies after graduation where they are asked to complete many small translation tasks so the opportunity to discuss such translations outside of the classroom gave them an authentic experience.

The ease of use, speed and distance afforded by the mobile phones enabled students to take greater control of when, how, and how much they communicate with others. The evidence here suggests that the mobile phone may increase the sense of ownership over learning. There is therefore, a definite need for researchers to investigate what specific factors influence this increased control so instructors can design their activities to further increase students' sense of autonomy and ownership of their learning. At the same time they must avoid putting the students in situations where they may use the device as a barrier (Turkle, 2012). Instructors should provide activities which allow students to take benefit from this improved communication while at the same time encourage students to support peers while respecting their right to control when they reply. Also the added control is beneficial to students with responsibilities beyond school such as in the area of lifelong learning by better integrating the school responsibilities with work.

Affect, and in particular motivation, has been identified as a key area for further investigation (Jones et al., 2007; Oatley & Nundy, 1996). The current research suggests that students can hold both very intimate and cautious feelings towards their mobile phones (Gikas & Grant, 2013; Ito, 2005; Kukulska-Hulme & Traxler, 2005). However, there is little research found that investigated how the students feelings towards their mobile phone might affect the opinion they hold of the activities mediated through the phone. In particular, it is important to increase our understand of the history, relationship, and current use of technologies by the students to begin to understand what might motivate them to use mobile devices for their learning (Davies, 1986a; Jones et al., 2007). Instructors need to strike a balance between the private and public space of the

students which allows them to take advantage of the mobile devices while respecting the students personal connection to the devices.

There is a considerable amount of research on students from various countries suggesting that mobile phones provide increased support for learners (Al-Fahad, 2009; Cavus & Ibrahim, 2008; Seppälä & Alamäki, 2003). However, there is are very few that look into the Japanese context (Thornton & Houser, 2004). This study hopes to add to this body of research on the use of mobile devices in the Japanese context but more studies are needed so that any cross-cultural correlations may be identified.

The MDS results from this study suggest that the mobile phone occupies a central position in the lives of the students. In addition, this position does appear to move to an even more central position when used for homework. An implication of this result is the possibility that students using their mobile phone for homework change the perceived position of both the homework and mobile phone in their lives. This finding adds to our understanding by providing an image of the relationship students have with their mobile phones so giving researchers a reference point for future research. Research that focuses on this particular topic would be able to use these findings as a starting point. In addition, this finding may help instructors to design activities that are more motivational for students by recognising that the popularity of a mobile device may have positive effects on student motivation.

The result of this research support the idea that the feelings of enjoyment, freedom and convenience associated with their mobile phones has influences their feelings towards homework. This may help to increase our understanding of what motivates the students to use their mobile phones and how this motivation may be leveraged to improve learning. Instructors could use these findings to design learning activities that intersect with these mobile entertainment activities.

Researchers have found that when using mobile devices there is no need to coordinate an exact time and place for communication for mobile learning collaboration(Geser, 2004; Ling, 2004). Meaning-making is enabled throughout the day as brief moments are bridged allowing the students to individually situate

the activity in a place and time that is authentic for them (Pachler, 2010). Students can separate the idea of a learning space from a physical space so that it is less about being at a place and more about belonging to a network of learning (Geser, 2004). However, the adoption of mobile technology is no guarantee of the adoption of mobile services provided for education (Liu et al., 2010).

Private and public spaces were brought together in a way that transformed the nature of homework. Students were able to bring parts of the private space into the public space by collecting examples from their daily life and relating these with the topic of discussion. The findings of this study point to the advantages of using mobile learning in education and reinforce the concept of knowledge acquisition across contexts and environments (Ruta et al., 2010). Also, that meaning making in daily life is an important component of mobile learning (Pachler, 2010). Again, this is an opportunity for instructors to extend the learning activities outside of the classroom while maintaining a connection for support when needed.

This study provided evidence indicating that students will effortlessly incorporate mobile phones into their educational space if there is a clear sense of usefulness (Davies, 1986b). The implication of this finding is that instructors using mobile devices should take care to design activities that exploit the particular affordances offered while not being seduced into believing that all mobile activity will be popular. The advantages of offering the activity on a mobile platform should be clear to the students so that they do not feel it is just another hoop to jump through.

The findings of this study support the idea that mobile phone use for collaboration changes the nature of the homework from a very public activity to a more private one by bringing the homework into areas of their lives not possible with traditional technology. A practical implications of this is an improved sense of community (Lave & Wenger, 1991). In addition, when pre-existing negative feelings are present in students the use of the mobile phone appears to erode these as the homework becomes more embedded in the private activities of the

students such as mixing education and entertainment activities. This is an opportunity for curriculum designers to incorporate what is meaningful to the students into the course material so diminishing the barriers between school and private life. This was seen in this study when the students used their mobile phones at work, school and home which demonstrated the possibility of integrating learning activities into all aspects of student lives.

An implication for the findings in this study coalesced around the blurring of lines. For example, the student participants often seemed to blur the lines between the use of the social networking tools and the mobile device, making little distinctions among mobile services, such as homework website, and social media, such as Mixi. In many examples from this study indicate that students prefer to use applications and text messaging outside of class that they already used in the course of their daily lives. This means that instructors can take advantage of popular pre-existing and very advanced commercial social networks to support learning activities and that over time this would be welcomed by many students so increase motivation and communication. One implication of this is that the mobile phones may provide a way for instructors to strengthen the network of learning formed by collaboration by allowing students to continue contact as they move through physical locations(Sharples et al., 2005). This opens up many possibilities for the design of collaborative activities in education such as the example collection activities in this study which allowed the students to individually situate the activity in a place and time that is authentic for them.

The immediate connections provided by the mobile phone has been reported as well suited to spontaneous reflection (Traxler, 2007). This research added to the empirical evidence supporting the idea that mobile phones can aid spontaneous reflection and provide a high level of support to students. The findings of this study suggest that increased access to opinions of other students provides new perspectives on material and that the mobile phone provides such access. This suggests that an increase in student communication such as that provided by the mobile phone will lead to more reflection. Students could exploit short fragments of time to stay in contact with their network of learners at the

moment they need. This implies that mobile phones can improve student reflection by increasing amount and variety of information availability from other group members. This suggests that the mobile phone could be used to support projects that require frequent exchanges of information and decision making amongst collaborators.

The mobile phone was found to act as a reminder to the students which encouraged some to search more consistently for homework examples which can be shared immediately with others. The constant presence of the mobile phone does make it an ideal means to send reminders to students, so providing a way to keep them involved. Also, this provides the opportunity for students to collect a richer selection of information for the group to reflect upon in relation to the broader topic of discussion and how it relates to their surroundings.

It has been noted that education absorbs technologies which were never intended for educational purposes (Traxler, 2010b). This process of hijacking technology for education was observed in this study. In this study the mobile phone as a tool for homework was new to the students so gave them an opportunity to see homework more as a collaborative act than a solitary one. While the mobile phone is not a replacement for existing methods or technologies, this research has found that it is a powerful tool that has a significant effect when incorporated into collaborative activities.

6.4. Limitations

There were several limitations with this study that may have limited the range and depth of the results. Firstly, they were Japanese language speakers studying English as a second language. The mobile phone did become a popular device with the students for language translation activities, but a wider diversity of activity types than used in this study would add more resolution to the effects of the device on collaborative learning. Secondly, these students all grew up in a relatively wealthy densely populated urban area. This environment provided them with a very good mobile phone infrastructure with high data transfer rates at a relatively low cost. The difficulties faced doing this study in a less developed

telecommunications environment could be substantial. Thirdly, the students in this study were very familiar with mobile phone technology since they have owned one from an early age. Even though the students had never used mobile phones to complete homework assignments they reacted positively to their use. However, the results may have been different if the participants had been less familiar with the mobile technology. Fourthly, the student sample was almost completely female in composition for reasons that were beyond the control of the researcher. It is not clear how the results may change, or what additional insights may be gained from a balanced sample of male and female participants. Or, in addition, to what point, beyond the findings for the small number of male participants in this study, could the results of this study be applied to a larger male population is an important question. Finally, this study successfully utilized a content management system for mobile collaborative activities. However, this system, Moodle 1.9, was not originally designed to be use with mobile phones so many of the systems regular features were not available to the instructor when designing the activities. A system that utilized a mobile application, or app, as an interface for a content management system that was designed to accommodate both computer and mobile access would have allowed greater freedom in activity design.

6.5. Further research

This research study provides a number of implications for further mobile learning research. There are several methodology related recommendations that may overcome issues with mobile data collection and mobile interface. The use of a mobile app as the interface would allow a more accurate and rich data collection process. The app would be stored on the student's mobile phone so could track the exact length of time the student spent accessing the course materials. This data would increase our understanding of how the students are using the mobile phone and the differences between mobile and computer use. Also, mobile learning tools can benefit from cloud technology expansion and can be quickly developed as cloud-enabled applications. Cloud-enabled M-learning

applications have the advantage of resource elasticity and will eliminate the device resource limitations (Buton, Tomal, & Mocean, 2013). In addition, during the initial stages of this study, critical design attributes of the mobile interface did not include cross-cultural differences such as high-context and low-context cultures. Any future use of apps as the basis for a mobile learning interface would provide the flexibility need to explore the effect of the interface design on student reaction to mobile learning.

In relation to the mobile phones and the position they hold in student lives, a longitudinal study using qualitative interviews and quantitative analysis techniques such as the MDS analysis presented here, may provide further insights. The relationship that students have with technology changes as fast as the technology advances. This could be in the form of data collection from a new cohort of students each year for several years. Each progressive year will have had a different history with the technology and it is this slight difference that could provide valuable insights on the relationship between affordances and mobile learning. Mapping the relationship the students have with mobile technology as the technology itself advances could allow researchers to increase their understanding of mobile collaborative learning.

APPENDICES

Appendix A: Pilot Study

This pilot study was undertaken with three main goals in mind. The first was to highlight problems prior to the start of the main doctoral data collection period. The idea was that any problems identified could be used to direct the design of the methodology used in the main doctoral research. The second goal was to gain a better insight into the current affordances that the students feel the mobile phone offers them in order to aid in the design of the collaborative activities which will be an essential part of the main study. The final goal was to gain an understanding of the students' affective relationship to the technology, this again is to direct the methodology design as well to give the researcher a clearer image of what the students' affective relationship is to this technology.

Questionnaire

Open ended questions were used because the wide range of possible answers that participants could give (Buckingham & Saunders, 2004) to the items made it difficult to design specific questions. The answers were not pre-coded but instead the answers were collected and classified thematically later. The following 12 open-ended questions were used:

1. I always use my mobile phone to ...
2. Most of the time I use my mobile phone to...
3. I sometimes use my mobile phone to...
4. I rarely use my mobile phone to...
5. I never use my mobile phone to...
6. I use my mobile phone when I...
7. I carry my mobile phone...
8. I use my mobile phone to study by...
9. A good mobile phone is...
10. A good mobile phone can...
11. Unfortunately mobile phones are...
12. I wish my mobile phone could...

There was a total number of 94 students (n=94) who completed the questionnaire. The answers were coded into 44 categories. Thematic coding was used to allow the coding to emerge from the data as opposed to a predetermined coding. The

coding categories and the number of responses for each are included in Table 4 on page 232.

Biplot analysis

The data was analysed using a biplot analysis. (Gower & Hand, 1996). The results for questions 1 through 5 are shown in Figure 35 on page 233 and those for questions 6 through 12 are in Figure 36 on page 233. A biplot is a technique which aims to represent both the observations and variables of a matrix of multivariate data on the same plot. There are many variations of biplots and perhaps the most widely used one is implemented based upon principal component analysis. The data used is two mode two-way data. Two mode data is represented by the questions and the coded answers each of which represent one mode. Two-way data is two-dimensional matrix data which is the numerical values of how many times each code was given as an answer for each question. This data can be seen in Table 4 on page 232.

The biplot results seen in Figure 35 on page 233 and Figure 36 on page 233 can tell us three important pieces of information about the data. The red lines radiating out from a centre point represent the variables which in this case are the open-ended questions 1 through 12. The black numbers represent the coded answers to the questions. Each code and corresponding number can be seen in Table 4 on page 232. The first piece of information the biplot displays is the relationship between the questions as represented by the difference in angle between the lines. The smaller the angle between two lines then the more intimate the relationship or similarity of those variables which in this case are the questions. So, in Figure 35 on page 233 question 1 and question 2 have a closer relationship than do variable 1 and variable 3. This might be due to the similarity in the term “always” used in question 1 and the term “most of the time” used in question 2.

Table 4: Pilot Study-Student Survey Sheet

Code	Code Value	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
1	Voice	11	10	38	6	0	2	0	0	0	1	0	0
2	Email	55	39	3	2	2	7	0	1	0	1	1	1
3	Internet	6	26	21	9	5	2	0	34	0	5	0	3
4	Pictures	0	1	15	5	1	1	0	0	1	1	0	1
5	Video	0	0	0	1	1	0	0	0	0	0	0	2
6	Audio	1	4	2	14	8	1	0	4	0	0	0	4
7	Video Call	0	0	0	1	3	0	0	0	0	0	0	0
8	TV	0	1	1	21	17	0	0	0	0	9	0	4
9	Clock	3	4	2	0	0	0	0	0	0	0	0	0
10	E-Ticket	0	0	0	0	0	0	0	0	0	0	1	0
11	E-Money	0	0	2	5	29	0	0	0	0	0	0	0
12	Games	0	1	1	11	13	0	0	1	0	0	0	0
13	Navigation	0	0	1	4	2	3	0	1	0	1	0	1
14	Dictionary	0	0	1	2	1	0	0	40	0	0	0	0
15	Schedual	0	0	0	3	2	0	0	0	0	0	0	0
16	Reading	0	0	1	1	0	0	0	0	0	0	0	0
17	Take Notes	1	0	1	1	0	0	0	0	0	0	0	0
18	General Comm	15	1	1	0	0	20	0	3	0	0	0	0
19	Functions/Apps	0	1	1	4	1	0	0	0	7	15	1	11
20	Expense	0	0	0	0	0	0	0	0	3	0	19	7
21	Phone Size	0	0	0	0	0	0	0	0	7	0	5	4
22	Screen	0	0	0	0	0	0	0	0	0	0	3	0
23	Interface	0	0	0	0	0	0	0	0	0	2	0	2
24	Battery	0	0	0	0	0	3	0	0	3	5	6	9
25	Memory	0	0	0	0	0	0	0	0	0	2	0	2
26	Signal	0	0	0	0	0	0	0	0	0	5	2	5
27	Camera Quality	0	0	0	0	0	0	0	0	1	18	1	4
28	Memory	0	0	0	0	0	0	0	0	0	0	0	1
29	Anytime/Anywhere	0	0	0	0	0	4	87	0	0	1	0	0
30	Home	0	0	0	0	0	0	0	1	0	0	0	0
31	Travel	0	1	0	0	0	11	0	0	0	0	0	0
32	School	0	0	0	0	0	2	5	0	0	0	0	0
33	Freetime	0	0	0	0	0	27	0	0	0	0	0	0
34	Emotion	0	0	0	0	0	5	0	0	0	3	0	0
35	Ease of use	0	0	0	0	0	0	0	0	9	3	10	3
36	Useful	0	0	0	0	0	0	0	0	8	4	0	1
37	Personal(Style, Appearence)	0	0	0	0	0	0	0	0	11	0	0	4
38	Physical Quality	0	0	0	0	0	0	0	0	9	9	17	15
39	Speed	0	0	0	0	0	0	0	0	1	6	1	5
40	International	0	0	0	0	0	0	0	0	0	1	0	2
41	Health Danger	0	0	0	0	0	0	0	0	0	0	8	0
42	Over use	0	0	0	0	0	0	0	0	0	0	11	0
43	Lost	0	0	0	0	0	0	0	0	0	0	2	0
44	Unknown	2	5	3	4	9	6	2	9	34	2	6	3

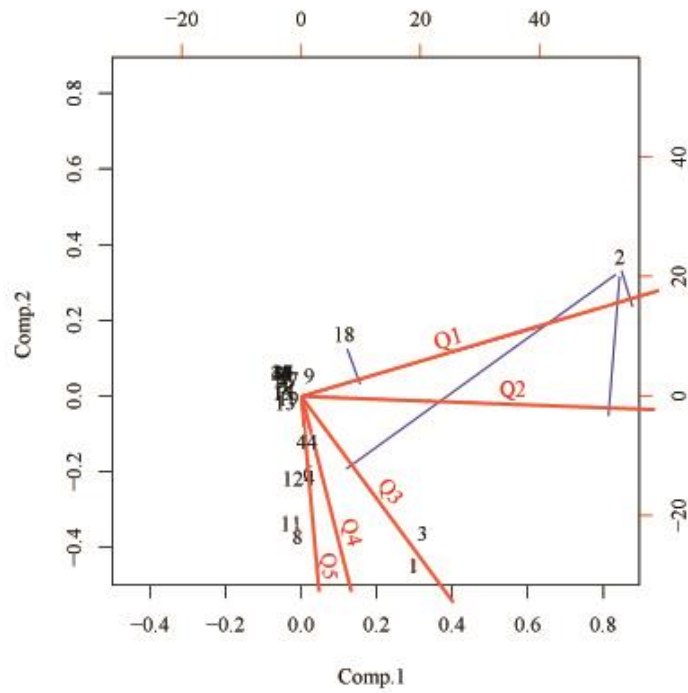


Figure 35: Pilot Study-Biplot Questions 1 to 5

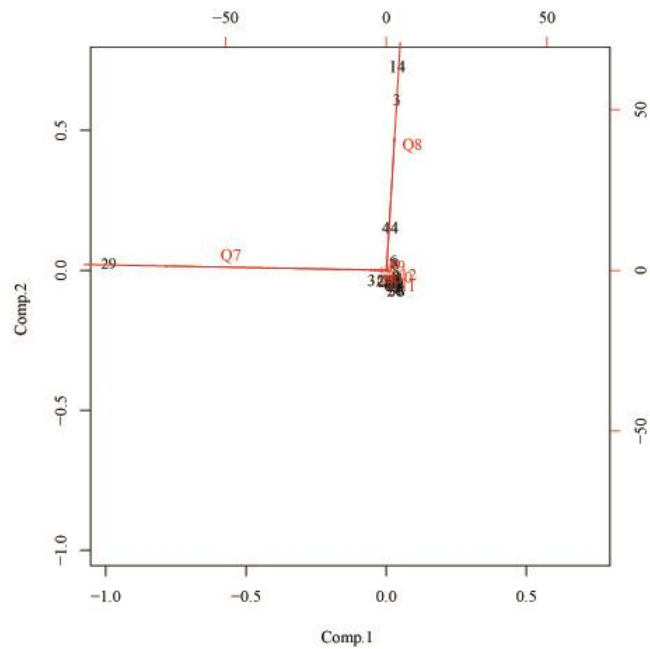


Figure 36: Pilot Study- Biplot Questions 6 to 12

The second relationship that is expressed in the biplot is between the questions, as represented by the red lines, and the coded answers represented by the numbers. This type of relationship is represented by the distance from the coded number on the plot to the centre point of the lines. The farther away from the centre point of a red line that a number appears then the closer the relationship. In Figure 35 on page 233, the point labelled number 2 is farther away from the centre point of line 1 than is number 18. This indicates that code number 2 (email), has a closer relationship to line 1 (question 1) than number 18 (general communications). One way to clearly see the distance is to draw a line from each number down through each line so that it crosses at a 90-degree angle. These lines have been added in Figure 35 on page 233 for numbers 2 and 18 as an example. Now it is clear that number 3 (internet) has a closer relationship to line 3 (question 3) than number 2 (email).

The third piece of information provided by the biplot is the relationship amongst the coded numbers themselves. This is similar to the tradition principle component plot where the distance between the numbers represents the relationship. The closer the numbers are the stronger the relationship they have or in other words the more similar they are. Again looking at Figure 35 on page 233 it is clear that code 1 (voice) has a much stronger relationship to code 3 (internet) than it does to code 2 (email).

The biplot in Figure 35 on page 233 includes questions 1 to 5 and all 44 coded data items and had a cumulative proportion of 0.57 for component 1, 0.78 for component 2, 0.94 for component 3, 0.97 for component 4 and of course 1.00 for component 5. Since the biplot process produces a two-dimensional image we can only see component 1 and component 2. This means that Figure 35 on page 233 can visually represent 78% of the total data structure. The biplot in Figure 36 on page 233 includes questions 6 to 12 and all 44 coded data items and has a cumulative proportion of 0.68 for component 2 which means it represents 68% of the total data structure in two dimensions.

In Figure 35 on page 233 question 1 (“I always use my mobile phone to ...”) is closely associated with “email” (code 2) and has a much weaker association with “general communication” (code 18) “Email” is also associated with question 2 (“Most of the time I use my mobile phone to...”) but to a slightly smaller degree because the blue

line crosses the variable line at a closer point to the centre point of the lines. Question 3 (“I sometimes use my mobile phone to...”) is strongly related to “voice” (code 1) and to a slightly weaker extent “internet” (code 3). Question 5 (“I never use my mobile phone to...”) is strongly related to “television” (code 8) and “e-money” (code 11).

Considering Figure 36 on page 233, question 7 (“I carry my mobile phone...”) is strongly related to “anytime/anywhere” (code 29) which supports the idea that the mobile phone is a ubiquitous tool. Question 8 (“I use my mobile phone to study by...”) is strongly related to “dictionary” (code 14) and “internet” (code 3). “Unknown” (code 44) is also weakly related to this question of study which is supported by the large distance that “mobile phone” appears away from the educational side of MDS results in Figure 37 on page 241.

Summary of result

These results indicate that amongst this sample population communicating through email is by far the most widespread use of the mobile phone. This is followed by voice communications and internet use which are less popular. In addition, the results support the idea that the mobile phone is an anytime and anywhere device in the sense that it is carried throughout the day by the students. Finally, in the context of study, the mobile phone is used as an electronic dictionary on a regular basis and as an internet information gathering tool.

Interview

The purpose of these interviews was to first identify any problems and then to use this information to direct changes prior to the start of the major study. The interview was given to 36 students who had been taking part in a class which required the use of the content management system (CMS) Modular Object-Oriented Dynamic Learning Environment (Moodle) for one academic year. The system included all of the mobile learning features that will be used for the upcoming doctoral study. Each student was interviewed for approximately 10 minutes in which time they discussed their experiences using the mobile system and their participation in the collaborative activities.

The interview questions include two scripted questions one each on the topic of the class collaborative activities and the use of the mobile system. These questions

were followed by unscripted probing questions to encourage the students to provide more detail where necessary in order to clarify points relevant to the research. The interview was not recorded but the student answers were written down as they were given. After the interviews the answers were coded for any positive or negative comments concerning either the collaborative activities or the mobile system.

Concerning the collaborative activities two significant problems were identified. Student participation in group discussions was a common problem mentioned with 36.1% of the students identifying it as inhibiting their completion of the CL activities. The probing questions revealed that the requirement that all students respond to each post meant that when a student did not post comments or delayed till just before the deadline to post their comments then the discussion would come to a stop. Therefore it will be essential that the collaborative activities be designed in such a way that either the activities can proceed irrespective of one non-participating group member or that there is some increased motivation to complete the activities.

The second problem identified was the lack of notification when a group member posts a comment which was mentioned by 11% of the students. This problem could be related to the previous one in that the students mentioned that they simply forgot to post comments or that they grew tired of continuously having to log on to the system to check for new posts. The solution for this problem will require that some system of notification be added to the current CMS which sends an email to students every time a group member posts a comment.

Concerning the mobile aspect of the CMS, 39% of students said they had tried the system and the remaining 61% did not try to access the site through their mobile phone. One reason for this lack of interest could be that the mobile system was given a brief mention only once at the beginning of the school year. Out of all of the students involved, 39% said they had a positive impression of the mobile system while 47% had a negative feeling and 14% had no opinion. However, when looking at only the 39% that actually used the mobile system, 71.4% of those reported a positive experience and 28.6% had a negative one, with the remaining 14% having no clear opinion. Out of all of the students the problems experienced or expected were typing at 47%, character encoding at 14%, site interface at 6%, screen size at 6%, and 28% mentioning other

issues. In addition, 33% of students reported that they had not tried the system because they predicted that typing would be difficult.

It is interesting that 71.4% of those who used the mobile system had a positive response while 64% of those same students reported some problem. This indicates that even with these problems or negative affordances of the mobile system the students still maintained a positive attitude to the use of the tool for education.

Summary of results

Considering this interview data there are several changes to be made which include:

1. The addition of e-mail alerts when members post comments.
2. The set-up of email between students within Moodle.
3. A clear introduction and practice using the mobile site at the beginning of the study.
4. In-class each group gives short presentation of their answer from CL homework activity.
5. Correcting any encoding problems.

The email alerts and addition of an internal email option in the CMS will remind the students of their responsibility and allow them to track the conversation more easily. A clear introduction will increase the students' awareness of the mobile functions and so increase the chance they will use them. The in-class presentation of group answers each class will motivate the students to complete the activities well before class and possibly stimulate more discussion.

MDS Analysis

The data is numerical and in the form of symmetric similarity data consisting of student perceptions of the similarity among the following 25 English words:

Afternoon	Evening	Night	Traveling
Alone	Groups	Outside	Video
Computer	Home	Picture	Voice
Dictionary	Homework	Reading	Writing
Discussions	Listening	School	
Education	Mobile-Phone	Speaking	
English	Morning	Text	

Sixty-three students (n=63) in the first year of study at a private university in Tokyo, Japan, were asked to complete a 25 x 25 matrix as shown in Table 5 on page 238. The

students were asked to write a value from 0 to 5 in the box at the intersection between each set of words which represented their perception of the strength of the relationship between the words. The participants were given the following number to meaning relationships as a reference:

- 0 = NO relationship
- 1 = very distant relationship
- 2 = distant relationship
- 3 = close relationship
- 4 = very close relationship
- 5 = extremely close relationship

Table 5: Pilot Study- MDS Data Collection Form

	Afternoon	Alone	Computer	Dictionary	Discussions	Education	English	Evening	Groups	Home	Homework	Listening	Mobile Phone	Morning	Night	Outside	Picture	Reading	School	Speaking	Text	Traveling	Video	Voice	Writing	
Afternoon	0	42	63	44	91	90	90	198	82	158	145	72	132	156	192	152	54	105	175	128	75	87	99	87	87	
Alone		0	218	152	13	78	92	110	71	161	211	154	207	92	158	101	65	219	57	50	105	120	162	73	154	
Computer			0	183	109	219	198	100	76	217	243	160	194	36	136	40	180	153	210	64	164	83	191	102	170	
Dictionary				0	93	267	301	46	50	98	267	126	142	25	53	40	32	216	264	147	217	128	55	74	226	
Discussions					0	243	250	54	286	55	114	148	66	35	43	70	63	89	256	278	135	58	60	187	112	
Education						0	303	86	224	152	292	249	98	70	80	108	96	264	305	261	266	102	125	144	269	
English							0	92	183	122	272	288	129	58	79	116	60	277	292	287	255	234	104	190	288	
Evening								0	74	156	160	89	147	162	217	110	45	102	110	100	75	82	127	85	83	
Groups									0	120	117	117	107	37	55	122	93	62	269	203	75	202	89	122	73	
Home										0	277	145	171	174	183	66	73	128	97	125	83	73	173	97	122	
Homework											0	193	72	51	141	46	53	220	294	160	242	23	64	64	251	
Listening												0	155	63	77	85	35	172	238	250	156	138	185	224	157	
Mobile Phone													0	97	137	219	178	142	127	234	73	197	106	204	134	
Morning														0	167	85	27	56	148	68	38	82	39	54	47	
Night															0	114	64	106	56	85	59	100	126	72	90	
Outside																0	154	63	158	141	60	278	66	96	45	
Picture																	0	82	110	46	137	220	185	48	66	
Reading																		0	263	211	276	84	80	79	229	
School																			0	52	287	129	115	136	265	
Speaking																				0	189	203	119	251	167	
Text																					0	59	74	75	226	
Traveling																							0	118	137	77
Video																								0	193	58
Voice																									0	62
Writing																										0

They were given instructions to indicate the strength of the relationship between the words with these values from 1 to 5. In order to reduce the chance of confusion the class was given several example word pairs and asked which number they would choose. The first example included the same word “apple” as an example of a relationship of value 5. For the second example the words “pencil” and “book” were

given which most students gave a value of 3. After the participants completed the data entry form the total marks for each word intersection over the 63 students were added. So each number in Table 5 on page 238 represents the total of all values given by the students for each row word and column word pair. A higher number indicates a greater number of participants thought there was some amount of similarity between the words. This type of data is known as proximity data which consists of measures of similarity or dissimilarity between objects of interest (Everitt & Rabe-Hesketh, 1997). In this case the objects of interest are the row words and the column words.

In this case, Kruskal's (1978) terminology was used, where the data pertains to a collection of objects indexed firstly by the letter i and secondarily by j and that run from 1 to n . This paper uses 25 words so in this case $n = 25$. The proximity, the data value connecting an i -th object (o_i) with a j -th object (o_j), is represent by δ_{ij} . The values δ_{ij} form a matrix Δ . In other words, we have a set of n^2 numerical relationships, called δ_{ij} between pairs of objects. The value δ_{ij} represents the extent to which an object i is related to an object j (Bezdek, 1999).

Multidimensional Scaling (MDS) is a method for capturing efficient information from observed dissimilarity data by representing the data structure in lower dimensional spatial space. As a metric MDS, the following model (Gower, 1966), (Kruskal & Wish, 1978) has been proposed:

$$d_{ij} = \left\{ \sum_{\lambda=1}^R d^k(x_{i\lambda}, x_{j\lambda}) \right\}^{\frac{1}{k}} + \varepsilon_{ij}. \quad (1.1)$$

In (1.1) d_{ij} is an observed dissimilarity between objects i and j , and $x_{j\lambda}$ shows the value of the coordinate of an object i with respect to dimension λ in R dimensional configuration space. For the purpose of this paper $R = 2$ so the result is presented in a two-dimensional plot. ε_{ij} is an error. $d^k(x_{i\lambda}, x_{j\lambda})$ shows dissimilarity between objects i and j , and usually $d^k(x_{i\lambda}, x_{j\lambda}) = |x_{i\lambda} - x_{j\lambda}|^k$. MDS finds R dimensional points (x_{i1}, \dots, x_{iR}) and illustrates the structure of the similarity relationship among the objects by representing the observed d_{ij} as the distance between a point $(x_{i\lambda})$ and a point $(x_{j\lambda})$ in R dimensional space. In (1.1) we use Euclidian distance when $k = 2$.

A special representation of a dissimilarity matrix consists of a set of R dimensional coordinates representing each object, chosen so that the distances between the points in the R dimensional space, match closely to the observed dissimilarities. Finding the 'best' fitting set of coordinates is the goal of multidimensional scaling techniques (Everitt & Rabe-Hesketh, 1997). As previously mentioned, in this paper a two-dimensional ($R = 2$) solution is used. This is because it has the benefit of being simple and provides an easily understood basis for an understanding of the dissimilarity data (Everitt & Rabe-Hesketh, 1997). The target data of MDS is dissimilarity data, d_{ij} . However, our observed data is similarity data between a pair of objects i and j , s_{ij} . So, this similarity data needs to be transformed to dissimilarity data as follows:

$$d_{ij} = \frac{s_{ij}}{\max_{i,j}(s_{ij})}, \quad i, j = 1, \dots, n.$$

Then this dissimilarity data can be applied to the MDS shown in (1.1) and a result obtained. The output from MDS is in the form of a plot of all the objects (words), and the distance between them indicates the value of dissimilarity. In other words, the closer the words appear in the plot the higher the perceived similarity. Figure 37 on page 241 shows the plot that resulted from the MDS analysis of the student data with comments added by the researcher. The goodness-of-fit is 0.940, which is considered to be a good result. The range of the stress is from 0 to 1, where 1 is the best result possible or perfect fit.

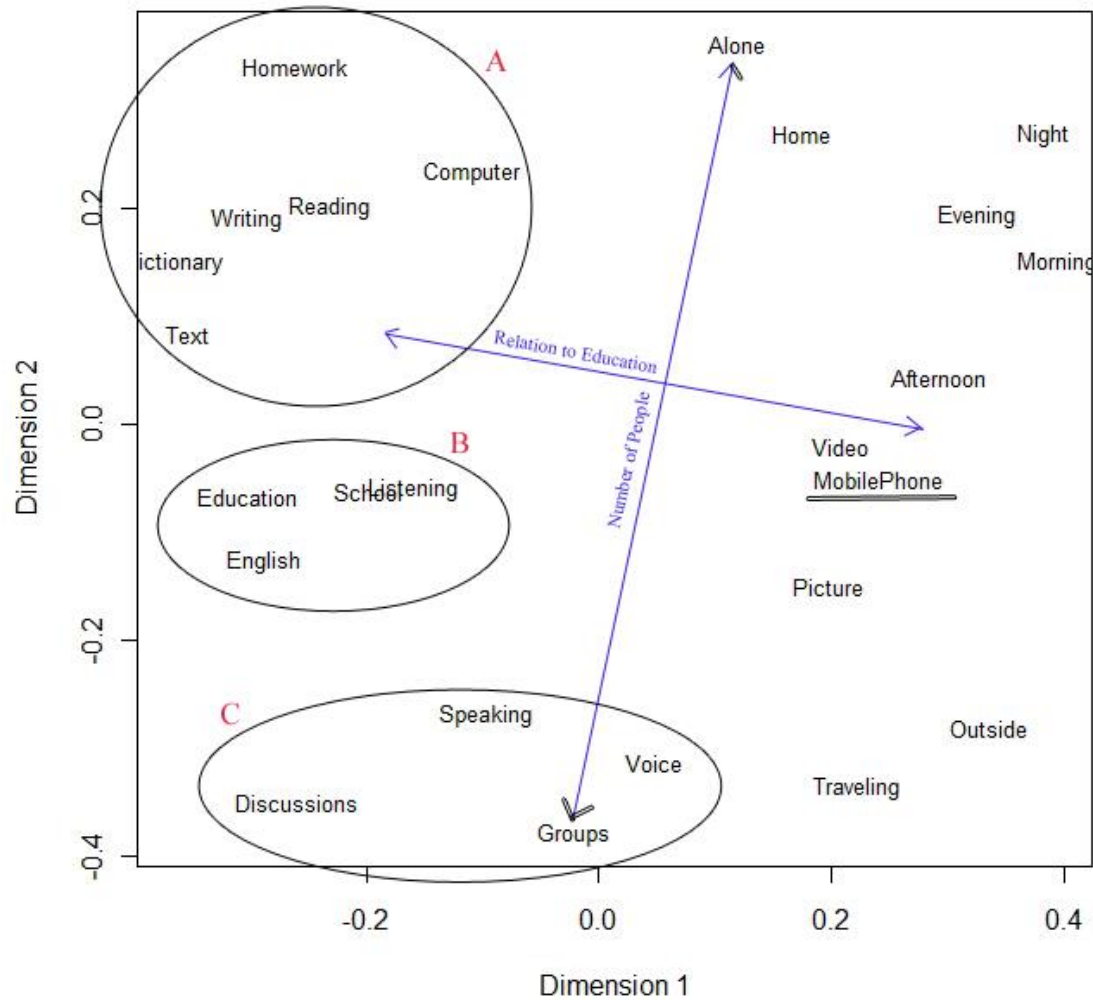


Figure 37: Pilot Study- MDS Analysis

In Figure 37 on page 241 the results of the analysis as produced by the computer software can be seen with several of the significant data groups marked along with one possible interpretation of the dimensions added. Here the blue arrow placed horizontally across the plot represents dimension 1, which is interpreted as representing the relation to education the words have for the students. This conclusion is supported by the presence of education related words in the circled clusters A, B, and C which are all on the left side of the plot. While at the same time, the right side of the plot contains words that we generally consider non-educational. The vertical blue arrow connecting the word

“alone” with “group” indicates that dimension 2 could represent the number of people involved in an activity. This interpretation is supported by the presence of the words in cluster A at the top of the plot. Cluster A contains words which represent things or activities usually done alone. While at the bottom of the plot, near the word “groups”, cluster C exists which contains activities involving more than one person. With this interpretation of the dimensions and the understanding that the distance between words is a measure of their similarity, as perceived by the students, it is possible to form an interpretation of the plot.

This pilot study is focused on the topic of mobile phone use in education by students so the interpretation will be restricted to this topic. The phrase “mobile phone” appears at the right side of the plot indicating that the students see it as a non-educational tool. When considering dimension 2 the phrase is equidistant between “alone” and “groups” which indicates that the students view this tool as used both alone and with friends. It is obvious that the mobile phone is a communication tool so this explains the relations to groups. This is supported by the results of the questionnaire in Figure 35 on page 233 where “email” (coded as 2) was the most frequently used affordance of the mobile phones. In addition, the smart phones ability to connect to the internet, run applications and take pictures could explain how they might use it while alone. Again, the biplot of the questionnaire data, in Figure 35 on page 233, shows that “internet” (coded as 3) access with mobile phones is widespread. “Mobile phone” is also equidistant between “home” and “traveling” which could be interpreted as meaning that it is used both inside and outside. Again this is supported by the anytime and anywhere answer in the Figure 35 on page 233 biplot. The clear gap down the centre of the plot with “mobile phone” on the non-education side indicates that students do not think of this tool as having an educational function. In the sense of the affective relationship, this could be an indication that the students view the mobile phone as belonging more to their personal space than to their educational space.

Summary of results

The MDS result shows that “mobile phone” appears at a large distance from education which suggests that students do not see this tool as having an educational use. This highlights the necessity of an introduction to the use of the mobile system that

clearly stresses the connection between the mobile phones and the class content so that all the students understand that they may use them for homework. The device is seen as a communication tool used both alone, for example searching the internet and answering emails, and as a group, by communicating with others which fits well with its proposed use as a collaborative tool in this study. It is often used both inside and outside which supports the idea of it being carried throughout the day so suggesting that it will give the students the freedom to choose when they post comments. In addition, “homework” appears near the top of the plot indicating that the students view this as an individual activity as opposed to a group activity. Since the study uses group homework the introduction given to students will need to include a clear explanation of the importance of working together because the majority might be unfamiliar with such collaborative homework.

Conclusion

This pilot study was undertaken with three main goals of highlighting any problems prior to the start of the main study, to gain a better insight into the current affordances that the students feel the mobile phone offers them, and to gain an understanding of the students’ affective relationship to the technology. The idea was that any problems identified could be used to inform the design of the methodology, the design of the collaborative activities, and to give the researcher a clearer image of where the students place this technology in their life. This pilot study included three sections which consisted of a questionnaire, an interview and a MDS analysis. The majority of the participant population remained the same for each section of the study in order to strengthen the validity of the findings.

The interview highlighted several problems with the mobile system used to complete the collaborative activities which indicates the necessity for several changes. The addition of e-mail alerts when members post comments will allow groups members to wait for new posts instead of continuously entering the system to check. Ensuring correct encoding of characters from the Japanese phones to the English CMS software will remove the confusion caused by irregular characters appearing in their messages. The setup of an email option inside the CMS will open another means of communication for group members so increasing participation in the discussions. The necessity at the

beginning of the year for a clear introduction to, as well as time to practice using, the mobile site is indicated by the large percentage of students who did not attempt to use the system. The use of a reward system to motivate students to use the system more would reduce the number of discussion stoppages caused by one or more group members not posting or posting too late. An additional motivation would be an in-class group presentation of their answer from each CL homework activity given at the beginning of each class to change the homework from a relatively private activity seen only by group members and the teacher to one monitored by all class members.

The questionnaire data was analysed using a biplot which gave three different insights into the data. These included the relationship between the questions themselves, between the coded items and questions, and between the coded items themselves. The results indicate that the affordance of email is by far the most common use of the mobile phone followed distantly by voice communications and internet searches. In addition, the affordance of anytime and anywhere use is indicated by the students carrying it throughout the day. In terms of education, it is used as an electronic dictionary and as an internet search portal which shows that they are familiar with viewing websites similar to the CMS on their mobile phones. The majority of coded terms can be seen in bunches close to the centre point of the red lines in the biplots. This indicates that they are very similar in that they had little relation to the questionnaire items. On the contrary, questions 1, 3, 5, 7, and 8 had a significant relationship to item voice, email, internet, TV, e-money, games, audio, dictionary, or anytime/anywhere. This is an indication that out of the 12 original questions only the following five are revealing useful information:

1. I always use my mobile phone to ...
2. I sometimes use my mobile phone to...
3. I never use my mobile phone to...
4. I carry my mobile phone...
5. I use my mobile phone to study by...

This means that a far shorter questionnaire could be used on future students to gain the same amount of information. Of the five remaining questions all but question 5 could be seen as asking for the popular affordances of the mobile phone. As mentioned above these affordances include mobility, communication, and access to information through

the internet. Alternatively, question 5 is asking for affordances that are not associated with mobile phones by the students. These affordances include TV, e-money, games, and audio.

These results can be used to adapt the way in which the CL activities used in the main study will be designed and presented to the students. Designing activities which utilize the students' familiarity with e-mail communication more than voice communication is supported by these results. Also supported is the idea of providing access to the activities through an internet based CMS. The near continuous connection the students have with the mobile phones should make the completion of the CL activities more likely as the students will be able to post comments at times most convenient for them. Although the affordance of audio is not popular with the students it could be incorporated into a CL activity in the form of a podcast as long as it was clearly introduced to the students.

The MDS analysis produced a clear 2-dimensional plot of the students' perceived relationship between words related to education and mobile phone use and so provides a way of getting at people's assumptions or implicit attitudes. The interview provided most of these words used in the MDS analysis. The results show that the mobile phone is seen as both an individual and a group tool by the students. This could be explained as the students answering emails from other people or groups, as well as searching the internet as an individual. The results also show that it is used both outside and inside, which indicates that it is carried throughout the day. The position of "mobile phone" in the plot also indicates that students do not see the mobile phone as an educational tool. This means that during the initial introduction of the mobile features of the CMS given to the students at the beginning of the study it will need to be made clear that the mobile phone can be used for education. Likewise, the students' view of homework as an individual activity as opposed to a group activity will require the introduction to include a clear explanation of the importance of working together because the majority of students will be unfamiliar with the concept of group homework.

Appendix B: Interview Questions

How do students use Mobile Phones for CL activities?
 Describe the steps necessary to complete the activities?
 Which step was the most challenging?
 Did you use your mobile phone for all the steps of the activities?
 Did you use you mobile phone for only some of the steps? Which ones?
 What feature was most useful for completing the activities?
 What advantage do mobile phones have over computers for completing the activities?
 [Looking at the logs] What were you thinking at this time?
 [Looking at the logs] Talk me through what you were doing at this time?

What is the distinctive affordance offered by the mobile phone for collaborative learning?
 What features of your phone did you use for the activities?
 What feature did you use the most? Why?
 What feature did you use the least? Why?
 Did you feel your mobile phone was useful for completing these activities? How?
 [Looking at the logs] What were you thinking at this time?
 [Looking at the logs] Talk me through what you were doing at this time?

What is the affective relationship between student the mobile phone and the homework?
 What was your original view or opinion of these activities?
 Has that view changed?
 How do you feel about using mobile phones for these activities? Is this new?
 Have your feelings towards your group members changed?
 Do you think of your mobile phone differently now?
 Do you think of these activities differently now?
 [Looking at the logs] What were you thinking at this time?
 [Looking at the logs] Talk me through what you were doing at this time?

Does the intervention affect the relationship between students the mobile phone and the homework?
 What is your opinion of the homework now?
 Were you motivated to complete the homework?

What are the distinctive features of the collaborative dialogue created through the mobile phone technology?
 Do you prefer collaborating through the computer, mobile phone, or face-to-face? Why?
 [Looking at the logs] What were you thinking at this time?
 [Looking at the logs] Talk me through what you were doing at this time?

Does the affordance offered by the technology lead to more awareness (reflection) of learning?
 [Looking at the logs] What were you thinking at this time?
 [Looking at the logs] Talk me through what you were doing at this time?

What is the nature of the dialogue with the mobile phone technology?
 [Looking at the logs] What were you thinking at this time?
 [Looking at the logs] Talk me through what you were doing at this time?

Appendix C: Homework

Homework Instructions 宿題の回答方法について

This homework is a forum discussion that you will complete as a group on the web site at: www.mcscl.com.

この宿題は、次のウェブサイトにおいて、グループで行うフォーラムディスカッションです。www.mcscl.com.

You may use a computer or mobile phone to complete this homework.

この宿題を完了するに当たり、コンピュータか携帯電話を使ってください。

This homework is done in a group so it is very important for each student to participate for the homework to be completed successfully.

この宿題は、グループで行うことが重要です。

Your group will be given a problem to solve and one group may give only one answer to the problem.

各グループに、1題の問題が出されます。各グループは、その問題に対して1つの回答をしてください。

You will use the website forum to post individual ideas and thoughts which you will eventually define into one answer. Your posts must clearly express your original opinion or why you agree or disagree with other student posts.

各学生は、各自の回答に至った経緯について周知するために、ウェブサイトのフォーラムを使ってください。また、独自の考えや、なぜ他の学生の考えに同意するのか、あるいはしないのかについて、明確に述べてください。

Every time a student posts a meaningful comment they will receive one homework point. There is a minimum of three points per student to pass the homework and a maximum of ten points each week. Your group must post a final single answer to the question to receive any of the points.

コメントを送信する度に、各学生は、1ポイントを得ることができます。この宿題をパスするためには、各学生につき最低3ポイントが必要です。また、各週で各学生が得ることができる最大のポイントは10ポイントです。（例えば、11回コメントを送信しても、10ポイントとなります。）各学生が、コメントを出しても、グループが、最終の一つの回答を、各質問につき送らなければ、そのグループに属す学生は、ポイントを得ることができません。

The comments you post must be meaningful, so simple “yes” and “no” answers are not acceptable. If I feel your answer has no relation to the homework question, you will not receive a point.

送信するコメントは、意味があるものでなければなりません。例えば、単に“yes”や“no”のみの回答は受け付けません。もし、あなたの回答が、宿題の課題に関連するものではない場合は、ポイントを得ることは出来ません。

All comments and answers must be in English. You may upload pictures, videos or sound recordings to the forum if it helps your group to come to an answer.

すべてのコメントや回答は、英語で書いてください。グループで相談し、回答に必要と思われる写真、ビデオ、録音をフォーラムに掲載しても構いません。

Homework Questions

Semester One

Homework 1.1

Question:

宿題の課題：

Write a single English word that cannot be translated to a SINGLE Japanese word.

一つの日本語の単語に訳せない英単語を書いてください。

This means, a single English word that is difficult to translate because it does not have a single equivalent Japanese word.

つまり、一つの英単語ですが、一つの日本語の単語に訳せない、翻訳に難しい英単語を書くということです。

Explain the reason for the difficulty using one of the 11 reasons we discussed in class.

Also, write a Japanese translation of the word.

翻訳に困難である理由を授業で話した11の理由の中から一つを用いて説明してください。また、その英単語の日本語訳を書いてください。

Example of Incorrect Answer:

Karaoke

間違った解答例：

カラオケ

一つの日本語の単語で、一つの英単語に訳せない例ではありません。

The answer should NOT be a single Japanese word that cannot be translated to a SINGLE English word.

Example of Correct Answer

ballet

正しい解答例：

バレエ

一つの英単語で、一つの日本語の単語に訳せない例が正しい解答です。

The answer should be a single English word that cannot be translated to a SINGLE Japanese word.

Homework 1.2

Question:

宿題の課題：

Write a single Japanese word that cannot be translated to a single English word.

一つの英単語に訳せない一つの日本語の単語を書いてください。

This means, a single Japanese word that is difficult to translate because it does not have a single equivalent English word.

つまり、一つの日本語の単語ですが、一つの英単語に訳せない、翻訳に難しい日本語の単語を書くということです。

Explain the reason for the difficulty using one of the 11 reasons we discussed in class.

Also, write a English translation of the word.

翻訳に困難である理由を授業で話した 11 の理由の中から一つを用いて説明してください。また、その単語の英訳を書いてください。

Example of Incorrect Answer:

間違った解答例：

ballet

一つの英単語で、一つの日本語の単語に訳せない例ではありません。

The answer should NOT be a single English word that cannot be translated to a single Japanese word.

Example of Correct Answer

カラオケ

正しい解答例：

バレエ

一つの日本語の単語で、一つの英単語に訳せない例が正しい解答です。

The answer should be a single Japanese word that cannot be translated to a single English word.

Homework 1.3

Question:

宿題の課題

Find an interesting, funny, or unusual collocation.

興味深い、面白い、あるいは、珍しいコロケーションを見つけてください。

Ilic

You can see many while traveling around Tokyo.

東京周辺を見て歩くと、沢山見つかるかもしれません。

Signs and advertisements are good sources, but any source is acceptable.

標識や広告は、よい資料ですが、他の資料でも構いません。

The examples can be in English or Japanese.

コロケーションの例は、英語で答えても日本語で答えても結構です。

You must identify the 2 words in the collocation, and explain why you think the collocation is interesting, funny, or unusual.

そのコロケーションで使われている二つの単語を示してください。また、何故、そのコロケーションが興味深く、面白く、または、珍しいコロケーションと考えたのかについて書いてください。

Homework 1.4

Question:

宿題の課題

Find an English idiom which you feel would be difficult to translate into Japanese because it is relate to specific English cultural habits or social occasions. Try to paraphrase them.

英語を話す国々特有の文化的習慣や社会的行事に関係しているために、日本語に訳すことが困難であると思われる英語のイディオムを書いてください。また、それらの意識をしてみてください。

Homework 1.5

Question:

宿題の課題

Find a Japanese idiom which you feel would be difficult to translate into English because it is relate to specific Japanese cultural habits or social occasions. Try to paraphrase them.

Homework 1.6

Question:

宿題の課題

Choose a notional category such as time, gender, shape, number, visibility, proximity, etc. that is grammatical in one language but lexical in another. (English/Japanese)

Time, gender, shape, number, visibility, proximity, 等のような概念のカテゴリーを選びなさい。すなわち、文法としては、一つの言語ですが、語彙としては、異なるものです。(英語、または、日本語)

Give examples in Japanese and English.

日本語と英語で例を出してください。

Example:

Notion = number

Japanese- 2 台の車 (lexical)

Homework 1.7

Question:

宿題の課題

One of the interesting things about Japanese personal pronouns is that there is more than one pronoun for first and second person and traditionally there have been no third person pronouns.

日本語の人称代名詞の興味深いことの一つに、一人称代名詞と二人称代名詞に対して、一つ以上の代名詞があること、及び、伝統的には、3人称代名詞がないことがあります。

Give examples of these pronoun forms, explain, using English, how they differ in meaning and discuss how they might cause difficulty when translating between Japanese and English. Remember, your group **MUST** decide on a single best final answer.

これらの代名詞の例をあげなさい。また、英語を用いて、それらの意味がどのように違うか説明し、日本語と英語間で訳する時に、どのような困難が生じるかについて議論しなさい。グループで一つが一番よいと思われる解答を決定してください。

First person (I)

watakushi (わたくし)

watashi (わたし) /atakushi (あたくし)

boku (ぼく) /atashi (あたし)

ore (おれ)

Second person (You)

anata (あなた)

kimi (きみ)

omae (おまえ) /anta (あんた)

Semester Two

Homework 2.1

Question:

宿題の課題

Due Tues. Oct. 18, 23:00

You must post a minimum of 3 comments and a maximum of 10:

1. Write 1 sentence in JAPANESE with a theme that is UNmarked. Then using the same sentence, rewrite it so that the theme is more MARKED.
2. Comment in ENGLISH on another student's sentences.
3. Comment in ENGLISH on which sentences you think are the best marked and unmarked example of the group.

Homework 2.2

Question:

宿題の課題

Due Tues. Oct. 25, 23:00

CBC News is following the Occupy Wall Street protesters. Today, they continue to camp out in New York's Zuccotti Park. The police showed up early this morning with plans to evict them. We'll be following the story throughout the day.

1. Identify the theme of each of the sentences.
2. Identify the new and old information in each sentence of this story.
3. Explain why you think your answer is correct.
4. Your group must agree on the best answer.

Homework 2.3

Question:

宿題の課題

Due Tues. Nov. 2, 23:00

Translate this five sentence paragraph about a boy into Japanese. You MUST use each of the five reference types and remember to keep the cohesion. Underline the referenced word in each Japanese sentence.

The boy's going to fall if he doesn't take care.	[repetition]
He's going to fall if he doesn't take care.	[pronoun]
The lad's going to fall if he doesn't take care.	[synonym]
The child's going to fall if he doesn't take care.	[superordinate]
The idiot's going to fall if he doesn't take care.	[general word]

Homework 2.4

Question:

宿題の課題

Due Tues. Nov. 15, 23:00

東京近辺でサブステチューションとエリプシスの例を見つけよ。

それをウェブに日本語と英語の両方で送ってください。

どこで見つけたか説明してください。(例: advertisement, newspaper, poster, school festival...).

例として写真を Web に送ることができます。

例として提出したサブステチューションとエリプシスを説明して下さい。

それに対応する英語と日本語の違いについて、コメントせよ。

二つの例を選択しなさい。

Find one example of substitution and one of ellipsis that you see as you travel around Tokyo. Post them to the website in Japanese with an English translation. Tell us where you found it (example: advertisement, newspaper, poster, school festival...). Remember you can post pictures to the website of your examples too.

Explain the substitution and ellipsis in your examples. Comment on any differences between the English and Japanese translations. Choose the top 2 examples.

Homework 2.5**Question:**

宿題の課題

Due Tues. Nov. 22, 23:00

Conjunctions

The five types of conjunction are:

Additive

Adversative

Causal

Temporal

Continuatives

Your GROUP needs to find one Japanese sentence example from around Tokyo for each of the 5 conjunction types.

1. Identify the Japanese conjunction.
2. Identify the type of conjunction, (1, 2, 3, 4, or 5).
3. Identify equivalent English conjunction.
4. Choose the most interesting single example.

Homework 2.6

Question:

宿題の課題

Due Tues. Nov. 29, 23:00

-Lexical Cohesion-

The four types of COLLOCATION are:

1. OPPOSITES: boy/girl, love/hate...
2. ORDERED SERIES: Tuesday/Thursday, dollar/cent ...
3. UNORDERED SETS:
 - a. Part-whole: car/brake, body/arm...
 - b. Part-part: mouth/chin, verse/chorus ...
 - c. co-hyponymy: red/green, chair/table ...
4. HISTORY of CO-OCCURRENCE: rain/pouring/wet...

Your GROUP needs to find one JAPANESE sentence example from around Tokyo for each of the four collocation types. One example from each group member is enough. Find an example. Do NOT create it yourself. Do NOT use my examples.

1. Identify the Japanese collocation
2. Identify where you found it.
3. Identify the type of collocation, (1, 2, 3 abc, 4
4. Identify equivalent English collocation
5. Choose the most interesting SINGLE example from your groups examples.

Homework 2.7

Question:

宿題の課題

Due Tues 06, 23:00

Pragmatics

COHERENCE

Each GROUP member needs to find one JAPANESE sentence example from around Tokyo for coherence. One example from each group member is enough. Find an example that you think is coherent (understandable) to you but that a non-Japanese person would find incoherent (not understandable). Do NOT create it yourself. Do NOT use my examples.

1. Identify where you found your example.
2. Write the sentences in Japanese.
3. Translate your example to English.
4. Underline the coherent words in each sentence.
5. Choose the most interesting SINGLE example from your groups examples.

Homework 2.8

Question:

宿題の課題

Due Tues. Dec. 13, 23:00

PRAGMATICS: IMPLICATURE

Each GROUP member needs to find one JAPANESE example from around Tokyo for implicature. One example from each group member is enough. Find an example that you think implies more than is actually written.

Do NOT create the example yourself.
Do NOT use my examples from class.

1. Identify where you found your example.
2. Write the Japanese sentence.
3. Translate your example into English.
4. Identify the inferred meaning in each sentence.
5. Choose the most interesting SINGLE example from your groups examples.

Homework 2.9

Question:

宿題の課題

Due Tues. Dec. 20, 23:00

SEMESTER 2 REVIEW

Topic 4: THEME

Topic 5: COHESION

Topic 6: PRAGMATICS

Each GROUP member needs to find one JAPANESE example from around Tokyo for THEME, COHESION and PRAGMATICS.

Do NOT create the example yourself.
Do NOT use my examples from class.

1. Identify where you found your example.
2. Write or post a picture of the Japanese sentence.
3. Translate your example into English.
4. Identify the topic (4, 5, or 6).
5. Choose your group's single most interesting example for topic 4.
6. Choose your group's single most interesting example for topic 5.
7. Choose your group's single most interesting example for topic 6.

Appendix D: Log Data

Table 6: Log Data of Group 1 Access Hours

	Atsumi		Chieno		Chika		Erika		Mai		Takashi		Toshinao		Atsumi		Chieno		Chika		Erika		Mai		Takashi		Toshinao		Group 1: Total		
	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M
1	0	0	0	6	2	6	1	2	4	8	2	0	0	34	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	56
2	0	0	0	0	1	0	5	0	0	1	0	0	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	
3	0	0	0	0	0	0	0	0	0	0	0	0	2	6	3	0	0	0	0	0	0	0	0	0	0	0	4	5	6	11	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	7	
5	0	0	5	1	5	1	0	0	0	0	0	0	0	4	5	0	0	0	0	0	0	0	0	0	0	0	1	0	11	6	
6	1	0	0	2	0	2	0	0	0	0	8	0	12	3	6	0	0	0	0	0	0	0	0	0	0	0	2	4	23	11	
7	4	0	1	0	1	0	0	0	4	0	0	0	9	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	
8	4	0	2	2	2	2	6	0	0	0	4	0	0	2	8	1	0	0	0	0	2	0	0	0	0	0	2	0	23	6	
9	1	0	0	0	1	0	1	0	5	0	8	0	8	0	9	13	0	0	0	0	12	0	0	0	0	0	2	2	51	2	
10	0	0	0	0	1	0	0	1	0	0	1	0	3	1	10	12	0	0	0	0	7	0	0	0	0	0	0	3	24	5	
11	0	0	4	0	4	0	2	2	0	0	1	0	2	5	11	0	0	0	0	4	0	0	0	0	0	0	0	2	19	7	
12	8	0	0	0	3	0	6	0	5	0	6	0	6	9	12	12	0	0	0	3	0	5	0	5	0	0	4	0	63	9	
13	9	0	1	0	9	0	15	3	3	0	3	0	2	25	13	19	0	0	10	0	6	0	19	0	0	0	6	0	102	28	
14	15	0	3	0	8	0	4	1	2	0	4	0	1	6	14	9	0	0	0	3	2	0	8	0	0	0	0	0	56	10	
15	5	0	1	0	5	0	0	3	2	1	15	0	2	5	15	9	0	0	0	0	0	4	0	0	0	0	0	2	43	11	
16	1	0	0	2	3	2	6	0	3	2	2	0	1	21	16	1	0	0	0	2	2	0	3	0	0	0	3	0	25	29	
17	0	0	0	2	0	2	0	0	0	4	0	0	0	2	16	17	1	0	0	9	0	26	0	0	0	0	2	8	44	28	
18	7	0	0	5	0	5	1	0	0	0	0	0	11	19	18	3	0	0	0	0	2	5	12	0	0	0	2	4	38	38	
19	1	0	3	6	4	6	5	3	2	0	0	0	13	18	19	2	0	0	0	7	0	0	5	11	0	0	3	11	51	49	
20	2	0	0	4	0	4	8	7	5	7	0	0	4	32	20	6	0	0	0	0	0	8	0	0	0	0	17	13	50	67	
21	1	0	0	3	4	3	13	0	6	11	4	0	8	20	21	3	0	0	0	0	6	0	13	0	0	0	7	8	64	45	
22	3	0	0	12	6	12	1	6	4	4	31	0	6	29	22	16	0	0	0	0	12	0	8	0	0	0	13	14	100	77	
23	0	0	0	6	0	6	3	15	12	10	26	0	3	44	23	5	0	0	2	0	11	4	4	0	0	0	0	2	66	87	
0	0	0	0	9	8	9	14	4	6	7	11	0	4	39	0	0	0	0	0	0	0	0	0	0	0	0	0	4	43	72	

Table 7: Log Data of Group 1 Access Days

	Semester 1														Semester 2														Group 1: Total		
	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	
Mon	10	0	10	1	14	1	5	6	4	4	2	0	29	35	Mon	23	0	0	0	9	0	26	10	19	0	0	15	20	Mon	166	77
Tue	38	0	9	16	15	16	8	16	10	29	33	0	43	120	Tue	71	0	0	0	22	0	42	2	67	0	0	49	53	Tue	407	252
Wed	15	0	1	30	18	30	56	14	28	12	63	0	9	120	Wed	0	0	0	0	0	7	0	0	0	0	0	0	8	Wed	197	214
Thu	0	0	0	2	6	2	5	4	9	0	23	0	6	24	Thu	0	1	0	0	0	0	2	0	0	0	0	0	2	Thu	53	35
Fri	0	0	0	1	4	1	8	4	7	6	3	0	3	17	Fri	6	0	0	0	4	14	0	2	0	0	0	0	0	Fri	47	33
Sat	0	0	0	2	1	2	1	3	3	0	0	0	1	13	Sat	3	0	0	0	0	4	0	0	0	0	0	0	2	Sat	13	22
Sun	0	0	0	0	4	0	6	0	4	0	0	0	0	11	Sun	9	0	0	0	0	0	2	2	7	0	0	0	6	Sun	38	13

Table 8: Log Data Group2 Access Hours

	Group 2 Semester 1										Group 2 Semester 2										Group 2 Total											
	Asaka	Ayaka	Eri	Hitomi	Hikaru	Lulu	Yuka	Yuuri	Asaka	Ayaka	Eri	Hitomi	Hikaru	Lulu	Yuka	Yuuri	M	C														
1	0	0	4	2	0	0	0	20	4	2	9	0	0	3	3	1	0	0	0	2	8	0	0	0	0	2	0	0	5	0		
2	0	0	0	0	0	0	0	4	12	3	5	0	0	0	0	2	0	0	0	0	9	0	0	0	0	0	14	0	0	0		
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	8	0	0	0	0		
4	1	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4	0	0	0	0	0	0	0	0	0	9	0	0	1	0		
5	0	0	0	0	0	1	0	2	0	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0	3	0	0	0	0		
6	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	5	0	0	0	0		
7	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	1	0		
9	0	4	22	1	7	0	4	0	3	0	0	0	0	3	0	9	0	0	0	3	0	0	7	0	0	3	0	0	0	5	0	
10	0	3	6	4	6	0	3	0	6	0	0	4	0	0	0	3	10	0	0	3	0	0	7	0	0	2	0	0	0	5	1	
11	0	0	4	1	4	0	4	0	5	0	0	0	0	10	2	11	0	0	0	1	0	0	0	0	7	0	0	0	3	0		
12	1	4	6	0	3	2	27	0	15	0	0	2	0	16	6	12	0	0	1	0	0	3	0	0	10	0	0	0	0	5	0	
13	3	1	8	0	17	0	7	0	3	0	0	0	0	7	5	13	0	0	0	1	0	0	1	0	0	2	0	0	10	0		
14	1	0	4	1	6	0	5	0	5	0	1	0	0	0	1	14	0	0	0	0	0	0	0	0	6	0	5	0	2	7	0	
15	1	0	0	0	11	3	6	0	5	0	0	0	2	4	6	0	15	0	0	0	0	0	0	0	14	0	8	0	4	1	0	
16	0	0	4	1	2	0	9	0	9	2	0	0	2	4	6	0	16	0	0	0	3	1	0	0	0	5	0	0	0	2	4	0
17	0	0	3	5	5	0	3	0	3	4	0	3	0	0	3	0	17	0	0	0	6	1	0	8	0	16	0	0	7	0	0	
18	0	1	10	4	0	1	4	0	6	0	0	0	0	20	0	0	18	0	0	0	7	2	0	13	0	9	0	0	4	4	0	
19	0	0	10	5	3	1	5	0	4	0	0	0	0	9	0	0	19	0	0	0	3	4	0	5	0	3	0	4	1	5	0	
20	0	0	18	0	0	0	8	0	0	2	0	0	0	2	1	0	20	0	0	0	5	0	0	8	0	7	0	2	0	4	7	0
21	0	3	11	2	5	2	10	0	4	3	0	0	0	0	0	21	0	0	0	6	5	2	5	0	0	4	0	11	0	5	21	0
22	0	2	13	1	3	2	6	0	15	4	0	6	0	0	0	22	0	0	0	16	14	2	11	0	0	9	0	11	0	5	18	3
23	1	11	18	2	1	6	15	0	10	2	0	26	3	3	25	0	23	0	0	10	7	1	19	0	2	8	0	9	0	4	12	4
0	0	3	24	3	6	0	2	1	12	5	0	32	0	0	10	1	0	0	0	2	7	1	8	0	2	14	0	1	0	2	19	2

Table 9: Log Data Group 2 Access Days

	Semester 1										Semester 2										Group 2 Total	
	Asaka	Ayaka	Eri	Hitomi	Hikaru	Lulu	Yuka	Yuuri	Asaka	Ayaka	Eri	Hitomi	Hikaru	Lulu	Yuka	Yuuri	M	C				
Mon	0</																					

Table 10: Log Data Group 3 Access Hours

	Group 3 Semester 1												Group 3 Semester 2												Group 3 Total	
	Akiko		Ayaka		Eri		Fumie		Yui		Yurina		Akiko		Ayaka		Eri		Fumie		Yui		Yurina		M	C
	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C		
1	3	7	14	5	0	0	0	0	7	12	1	4	1	0	0	0	4	0	2	0	0	2	6	0	0	
2	2	1	8	6	0	0	0	0	1	7	3	6	2	0	0	0	12	0	0	0	0	0	0	0	0	
3	2	2	0	1	0	0	0	0	0	2	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	
4	0	0	0	2	0	0	0	0	0	2	0	0	4	0	0	5	2	0	0	0	0	0	0	0	0	
5	0	0	0	1	0	0	0	0	0	0	0	0	5	0	0	0	6	0	0	8	0	0	0	0	0	
6	1	0	0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	0	0	8	0	0	0	0	0	
7	0	0	0	0	0	14	0	2	1	1	0	0	7	0	0	0	0	0	2	8	0	0	0	0	0	
8	3	2	5	0	2	13	5	7	3	2	3	0	8	0	0	0	0	0	2	10	0	0	0	0	0	
9	1	0	9	2	0	0	6	2	3	0	0	0	9	2	0	3	0	0	2	3	0	0	0	0	0	
10	11	0	8	0	0	6	11	8	5	4	8	0	10	0	0	1	2	0	11	8	0	1	0	0	0	
11	6	0	4	2	2	4	0	0	2	5	2	5	11	0	0	0	5	0	3	2	0	0	2	0	0	
12	4	0	5	0	1	0	6	0	1	0	13	0	12	6	3	0	2	0	6	7	0	0	0	0	0	
13	9	5	9	0	2	0	0	10	1	0	4	2	13	10	0	5	0	0	5	14	4	0	0	0	0	
14	10	5	9	0	4	0	0	6	0	3	2	7	14	0	0	0	1	0	5	2	0	0	0	0	0	
15	3	4	8	10	2	5	0	1	1	4	0	9	15	0	0	2	2	0	8	3	0	0	2	0	0	
16	3	4	15	0	2	4	1	4	0	0	1	3	16	2	3	2	4	0	0	10	0	0	0	0	0	
17	11	7	0	0	3	3	8	2	2	0	0	9	17	1	0	5	0	0	3	10	2	0	3	0	0	
18	2	6	0	3	10	10	3	18	2	0	0	5	24	1	8	6	3	0	5	5	6	3	2	0	0	
19	1	3	0	5	12	14	1	1	2	1	4	9	19	17	7	7	0	0	3	1	0	0	3	0	0	
20	6	5	5	2	10	7	8	11	0	0	2	8	20	17	18	2	1	0	3	3	3	0	5	0	0	
21	5	6	1	0	15	5	1	1	1	3	0	4	21	11	6	0	8	0	17	2	0	0	4	0	0	
22	8	10	0	0	17	2	0	4	0	4	8	10	22	12	13	13	18	1	10	4	17	6	7	0	0	
23	14	32	1	0	10	6	6	7	7	8	0	19	23	9	14	5	4	0	13	10	5	3	1	0	0	
0	13	13	3	2	6	6	0	8	0	12	1	23	0	0	4	4	3	0	11	2	2	0	3	0	0	

Table 11: Log Data Group 3 Access Days

	Semester 1												Semester 2												Group 3 Total	
	Akiko		Ayaka		Eri		Fumie		Yui		Yurina		Akiko		Ayaka		Eri		Fumie		Yui		Yurina		M	C
	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C		
Mon	16	17	21	4	11	8	7	15	8	19	11	24	Mon	0	8	3	0	0	1	0	0	0	6	0	0	0
Tue	18	16	27	12	8	22	3	4	5	7	8	26	Tue	3	8	9	0	0	2	8	2	0	2	0	0	0
Wed	37	32	25	4	34	44	18	20	15	12	14	39	Wed	2	2	1	6	0	7	10	0	0	0	0	0	0
Thu	18	13	11	7	21	16	12	19	4	6	10	20	Thu	0	2	3	8	0	11	10	3	0	0	0	0	0
Fri	6	5	3	0	4	3	4	7	2	4	2	7	Fri	1	4	5	8	0	10	23	2	0	3	0	0	0
Sat	6	25	4	6	7	2	8	16	0	8	10	8	Sat	20	19	5	7	0	19	27	0	0	9	0	0	0
Sun	17	4	13	8	13	4	4	11	5	14	5	18	Sun	62	33	34	50	1	61	42	32	15	18	0	0	

Table 12: Log Data Group 4 Access Hours

	Group 4 Semester 1												Group 4 Semester 2												Group 4 Total			
	Asako		Eri		Midori		Saori		Yuan		Yuri		Asako		Eri		Midori		Saori		Yuan		Yuri		M	C		
	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C				
1	0	6	3	8	0	3	1	0	1	0	6	3	1	0	0	0	0	0	0	0	0	0	1	5	1	12	25	
2	0	6	2	0	0	3	0	3	0	3	0	4	2	1	0	0	0	0	0	0	0	0	0	0	4	2	3	23
3	0	6	0	0	0	0	0	3	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	3	5	3	4	16
4	0	10	0	0	0	0	0	0	0	0	0	3	4	0	0	0	0	0	0	0	0	0	0	0	6	4	0	19
5	0	1	0	0	1	0	0	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	5	1	3
6	0	0	0	0	0	0	0	0	0	0	0	1	2	6	0	0	0	0	1	0	0	0	0	0	0	6	2	2
7	0	0	0	0	0	0	0	0	0	0	0	9	7	0	0	0	0	0	0	0	0	0	0	0	0	7	0	9
8	0	0	0	2	0	4	0	0	0	0	11	4	8	1	0	0	0	0	0	0	0	0	0	0	0	8	12	10
9	5	0	11	0	0	0	5	0	0	0	1	1	9	0	0	1	0	0	0	0	0	0	0	3	0	9	26	1
10	1	8	0	0	2	0	7	5	2	0	1	2	10	3	0	0	0	0	0	0	0	1	0	0	4	10	17	19
11	0	14	0	0	5	3	2	1	14	0	1	2	11	5	0	1	0	5	4	0	0	0	0	1	3	11	34	27
12	0	1	3	0	1	0	3	3	0	6	5	0	12	2	0	0	0	4	0	0	0	0	0	2	3	12	20	13
13	0	5	2	0	5	6	2	5	1	1	2	7	13	1	0	0	0	2	1	0	0	2	3	5	3	13	22	31
14	0	4	0	3	2	5	2	4	0	5	4	12	14	4	0	0	0	0	0	0	2	0	1	3	0	14	15	36
15	0	5	4	6	4	3	8	2	0	6	4	2	15	5	0	0	0	0	0	4	2	2	4	0	0	15	31	30
16	0	13	0	3	0	0	0	3	0	4	0	2	16	10	0	0	0	0	0	4	11	5	0	0	0	16	21	34
17	0	6	5	4	3	0	0	0	0	2	0	0	17	1	0	0	0	0	0	0	5	2	1	0	0	17	15	14
18	3	1	2	0	3	8	1	0	6	6	2	2	18	2	0	4	0	0	0	0	1	1	0	0	0	18	24	18
19	3	7	0	0	2	1	1	0	0	0	6	0	19	5	0	0	0	5	0	0	0	1	6	0	0	19	23	14
20	0	0	0	0	1	18	0	8	0	0	6	9	20	5	0	1	5	2	0	0	2	3	0	0	1	20	18	43
21	0	0	0	3	1	2	0	17	0	0	4	13	21	7	0	0	9	1	10	0	11	2	0	19	1	21	34	66
22	0	8	1	7	2	8	1	1	0	0	4	19	22	20	0	0	4	2	1	0	20	0	7	40	28	22	70	103
23	5	13	8	35	3	13	22	5	1	0	13	21	23	3	0	0	1	0	0	3	1	1	0	3	5	23	62	94
0	6	6	2	9	0	12	5	0	1	0	4	9	0	0	0	0	0	0	0	0	0	0	0	0	11	0	18	47

Table 13: Log Data Group 4 Access Days

	Semester 1												Semester 2												Group 4 Total				
	Asako		Eri		Midori		Saori		Yuan		Yuri		Asako		Eri		Midori		Saori		Yuan		Yuri		M	C			
	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C					
Mon	0	27	9	12	3	16	7	20	11	10	6	6	Mon	0	0	2	0	1	0	0	0	0	0	0	3	Mon	39	94	
Tue	7	19	5	0	6	7	8	0	7	0	20	19	Tue	0	0	0	0	0	0	0	0	0	0	0	0	0	Tue	53	45
Wed	9	22	23	40	10	32	24	13	0	0	28	43	Wed	0	0	0	0	1	1	0	0	0	0	1	0	0	Wed	96	151
Thu	1	26	1	21	5	24	19	23	1	13	15	39	Thu	0	0	0	0	0	0	0	0	0	0	0	0	0	Thu	42	146
Fri	6	3	0	0	6	8	2	0	6	3	5	5	Fri	0	0	0	0	0	0	0	0	0	3	1	0	0	Fri	26	22
Sat	0	12																											

Table 14: Log Data Read and Write Count

		HW1		HW2		HW3		HW4		HW5		HW6		HW7		HW8		HW9		HW10		HW11		HW12		HW13		HW14		HW15		HW16		Total Post	Total Read	Total			
		Post	Read	Post	Read	Post	Read	Post	Read	Post	Read	Post	Read	Post	Read	Post	Read	Post	Read	Post	Read	Post	Read	Post	Read	Post	Read	Post	Read	Post	Read	Post	Read						
G1	Atsumi	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		M	4	5	4	6	3	6	3	6	3	4	3	3	1	3	4	7	9	12	7	13	2	7	4	7	7	11	4	6	5	5	0	0	0	63	101	164	
	Mai	C	1	1	4	7	2	6	3	5	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		M	2	13	1	6	3	4	0	6	1	2	2	2	4	5	5	9	7	8	6	7	3	3	6	7	6	6	4	4	4	5	1	2	55	89	144		
	Toshinao	C	2	15	6	9	5	7	4	10	3	11	4	9	0	7	5	5	4	8	3	4	4	6	4	3	6	2	4	1	0	0	2	1	56	98	154		
		M	2	23	0	5	0	3	1	9	1	5	0	5	1	14	0	12	0	6	1	5	0	1	0	0	0	0	0	1	5	12	0	2	11	103	114		
	Erika	C	2	5	1	6	0	0	0	1	0	6	1	1	0	1	4	5	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	27	35
		M	1	2	2	8	4	14	3	14	4	6	2	7	4	10	3	6	5	6	3	5	1	4	5	7	4	9	1	4	4	7	0	0	46	109	155		
	Chika	C	1	11	1	2	3	2	0	0	0	2	0	0	0	1	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	21	26
		M	1	7	1	8	0	3	0	3	1	2	1	3	2	7	3	4	1	1	1	2	0	0	4	5	3	4	0	0	1	1	0	0	0	19	50	69	
	Chieno	C	1	1	5	3	5	4	4	6	1	0	3	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	16	38
		M	3	8	0	0	0	1	0	1	1	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	15	20	
	Takashi	C	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
		M	3	7	3	7	4	12	4	11	6	6	3	7	7	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	78	108	
G2a	Hitomi	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		M	4	27	5	18	3	10	3	11	3	10	3	5	5	12	4	11	5	8	4	7	4	7	7	11	1	4	4	6	3	5	3	5	61	157	218		
	Asaka	C	0	0	2	5	0	0	1	1	0	0	5	2	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	10	23
		M	0	1	0	0	0	0	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	5	
	Eri	C	0	1	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
		M	3	9	2	2	4	11	2	7	4	12	4	5	2	8	2	2	6	5	3	6	4	5	1	1	0	0	7	7	1	1	3	3	51	84	135		
	Ayaka	C	0	0	0	5	0	0	0	0	0	0	3	2	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	22	65
		M	4	14	10	27	3	15	4	22	9	31	0	1	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	114	145	
G2b	Lulu	C	4	26	0	0	2	9	2	6	2	4	5	5	2	8	5	5	4	14	4	6	2	2	3	5	3	3	4	2	4	2	2	2	45	103	148		
		M	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	
	Hikaru	C	3	7	5	5	0	1	0	0	2	1	0	0	0	0	2	3	6	10	3	1	7	7	4	8	3	6	5	0	0	0	3	7	43	56	99		
		M	0	3	0	5	4	29	4	28	1	12	3	14	5	9	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	106	124	
	Yuka	C	3	3	0	0	0	0	3	7	5	3	4	1	0	1	0	5	0	3	0	0	0	3	1	0	2	2	4	3	1	0	0	0	23	31	54		
		M	0	0	0	0	0	0	0	2	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	
	Yuuri	C	0	0	5	2	0	0	0	0	0	2	4	0	0	0	1	0	1	0	0	0	2	1	0	1	0	0	0	0	0	0	0	0	0	9	9	18	
		M	5	9	2	6	5	9	4	7	4	7	1	3	5	9	8	18	8	13	4	14	7	16	5	4	5	6	3	4	2	4	3	4	71	133	204		
G3	Eri	C	0	2	0	2	3	9	5	4	6	11	4	5	2	6	6	2	5	5	2	3	1	2	4	3	3	2	7	3	5	8	2	6	55	73	128		
		M	8	26	5	13	0	5	0	10	0	2	1	6	3	7	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	69	87	
	Akiko	C	6	12	5	17	4	7	1	8	1	4	1	8	0	5	0	5	1	7	1	7	0	0	0	2	1	1	0	0	0	4	0	0	3	21	90	111	
		M	2	33	1	8	0	7	2	14	3	12	3	6	3	13	3	9	4	11	3	2	4	8	3	9	3	9	3	3	3	3	3	3	43	150	193		
	Yui	C	2	19	3	9	0	1	1	2	0	0	2	4	1	4	0	2	2	3	1	2	2	4	0	3	0	2	0	0	0	1	0	2	14	58	72		
		M	1	8	0	2	0	0	0	0	1	6	0	6	2	12	0	0	0	0	0	0	0	0	0	1	1	2	1	1	1	1	3	2	2	11	42	53	
	Ayaka	C	4	8	4	8	2	2	0	0	0	0	0	0	0	1	0	2	5	3	2	1	3	4	7	6	7	5	1	2	0	0	8	4	43	46	89		
		M	2	7	1	4	1	13	3	15	4	14	3	10	3	14	1	5	2	7	1	5	0	0	0	2	0	1	6	8	5	9	0	0	32	114	146		
	Fumie	C	5	9	3	7	3	7	2	4	3	10	0	0	0	2	0	0	0	0	0	0	2	6	0	1	2	6	0	0	3	7	0	1	23	60	83		
		M	0	1	1	3	0	0	0	0	0	2	8	4	12	2	14	3	9	3	11	2	11	2	11	4	11	4	12	6	15	3	7	0	0	36	125	161	
	Yurina	C	4	21	3	8	2	15	4	2	4	6	4	17	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	71	92	
		M	0	7	0	7	0	4	0	3	0	4	0	11	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	39
	Rika	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G4	Yuan	C	3	6	1	1	0	0	0	0	0	0	1	4	1	1	0	4	1	1	0	1	2	3	1	2	1	1	0	0	0	0	0	0	0	11	24	35	
		M	0	1	0	1	1	5	4	7	1	4	0	0	0	0	1	1	0	1	1	1	0	1	2	8	0	0	1	1	1	3	3	3	15	37	52		
	Yuri	C	5	35	2	19	1	2	3	5	1	2	3	2	0	4	5	10	2	4	1	2	1	1	5	12	0	1	2	3	1	1	5	2	37	105	142		
		M	0	0	0	0	2	14	5	16	3	13	2	9	2	5	0	0	4	12	0	1	2	10	4	10	4	9	2	3	4	10	2	6	36	118	154		
	Midori	C	3	3	2	11	0	3	3	9	0	0	4																										

Table 15: Log Data Total Time On-line

G1	Mobile	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	Av.
	Atsumi	15.33	32.77	40.72	24.38	36.88	34.93	2.08	41.07	99.93	67.48	80.22	17.12	61.07	32.42	22.90	0.00	38.08
	Chika	9.32	17.72	32.42	0.52	8.75	3.80	21.98	28.42	1.10	1.30	0.00	16.88	27.17	34.73	0.00	0.00	12.76
	Chieno	60.43	0.00	48.10	0.42	15.68	3.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.034
	Mai	51.42	15.22	110.40	2.77	12.63	42.65	32.30	44.50	76.15	41.70	42.47	71.50	41.92	17.77	32.98	2.18	39.91
	Takashi	4.20	169.40	70.33	120.95	36.03	16.10	92.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.86
	Erika	17.08	14.83	114.25	72.23	53.70	33.18	41.73	20.93	34.47	32.73	13.68	52.62	48.10	34.43	45.47	0.98	39.4
	Toshinao	129.70	3.93	7.10	27.97	10.90	41.77	327.37	54.47	23.78	28.10	0.00	8.45	7.23	3.83	104.57	1.07	48.76
G1	Computer	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
	Atsumi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	Chika	126.98	18.10	0.60	0.00	1.88	0.00	1.13	0.78	0.00	0.00	1.02	0.00	0.00	0.00	0.00	0.00	9.406
	Chieno	34.18	55.42	20.10	50.67	6.97	19.22	79.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.61
	Mai	6.52	93.53	51.50	101.12	34.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.97
	Takashi	0.78	0.47	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.181
	Erika	15.60	15.80	0.00	1.60	10.13	9.87	0.00	27.88	4.68	4.07	0.00	0.00	0.00	0.00	0.00	0.00	5.602
	Toshinao	91.38	95.28	94.10	93.82	213.67	81.32	34.77	30.33	70.27	21.50	80.85	39.27	35.77	19.68	0.00	113.35	69.71
G2	Mobile	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
	Hitomi	303.75	139.42	102.93	41.67	30.78	21.17	19.27	42.25	55.33	8.78	20.67	48.42	5.33	9.97	6.95	34.25	55.68
	Eri	90.23	79.55	49.08	20.25	92.95	32.37	41.42	16.97	132.40	24.77	10.10	1.30	19.92	15.48	2.38	17.68	40.43
	Hikaru	19.58	30.53	106.42	82.73	89.27	28.58	36.82	65.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.72
	Yuuri	81.25	170.78	55.90	44.32	40.80	11.13	92.37	248.43	254.40	96.58	119.63	61.55	26.88	23.97	7.23	12.65	84.24
	Ayaka	110.23	107.40	58.83	216.57	124.32	0.53	24.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.16
	Yuka	0.00	0.00	0.00	4.87	4.87	1.28	5.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.032
	Asaka	29.07	0.18	0.00	17.82	0.00	7.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.4
	Lulu	0.00	27.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.745
G2	Computer	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
	Hitomi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	Eri	6.28	0.00	0.00	1.13	0.57	3.38	0.00	0.00	0.00	2.63	0.00	0.00	4.92	0.90	0.38	0.00	1.262
	Hikaru	61.03	49.40	0.82	0.00	36.52	0.00	0.00	18.32	151.77	23.22	185.43	150.27	261.33	40.97	0.00	142.98	70.13
	Yuuri	23.72	299.17	0.00	0.00	0.00	41.63	0.00	11.43	6.80	0.00	84.45	0.93	0.00	0.00	0.00	0.00	29.26
	Ayaka	0.00	96.30	0.00	0.00	0.18	83.23	391.45	51.32	107.50	83.85	170.57	70.82	19.18	217.30	178.43	53.03	95.2
	Yuka	45.60	0.00	0.00	51.37	0.00	55.85	37.00	29.05	54.58	0.00	0.00	15.75	5.00	24.75	18.82	0.00	21.11
	Asaka	0.00	33.78	0.00	34.68	0.00	53.12	147.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.82
	Lulu	225.95	0.00	52.17	31.85	25.58	54.48	30.50	61.73	155.83	73.22	27.77	66.35	42.58	38.27	36.50	132.90	65.98
G3	Mobile	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
	Fumie	9.60	14.47	0.00	0.00	23.02	53.68	165.25	47.88	43.47	54.47	72.87	61.07	68.95	122.08	43.40	3.40	48.98
	Akiko	74.05	65.35	2.65	36.52	37.57	14.30	20.78	34.82	22.40	2.87	55.93	29.27	162.05	82.95	7.30	4.42	40.83
	Yui	27.23	6.15	0.00	0.00	9.55	2.20	84.67	0.00	0.00	0.00	0.00	279.58	44.20	10.43	50.05	9.53	32.73
	Eri	387.90	41.68	39.17	11.00	4.37	32.03	129.72	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	40.39
	Ayaka	42.85	4.53	9.00	107.80	71.13	17.02	24.07	33.90	17.68	10.88	0.00	1.27	0.60	22.37	64.07	0.00	26.7
	Yurina	27.17	5.77	2.53	2.58	3.32	9.28	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.22
G3	Computer	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
	Fumie	278.80	5102.53	77.92	46.15	58.87	0.00	5.37	0.00	0.00	0.00	23.65	2.28	119.30	0.00	43.70	7.53	360.4
	Akiko	292.80	177.95	105.08	23.70	96.60	117.75	79.18	15.70	72.85	5913.88	9.27	48.43	5.83	64.32	26.98	5.32	441
	Yui	422.05	100.07	11.45	117.60	0.00	202.28	37.20	20.37	141.92	77.03	311.48	535.33	3.62	0.00	133.77	67.12	136.3
	Eri	2.03	1.98	133.43	187.63	202.45	113.42	1550.77	65.77	127.27	13.23	2319.20	85.73	53.12	61.62	238.83	194.00	334.4
	Ayaka	192.48	1102.83	96.97	0.00	0.00	0.00	0.00	7.68	41.17	12.72	48.17	552.95	76.22	73.63	0.00	4110.78	394.7
	Yurina	1535.03	237.47	210.30	125.42	80.97	353.00	3.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	159.1
G4	Mobile	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
	Yuri	3.08	1.20	27.70	19.72	50.78	25.15	24.47	0.00	490.40	0.22	83.78	0.33	52.68	13.85	68.40	30.30	55.75
	Saori	6.45	116.10	0.65	27.17	14.17	7.23	7.68	0.00	0.00	0.00	0.00	14.92	0.00	0.00	0.00	0.00	12.15
	Eri	10.50	0.00	10.27	0.00	12.53	311.48	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.42	24.75
	Asako	0.00	0.00	0.00	0.00	0.00	25.45	110.53	33.70	86.47	159.22	11.72	5.37	33.70	8.58	182.00	45.22	43.87
	Rika	9.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59
	Midori	0.00	0.00	0.00	14.22	44.22	4.17	95.60	0.00	0.00	0.00	0.00	77.60	96.72	0.83	0.00	0.00	20.83
	Yuan	0.00	1.48	34.33	56.71	29.17	0.00	0.00	70.72	0.00	28.35	0.68	77.58	0.00	30.78	21.57	119.35	29.42
G4	Computer	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
	Yuri	503.72	1918.77	30.65	154.70	33.43	6683.28	0.00	93.92	46.97	17.97	58.37	121.27	1.15	84.15	4.15	289.25	627.6
	Saori	83.13	92.15	0.00	29.53	46.23	100.87	17.22	75.27	0.60	55.17	0.00	18.63	52.25	1.05	54.50	1.30	39.24
	Eri	74.43	7.12	64.52	33.55	28.38	7.57	98.72	190.48	0.00	0.00	0.00	19.12	0.00	0.00	0.00	0.00	32.74
	Asako	232.17	164.67	49.08	86.73	36.55	206.70	15.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.47
	Rika	3.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.214
	Midori	198.75	128.80	9.70	121.60	0.00	126.48	213.93	0.00	0.00	0.00	0.00	4.77	4.58	3.87	0.00	61.03	54.59
	Yuan	60.63	31.82	0.00	0.00	0.00	129.68	41.23	10.07	32.17	1.33	24.95	5.23	28.02	0.00	0.00	0.00	22.82

Table 16: Log Data Login Count

G1		Mobile	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	Av.
		Atsumi	5.00	5.00	3.00	7.00	4.00	2.00	2.00	5.00	6.00	6.00	6.00	6.00	3.00	3.00	2.00	2.00	4.19
		Chika	8.00	8.00	2.00	3.00	2.00	3.00	6.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	2.38
		Chieno	3.00	0.00	2.00	2.00	2.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63
		Mai	11.00	4.00	4.00	4.00	2.00	2.00	4.00	6.00	4.00	6.00	2.00	4.00	2.00	3.00	3.00	1.00	3.88
		Takashi	6.00	3.00	4.00	4.00	2.00	1.00	11.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.94
		Erika	4.00	8.00	7.00	6.00	4.00	5.00	5.00	4.00	3.00	2.00	2.00	3.00	5.00	3.00	4.00	2.00	4.19
		Toshinao	9.00	4.00	4.00	7.00	5.00	5.00	13.00	12.00	6.00	6.00	0.00	1.00	1.00	1.00	7.00	1.00	5.13
G1		Computer	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
		Atsumi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Chika	11.00	1.00	3.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.19
		Chieno	3.00	3.00	3.00	3.00	1.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19
		Mai	2.00	4.00	2.00	4.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88
		Takashi	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
		Erika	9.00	4.00	0.00	3.00	4.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50
		Toshinao	11.00	5.00	4.00	7.00	6.00	7.00	5.00	4.00	5.00	4.00	3.00	3.00	2.00	1.00	0.00	1.00	4.25
G2		Mobile	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
		Hitomi	18.00	14.00	7.00	9.00	6.00	3.00	6.00	7.00	5.00	3.00	4.00	3.00	2.00	3.00	2.00	3.00	5.94
		Eri	13.00	4.00	9.00	5.00	11.00	7.00	7.00	2.00	6.00	4.00	5.00	1.00	1.00	5.00	1.00	2.00	5.19
		Hikaru	3.00	3.00	14.00	14.00	9.00	11.00	6.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.94
		Yuuri	7.00	2.00	3.00	3.00	6.00	2.00	5.00	9.00	6.00	7.00	7.00	2.00	2.00	1.00	2.00	2.00	4.13
		Ayaka	12.00	12.00	7.00	12.00	15.00	1.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.81
		Yuka	0.00	0.00	0.00	2.00	2.00	1.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
		Asaka	2.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
		Lulu	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
G2		Computer	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
		Hitomi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Eri	1.00	0.00	1.00	1.00	1.00	2.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.63
		Hikaru	5.00	3.00	1.00	0.00	3.00	0.00	0.00	3.00	7.00	3.00	7.00	3.00	4.00	3.00	0.00	6.00	3.00
		Yuuri	1.00	3.00	0.00	0.00	0.00	2.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.63
		Ayaka	0.00	4.00	0.00	0.00	1.00	2.00	6.00	2.00	4.00	4.00	2.00	2.00	1.00	2.00	3.00	4.00	2.31
		Yuka	2.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00	0.00	1.00	5.00	4.00	1.00	0.00	1.44
		Asaka	0.00	2.00	0.00	1.00	0.00	3.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63
		Lulu	3.00	0.00	2.00	1.00	1.00	3.00	3.00	1.00	2.00	4.00	1.00	3.00	1.00	5.00	2.00	2.00	2.13
G3		Mobile	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
		Fumie	3.00	2.00	0.00	0.00	4.00	9.00	5.00	6.00	7.00	6.00	9.00	7.00	7.00	7.00	7.00	6.00	5.31
		Akiko	32.00	9.00	7.00	10.00	10.00	8.00	13.00	10.00	7.00	4.00	5.00	6.00	7.00	4.00	7.00	5.00	9.00
		Yui	8.00	6.00	0.00	0.00	4.00	5.00	11.00	0.00	0.00	0.00	0.00	2.00	1.00	1.00	2.00	1.00	2.56
		Eri	14.00	6.00	3.00	4.00	2.00	3.00	4.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	2.31
		Ayaka	7.00	2.00	8.00	11.00	9.00	8.00	11.00	3.00	5.00	3.00	0.00	2.00	1.00	4.00	4.00	0.00	4.88
		Yurina	8.00	6.00	4.00	3.00	4.00	10.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.38
G3		Computer	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
		Fumie	8.00	7.00	5.00	3.00	9.00	0.00	1.00	0.00	0.00	0.00	4.00	1.00	3.00	0.00	1.00	1.00	2.69
		Akiko	10.00	12.00	6.00	9.00	5.00	7.00	6.00	7.00	10.00	5.00	4.00	5.00	4.00	3.00	7.00	5.00	6.56
		Yui	3.00	8.00	1.00	2.00	0.00	4.00	2.00	1.00	2.00	2.00	2.00	2.00	1.00	0.00	1.00	2.00	2.06
		Eri	1.00	1.00	5.00	3.00	8.00	5.00	6.00	5.00	5.00	5.00	3.00	5.00	3.00	3.00	5.00	3.00	4.13
		Ayaka	5.00	2.00	2.00	0.00	0.00	0.00	0.00	1.00	4.00	1.00	2.00	5.00	2.00	2.00	0.00	2.00	1.75
		Yurina	8.00	5.00	6.00	3.00	7.00	11.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.56
G4		Mobile	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
		Yuri	2.00	1.00	9.00	11.00	11.00	6.00	3.00	0.00	3.00	1.00	3.00	1.00	3.00	1.00	3.00	4.00	3.88
		Saori	7.00	9.00	2.00	7.00	9.00	2.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	2.50
		Eri	6.00	0.00	3.00	0.00	1.00	6.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	1.31
		Asako	2.00	2.00	2.00	2.00	2.00	3.00	8.00	7.00	12.00	11.00	5.00	9.00	6.00	7.00	3.00	3.00	5.25
		Rika	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
		Midori	0.00	0.00	0.00	1.00	9.00	6.00	6.00	0.00	0.00	0.00	0.00	7.00	1.00	1.00	0.00	0.00	1.94
		Yuan	2.00	5.00	2.00	3.00	0.00	4.00	6.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.63
G4		Computer	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	
		Yuri	15.00	20.00	2.00	5.00	2.00	2.00	0.00	4.00	4.00	2.00	1.00	1.00	1.00	2.00	2.00	2.00	4.06
		Saori	4.00	3.00	0.00	4.00	6.00	1.00	2.00	2.00	1.00	3.00	0.00	2.00	2.00	1.00	1.00	1.00	2.06
		Eri	4.00	1.00	4.00	2.00	4.00	1.00	10.00	2.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.81
		Asako	11.00	11.00	7.00	6.00	3.00	4.00	3.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	3.94
		Rika	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
		Midori	2.00	5.00	2.00	3.00	0.00	4.00	6.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.63
		Yuan	3.00	1.00	0.00	0.00	0.00	2.00	1.00	2.00	1.00	1.00	3.00	1.00	1.00	0.00	0.00	0.00	1.00

Table 17: Mobile Entry Locations

Group 1	HW1	HW2	HW3	HW4	HW5	HW6	HW7	HW8	HW9	HW10	HW11	HW12	HW13	HW14	HW15	HW16
inside	32	19	19	31	15	21	33	13	7	5	2	11	6	3	11	4
outside	0	1	1	2	2	2	4	3	0	2	0	0	0	0	1	0
traveling	0	1	7	7	1	2	4	7	6	5	1	2	4	2	4	0
Total	32	21	27	40	18	25	41	23	13	12	3	13	10	5	16	4
Group 2	HW1	HW2	HW3	HW4	HW5	HW6	HW7	HW8	HW9	HW10	HW11	HW12	HW13	HW14	HW15	HW16
inside	21	20	22	17	16	23	23	7	9	4	11	5	3	8	3	9
outside	1	0	1	4	3	0	4	0	0	0	0	0	0	0	0	0
traveling	15	12	19	17	12	6	18	8	5	9	4	1	1	2	3	2
Total	37	32	42	38	31	29	45	15	14	13	15	6	4	10	6	11
Group 3	HW1	HW2	HW3	HW4	HW5	HW6	HW7	HW8	HW9	HW10	HW11	HW12	HW13	HW14	HW15	HW16
inside	9	1	0	0	0	2	3	7	2	3	1	2	0	3	1	4
outside	8	1	0	0	0	4	0	0	1	0	0	0	0	1	0	1
traveling	2	0	0	0	2	1	0	6	4	0	0	0	1	1	0	0
Total	19	2	0	0	2	7	3	13	7	3	1	2	1	5	1	5
Group 4	HW1	HW2	HW3	HW4	HW5	HW6	HW7	HW8	HW9	HW10	HW11	HW12	HW13	HW14	HW15	HW16
inside	6	2	3	0	1	2	7	1	5	6	1	9	4	4	1	1
outside	2	0	1	0	2	4	3	1	3	5	3	4	0	1	1	1
traveling	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Total	9	2	4	0	3	6	10	2	8	11	5	13	4	5	2	2
All Groups	HW1	HW2	HW3	HW4	HW5	HW6	HW7	HW8	HW9	HW10	HW11	HW12	HW13	HW14	HW15	HW16
inside	68	42	44	48	32	48	66	28	23	18	15	27	13	18	16	18
outside	11	2	3	6	7	10	11	4	4	7	3	4	0	2	2	2
traveling	18	13	26	24	15	9	22	21	15	14	6	3	6	5	7	2
Total	97	57	73	77	54	68	99	53	42	39	24	34	19	25	25	22

Table 18: Mobile Phone Model

	Subject	Maker	Model	Style	Width	Hieght	Full Keyboard	Browser
Group 1	Mai	Panasonic	P02B	slide	480	854	no	Mozilla/5.0
	Chika	Sharp	Aquos 945SH	flip	480	854	no	Mozilla/5.0
	Atsumi	Apple	iPhone 4	touch	640	960	yes	Mozilla/5.0
	Erika	Apple	iPhone 4	touch	640	960	yes	Mozilla/5.0
	Toshinao	Panasonic	P10A	flip	240	427	no	Mozilla/5.0
		Sharp	Aquos SH-02D (Dec)	slider	540	960	no	Mozilla/5.0
	Chieno	no int.						
	Takashi	no int.						
Group 2	Ayaka	Toshiba	Regzas IS04	touch	480	854	yes	Mozilla/5.0
	Hitomi	Apple	iPhone 4	touch	640	960	yes	Mozilla/5.0
	Lulu	Apple	iPhone	touch	640	960	yes	Mozilla/5.0
	Eri	Panasonic	P02B/ P08A3	slide	480	854	no	Mozilla/5.0
		Apple	iPhone (Nov)	touch	640	960	yes	Mozilla/5.0
	Hikaru	Sony					no	
		Toshiba	Regza IS04(sem2)	touch	480	854	yes	Mozilla/5.0
	Yuka	Apple	iPhone 4s(Oct)	touch	640	960	yes	Mozilla/5.0
	Yuuri	Apple	iPhone 4	touch	640	960	yes	Mozilla/5.0
		Toshiba	T004	flip	480	854	no	Mozilla/5.0
Asaka	no int.	(Android)						
Group 3	Akiko	Sharp	SH07B/NEC 906i	flip	480	854	no	Mozilla/5.0
	Yui	Sharp	SH07B	flip	480	854	no	Mozilla/5.0
	Eri	Apple	iPhone	touch	640	960	yes	Mozilla/5.0
	Ayaka	Apple	iPod Touch	touch	640	960	yes	Mozilla/5.0
		Sony	SOO4	flip	480	854	no	Mozilla/5.0
	Fumie	Toshiba	Regzas IS04	touch	480	854	yes	Mozilla/5.0
		Sharp	IS03 (1month)	touch	640	960	yes	Mozilla/5.0
Yurina	no int.							
Group 4	Saori	Fujitsu	F-06B	slide	480	960	no	Mozilla/5.0
	Yuri	Apple	iPhone 4s	touch	640	960	yes	Mozilla/5.0
	Yuan	Apple	iPhone 4s	touch	640	960	yes	Mozilla/5.0
	Midori	Panasonic	P02B	slide	480	854	no	Mozilla/5.0
	Eri	Apple	iPhone 4s	touch	640	960	yes	Mozilla/5.0
	Asako	Samsung	Galaxy SII SC-02C	touch	480	800	yes	Mozilla/5.0

Table 19: Message Character/Word Count

	All		Mobile		Computer		Mobile		Computer	
	Char. Count	Word Count	Char. Count	Word Count	Char. Count	Word Count	Av Char.	Av Word	Av Char.	Av Word
Group 1	53118.0	8888.0	36284.0	5977.0	16834.0	2911.0	157.8	26.0	170.0	29.4
Group 2	82483.0	14596.0	47324.0	8286.0	35159.0	6310.0	216.1	37.8	208.0	37.3
Group 3	74498.0	13030.0	34366.0	6067.0	40132.0	6963.0	243.7	43.0	243.2	42.2
Group 4	55605.0	9635.0	22280.0	3904.0	33325.0	5731.0	225.1	39.4	250.6	43.1

Table 20: Homework Picture Count

	HW 1	HW 2	HW 3	HW 4	HW 5	HW 6	HW 7	HW 8	HW 9	HW 10	HW 11	HW 12	HW 13	HW 14	HW 15	HW 16
Group 1	3	0	1	1	1	1	0	0	0	2	1	0	1	0	1	0
Group 2	2	0	0	0	1	0	0	0	0	0	2	3	3	2	2	2
Group 3	1	0	5	1	0	0	0	0	0	0	3	11	14	9	4	7
Group 4	3	3	1	0	0	0	0	1	0	0	1	4	2	2	1	2

Appendix E: MDS Data

Table 21: MDS Data All Groups April 2011

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Afternoon	0	42	37	21	33	34	34	70	31	63	63	30	44	49	64	61	18	46	63	41	25	34	33	25	32
Alone	35	0	68	47	9	28	18	44	20	57	73	44	73	31	57	46	25	64	22	18	33	53	57	18	52
Computer	39	69	0	52	32	73	63	35	27	64	85	54	60	14	46	8	69	58	70	30	69	45	76	34	50
Dictionary	25	50	55	0	41	87	99	25	20	38	91	46	54	9	18	15	18	79	89	50	53	50	9	30	75
Discussions	28	4	30	46	0	81	76	23	99	24	34	73	26	14	13	28	24	28	83	93	24	14	19	71	33
Education	24	19	72	90	88	0	98	20	75	31	96	93	28	18	16	20	33	96	109	90	56	22	43	42	94
English	23	16	65	94	81	99	0	17	55	25	94	103	39	17	18	39	17	101	97	101	62	64	49	68	102
Evening	58	37	40	20	29	26	27	0	29	51	54	27	41	49	74	52	14	34	24	34	26	28	26	22	27
Groups	32	20	19	20	98	65	51	29	0	30	32	45	18	11	36	48	36	22	84	80	12	66	17	51	21
Home	44	54	53	39	30	40	31	45	29	0	78	45	52	46	63	24	22	36	21	46	27	15	49	37	33
Homework	43	68	75	86	38	94	87	50	33	86	0	69	45	21	54	28	24	91	96	55	60	7	22	32	91
Listening	31	34	45	37	65	82	89	31	47	36	60	0	48	14	32	41	15	47	73	82	28	41	67	82	51
Mobile Phone	45	69	66	48	32	37	48	40	27	53	34	59	0	27	39	61	65	62	35	70	75	53	38	69	54
Morning	48	40	12	7	15	28	21	50	11	60	20	30	39	0	52	27	12	22	50	25	15	35	16	19	15
Night	53	47	41	23	23	27	33	62	30	69	61	37	50	55	0	40	16	33	17	37	18	30	29	23	31
Outside	39	33	17	7	22	25	32	40	40	40	22	38	63	31	46	0	42	28	41	45	19	93	20	26	27
Picture	24	18	64	11	19	37	12	16	34	24	29	6	67	13	25	48	0	20	36	10	34	68	50	7	16
Reading	31	58	54	79	40	90	88	34	21	44	86	56	66	24	38	37	21	0	79	60	73	26	23	13	77
School	44	25	64	82	81	106	89	29	75	23	85	80	37	38	11	42	32	82	0	82	55	19	34	55	84
Speaking	39	12	30	38	92	90	88	32	77	44	42	78	57	17	31	47	12	60	83	0	23	60	27	84	58
Text Message	15	34	66	56	24	58	62	22	22	28	59	31	75	13	19	28	34	72	57	32	0	17	22	11	67
Traveling	34	51	35	39	24	27	64	33	69	18	6	50	65	35	32	91	72	24	19	66	22	0	28	41	18
Video	28	47	70	16	21	34	54	29	22	58	18	75	38	13	33	18	75	21	25	40	20	29	0	78	11
Voice	25	10	38	28	81	42	57	27	53	27	15	90	81	19	25	40	10	43	45	95	19	37	81	0	7
Writing	25	51	62	74	26	93	88	24	17	31	87	45	40	12	22	15	25	52	85	38	78	20	11	12	0

Table 22: MDS Data All Groups January 2012

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Afternoon	0	2	4	3	2	4	4	0	4	1	3	4	5	0	0	4	2	4	4	4	4	4	3	4	3
Alone	32	0	72	47	15	36	35	43	44	55	70	43	70	39	57	43	33	64	34	29	39	53	47	26	49
Computer	41	63	0	53	40	69	57	43	34	62	78	46	80	23	44	23	59	45	70	32	58	39	66	31	54
Dictionary	33	42	66	0	46	88	94	24	26	38	89	46	57	22	32	26	20	84	86	44	50	50	22	29	73
Discussions	35	18	48	41	0	81	73	26	101	32	58	74	49	21	24	28	31	38	84	94	38	21	29	84	42
Education	33	28	73	85	86	0	94	29	65	44	96	89	49	24	22	45	45	95	107	90	53	40	43	46	94
English	32	35	75	94	80	102	0	28	57	35	89	101	55	22	26	43	33	98	99	97	62	73	46	66	97
Evening	67	42	36	26	32	33	25	0	28	48	54	37	50	65	75	39	24	36	33	47	37	35	30	30	36
Groups	34	38	27	24	98	68	57	27	0	28	33	44	36	16	23	41	37	29	82	72	28	56	27	53	27
Home	35	58	59	30	26	37	32	33	30	0	80	32	57	56	59	31	25	37	27	41	31	23	45	37	42
Homework	48	61	79	83	50	100	90	53	42	83	0	76	53	31	55	22	30	90	99	62	53	13	25	27	89
Listening	33	27	54	42	75	86	88	32	57	39	62	0	59	25	26	46	10	63	84	80	28	53	57	84	61
Mobile Phone	49	60	73	61	55	51	62	42	40	50	46	66	0	32	46	60	62	67	41	82	76	60	55	84	56
Morning	54	42	20	15	16	26	20	51	15	58	23	25	37	0	55	31	17	18	35	24	20	22	12	26	16
Night	67	47	42	27	23	24	34	78	29	60	57	39	47	58	0	42	24	36	19	40	31	32	32	37	36
Outside	43	40	22	24	28	35	34	46	41	40	30	42	66	26	43	0	47	33	59	45	36	82	16	41	27
Picture	25	33	69	20	19	40	29	26	36	31	34	14	76	15	29	47	0	15	47	18	32	60	62	13	25
Reading	32	48	58	79	37	92	85	32	35	40	88	65	59	20	30	34	24	0	90	63	77	29	28	36	69
School	51	33	77	87	83	108	96	35	69	30	99	91	45	40	24	38	37	94	0	85	56	25	42	52	96
Speaking	41	20	35	43	91	87	88	40	65	35	46	85	84	27	33	46	23	64	84	0	31	52	42	87	64
Text Message	33	35	69	42	38	51	60	41	36	37	46	31	87	22	37	29	41	81	51	35	0	31	21	27	75
Traveling	36	42	38	42	24	30	59	37	56	17	13	38	59	37	32	93	68	32	31	55	29	0	34	43	25
Video	29	37	77	20	20	34	48	29	29	48	23	72	61	19	31	25	64	27	37	42	25	37	0	78	17
Voice	33	15	51	32	81	47	49	33	54	36	29	79	83	22	36	41	15	39	60	89	21	48	81	0	21
Writing	34	48	58	67	37	95	84	28	27	38	92	70	57	18	33	22	22	73	87	65	69	28	19	20	0

Table 23: MDS Data Point Coordinates

	X	Y		X	Y
1a	-0.27462527	-0.005350172	1b	-0.23670166	0.039543554
2a	-0.25745151	0.317054889	2b	-0.21289362	0.201591386
3a	0.02668006	0.212222471	3b	0.01094676	0.163252225
4a	0.28617097	0.22854103	4b	0.21884289	0.168551591
5a	0.26002962	-0.299168242	5b	0.25237287	-0.229510169
6a	0.30647147	0.030809641	6b	0.30502858	-0.011587911
7a	0.28929723	-0.047778212	7b	0.28451315	-0.045036052
8a	-0.29766294	0.042597691	8b	-0.28537355	0.063630471
9a	0.06368744	-0.355838883	9b	0.07230668	-0.284617264
10a	-0.24338493	0.158291412	10b	-0.18709124	0.151106826
11a	0.13591924	0.360985002	11b	0.14210539	0.239149113
12a	0.13967274	-0.148598224	12b	0.18394135	-0.164452177
13a	-0.18258079	0.017608196	13b	-0.06061734	-0.036109315
14a	-0.37027117	0.036322418	14b	-0.3459251	0.053424442
15a	-0.37531833	0.097157867	15b	-0.31193675	0.097951205
16a	-0.28005118	-0.213384478	16b	-0.23912456	-0.140649893
17a	-0.22419047	-0.048809276	17b	-0.2260883	-0.001737352
18a	0.1646837	0.188906632	18b	0.20498425	0.189364673
19a	0.28659457	-0.017355562	19b	0.25268925	-0.005953436
20a	0.15938461	-0.281884222	20b	0.16311693	-0.226271306
21a	0.14858361	0.273443161	21b	0.05858094	0.196862797
22a	-0.2167696	-0.248373225	22b	-0.20817035	-0.22534531
23a	-0.15836111	-0.130511235	23b	-0.15385001	-0.147959844
24a	0.04751313	-0.397716879	24b	0.02638607	-0.344435576
25a	0.24447316	0.316039575	25b	0.23527191	0.237973126

Table 25: MDS Plot Euclidean distances 1b to 25b

	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a	14a	15a	16a	17a	18a	19a	20a	21a	22a	23a	24a	25a		
1a																											
2a																											
3a																											
4a																											
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Appendix F: e-Journal Data

Table 26: e-Journal Inter-Group Communications

	face to face	Website-Mobile	Website-Comp	Voice Call	e-mail	Other Website	Other
Sem 1 Group 1	14	16	13	1	2	0	0
Sem 2 Group 1	18	26	20	1	3	0	0
Sem 1 Group 2	5	9	3	0	0	1	0
Sem 2 Group 2	7	12	4	0	0	2	0
Sem 1 Group 3	26	19	17	8	14	13	0
Sem 2 Group 3	40	27	22	15	21	20	0
Sem 1 Group 4	18	10	13	2	8	10	0
Sem 2 Group 4	24	11	15	4	12	14	0
Totals	152	130	107	31	60	60	0

Appendix G: End of Year Final Questions

Questions: 1-6

Instructions: これらの質問には、日本語か英語で答えて下さい。

You may answer these questions in Japanese or English.

1. どんな時、面談の方が e-mail よりもコミュニケーションをとるのに好ましいと思いますか？それは、何故ですか？When do you prefer to communicate face-to-face more than email? Why?
2. どんな時、e-mail の方が面談よりもコミュニケーションをとるのに好ましいと思いますか？それは、何故ですか？ When do you prefer to communicate with email more than face-to-face? Why?
3. 宿題のために携帯電話を使用することは、あなたの学校の宿題に対する考え方を変えましたか？説明して下さい。Has using a mobile phone for your homework changed the way you think of your school homework? Please explain.
4. 宿題のために携帯電話を使用することは、あなたの携帯電話に対する考え方を変えましたか？説明して下さい。Has using a mobile phone for your homework changed the way you think of your mobile phone? Please explain.
5. 宿題のために携帯電話を使用することは、学習に役立ちましたか？説明して下さい。Has using a mobile phone for your homework helped you to learn? Please explain.
6. 何故、日本では、携帯電話のテキストメッセージを用いてコミュニケーションをとることが、大変、人気があるのだと思いますか？
Why do you think communicating with text message on a mobile phone are so popular in Japan?

Appendix H: MDS Analysis

In this case, Kruskal's(1978) terminology was used, where the data pertains to a collection of objects indexed firstly by the letter i and secondarily by j and that run from 1 to n . This paper uses 25 words so in this case $n = 25$. The proximity, the data value connecting an i -th object (o_i) with a j -th object (o_j), is represented by δ_{ij} . The values δ_{ij} form a matrix Δ . In other words, we have a set of n^2 numerical relationships, called δ_{ij} between pairs of objects. The value δ_{ij} represents the extent to which an object i is related to an object j (Bezdek, 1999).

Multidimensional Scaling (MDS) is a method for capturing efficient information from observed dissimilarity data by representing the data structure in lower dimensional spatial space. As a metric MDS, the following model (Gower, 1966), (Kruskal & Wish, 1978) has been proposed:

$$d_{ij} = \left\{ \sum_{\lambda=1}^R d^k(x_{i\lambda}, x_{j\lambda}) \right\}^{\frac{1}{k}} + \varepsilon_{ij}. \quad (1.1)$$

In (1.1) d_{ij} is an observed dissimilarity between objects i and j , and $x_{j\lambda}$ shows the value of the coordinate of an object i with respect to dimension λ in R dimensional configuration space. For the purpose of this paper $R = 2$ so the result is presented in a two-dimensional plot. ε_{ij} is an error. $d^k(x_{i\lambda}, x_{j\lambda})$ shows dissimilarity between objects i and j , and usually $d^k(x_{i\lambda}, x_{j\lambda}) = |x_{i\lambda} - x_{j\lambda}|^k$. MDS finds R dimensional points (x_{i1}, \dots, x_{iR}) and illustrates the structure of the similarity relationship among the objects by representing the observed d_{ij} as the distance between a point $(x_{i\lambda})$ and a point $(x_{j\lambda})$ in R dimensional space. In (1.1) we use Euclidian distance when $k = 2$.

A special representation of a dissimilarity matrix consists of a set of R dimensional coordinates representing each object, chosen so that the distances between the points in the R dimensional space, match closely to the observed dissimilarities. Finding the 'best' fitting set of coordinates is the goal of multidimensional scaling techniques (Everitt & Rabe-Hesketh, 1997). As previously mentioned, in this paper a two-dimensional ($R = 2$) solution is used. This is because it has the benefit of

being simple and provides an easily understood basis for an understanding of the dissimilarity data (Everitt & Rabe-Hesketh, 1997). The target data of MDS is dissimilarity data, d_{ij} . However, our observed data is similarity data between a pair of objects i and j , s_{ij} . So, this similarity data needs to be transformed to dissimilarity data as follows:

$$d_{ij} = \frac{s_{ij}}{\max_{i,j}(s_{ij})}, \quad i, j = 1, \dots, n.$$

Then this dissimilarity data can be applied to the MDS shown in (1.1) and a result obtained. The output from MDS is in the form of a plot of all the objects (words), and the distance between them indicates the value of dissimilarity. In other words, the closer the words appear in the plot the higher the perceived similarity.

Appendix I: Ethics Approval Form

MSc, PhD, EdD & DEdPsych theses.



Graduate School of Education

Certificate of ethical research approval

MSc, PhD, EdD & DEdPsych theses

To activate this certificate you need to first sign it yourself, and then have it signed by your supervisor and finally by the Chair of the School's Ethics Committee.

For further information on ethical educational research access the guidelines on the BERA web site: <http://www.bera.ac.uk/publications> and view the School's Policy online.

READ THIS FORM CAREFULLY AND THEN COMPLETE IT ON YOUR COMPUTER (the form will expand to contain the text you enter). **DO NOT COMPLETE BY HAND**

Your name: Peter Ilic

Your student no: 590060752

Return address for this certificate:

DIA Palace #509, Fujisaki 1-1-13, Tsuchiura, Ibaraki, Japan. 300-0813

Degree/Programme of Study: PhD Education (4 year)

Project Supervisor(s): Professor Rupert Wegerif

Your email address: pi207@exeter.ac.uk

Tel: (+81) 29-827-0562

I hereby certify that I will abide by the details given overleaf and that I undertake in my thesis to respect the dignity and privacy of those participating in this research.

I confirm that if my research should change radically, I will complete a further form.

Signed:

A handwritten signature in black ink that reads "Peter Ilic".

.date: 07 / 18 / 2013

Chair of the School's Ethics Committee
updated: March 2013

Certificate of ethical research approval

PLEASE ALLOW A MINIMUM OF ONE MONTH FOR THE ETHICAL APPROVAL PROCEDURE TO BE COMPLETED.

TITLE OF YOUR PROJECT: The impact of Mobile phones on Collaborative learning Activities

1. Brief description of your research project:

The main theme of this thesis is the role of mobile phones as a support for collaborative learning both in and out of the classroom. The questions asked are: What is the distinctive affordance offered by the mobile phone for collaborative learning? What is the affective relationship between student the mobile phone and the homework? Does the intervention affect the relationship between students the mobile phone and the homework? Does the affordance offered by the technology lead to more awareness of learning? What is the nature of the dialogue with the mobile phone technology? In this thesis, the methodology is designed to explore the areas of the collaborative learning and the use of mobile phones as a support for collaborative learning through critical reviews of the literature and through a year-long exploratory multiple case study approach integrating both qualitative data analysis and quantitative data analysis. Qualitative exploratory interviews and surveys are combined with extensive quantitative internet log data to provide a detailed image of students' mobile use during collaborative activities. The results are triangulated and key issues are interpreted and discussed in light of current research. The findings of the study support four key hypotheses which emerge from the theoretical framework. First, that there are distinctive affordances offered by the mobile phone for collaborative learning which increase learning opportunities. Second, that the affective relationship between students the mobile phone and the homework has a positive influence on attitudes towards homework. Third, that the intervention affected the relationship between students the mobile phone and the homework by reducing barriers between the private and public spaces of participates. Fourth, the affordances offered by the technology leads to more awareness of content through an increase in reflection opportunities. Fifth, some insights into the nature of the dialogue with the mobile phone technology are explored. These findings have significant implications for educational theory and practice since they provide evidence to support some key issues related to the incorporation of mobile devices into collaborative educational situations. This research will be of interest to those concerned with the impact of mobile devices on the area of collaborative learning specifically and the field of education in general. The contribution that this research brings to scholarship and to the educational community is an increased understanding of the ways that ubiquitous mobile technology can affect a student's mobile-based collaborative learning experience. The integration of these findings into the current body of knowledge will lead to improvements in future educational design and highlight areas which require further research.

2. Give details of the participants in this research (giving ages of any children and/or young people involved):

Participant selection will be on a completely voluntary basis. Approximately fifty 2nd and 3rd year University students between the ages of 19 and 21 are the possible participants who will be introduced to the research and asked to contact the researcher if they would like to participate. During the introduction participants are informed that the research will have no rewards and will have no effect on their academic performance.

Give details (with special reference to any children or those with special needs) regarding the ethical issues of: No children or special needs students will take part in this research.

3. Informed consent: Where children in schools are involved this includes both headteachers and parents). Copy(ies) of your consent form(s) you will be using must accompany this document. a blank consent form can be downloaded from the GSE student access on-line documents: **Each consent form MUST be personalised with your contact details.**

No children took part in this research, but the participants were asked to sign a consent form which included below:

Research Subject Consent Form

Circle your class: Translation 1 Translation 2 Translation 3 Translation 4
 Can you enter my website using your mobile phone? Yes No

This research will investigate the possible advantages of using mobile devices to assist in completing collaborative activities. This research will require approximately 4 hours of your time in semester 1 and 2. You will have 2 interviews; one in semester 1 and one semester 2. You may withdraw from this study at any time during the year without an explanation.

These interviews will NOT affect your grade in this class. If you participate in this research you will NOT be required to do anything that will affect your responsibilities or mark in the class.

All data collected will be available to you at any time. NO personally identifiable information will be published and any stored data will be in encrypted form. They will not be used other than for the purposes described above and third parties will not be allowed access to them (except as may be required by the law). However, if you request it, you will be supplied with a copy of your interview transcript so that you can comment on and edit it as you see fit. Your data will be held indefinitely on an anonymous basis.

If you are interested, please hand this paper to me or contact me at:
 Peter Ilic (Department of English Communications)
 Hakusan Campus, Building 6, Room # 60423
 pi207@exeter.ac.jp or peter@toyo.jp

If you have any concerns you may contact my advisor:
 Prof. Rupert Wegerif (Department of Education, Exeter University)
 r.b.wegerif@exeter.ac.uk

I voluntarily agree to participate and to the use of my data for the purposes specified above. I can withdraw consent at any time by contacting the researcher.

TICK HERE: DATE.....

Note: Your contact details are kept separately from your data

Name of interviewee:.....
 Signature:
 Email/phone:.....
 Signature of researcher.....

4. anonymity and confidentiality

Participants will be identified by group number and first name only so there will be no way for anyone viewing the data to be able to understand the identity of the participants. All data will be stored on a single encrypted hard disk which is physically locked as well as password protected. This drive will not be moved and is in a locked office.

5. Give details of the methods to be used for data collection and analysis and how you would ensure they do not cause any harm, detriment or unreasonable stress:

Second and third year undergraduate university student will complete electronic journals (e-journals), student artefacts, face to face interviews, and online collaboration transcripts and this will be the means of data collection over a period of one academic year. E-journals will provide a means to collect the students' reflection about their exploration and use of the mobile phones in their collaborative activities throughout the year. The primary artefact will be the forum comments submitted by each student during the homework activity which will be collected from the web site activity logs. Two semi-structured individual interviews will be conducted during a one year period. The first will be held at the end of the first semester and the second interview and at the end of the second semester. With these data sources the researchers will be able to use triangulate to better understand the use of the mobile phone as mentioned by the students in their e-journals, interviews, and through artefacts. A computer logging systems will be used to record the subjects' use of the mobile website which includes access times and comments posted. These logging systems, will give the researcher an opportunity to identify interesting usage patterns that may be investigated further during the interviews as well as informing the interview questions. Participants will be able to leave the research group at any time or decline participation in any part of the research without explanation.

6. Give details of any other ethical issues which may arise from this project - e.g. secure storage of videos/recorded interviews/photos/completed questionnaires, or

Participants will be identified by group number and first name only so there will be no way for anyone viewing the data to be able to understand the identity of the participants. All data will be stored on a single encrypted hard disk which is physically locked as well as password protected. This drive will not be moved and is in a locked office.

7. Special arrangements made for participants with special needs etc.

No participants with special needs are included in this research.

8. Give details of any exceptional factors, which may raise ethical issues (e.g. potential political or ideological conflicts which may pose danger or harm to participants):

There is no foreseeable harm that the research can cause the participants since the selection is voluntary, all posted comments are controlled by the participants, the interviews are voluntary, and the participants are not required to do any extra class activities.

This form should now be printed out, signed by you on the first page and sent to your supervisor to sign. Your supervisor will forward this document to the School's **Research Support Office** for the Chair of the School's Ethics Committee to countersign. A unique approval reference will be added and this certificate will be returned to you to be included at the back of your dissertation/thesis.

N.B. You should not start the fieldwork part of the project until you have the signature of your supervisor

This project has been approved for the period: *October 2010* until: *September 2013*

R. Węgraj

By (above mentioned supervisor's signature):

....date:....21/08/2013...

N.B. To Supervisor: Please ensure that ethical issues are addressed annually in your report and if any changes in the research occur a further form is completed.

GSE unique approval reference:.....*D/12/13/43*.....

R. Węgraj

Signed:.....

.....date:.....21/08/2013.....

Chair of the School's Ethics Committee. (Director of Research on behalf of Chair of Ethics Committee)

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ENDNOTES

¹ Interviews\\Time 1\\G1_Atsumi

G1_Atsumi: I like the design. It is very thin

² Interviews\\Time 2\\G1_Atsumi

G1_Atsumi: I think it's easy to operate for me, we can do that with one hand and we can touch the screen.

³ Interviews\\Time 1\\G1_Mai_01

I: Ok. So it is easy to carry?

Mai_01: Yes.

⁴ Interviews\\Time 1\\G1_Erika

I: Okay. When you log-in with mobile phone to read answers when is that?

G1_Erika: While taking train. Yeah, mainly.

I: Does that help you - checking on the train? Why do you check on the train?

G1_Erika: Mobile phone is very compact to bring and I often use mobile phone on the train, so I also check website.

⁵ Weekly E-journal Comments

G2_Ayaka 2011-05-30 I'm sorry that I forgot to post the comment of homework 2. I enjoyed doing the homework, and it is nice to do homework on the train even though I can't sit on the seat.

⁶ Interviews\\Time 2\\G3_Eri

I: So why do you make notes on mobile phone and not notebook? Why do you choose the mobile phone?

G3_Eri: When I get on the train, maybe - depends on the situation. When I use a notebook, maybe there are space, but when I use a mobile phone, maybe crowd around me so mobile is best to use, in that situation.

⁷ Interviews\\Time 1\\G2_Ayaka

I: When - you do my homework, you said, different times, many times. When do you do other class homework usually, like PC homework or paper homework?

G2_Ayaka: At night, I always do my homework at night.

I: Why don't you do it on the train?

G2_Ayaka: Because in the train many people, there are many people packed, so... Yes, so I cannot sit down the seat, so I don't have any space to do, so I can only use this mobile phone.

⁸ Interviews\\Time 1\\G2_Yuuri

I: So when you bought your iPhone, you were thinking about homework?

G2_Yuuri: To do my homework.

I: You would like to do homework in other classes if possible?

G2_Yuuri: Yes.

⁹ Interviews\\Time 2\\G2_Yuuri

I: Why do you think you enter it more often with a mobile phone than with a PC?

G2_Yuuri: I don't need to worry about it - others - other people's - if I use PC next to people, pass on things, pass on...

I: Watching?

G2_Yuuri:...watching the screen, I don't like that so I can use mobile phone and I don't worry about that.

I: So it has more privacy?

G2_Yuuri: Yes.

¹⁰ Interviews\\Time 2\\G2_Yuuri

I: Why do you think you enter it more often with a mobile phone than with a PC?

G2_Yuuri: I don't need to worry about it - others - other people - if I use PC next to people, pass on things, pass on...

I: Watching?

G2_Yuuri:...watching the screen, I don't like that so I can use mobile phone and I don't worry about that.

I: So it has more privacy?

G2_Yuuri: Yes.

¹¹ Interviews\Time 1\G3_Ayaka

G3_Ayaka: Yeah, while riding a train. If I can get a free time I often see our website.

I: Okay, good. Okay, so usually you check on the train?

G3_Ayaka: Mm, train and the class.

¹² Interviews\Time 2\ G3_Ayaka

G3_Ayaka: The most useful - the most useful things to have a Smartphone or iPod Touch is I can do homework or research every time and everywhere. So I think it's very useful for me to do so, know everywhere - any time, everywhere, to do something, everything. If I have no mobile phone I have to go to PC Learn or [unclear] of the computer so it's need to a lot of time to - so it's need not time. Its need not time to the homework.

I: So do you think using a mobile phone for your homework increases the time that you spend on homework?

G3_Ayaka: Yes, increase the homework and the think about homework.

¹³ Interviews\Time 2\ G3_Ayaka

G3_Ayaka: Mobile phone. Maybe, and semester 2 at deadline 11:00 pm. When I use mobile phone to do homework maybe I was the working place and when I do homework by using computer maybe when I was in home.

I: So that's why computer is bigger...

G3_Ayaka: Yes, yes. So this time to do homework by using computer. Weekdays I was in working place so I often use mobile phone this time - during this time.

I: Between four and five...

G3_Ayaka: Yes because this [less time]. Yeah. So [unclear] less time I often do homework by using mobile phone.

I: That's second semester?

G3_Ayaka: Second - only second semester.

I: On break time.

G3_Ayaka: Yeah.

I: So if you did not have mobile phone at this break time what would you do?

G3_Ayaka: Maybe I can't do homework because I'm in working place so no computers. So I can - I have no way to do homework in working place.

¹⁴ Interviews\Time 1\G1_Atsumi

Travel: Train

I: You log in many times. Is there any advantage or disadvantage to using mobile phone for homework.

G1_Atsumi: Advantage is that we can do assignment anywhere with a mobile phone.

I: How does that help you to do your homework?

G1_Atsumi: Homework on mobile phone I can do in the train. We don't have time so much and the time taking the train is very long and boring last year, but this year I have the mobile phone site so I can do homework on the train. Maybe it seems like a simple problem but I think it is important that we can use the mobile phone to do homework on the train. It is really great for me. I think.

¹⁵ Interviews\Time 2\G1_Atsumi

I: This is your group; this is the time of the day when they log on the website. You can see the red is computer, blue is mobile and of course one in the morning, two in the morning, three, not many people but suddenly six, seven, eight and nine there is a lot.

G1_Atsumi: Maybe they are in the train and going to school.

I: Do you think they have access to computer at this time?

G1_Atsumi: No, I think they're in the train or some people.

I: So if you did not have mobile phone could you access the website at this time?

G1_Atsumi: No.

I: If you did not access the website at that time, what would you do on the train?

G1_Atsumi: I would sleep.

¹⁶ Interviews\\Time 1\\G1_Erika

G1_Erika: Advantage is I think I can see - I can open the website everywhere. So yes I think so.

I: Where do you usually open the website with mobile?

G1_Erika: Usually when taking train or walking to school - coming to school - I often using, opening website while I going school or coming back home.

G1_Erika: it helps me to think, to [remind the class], the topic of class or the way of thinking to do homework

I: do you like the idea of doing homework on mobile phone?

G1_Erika: Yes I like it, because it's convenient to do homework by mobile phone because I bring mobile phone - always bring it - and I can do homework whenever I want to do it. So it's convenient I think.

¹⁷ Interviews\\Time 2\\ G1_Erika

I: Okay. Where do you think everyone is here?

G1_Erika: Nine o'clock in the morning? Oh [laugh] home or in a train.

I: I don't know what, nine o'clock. Are you coming to school?

G1_Erika: Maybe.

I: Do you use it on the train to check homework?

G1_Erika: Yes.

I: Okay, how much time do you have on the train?

G1_Erika: I have time, about one hour. Especially, I 30 minutes train I have so I do homework in the train.

I: I see, okay. If you did not have mobile phone could you do homework in the train?

G1_Erika: I think I couldn't without iPhone.

¹⁸ Interviews\\Time 1\\G1_Toshinao

I: Where do you usually use the mobile phone to do the homework?

G1_Toshinaoi: Outside. I often use my mobile phone to check other students' posts or comments. Outside, for example, in the train, on the way to my home.

I: Do you like that? Do you think that's a good thing?

G1_Toshinaoi: Yes.

¹⁹ Interviews\\Time 1\\G2_Ayaka

I: If you only had PC, no mobile, would you go to website same number of times?

G2_Ayaka No, because I - I always bring the mobile phone, so to kill time, I watch the website.

²⁰ Interviews\\Time 1\\G3_Eri

G3_Eri: Computer is very heavy so I can't take it every day so I use iPhone. I always use iPhone. It's easy to answer my question.

I: Okay, all right, so why do you use the mobile phone and not just a computer for my homework?

G3_Eri: It's easy to do homework.

G3_Eri: Computer is not always - I have not always so always the people have the computer at home so the mobile phone is very easy to do homework every time, everywhere so the mobile phone is a good way to do homework.

I: Yes, okay. When do you usually do other class homework?

G3_Eri: Morning.

I: In the morning, okay, and my class homework?

G3_Eri: Is any time.

²¹ Interviews\\Time 1\\G3_Yui

G3_Yui: I watch on the mobile phone and - I often reply on the computer.

I: Okay, so why do you watch on the mobile phone?

G3_Yui: Many students reply every time, so I don't have computer always so I want to watch members comment. When I want to watch members comment I use mobile phone.

I: When do you enter website and watch other people's comments? When or where?

G3_Yui: Always outside. Far away from home.

G3_Yui: I go shopping and school - in school or...

I: Why don't you use computer at school?

G3_Yui: Many people in computer room, so I can't use many

²² Interviews\\Time 1\\G3_Fumie

G3_Fumie: In my home I use a PC, so I think this homework is advantage over -not only using PC - so I can use the cell phone - so I often use my cell phone on train. So I take one hour 20 minutes, university to my home, so before studying this homework I always [sleep], but I check homework. I often check this homework on the train.

G3_Fumie: Train time is long. Sometimes I am on the train so long and I think on the train is my free time, so I think on the train is good using cell phone [unclear].

²³ Interviews\\Time 1\\G4_Midori

G4_Midori: Because if I go outside and free time I can watch comment, so mobile phone is very convenient.

²⁴ Interviews\\Time 2\\ G1_Toshinao

I: Okay. So if you did not have - imagine no mobile phone - would you access homework at these times and places?

G1_Toshinao: No. Maybe I would go to Knowledge Square or the department office - as you know, there are some PCs.

I: So in the cafeteria and classrooms and library...

G1_Toshinao: I couldn't do anything. I would have to give up doing homework.

I: Imagine you do not have a mobile phone - ever - just imagine. Would you do homework on the train?

G1_Toshinao: No.

²⁵ Interviews\\Time 2\\ G2_Ayaka

I: If you did not have a mobile phone, would you do my homework at lunch?

G2_Ayaka: No.

I: Okay. Maybe that's why. So, this is when you enter the website. Sometimes one o'clock or nine, ten. What's happening at this time?

G2_Ayaka: Maybe when I get on the train.

I: At this time - can you use a computer at this time?

G2_Ayaka: No.

I: If you did not have a mobile phone, could you do my homework at this time?

G2_Ayaka: No.

I: When do you use face to face and when do you use mobile? When is it better face to face and when is it better mobile?

G2_Ayaka: Mobile phone is better when I am travelling. Yeah.

I: When you're travelling, can you enter my website a different way? Not mobile?

G2_Ayaka: No.

I: So, entering my website while travelling, entering a website while travelling to do homework - can you do that in - does that increase your chance to do homework?

G2_Ayaka: Yes.

I: Does that help you to learn, to understand?

G2_Ayaka: Yeah. I think.

²⁶ Interviews\\Time 2\\ G3_Eri

I: Do you use yours inside for homework?

G3_Eri: Sometimes.

I: Where, usually?

G3_Eri: Inside? My room, or restaurant.

I: If you did not have a mobile phone, could you do your homework in a restaurant?

G3_Eri: No.

I: Okay. So the mobile phone gives you more chance to do homework?

G3_Eri: Yes.

I: Where else do you use the mobile phone for homework?

G3_Eri: On the train or bus or walking to go to school or at home.

I: So walking, you could use a computer?

G3_Eri: Oh, no.

I: Or train or bus?

G3_Eri: Oh, okay. No, I can't use computer doing the walking or bus and train.

I: So the mobile phone lets you work on the bus, train, and walking, but if you did not have mobile phone, you could not do homework on the train, bus, or walking as easily?

G3_Eri: Yes.

I: This is a little interesting, right here. Eight, nine, 10 at night, 11 at night, you're actually using mobile phone more than computer. What's the reason there?

G3_Eri: Maybe I - I have part-time job in these, so when I part-time job, I can't use computer, so I use mobile phone.

I: For homework. Is that good for you? Does it help you to do homework?

G3_Eri: It helps to do homework.

²⁷ Interviews\Time 2\ G3_Yui

I: So you use mobile phone at work?

G3_Yui: Yeah.

I: Can you use a computer at work?

G3_Yui: Yes. But I'm not so use often in my work.

I: At work you sometimes look at homework page?

G3_Yui: Yes, but I watch on mobile phone.

I: If you are at work, would you look at homework if you did not have mobile? If you did not have mobile phone, would you look at homework at work?

G3_Yui: At work, if you don't have mobile phone I never watch my homework because I can't remember my homework website URL.

I: This is one here. This is one o'clock am, morning, two, three, four, dah, dah, dah, midnight. Blue is mobile phone, red is computer. You can see at about 10 o'clock a lot of people use mobile phone, at nine o'clock almost no computer. Why do you think so?

G3_Yui: Nine o'clock is they include me. They go to school in train or in bus or walking, so they cannot use computer.

I: So they cannot use computer?

G3_Yui: Yes.

I: If they cannot use computer on train and bus and they do not have mobile phone, then they cannot do homework on the - they cannot access website.

G3_Yui: Yes.

²⁸ Interviews\Time 2\ G3_Fumie

I: How long do you usually use it on the train?

G3_Fumie: [Unclear] but about 20 to 30 maybe. So I often find looking for answer, so station or for start on train - so I like with my hometown - the way to home walking look shops on the road for photo or quote - [unclear]. [Unclear] and walking go home.

I: If you find example walking home or on the train, what do you do?

G3_Fumie: Like [unclear] or - so mobile open web site and reply answer.

²⁹ Interviews\Time 2\ G4_Midori

Travel: Train

I: Where do you use mobile phone for homework?

G4_Midori: When I take train and at school.

Unusual: Toilet

I: Where at school?

G4_Midori: Where at school? In the WC.

I: In the toilet?

School: lunch

G4_Midori: Maybe I go to school this time so I use mobile phone.

I: You're at school?

G4_Midori: Yes.

I: What eating lunch?

G4_Midori: Yes.

I: Where are you?

G4_Midori: [Unclear].

I: Do you have a PC at that time?

G4_Midori: No.

I: If you did not have mobile phone this time, lunch time in the classroom could you connect to homework?

G4_Midori: Maybe not.

³⁰ Interviews\\Time 2\\ G4_Midori

G4_Midori: Yeah. I was busy.

I: No, that's good that means you used a lot of mobile phone. So what do you mean busy? Why busy equals a lot of mobile? What do you mean?

G4_Midori: Play with my friends all the time so I don't go to my home and don't open the PC so I use the mobile phone.

I: I see, okay. If you did not have mobile phone here and you're out with your friends could you do homework?

G4_Midori: [Unclear] go to café.

I: Okay, you have to go to café?

G4_Midori: Mmm.

³¹ Interviews\\Time 1\\G2_Hitomi

I: Do you think mobile - this Ketai is useful for homework?

G2_Hitomi: Yes, useful, I think useful.

G2_Hitomi: Because when I not have a iPhone I always check on my house personal computer. Just mean I - at home use, I can use personal computer at home, only use, so if I have my opinion at school, not - I can't write, I just - not log in, so useful.

G2_Hitomi: Everywhere - the train, just walk, just at school, on lunchtime, something.

³² Interviews\\Time 1\\G4_Asako

I: What do you think the difference is between doing homework on computer and doing homework on mobile phone? What do you think is good or bad?

G4_Asako: Cell phone is good because all the time can reply. But on computer I can't reply with working or something. So mobile is good but I think it depend on myself, I think.

I: Okay. Would you like to other classes, to have homework on mobile phone?

G4_Asako: Yes.

I: Why?

G4_Asako: I do my homework on website when I get back my home at night. Only night or morning early. So I want to do my homework all the time I think up idea.

³³ Final Questions G3_Yui Question 5

携帯電話から投稿できるので思い立ったときにすぐ出来て、どこにいても出来るので便利でした。

Because I was able to do my homework as soon as I had an idea of what I wanted to write about, I was able to do it right away. It's convenient to be able to do this from anywhere.

³⁴ Interviews\\Time 1\\G2_Hikaru

G2_Hikaru: I can use cell phone in the train, mainly I can use - I use telephone. Not use computer.

I: Why do you like using mobile phone, cell phone for homework?

G2_Hikaru: I can use - I can put comment everywhere, I - everywhere I am. If I use PC I must go back home, so I use cell phone mainly.

³⁵ Interviews\\Time 2\\ G2_Hikaru

I: This is different here. So, three o'clock and five o'clock. So you used it more second semester at three o'clock and five o'clock. The class finishes at 2:30. Your class is Wednesday at 2:40.

G2_Hikaru: 2:40. Sometimes I read other student answer when I take that class.

I: In the class?

G2_Hikaru: In the class.

I: During class? If you did not have a mobile phone, could you look at other students' comments in the class?

G2_Hikaru: No, I can't.

I: Why do you look at other students' comments in class?

G2_Hikaru: Second semester, my group member often put their answer before the train.

G2_Hikaru: Tuesday. But I want their answer quickly so I check answers.

³⁶ Interviews\\Time 2\\ G2_Hikaru

I: How is different, doing homework with mobile and homework with PC, how is it different for you? Why do you choose mobile?

G2_Hikaru: If I use PC, then I must go back home, if I use mobile phone, I can do homework in the train for bus.

I: So higher on Tuesday. Blue is mobile phone, red is computer. So you can see Monday. So, many people on Monday use mobile phone. Why do you think that is? Big difference here, not so much here.

G2_Hikaru: Maybe they remind that deadline.

I: Okay, so they remember deadline. But why mobile phone, not so much computers?

G2_Hikaru: Maybe remind deadline in the place of - there is no computer.

I: Example?

G2_Hikaru: Train, bus, car.

³⁷ Interviews\\Time 2\\ G2_Yuuri

I: So you don't use it inside? Inside means school, home, restaurant.

G2_Yuuri: Sometimes I used.

I: Where?

G2_Yuuri: Here and at home and at working place.

I: Do you - can you access a personal computer, PC at home?

G2_Yuuri: Yes.

I: How about school? Can you access a PC at school?

G2_Yuuri: Oh yes.

I: At work can you access a PC?

G2_Yuuri: No.

³⁸ Interviews\\Time 1\\G2_Yuuri

I: When you access my website with mobile phone, when do you usually do it?

G2_Yuuri: At night, at late night, or morning to school, go to school - on the way to school.

I: Why?

G2_Yuuri: I have my part-time job from evening to late night, so I don't have enough time to do my homework at home, so I always on a train, I do it on a train.

I: How do you do other homework in other classes?

G2_Yuuri: By PC many times.

I: When do you usually do that homework?

G2_Yuuri: When I can use PC it is - I am at home, only at home.

³⁹ Interviews\\Time 1\\G4_Yuri

G4_Yuri: Basically I so busy, so I try access - I can access time is - yes, at night, so in train at night.

G4_Yuri: I check their answer, my group's answer, so I could start my answer and search it so theme about theme, about homework so...

G4_Yuri: For example, last week we discussed the idioms, English idioms, but I have no ideas about idioms, so then I study in good place and good phrase and if I looking for the good phrase.

I: How do you look on the train?

G4_Yuri: About Google. Google it.

⁴⁰ Interviews\\Time 2\\ G4_Yuri

I: Do you carry iPhone more often than you carry pen and paper?

G4_Yuri: Yes.

I: So, iPhone is convenient for finding examples. So, you carry iPhone every day?

G4_Yuri: Yes.

I: You carry iPhone every day. You can do homework with iPhone. Does that help you to remember homework?

Oh, I have homework.

G4_Yuri: Yes, particularly when homework deadlines are approaching. I am not staying in my home and couldn't check the PC, so if I have an iPhone and mobile phone, I can do some homework. So, it's very convenient.

I: Nine o'clock second semester is only mobile phone.

G4_Yuri: Yes.

I: iPhone. Where's that?

G4_Yuri: Maybe in the train, yes.

I: So, you're using iPhone to check homework in the train. If you did not have iPhone, could you do that at that time?

G4_Yuri: I don't think so. Maybe I couldn't check things out.

⁴¹ Interviews\\Time 1\\G4_Yuan

G4_Yuan: Actually after class I have to do my part-time job, so it's easy and useful for me to do my homework on train or just after work. So it saves time I think, yeah.

I: So what are some advantages of using your mobile phone over a computer? You said...

G4_Yuan: Save time. Yeah I can do my homework everywhere and every time I want, yes I think it's the best.

I: Would you like it if more teachers put the - made their homework so you can do from your mobile phone?

G4_Yuan: Yeah, yeah. Now I very like, I hope every teacher.

I: What are the main reasons you would like that to happen?

G4_Yuan: It just - because I have no - really I have no time to do my homework with computer at home, so I need - so I have to do my homework and I need to do my homework whenever and wherever, what time I can do, so it can save more time.

⁴² Interviews\\Time 1\\G2_Eri

G2_Eri: I usually use my mobile phone, yes.

G2_Eri: Because I can find - I can search every time, everywhere, because I have the mobile phone always.

I: Where do you usually use it?

G2_Eri: In the train, on the train.

⁴³ Interviews\\Time 2\\ G2_Eri

I: Then about eight o'clock it's only mobile. Then nine, really high; ten, eleven is here. What do you think is happening here?

G2_Eri: I think someone did homework in the train.

I: Do you do homework in the train?

G2_Eri: Yes.

I: Can you use computer in the train?

G2_Eri: No.

I: If you did not have mobile phone in the train, could you do homework?

G2_Eri: No I couldn't; I can't.

I: If you were not doing homework, what would you be doing? If you did not have mobile, could not do homework, what would you be doing?

G2_Eri: No, if I don't have mobile phone...

I: Yeah, no mobile phone so you cannot do homework on the train at this time. What would you do?

G2_Eri: Just sleeping or I read a book.

⁴⁴ Interviews\\Time 2\\ G3_Akiko

I: If you did not have mobile phone on the train what would you be doing?

G3_Akiko: Sleeping, honestly.

I: So if you did not have a mobile phone you wouldn't do homework on the train?

G3_Akiko: Yeah.

I: So having a mobile phone gives you more chance to do homework.

G3_Akiko: Yeah.

I: So what is this, lunchtime?

G3_Akiko: Hmm [unclear].

I: So where are you at this time?

G3_Akiko: Train or cafeteria.

I: Okay so if you did not have a mobile phone could you work on your homework at this time?

G3_Akiko: No.

⁴⁵ Interviews\\Time 1\\G1_Takashii

G1_Takashii: if I at home and if I do your homework at home I use computer, but I only use cell phone in case of your homework, because I can do on the train morning, in the morning.

G1_Takashii: Each student - many students always busy. We have lot of homework, but we don't have to make appointment on website.

G1_Takashii: I can always do my homework if I have a mobile phone - anywhere, anytime, anywhere.

⁴⁶ Interviews\\Time 1\\G4_Eri

G4_Eri: Ketai [mobile phone] is always near my body so I can read comment anywhere. So - because I want to find other people's comment. But person [PC]. I am busy every day so person looking... person time not any

⁴⁷ Interviews\\Time 2\\ G4_Eri

I: Here computer, computer - right here eight, nine and 11 a lot of mobile phone Ketai. Why do you think?

G4_Eri: Probably they [unclear] in train or bus so they have free time. They think that I have a homework.

I: So if you did not have Ketai, mobile phone, could you do homework on the train and bus?

G4_Eri: No.

I: So mobile phone gives you more chance to do homework?

G4_Eri: Yeah.

⁴⁸ Final Questions G3_Fumie Question 5

もちろん、役立った！なぜなら勉強時間を増やただけでなく、なかなかやる機会のない、英語を使ったちょっとした友達とのやりとりや今の心境などをも話したりできるから、そのようなときにどう言うのか考えたりする機会をもらった。また電車の中でも関係なく辞書をひくようにさえなった。Of course it was useful! Not only did it increase the time I spent studying, but it also gave me the opportunity to discuss how I felt about something with friends whom I wasn't so close to, something I was otherwise not interested in doing [i.e., I'm not usually inspired to communicate in English]. It gave me the chance to think about what I wanted to say as well. It also let me use the dictionary wherever I was, riding on the train or wherever.

⁴⁹ Interviews\\Time 2\\ G1_Toshinao

I: So I mean, each time you start, durr, durr, durr, stop - how long is that? At these times - cafeteria times?

G1_Toshinao: Only - no more than five minutes.

I: Okay. If you used the computer at Knowledge Square, how long would you stay on?

G1_Toshinao: To check the homework or to do the homework? About one hour.

⁵⁰ Interviews\\Time 2\\ G1_Atsumi

I: Does that help you to answer it, when you can go on for a short time and then go off?

G1_Atsumi: Yes because I often do the homework after someone answer it, that one example and after I comment that when I hand in that example, so this is my checking time for other questions for what to do for homework for me and if they're in this time, if I found one comment or answer, I comment to the answer and if I have one or more example I hand in in one time and this is one time and next time I check the other person's comment to me and we re-comment for the other classmates, members and take the other members' answers.

⁵¹ Interviews\\Time 1\\G1_Chika

I: Does she send you a message on your keitai to check her answer?

G1_Chika: No. Face-to-face. Then I log in and check quickly.

⁵² Interviews\\Time 2\\ G1_Chika

I: Why do you use the mobile phone and not the computer at home?

G1_Chika: I have my own computer but it's laptop and I have to connect some like Wi-Fi, in my mobile as well, so I have to connect up that one and some - I have to push some buttons, so just take more than one or two minutes for me. If I use mobile phone I only push some buttons or one or two button; that's easy to access; that's why.

I: Where are you usually when you remember your homework?

G1_Chika: Classroom.

I: Then what do you do, do you enter the mobile site?

G1_Chika: Yes, remember homework and so it's always happen in lunchtime so if I can remember more than 10 minutes before the next class I can use mobile phone, less 10 minutes I can use because I have to make some copies of my homework or something for my next class.

I: You can use your mobile if there's only 10 minutes?

G1_Chika: Even with eating lunch with my friends and talking about some classes with my friends and as well.

I: At that time when you remember, at lunch time, can you use a computer to do your homework at that time?

G1_Chika: No. Sometimes I bring my laptop to school but if I use my laptop - because of using laptop take long time, take more time than mobile phone so I don't want to use it.

I: So at lunch time you cannot use computer because it takes too long?

G1_Chika: I can use but I don't want to use it.

I: You use your mobile to make notes.

⁵³ Interviews\\Time 2\\ G4_Eri

I: So you said at home - do you have computer at home?

G4_Eri: Yes. But since change my mobile phone - iPhone - I always - I am not open computer to do this homework.

I: Why?

G4_Eri: Easy to use more than personal computer.

I: What do you mean easier? You can say it in Japanese, it's okay.

G4_Eri: What do you say raku [easy] kantan [easy] in English...

⁵⁴ Interviews\\Time 2\\ G1_Mai

I: Okay. Did you ever use your mobile phone at school for homework? Have you ever used it?

G1_Mai: I sometimes used mobile phone because the deadline is always Tuesday and sometimes I have a friend after school so I can't do my homework by deadline so I have to do my homework between that class.

I: Okay. Between classes. If you did not have a mobile phone could you do your homework between classes?

G1_Mai: I think I can do homework because of course Toyo has technology room where the computer, it has very nice computer but it is very crowd so I'm not sure I can use computer between the classes.

I: So using mobile phone for homework lets you use time between classes?

G1_Mai: Mm.

I: Okay. If you did not have mobile, so using mobile phone between classes for homework lets you finish homework when you don't have other time.

G1_Mai: Yeah.

I: So if you had deadline and you were between classes, what would you do?

G1_Mai: If I don't have mobile phone I will give up.

I: Just give up.

G1_Mai: Yeah.

⁵⁵ Interviews \\Time 1\\G2_Hikaru

G2_Hikaru: I can do my homework every time.

I: Why is that important, any time?

G2_Hikaru: I have little break time - 10 minute or 20 minutes. I often have - so I can use this time for my homework.

I: Where do you usually use mobile phone for homework, where?

G2_Hikaru: On the train or in the Toyo University. Sometimes home, at home.

I: Why do you use it at home?

G2_Hikaru: I - if I use computer, personal computer, I need lot of time, but cell phone I need little time.

I: What do you mean little time - why does it take little time?

G2_Hikaru: I can open the website easily using cell phone.

I: Your new iPhone, what do you use it for?

G2_Hikaru: I can look at many PC website and useful for doing homework, so it is useful.

⁵⁶ Interviews\\Time 2\\ G2_Hikaru

I: So using mobile phone at school in class room for 10 minutes, is that very useful for you?

G2_Hikaru: Yeah, it is useful.

I: So using mobile phone in class room, 10 minutes, does that help you to understand the homework topic?

G2_Hikaru: If I use PC, then I need more time - enough time so it is useful to use mobile phone.

I: If you did homework with mobile phone, imagine, and imagine doing homework with PC, what's different in how you do homework?

G2_Hikaru: What's different? Easy for me to open the website if I use mobile phone.

I: What do you mean, easy?

G2_Hikaru: Easy. If I don't enough time, I can use mobile phone. But if I don't enough time, PC need enough time to open the website.

I: Why do you think nine o'clock?

G2_Hikaru: It is hard to use PC in the morning because many people have not enough time in the morning.

I: So why is not enough time? Why is that - if short time, do you choose PC or mobile phone?

G2_Hikaru: Mobile phone.

I: Why?

G2_Hikaru: I need - PC take a lot of time but I must go to the university so I don't have enough time.

I: Okay, so mobile phone is better for short times?

G2_Hikaru: Hmm.

⁵⁷ Interviews\\Time 1\\G4_Midori

G4_Midori: I only Mixi always on my mobile phone.

I: Why?

G4_Midori: Because it is easy to login than PC.

⁵⁸ Interviews\\Time 2\\ G4_Midori

I: So this is interesting here. What's happening there at 5:00 and six o'clock in the morning, only mobile phone?

G4_Midori: No reason. It is difficult to open my PC. When I wake up in the morning, first I check my mobile phone so I check [unclear] website.

I: If you did not have mobile phone would you check the website?

G4_Midori: Morning, maybe not.

⁵⁹ Interviews\\Time 2\\ G2_Hitomi

I: If - this is mobile - if you used only computer what would be different here do you think? When would you...

G2_Hitomi: More night.

I: More night?

G2_Hitomi: Yeah. At home.

I: Why?

G2_Hitomi: I never use morning.

I: Okay, PC?

G2_Hitomi: Yeah PC. At home just night. Yeah a lot of time for - night - free time.

I: Okay have free time. What do you mean free time? What is free time? So a small amount of time, big amount of time - what is free time?

G2_Hitomi: Big.

I: Big - is it? What is free time? How much - so if you have between - how much free time do you need to use mobile and how much free time do you need to use PC?

G2_Hitomi: Mobile is short free time I can use mobile phone but PC needs more time - more my free time especially just night. Morning is very busy for me.

⁶⁰ Interviews\\Time 1\\G2_Yuuri

G2_Yuuri: Mixi and sometimes Facebook.

I: How do you access those - PC or mobile?

G2_Yuuri: Mobile phone.

I: Why do you access Mixi with mobile phone?

G2_Yuuri: Mixi - I - actually I don't have custom to use PC.

I: You said you like the big view of PC. So why don't you use PC for Mixi and social network?

G2_Yuuri: It's only to check the others' opinion once - at once - one time. I usually check the website many times. This website, by cell phone, so I don't need to check the website with large pages many times. Mobile phone is useful for me because I don't have time to use PC so much.

⁶¹ Interviews\Time 2\G2_Yuuri

G2_Yuuri: No in school - at school I use mobile phone rest time. 10 rest time - 10 minutes rest time.

I: 10 minutes between classes and when you have open class. Okay so 10 minutes between classes, if you sometimes use mobile phone to enter website.

G2_Yuuri: Yes.

I: Now imagine you did not have mobile phone. 10 minutes between class, what would you do?

G2_Yuuri: I can't do anything.

I: So because you have mobile, 10 minutes between class you can do homework. If you did not have mobile, 10 minutes between class you probably wouldn't do homework. So does doing homework 10 minutes between class, does that help you? Is it an advantage for you?

G2_Yuuri: Actually I think yes.

I: Why?

G2_Yuuri: Even only reading is useful to supplement my opinion and I want to check others' comments.

I: So having the chance for 10 minutes to see the homework helps you.

G2_Yuuri: Yes to see...

I: Now at work, when do you use the mobile phone at work for...?

G2_Yuuri: Rest time.

I: Break time. How long is your break time?

G2_Yuuri: 15 - from 15 to 30.

I: So at work on break time you use iPhone to look at website? Now again, imagine, no mobile phone. At the same time what would you be doing?

G2_Yuuri: I don't do anything - I can't do my homework.

I: So you'd do something else? What's that?

G2_Yuuri: Reading book or something like that.

⁶² Interviews\Time 2\G1_Erika

G1_Erika: I would like to use PC, but actually I get used to doing homework with mobile phone so don't, I don't think so much to want to use PC at night.

I: Okay. So you got used to using mobile phone so now it's easier for you?

G1_Erika: Yes, yes.

⁶³ Weekly E-journal Comments

G3_Eri 2011-06-01-In this homework #3 is interested in and I easy to find collocation. I realized new things about collocation by looking forward around the town.

⁶⁴ Interviews\Time 1\G3_Ayaka

G3_Ayaka: I have iPod touch always and iPod touch, it's easy to start internet but PC is - I need - to connect the internet I have to wait open internet and [unclear].

I: Okay. Now, imagine my homework but only face-to-face, no website - the same homework, one question, group talking, make one answer for one week, would that be okay?

G3_Ayaka: No, no, no, no, absolutely no. Each student so busy so we can't meet to do homework to talk about program.

I: So why is the mobile better for that?

G3_Ayaka: Because I can see other students' comment soon. Only connect to internet because we have no time and we are busy to do something.

⁶⁵ Interviews\Time 1\G1_Toshinao

I: What do you think is advantage of mobile phone over computer? Or do you think there's an advantage?

G1_Toshinao: I think, in my opinion, while the [unclear] is that it is easy to check whether some other members, they write to me or not, but as I told you, I think with not smartphone, but ordinary cell phone, it is so messy to type up posts or a comment.

⁶⁶ Interviews\\Time 1\\G3_Yurina

G3_Yurina: It's easy to access because when I use PC I - it takes one minute or about a minute to...

Yeah, but mobile phone is quickly [unclear]. Mobile phone is convenient to use because it can use - it can be used when I want to use the internet.

I: Why is quick important?

G3_Yurina: Why? It's just convenient.

I: Why?

G3_Yurina: I don't want to wait to start so it is important to quick - quickly, I think.

I: So, with mobile phone you log on and read I think quite a few times. If you were only PC, no mobile, would you log on the same number of times or less?

G3_Yurina: Maybe less.

I: Okay, why?

G3_Yurina: Because I often see other members' opinion by mobile phone.

I: So often - why do it more often with the mobile phone?

G3_Yurina: Just convenient.

⁶⁷ Final Questions G3_Yui Question 2

すぐに話したいことがある時で、文章で伝えられる時。When there's something I want to say right away, and for issues that area easily expressed in writing.

⁶⁸ Final Questions G3_Fumie Question 6

やっぱり忙しい中でも関係なくすぐに人とコミュニケーションを取れるのはみんなが持つてる携帯電話しかないからだと思う。そして今や電車内や歩いている人の多くが携帯をいじりながら過ごしている。それは隙間時間も充実させ満たすことを得意とする携帯だからこそできることだと思う。今や携帯電話一つ持てばなんでもできると言っただけで過言ではない。携帯で宿題をやったとき、なぜ私を嬉しくさせられるかという、宿題をためずに効率によくできるからだ。また、わからないことを共有できる場もこのサイトに与えてもらった。宿題の答えを共有し、コミュニケーションをとりながら身近な携帯で勉強ができる。私はこの宿題のスタイルが現代にのっとって良かった。Regardless of how busy we all are, everyone has a mobile phone, and it is this device that allows us to communicate with each other immediately. We can see numerous people fiddling with their phones on the train and walking down the street. Mobile phones are great at allowing us to fully use brief moments of free time. It's not an overstatement to say that you can do just about anything if you just have a mobile phone. It made me so happy to be able to work on my homework using my phone because I was able to do my homework more effectively without letting it build it up. I was also able to discuss the parts I didn't understand on a shared website. I was able to study using the phone that I was comfortable with, communicating with others and sharing answers to the homework. I think this approach was great, taking advantage of modern [ideas and technology].

⁶⁹ Interviews\\Time 2\\ G3_Ayaka

G3_Ayaka: Recently I use mobile - I use iPod Touch to watch a movie, for example, YouTube or Dailymotion and so on or read the manga, listen to music. Yeah, that's it. Manga, music, movie and the [animation].

I: Okay. So when you're doing this with your mobile phone you're also doing homework.

G3_Ayaka: Yes, yes, yes.

I: Okay, so you change back.

G3_Ayaka: Yep so if I have to be hurry for homeworks I often use the mobile phone to research.

I: So because you're using mobile phone already on the train for movies and music does that make it easier for you to just mobile - music, movies, homework, movies, email, homework?

G3_Ayaka: Yes.

I: To move back and forth...

G3_Ayaka: Yes, yes, yes. It's easy, I think. I can use all function at the same time, only switch the...

I: So all of these you just switch back and forth.

⁷⁰ Interviews\\Time 2\\ G4_Saori

I: So if you had no mobile phone, would you study same about or with mobile phone would you study more with homework?

G4_Saori: No. Mobile phone, it's good for me to study for this class.

I: So if you had no mobile phone, what would be different?

G4_Saori: If don't have mobile phone we can't check homework or website, so [pause] study time is decreased.

⁷¹ Interviews\\Time 1\\G2_Ayaka

G2_Ayaka: I usually watch the Mixi by using mobile phone, and I don't use PC, because I always watch Mixi in outside...Outside, for example when I take train or at school, or walking.

I: Why do you only look at Mixi at that time?

G2_Ayaka: Why? Because I do not watch the Mixi for long time. Very short time I check the Mixi, so I don't need to watch the PC.

I: Because mobile phone you can go to website many times in day, going many times, does that help you understand the homework?

G2_Ayaka: Yes.

I: Can you tell me example how?

G2_Ayaka: I have more - I can have more opportunity to think about the homework, so I can have more time to understand or more time to come up with opinion or answer, so - helpful.

I: Would you like other classes to offer homework on PC and mobile? Would you like if more classes have mobile...

G2_Ayaka: Yes. I like it. Because I like to watch everywhere, anywhere. Wherever I am, I can study English or I can do homework. It's good for me to improve my English skill, I think.

⁷² Interviews\\Time 2\\ G2_Ayaka

I: So, between classes you have 10 minutes? If you did not have a mobile phone, between classes in 10 minutes, what would do?

G2_Ayaka: Maybe I'd talk with my friends or do homework.

I: Could you use a computer at this time?

G2_Ayaka: No. Computer means like a...

I: PC. Yeah. Why?

G2_Ayaka: Why. I can't go to the computer room in those 10 minutes.

I: How much time would you need to go to the computer room?

G2_Ayaka: From 30 minutes to one hour or two hours.

I: Okay. Does the mobile phone help you between classes?

G2_Ayaka: Yes.

I: So, entering website between classes, does that help you?

G2_Ayaka: Yes. Of course.

I: Does it increase your chance to do homework?

G2_Ayaka: Yes.

I: So, a mobile phone note. If you did not have your mobile phone, what would you do?

G2_Ayaka: Maybe, I guess, I may write down on the paper.

I: Do you always carry paper every day? Saturday? Sunday?

G2_Ayaka: On Sunday, I don't have any.

I: Does the mobile phone make it easier to remember?

G2_Ayaka: Yes.

⁷³ Interviews\\Time 1\\G4_Asako

I: Okay. Would you like to other classes, to have homework on mobile phone?

G4_Asako: Yes.

I: Why?

G4_Asako: I do my homework on website when I get back my home at night. Only night or morning early. So I want to do my homework all the time or I think up idea.

I: You mean when you think?

G4_Asako: Yeah, sorry.

I: Okay so when you think of idea you would like to put it on website?

G4_Asako: Yeah.

⁷⁴ Interviews\\Time 2\\ G4_Asako

I: If you did not have mobile phone - smart phone would you read their comments and think about them as much with only PC?

G4_Asako: Only PC? Mobile phone can much more.

I: So you can connect many more times?

G4_Asako: Yeah.

⁷⁵ Weekly E-journal Comments

G3_Akiko 2011-05-21- This homework is difficult, especially the need to describe the reason. Summarizing one answer with several people using a chat form makes me feel troublesome/a lot of work. However, I feel it is good that this homework will not be finished using only one day but needs to continue over several days, because I believe study should be continues. It was very good to that I can make sure by using a mobile phone. It was very helpful because I could make sure of the status of the homework using any small open time I had between busy times and during travel time to school. This time what I noticed is that when I am doing the homework I did not know who commented to whom. If someone wrote "I agree with your opinion." I did not know the person who was the "you". So, I think it will be better if writing in the message who is writing to whom.

⁷⁶ Weekly E-journal Comments

G3_Akiko 2011-06-07- I think it is great that we can make sure of the state of the homework proceedings when we see the site by using a mobile phone

⁷⁷ Final Questions G4_Saori Question 5

宿題に関しては便利になったと思いますが、勉強に関してはあまり変わっていないと思います。I think it's a convenient way of doing homework, but I don't think there was much of a change as far as studying goes.

⁷⁸ Interviews\\Time 1\\G4_Yuan

I: Why do you use computer sometimes and mobile phone sometimes?

G4_Yuan: If I at home, you know actually use computer, it's easy to see. It's easy to see and find information than the mobile phone. But if outside, I have to use my phone and the phone always keeps the screen on this website, on the website. I don't cancel the website, do you know my - what's my meaning? So I always can keep - no. If I just open your website, I can keep it always, I don't constantly - if I close it, if I click here, it can yes, it appears immediately so it's very useful and easy, yes. Convenient.

I: Is that iPhone 3 or 4?

G4_Yuan: Three.

I: Is that an app or can all the phones does that?

G4_Yuan: I think yes, all phones can keep this screen all the time.

I: So do you login every time?

G4_Yuan: No, no it's not in login. Just the one time I keep this screen, don't - rarely cancel it. Just close is okay, yes and after next time even you open this one you can look up. I think - actually I just do it at my first time when I log in. So after the first time I never do it again.

I: Yeah 'cause I never - I see someone log in one time and then suddenly yeah, like your - like here, your checking again but there's no login. So that's what you're doing right?

G4_Yuan: Yeah, yeah, yes.

I: So it remembers your - you don't have to type password.

Yes, yeah.

I: Okay. Now one more question, when you read someone else's answer and you log off and then you log on and read someone else's answer. Could you do that from a computer?

G4_Yuan: No, no, no I can't.

I think the mobile phone is often to log in, yes and read. That's common I just open, I can see all round, on other opinion.

I: Does it have an effect on your homework? So you log in more times to read.

G4_Yuan: I think yes. If I login often, also I see my partner's answer frequently and then maybe if I have submit my homework I will think about maybe I have some - I have written it - the words I have written it's wrong or oh my partner's opinion is good, it's better than me, yeah I always think about it I feel.

⁷⁹ Interviews\\Time 1\\G1_Atsumi

G1_Atsumi: if I have a mobile phone I can call immediately

⁸⁰ Interviews\\Time 2\\G3_Akiko

I: About 6 o'clock am it's only mobile, why?

G3_Akiko: Why? I go into your website; it's easier to use mobile phone.

I: So in the morning...

G3_Akiko: I don't go to use the computer...Because it is very easy in the mornings.

I: So you use mobile.

G3_Akiko: Hmm...Breakfast I take the call, I take it in my room and go there, dining, going to train.

⁸¹ Interviews\\Time 2\\G3_Ayaka

G3_Ayaka: The most useful - the most useful things to have a Smartphone or iPod Touch is I can do homework or research every time and everywhere. So I think it's very useful for me to do so, know everywhere - any time, everywhere, to do something, everything. If I have no mobile phone I have to go to PC Learn or [unclear] of the computer so it's need to a lot of time to - so it's need not time. It's need not time to the homework.

I: So do you think using a mobile phone for your homework increases the time that you spend on homework?

G3_Ayaka: Yes, increase the homework and the think about homework.

I: By 10 o'clock quite a bit mobile.

G3_Ayaka: Maybe in the other class.

I: 10 o'clock?

G3_Ayaka: [Unclear] I do - we - maybe we may do homework during the other class. Yes.

I: Okay. With the mobile?

G3_Ayaka: Yes, with mobile phone. So some students Smartphone - will get a lot of chance to do homework. So if I have no mobile phone maybe we couldn't do homework during this time.

I: So having more chance because of mobile phone, does that help you to learn...

G3_Ayaka: Yeah, yeah, yeah.

⁸² Interviews\\Time 1\\G1_Toshinao

G1_Toshinao: I think while it's good aspects, if I tell other members my answer, I can receive other members' feedback soon of course.

I: So face-to-face you get feedback faster, but it's difficult to schedule?

G1_Toshinao Yeah, to meet schedule is a little difficult I think.

⁸³ Final Questions G1_Toshinao Question 2

用件を簡潔に伝えたいとき。メールだと、相手の時間を束縛することがない。When I want to just get to the point, email doesn't put any constraints on the other person's time.

⁸⁴ Final Questions G3_Yui Question 6

やることなく暇な時などに簡単に他の人と連絡が取れるので人気があるのだと思います。I think it's become popular because you can contact someone easily when you're free and have nothing to do.

⁸⁵ Final Questions G2_Yuka Question 2

例えば週末など、友達やグループのメンバーに会えないときは mailの方が便利でした。It more convenient to just be able to email my friends or other members in my group when we're unable to meet up on the weekend or whenever.

⁸⁶ Final Questions G1_Erika Question 2

When I need to let people know some information quickly. Texting email is the useful way to contact with people who are not nearby.

⁸⁷ Interviews\\Time 1\\G1_Chika

G1_Chika: send email to my friends telling them what I am doing. When I want to check other people's answer that is when I mainly use mobile phone

I: If I gave you the same homework face-to-face and homework on my website what do you think the difference is?

G1_Chika: Online can do many times while I am doing other homework. So we can spend a long time for one homework. But face-to-face can do only ten or fifteen minutes.

I: Why?

G1_Chika: Everyone takes other classes so we can't meet outside the class. Maybe we can't do it for a long time.

⁸⁸ Final Questions G3_Akiko Question 2

忙しい時や、難しい問題を出された際、つまりすぐに回答を言えない際などは e-mailだと自分の空いている時間に返すことができ、また考える時間を作れるという点でいいと思います。When I'm busy or when I've been asked a difficult question, in other words in situations when the I need some time to respond, email is good in that it lets me reply when I have the time, giving me the time to think about my answer.

⁸⁹ Final Questions G3_Fumie Question 2

面談よりメールの方が良いときは、すぐに伝えたいときや直接は言いづらいことはメールの方が気が楽だと思ふし、逆にすぐに返事をするのに困る場合でも、考える時間を作ることができるから良い。Email is easier than face-to-face communication when there's something that needs to be said right away, or when there's something that's just hard to say directly to the other person. Email is also better when a more well-thought out response is needed, as it gives you time to think.

⁹⁰ Final Questions G1_Mai Question 2

すぐに会えないときや簡単な質問をしたいときにはメールの方が好ましい。個人的に携帯電話でのメールのやり取りは時間がないときでもすぐにできるし、相手も好きなきに返事ができるので負担が少ないとおもうから。I prefer using email when I can't meet someone right away or when I just have a simple question to ask. I can communicate through text message with someone when I don't have time, and they can answer me whenever they want, so I think this reduces the burden.

⁹¹ Final Questions G4_Saori Question 2

その場に相手が居ない、離れている時。直接話す事が出来ない時、メールなら相手がいつでも確認出来るから。When the person I want to talk to isn't there, or is far away. When I can't speak with someone directly, I can send a message and the other person can check the message anytime.

⁹² Weekly E-journal Comments

G1_Mai 2011-06-30- I am sorry to be late with the comments about homework 6. Since you showed a concrete example from homework 6 it became easier to do this homework. Also I could receive mail when a group member replies so it is a better situation for me because I do not need to check the site every time.

⁹³ Interviews\\Time 2\\G2_Yuuri

I: You don't know them. So with people you don't know well, how do you prefer to communicate? Face to face, email, website?

G2_Yuuri: Website.

I: Why?

G2_Yuuri: I don't care about the schedule, their schedules. I don't know what about their schedule but I don't care about and I don't need to know their email address so it's easy to use.

⁹⁴ Final Questions G1_Chika Question 2

緊急を要する時やお礼など。→直接会うのが困難な場合や、ある程度前置きをしたい場合、社交辞令などはメールの方が圧倒的に楽だから。For emergency matters and when expressing gratitude. Email is a far

easier way to communicate when meeting someone directly is too difficult, or in situations where a “heads up” is in order, for social etiquette and so on.

⁹⁵ Final Questions G1_Atsumi Question 2

相手に説明することが多いときはEメールの方が便利だと思う。理由は、説明したいことを文面に記録することによって相手はその文を読んで理解を深めることができるから。Email is more convenient when you have a lot of things to explain to someone. This is because the points that need to be made are written down, providing the other person with a deeper understanding.

⁹⁶ Interviews\Time 1\G1_Takashii

G1_Takashii: Yeah, older. Of course you have mobile phone and I have and everyone have, so it's convenient because we can contact any time each other if [unclear]. Also we can check the homework. It's the way of other communicating.

⁹⁷ Interviews\Time 2\Group 4\G4_Yuri

I: My homework, find examples. Where would you look?

G4 Yuri: Maybe I work around there, so, for example, stations, in department stores, schools. Yes, I'd look for many examples and maybe I just memorize in my brain.

I: Would you remember as often as - so with no mobile phone, would you remember as often as you do with a mobile phone? Same amount?

G4 Yuri: I don't think so.

I: Why? Is it difficult to remember?

G4 Yuri: Yes.

⁹⁸ Interviews\Time 2\G2_Hikaru

I: Now, my homework, many times you must find examples. My homework, like find example of collocation, find example of cohesion and you have to look around Tokyo. When do you look for examples?

G2_Hikaru: I often find examples at a station, in the train, sometimes my hall.

I: Okay, when do you look for examples? Do you look every day or two days a week? When do you look?

G2_Hikaru: Every day I research the example but I can't find good example every day.

I: And? So you're looking and you think good example, so what do you do? You see good example and you...

G2_Hikaru: I take a picture.

I: Only picture?

G2_Hikaru: Or note.

I: Do you take a picture or note with your...

G2_Hikaru: Mobile.

I: Okay, do you take note on mobile phone?

G2_Hikaru: Yeah.

I: Do you like doing that?

G2_Hikaru: Yeah.

I: Is it easy?

G2_Hikaru: Easy.

I: Do you like note on mobile phone better than note on paper?

G2_Hikaru: Yes.

I: Why?

G2_Hikaru: If I use paper, I need pencil and paper, but if I use mobile phone, I need only mobile phone.

I: So why is pencil and paper not so good?

G2_Hikaru: In the train many people and train is crowded. Maybe people feel uncomfortable if I use paper and pencil.

⁹⁹ Interviews\Time 2\G2_Yuka

G2_Yuka: I tried to remember the homework topic and in daily life I tried to find an example, maybe in the train or in conversation with our friend, my friend. That's why I try to go to website Wednesday.

I: Did you look for examples on the train when going home?

G2_Yuka: Yeah.

I: If you found examples what did you do?

G2_Yuka: On the train I can't take a picture so try to write on mobile phone or...

¹⁰⁰ Interviews\\Time 2\\ G2_Hikaru

I: So you said with mobile phone you look every day for examples.

G2_Hikaru: Yeah.

I: If no mobile phone, would you look every day?

G2_Hikaru: Maybe not every day.

I: Why?

G2_Hikaru: It is hard to memorise everything.

¹⁰¹ Interviews\\Time 1\\Group 1\\1180100104_Erika

G1_Erika: For example - the other class - the class of marketing, the teacher has own website and here is, there are many information about class, so I use mobile phone to watch the website.

¹⁰² Interviews\\Time 2\\Group 1\\G1_Erika

I: So why do you go short time, leave, short time, for mobile?

G1_Erika: To look notebook and on mobile phone. I mean, if I log in to your website I need to open several pages, so I take iPhone photo on the page of homework subject and then log it out and look notebook and just think about homework.

I: Oh, it saves website pages.

G1_Erika: Yes.

I: So like a notebook.

G1_Erika: Yes, and I can come up with answer to homework, I log in again.

¹⁰³ Interviews\\Time 2\\G3_Fumie

I: How long do you usually use it on the train?

G3_Fumie: About 20 to 30 maybe. So I often find, looking for answer, so I often look for advertising poster on train - so I arrive my hometown - the way to home walking road - shops on the wall posters or kajiban [bill board] or watching and walking go home.

I: If you find example walking home or on the train, what do you do?

G3_Fumie: Like writing a memo or soon open mobile web site and reply answer.

I: What do you usually do, note or reply?

G3_Fumie: Example and take the picture and - I want to say - what I want to say - thinking. So if I think up an answer how do it right, so take notes.

I: So how do you take notes? Do you use paper or do you use your keitai [mobile phone]?

G3_Fumie: No I don't have a pen. I use a mobile phone.

I: Page four - this is you only. So you use 7 to 9, and 10 in the morning you use [mobile] a lot. What are you doing at this time?

G3_Fumie: When I go to school, is 10 here.

I: Can you use a computer at this time?

G3_Fumie: Maybe after the school day. Maybe, maybe. So before it breakfast, I get up and do the homework.

I: Okay, and then at one o'clock you use mobile a lot. Maybe lunchtime.

G3_Fumie: Ah, maybe to check.

I: Could you use a computer at this time?

G3_Fumie: Maybe.

I: But you choose to use mobile?

G3_Fumie: Yes.

I: If you did not have mobile, at this time - morning and lunch - would you look at the homework, the same amount - as often? So if you did not have mobile here - only pc - would you look at the homework as many times?

G3_Fumie: No.

I: So does this - looking at with mobile, you look at the site more - homework you look at more - does that help you to learn?

G3_Fumie: Yes.

¹⁰⁴ Final Questions G1_Erika Question 3

Yes, it has. By using a mobile phone, I could find some fun in each homework, especially by taking photos.

¹⁰⁵ Interviews\\Time 2\\G2_Eri

I: my homework, you had to find example in Tokyo of collocation or something. Did you like that?

S: Yes, I like.

I: Why did you...?

S: Because I was - when I found it - any collocation - finding collocation - I usually don't pay attention a lot, me, so it's interesting.

¹⁰⁶ Interviews\\Time 2\\G3_Yui

I: Where do you usually use mobile phone?

G3_Yui: I often use in my house or in school.

I: Do you have a computer at home?

G3_Yui: Yes.

I: Why do you use mobile phone at home if you have a computer?

G3_Yui: I use my computer also often. Recently homework has picture and have to take picture, so I write on my mobile phone. So I use mobile phone.

I: Do you take picture with your mobile phone?

G3_Yui: Yeah.

¹⁰⁷ Interviews\\Time 2\\Group 3\\G3_Ayaka

I: How many - when do you look and where do you look?

G3_Ayaka: ...I often walk on the road; look around the city, for example in the toilet, toilet and station. Maybe in toilets and the station there are many good examples. It's easy to find - look for these examples.

I: Okay. How often do you look? When do you usually look?

G3_Ayaka: Many times.

I: So many during the week?

G3_Ayaka: Yes, during the week and do homework at this Saturday and the Sunday.

¹⁰⁸ Final Questions G3_Ayaka Question 5

はい。本で探すよりもより多くの情報を収集でき、学習の幅が広がる。Yes. More information can be gathered together than in a book, offering a wider breadth of what can be learned.

¹⁰⁹ Interviews\\Time 2\\Group 3\\G3_Ayaka

I: If you did not have mobile phone would you look for example? How would - so you use your mobile phone to record examples. If you did not have mobile phone how would you find example - would you look for examples?

G3_Ayaka: Maybe - it's impossible to take a picture on the road so maybe I have to find example like an advertisement or - advertisement - it's impossible.

I: So mobile phone gives you many chances to find examples.

G3_Ayaka: Yes and take pictures.

¹¹⁰ Interviews\\Time 1\\Group 1\\1180100071_Mai

G1 Mai: In the case of keitai [mobile phone] using Mixi [third party site], I can know what my friend is doing now. But face-to-face communication is...ah, on the Mixi website I know what my all friends is doing now but face-to-face communication is I think only a few people. What a few people are doing know.

I: Can you look at Mixi on your keitai [mobile phone]?

G1 Mai: Yes.

¹¹¹ Interviews\\Time 2_G1_Mai

G1_Mai: I think it doesn't help me to do my homework, just I think it is good for my group member to reply soon, reply to their comment soon.

I: Why is that good?

G1_Mai: Because we have to do, we have to write comments three times so we, if some student writes their idea and I will write my comment to the other student then this student can reply to my comment.

G1_Mai: So they can comment two times in short time, so I think it is good for our group members.

I: Okay, so it's good because you can finish faster.

G1_Mai: Yeah.

I: Okay, so if you were using a PC it would take you longer to finish?

G1_Mai: I think so.

I: Because the log in time is different between each student so if I use only computer I the time between [laughs].

G1_Mai: Different.

I: Okay, but if you use mobile phone?

G1_Mai: I can check anytime, anywhere.

I: Okay. So more chance of catching...

G1_Mai: Yeah.

¹¹² Final Questions G1_Mai Question 6

いつでもどこでも簡単に相手にコンタクトがとれて、受け取る側は自分が好きな時に返事ができるから。 Because I can contact someone anywhere, anytime, and the person can respond at their own convenience.

¹¹³ Final Questions G1_Toshinao Question 6

お互い都合のいい時間帯にやりとりができる。相手の時間を束縛することがない。 People can communicate without interfering with each other's free time. It doesn't put constraints on the other person's time.

¹¹⁴ Final Questions G3_Ayaka Question 6

日本人は時間に追われているしなにかとメールのほうが都合がいい。相手の都合を気にせず気軽に用件を伝えることができる。 Japanese people are always pressed for time, so emailing is more convenient. You can easily [i.e., without being stressed about it] get your message across without inconveniencing the other person.

¹¹⁵ Final Questions G1_Chika Question 6

電話は相手の状況などによって用件を伝えることが出来ない場合がありますが、メールは相手のタイミングで確認し、返信する事が出来ます。また、言葉をゆっくり選びながら話をすすめる事ができるため、電話に比べて失言や失敗が少ないと思います。日本には昔から年賀状や寒中見舞いなど、手紙を送る機会が多くあることも理由の一つだと思います。 Although there are times when, depending on the situation with the other person, communicating over the phone isn't going to completely communicate everything you want to tell the other person, email allows us to confirm the other person's timing, and reply [i.e., to respond without infringing on the other person's schedule]. Also, in comparison to talking over the phone, email allows us to take the time to select words during an exchange, thus reducing the risk of saying the wrong thing. Another reason for this is that Japan has historically had a tradition of sending New Year's greeting cards, get well cards, and other seasonal greetings.

¹¹⁶ Final Questions G1_Erika Question 6

I think it is because Japanese people want to find piece in one's mind. Maybe by texting email, people can feel a kind of relief.

¹¹⁷ Final Questions G1_Atsumi Question 6

日本人は元来、他人に気をつかうことを美德としてるので、テキストメッセージの方が相手に返事をするときに相手のことを考えながら気分を害さないように慎重に返事ができるためだと思う。 Japanese people essentially see it as a virtue to carefully consider how the other person feels. Text messages allow the sender to carefully consider the other person's situation, and avoid a potential insult.

¹¹⁸ Final Questions G1_Toshinao Question 6

お互い都合のいい時間帯にやりとりができる。相手の時間を束縛することがない。 People can communicate without interfering with each other's free time. It doesn't put constraints on the other person's time.

¹¹⁹ Final Questions G2_Yuka Question 6

日本人は shy であり、電話や直接会って話すことよりも、テキストを用いることを好む。テキストのほうが感情や表情が見えないからである、と私は考える。mobilephone を使うことによって homework があることを思いだし、やる気になる。例えば私自身は homework について忘れていたとする。たまたま、ツイッターや facebook など誰かが水曜日の課題難しい。などとつぶやきそれを見たとしたら、難しいなら早めに終わらせよう。と思い、その場で mobilephone を使って topic を調べるだろう。しかしパソコンだった場合、家に着いた時点で忘れていた可能性もある、また覚えていたとしても、パソコンを立ち上げるのは面倒だから、違う課題と一緒にやろう。などと思い、結局わすれてしまう。一年間ありがとうございました。Japanese people are shy, so using text is preferable to speaking over the phone or meeting directly. I believe that this is because the use of text [lets us hide] how we feel and [hide] our expressions [physical expressions that might be embarrassing]. Using my mobile phone reminded me that I in fact had homework, and this gave me the desire to do that homework. For example, let's say I forgot about the homework. Then someone on Facebook or Twitter grumbles about how Wednesday's homework is really hard. When I read that message, it makes me think that I better get started on the homework if it's so hard. So right then and there I can use my phone to look up the homework. In contrast, if I'm using a PC, I might forget about the homework as soon as I get home. Even if I remember [that I need to do my] homework, it takes so long just to switch my computer on, and I might start doing something else. So in the end I would forget. Thank you very much for this past year.

¹²⁰ Final Questions G4_Yuri Question 6

日本では特に、携帯電話を所持している人が多く、とても身近なコミュニケーションツールです。日本人はどちらかといえば内向的で、メールや SNS などのインターネットを利用したコミュニケーションが思っていることを相手に伝えやすいのだと思います。なので、日本では Face Book や Mixi、Twitter などがとても流行しているのだと思います。Particularly in Japan, there are so many people who own mobile phones, so it's a very familiar communication tool. Japanese people are by in large introverts, so I believe communication that uses the internet such as email and SMS messaging is an easier way to tell someone something you want to say. For this reason, Facebook, Mixi, and Twitter are huge hits in Japan.

¹²¹ Final Questions G3_Akiko Question 6

日本人は直接物事を言うことを苦手としています。そのため、e-mail は電子機器を通して相手とコミュニケーションを図れるので、間接的方法となります。日本人にとってはすごくいいツールであると思います。Japanese people are pretty bad at saying things directly. Email achieves communication with the other person through electronic devices, so it's an indirect way of communicating. I think it's a great tool for Japanese people.

¹²² Final Questions G4_Saori Question 6

日本人は面と向かって直接意志疎通をはかることが得意ではないから。Because Japanese people are pretty bad when it comes to direct communication channels.

¹²³ Final Questions G2_Lulu Question 6

Because mobile phone in Japan is more popular than other countries. For example, in china, not all the students in the university have mobile phones. So it is not very popular. But in Japan, it is very easy to get a cell phone. Meanwhile, most of the people are using the smartphone or iPhone to go to the internet very easily. But in china, buying an iPhone is very expensive and referred to the internet package, it is more expensive.

¹²⁴ Interviews\\Time 1\\G2_Lulu

G2_Lulu: Yes, maybe for sometimes before I go to bed, I have custom to play with iPhone a little, so at that time I can upload it.

I: For example, music or talking to your friend, or, why do you use iPhone? So maybe just before you go to sleep you might upload from iPhone?

G2_Lulu: Yes.

I: Why do you use mobile phone just before you go to sleep, not computer?

G2_Lulu: For some relaxing. If I go to sleep directly, at that time I don't want to - I cannot fall asleep quickly, so I would like to listen some of the music, and that time I would...

¹²⁵ Interviews\\Time 2\\ G1_Atsumi

I: Then the last one here, at night, so this is nine o'clock, 10, 11, 12 and it's quite high here. At this time can you access your computer?

G1_Atsumi: Yes.

I: But you use the mobile?

G1_Atsumi: Yes.

I: So you can access computer but you use a mobile, why, for the same reason as before?

G1_Atsumi: I can do the homework in the bed, lying down operating the cell phone, so that's really great for me.

I: So it's comfortable?

G1_Atsumi: Yes.

¹²⁶ Interviews\\Time 2\\ G2_Ayaka

I: Okay. One last question. Do you enjoy using your mobile phone?

G2_Ayaka: Yes.

I: With your friends outside of school?

G2_Ayaka: Yes.

I: Because you enjoy your mobile phone outside of school, does that make it easier for you to - a little bit more easy - start homework with it?

G2_Ayaka: Yes.

I: Yeah? Do you feel more comfortable using your mobile phone? So, that comfortable...

G2_Ayaka: Yes.

I:...makes it easier to...

G2_Ayaka: Yes.

¹²⁷ Final Questions G3_Fumie Question 6

やっぱり忙しい中でも関係なくすぐに人とコミュニケーションを取れるのはみんなが持ってる携帯電話しかないからだと思う。そして今や電車内や歩いている人の多くが携帯をいじりながら過ごしている。それは隙間時間も充実させ満たすことを得意とする携帯だからこそできることだと思う。今や携帯電話一つ持てばなんでもできると言っつ過言ではない。携帯で宿題をやったとき、なぜ私を嬉しくさせられるかという、宿題をためずに効率によくできるからだ。また、わからないことを共有できる場もこのサイトに与えてもらった。宿題の答えを共有し、コミュニケーションをとりながら身近な携帯で勉強ができる。私はこの宿題のスタイルが現代にのっついていて良かった。

6. Regardless of how busy we all are, everyone has a mobile phone, and it is this device that allows us to communicate with each other immediately. We can see numerous people fiddling with their phones on the train and walking down the street. Mobile phones are great at allowing us to fully use brief moments of free time. It's not an overstatement to say that you can do just about anything if you just have a mobile phone. It made me so happy to be able to work on my homework using my phone because I was able to do my homework more effectively without letting it build it up. I was also able to discuss the parts I didn't understand on a shared website. I was able to study using the phone that I was comfortable with, communicating with others and sharing answers to the homework. I think this approach was great, taking advantage of modern [ideas and technology].

¹²⁸ Final Questions G4_Yuri Question 6

日本では特に、携帯電話を所持している人が多く、とても身近なコミュニケーションツールです。日本人はどちらかといえば内向的で、メールや SNS などのインターネットを利用したコミュニケーションが思っていることを相手に伝えやすいのだと思います。なので、日本では Face Book や mixi、Twitter などがとても流行しているのだと思います。

6. Particularly in Japan, there are so many people who own mobile phones, so it's a very familiar communication tool. Japanese people are by in large introverts, so I believe communication that uses the internet such as email and SMS messaging is an easier way to tell someone something you want to say. For this reason, Facebook, mixi, and Twitter are huge hits in Japan.

¹²⁹ Interviews\\Time 2\\ G2_Yuka

I: If you like mobile phone then doing homework on mobile phone does that help you to like homework a little bit?

G2_Yuka: Yes a little bit because use mobile phone, I don't have a - if I use mobile phone I don't feel that I have to do homework or something like that, just go website. But if I don't have a mobile phone oh my god, I have to use computer so how can I say? I need to [unclear] the computer and logging in and go to internet. It is troublesome.

I: When you think about doing homework with a mobile you feel different than thinking about doing homework with the computer?

G2_Yuka: Yeah.

I: How do you feel different? You feel...

G2_Yuka: I think, for example, the most convenient point is mobile phone just look the comment and check the topic. First check the topic and if someone write the comment check it and think about outside or like during go home. Go home and go to Knowledge Square to use computer just write a comment, it is feel good because if only I have a computer first check the computer and log off the computer and think about this and discuss with friend and check the - find the example and go to computer again. It is troublesome.

I: Sometimes you forget?

G2_Yuka: Yeah.

¹³⁰ Interviews\\Time 2\\ G1_Erika

G1_Erika: Oh, right, because by thinking about, no, by finding examples around close to me I could understand the topic more closely. I felt that translation is - how can I say - translation is familiar with me more than I expected and with PC also I can easy to upload or easy to do homework, but take picture is only, taking picture. With PC I can't take picture, so using mobile phone is better, much better to close to translation.

I: You enjoy using your mobile phone?

G1_Erika: Yes.

I: It's fun?

G1_Erika: Yes.

I: Is doing homework on your mobile phone a little bit fun?

G1_Erika: Mm, yes I think so. Especially, as I said, taking picture and posted and look at other peoples posts, to look the other peoples' posts was fun... Yeah, I thought that my [unclear] is often posted and her some was very interesting.

I: Okay, so doing homework with mobile phone is a little funnier...than doing homework with PC?

G1_Erika: Yes. I think so.

¹³¹ Final Questions G1_Erika Question 3

Has using a mobile phone for your homework changed the way you think of your school homework? Yes, it has. By using a mobile phone, I could find some fun in each homework, especially by taking photos.

¹³² Interviews\\Time 2\\ G1_Mai

I: Okay, I have one quick question. So, you enjoy using your mobile phone?

G1_Mai: Yes, I enjoy using mobile.

I: So when you use mobile phone for homework does it make that a little bit less, a little easier, mentally, to start homework?

G1_Mai: Oh, mm, yeah. Because yeah, the - not too easy but - the feeling is kind of like sending email to my friend, so it is more easy to do, not easier but easy to do my homework.

I: Like, does it help you to do the homework?

G1_Mai: Mm, yes.

I: Do you think that helps you to learn better? That feeling?

G1_Mai: Yeah. Feeling, feeling is more good compared to using computer.

¹³³ Final Questions G1_Mai Q 5

「宿題をする」というよ「友達にメールを送る」ような感覚でできたのであまり負担がなく宿題ができた。

5. Rather than, "doing homework," it feels more like I'm just sending a message to my friends. I've been able to do my homework without any sense of burden.

¹³⁴ Interviews\\Time 2\\ G2_Yuuri

I: That's what I'm interested in - why? Is it the same with PC, sitting at a PC and doing homework? Is it the same, don't care?

G2_Yuuri: I think using the PC is hard to doing homework and jobs - some task I think.

I: So like work and mobile is...

G2_Yuuri: It's like game.

I: What do you mean like game?

G2_Yuuri: Using mobile phone is fun for me. It's like portable game so I am impressed using mobile phone - iPhone.

I: So because using mobile phone is enjoyable, homework will - on the mobile phone becomes...

G2_Yuuri: Fun, enjoyable a little.

I: That's what I'm interested in, that difference. So, because of that, because the feeling is different - do you think you think about homework or try to do homework a little more on the mobile than you do on - would on the PC?

G2_Yuuri: Yes.

¹³⁵ Interviews\\Time 2\\ G3_Eri

I: Would that be as easy?

G3_Eri: Easy, but my phone is also a game I want to use. but the same.

¹³⁶ Interviews\\Time 2\\G4_Asako

G4_Asako: PC? When I want to go on the website I use the PC and typing is the PC but ... email or telephone or sometimes to play the games is mobile phone.

I: Okay so you like mobile games?

G4_Asako: Hmm - so, so.

I: Is that android?

G4_Asako: Android yeah. Yeah they have a lot of good games.

I: It's famous for games that one. I want to get one. So when you use your mobile phone for games it's fun?

G4_Asako: Yeah.

I: They're just fun right?

G4_Asako: We certainly - I play anarchy game [laughs], mushroom game.

I: Then sometimes you use a mobile phone for homework?

G4_Asako: Yeah.

¹³⁷ Interviews\\Time 2\\ G3_Ayaka

I: Okay. So, on the train you use your mobile phone to read. How long do you usually stay on my website?

G3_Ayaka: Maybe 10 minute, about 10 minute.

I: Okay. If you did not have mobile phone on the train what would you do with your time?

G3_Ayaka: Maybe perhaps I do other homework or sleeping or maybe sleep or do homework, other homework.

I: Okay. So your other homework on the train, how do you do that?

G3_Ayaka: Reading the book or write a draft.

I: Okay. So what's the percentage sleep to homework if you're on the train?

G3_Ayaka: Maybe seven three. Seven three.

I: Seventy per cent.

G3_Ayaka: Yes.

I: Okay. What about if you have mobile phone what's the percentage of these three with mobile phone?

G3_Ayaka: Maybe 100 per cent I use mobile phone. Yes. I always use mobile phone iPod Touch during the train. Recently I use mobile - I use iPod Touch to watch a movie, for example, YouTube or Dailymotion and so on or read the manga, listen to music. Yeah, that's it. Manga, music, movie and the [animation].

I: Okay. So when you're doing this with your mobile phone you're also doing homework.

G3_Ayaka: Yes, yes, yes.

I: Okay, so you change back.

G3_Ayaka: Yep so if I have to be hurry for homework I often use the mobile phone to research.

I: So because you're using mobile phone already on the train for movies and music does that make it easier for you to just mobile - music, movies, homework, movies, email, homework?

G3_Ayaka: Yes.

I: To move back and forth...

G3_Ayaka: Yes, yes, yes. It's easy, I think. I can use all function at the same time, only switch the...

I: So all of these you just switch back and forth.

G3_Ayaka: Yes, yes.

I: Okay. So like movie, music, email, Twitter or something.

G3_Ayaka: While listening music I check the email or - yeah.

I: Or music. So you just switch - so you can listen to music while doing homework, too?

G3_Ayaka: Sometimes [laughs].

I: So because you're using these already it makes it easier to - do you think about switching to homework more often? So if you were not using mobile phone...

G3_Ayaka: So if I have no mobile phone.

I: Yeah, would you contact homework the same amount of time?

G3_Ayaka: Maybe no.

I: Because you have mobile phone you're listening to music and movies and then you switch homework. So, I mean, does this make it that you contact homework more times than if you did not have mobile, just paper or a book?

G3_Ayaka: Yes, maybe, yeah.

I: Okay, so because this movies, music, email, friends and music - sorry, I got music twice...

G3_Ayaka: I often check and check Facebook and Twitter. Most of my time maybe I check these site.

I: This is for your friends...

G3_Ayaka: Yes, yes, yes.

I: Okay. So because - this is fun, right, movies, music...

G3_Ayaka: Yeah. Yes, my hobby.

I:...Facebook, Twitter, it's your hobby. It's not school.

G3_Ayaka: Yes.

I: But because you're doing these does it make it easier for you to go. I'll check my homework?

G3_Ayaka: Yes, yes, yes.

I: So you don't feel like I have to...

G3_Ayaka: Yeah.

I: Okay. So it makes a little easier, a little bit.

G3_Ayaka: Yes.

¹³⁸ Weekly E-journal Comments

G3_Fumie 2011-05-22 宿題の質問の意味を理解するのに時間がかかった。最初は定期的にチェックして返信をすることが大変に感じたが、だんだん慣れてくるとチャットみたいに mixi 感覚でできて返信がきているかどうかチェックするのが楽しみに感じた。[ENGLISH: It took time to understand the meaning of the question in the homework. At first, I felt it was difficult to reply by checking regularly, however, gradually I learned how to do it. Then I felt it was fun to check and see whether I had received a reply. It was a similar feeling to mixi or chat.]

¹³⁹ Interviews\\Time 2\\ G4_Eri

G4_Eri: Mobile phone. I like went to website with [unclear] phone more than computer because I don't like computer. I like - I think that I want to connect website [unclear] phone.

I: So why don't you like the computer?

G4_Eri: Heavy.

I: You mean laptop?

G4_Eri: [Unclear].

I: Oh, difficult?

G4_Eri: Yeah, difficult. So feel too heavy. I don't like everything homework and I don't [unclear] so feel too heavy for me personal computer.

I: So do you mean heavy like heavy or heavy like your heart?

G4_Eri: Yeah.

I: Oh, so feeling is heavy.

G4_Eri: Feeling is heavy.
 I: So if you do homework with computer your feeling is heavy?
 G4_Eri: Yes. What do you say [Japanese] in English?
 I: I don't know.
 G4_Eri: [Japanese].
 I: Oh okay, you don't like it, the feeling?
 G4_Eri: Yep.
 I: Can you tell me this in Japanese? How would you say this - heavy feeling - in Japanese?
 G4_Eri: [[Ni ga o moi] Heavy burden. (too heavy for her to carry) . [Yaruki ga okina i] So I don't feel like doing it. (She procrastinates because of the heavy feeling from homework.)
 I: Now what's the difference with mobile phone doing homework? What you're feeling different?
 G4_Eri: Mobile is I finished the connect computer so [unclear] next page for example, [fashion] page or Mixi... so this is... same network same feeling if I use iPhone.
 I: That's very interesting. So if you use mobile phone for homework you get the same feeling as if you were - you can quickly change to your fun things?
 G4_Eri: Yes.
 I: Fun meaning personal things, website.
 G4_Eri: Yes.
 I: Mixi, shopping, fashion?
 G4_Eri: Yes.
 I: So when you use mobile phone, homework and Mixi, shopping and fashion are the same?
 G4_Eri: Yeah I can collect.
 I: So nice feeling?
 G4_Eri: Yes. Compared to personal computer.
 I: So my homework, sometimes you must look for example and then put it on webpage. Do you like that homework? Like colocation when you take it and put it...
 G4_Eri: I don't like homework.
 I: You don't like any homework?
 G4_Eri: Especially [unclear] wonder word for me - difficult - expert subject for me. So I can't [unclear] this subject.
 I: Does it make it easier for you to do homework with Ketai? Does Ketai homework make it easier for you than PC homework?
 G4_Eri: Yeah.
 I: Ketai easier?
 G4_Eri: Yeah.
 I: Why?
 G4_Eri: Ketai is tool of play, so easy to connect.
 I: Can you say this in Japanese - tool of play?
 G4_Eri: [unclear].
 I: What do you mean? Can you say your meaning in Japanese?
 G4_Eri: Tool of play.
 I: What is that?
 G4_Eri: [Asobi no dogu] tool of play.
 I: Okay - and that's good?
 G4_Eri: Yeah. Actually I want to say Japanese but I can't translate to English.
 I: You can in Japanese and later I will translate it.
 G4_Eri: [Asobi no encho senjyo] extension of play.

¹⁴⁰ Final Questions G1_Toshinao Question 3

Has using a mobile phone for your homework changed the way you think of your school homework? I don't think anything has really changed. I think it's actually more inconvenient to use my mobile phone for doing homework

¹⁴¹ Interviews\\Time 1\\G1_Atsumi

G1_Atsumi: In the train I have nothing to do, and I couldn't do large things on the train. Using mobile phone in the train is very good to kill time so I often use it.

I: And you do homework then [on the train]?

G1_Atsumi: Yes.

¹⁴² Weekly E-journal Comments

G1_Atsumi 2011-06-07 イディオムは高校の時から知っていたので学びやすいものでした。色々調べてみたら興味深いイディオムがたくさん出てきたので意外と楽しめながら学ぶことができました。[ENGLISH: It is easy for me to learn idioms because since I was a young student I knew about idioms. I could enjoy learning which was unexpected because after searching various ways I could find many interesting idioms.]

¹⁴³ G1_Atsumi 3. 宿題を携帯電話ですることによって、これまで自分にとって宿題は家や図書館など、机があり、イスがあり、ある一定の期間とどまっていた所ではできなかったのに対して、いつでもどこでも宿題ができるようになり、自分にとっての宿題からの拘束が弱まったと思う。Up until this point, I've been restricted to doing my homework at home or in the library. I had to have a desk, and chair, and be in a place for a fixed amount of time. Now I can do my homework anywhere, anytime. This really loosened the restraints of homework.

¹⁴⁴ Weekly E-journal Comments

G1_Chika 2011-05-19 普段あまり考えない内容だったので、楽しく取り組むことができました。宿題の内容とは直接関係はありませんが…のオーラルコミュニケーションと放送英語を履修していたので、宿題の取り組み方を理解していたため特に問題はありませんでした。初めて先生の授業を履修した友人に、どう取り組めばいいのか困惑していたり、うまく書き込みができず困っている人が数名いました。授業の際に、スライドだけでなく実際のページを使って説明していただけるとよりわかりやすかったのかな、と思いました。[ENGLISH: I could enjoy because the context I has not thought of so much before. So possibly it is not related so much with the context of the homework... There are a few of my friends who had difficulty and could not understand how to work for this homework because it was the first time they had taken your class. However, i did not have any difficulty because I took your oral communication class last year. So I think when you are doing the class if you use not only the slide but also using the real [web] page would be much more helpful for students to understand.]

¹⁴⁵ Interviews\\Time 2\\ G1_Chika

I: This is page three, here are your comments that you sent to me and yours says in English, I could enjoy because the context is not thought of so much before. What does that mean?

G1_Chika: Your homework is like looking outside, so I didn't care about that, I don't care some advertisement or that kind of thing, so your homework make me work outside. We don't care about some advertisement, we only looking like...

I: Looking outside on the street for example is interesting?

G1_Chika: Yes.

I: Does that change the way you think of your homework? You said it's interesting, it's different, why?

I: Looking for examples on the street is new for you?

G1_Chika: Yes.

¹⁴⁶ Final Questions G1_Chika Question 3

机のある場所でなくても課題ができるというのは、宿題は取り組みやすいものだと考えるきっかけになりました。Having the ability to do my homework without needing to be sitting at my desk gave me the chance to feel that homework is something that can be easily tackled.

¹⁴⁷ Final Questions G2_Yuuri Question 3

宿題のために時間を作るのではなく、空き時間にできるという便利さが向上心につながったと思う。Instead of needing to make time for my homework, I could just do it in my spare time. This convenience increased my desire to get it done.

¹⁴⁸ G3_Akiko 3. 携帯で宿題をすることにより、課題を今までよりも身近に感じるようになりました。今までは家でしかできなかった課題を、空いている時間にもできるようになり、時間をうまく使えるように

なりました。 Using my phone to do homework has made me feel more involved with my homework than ever before. Up until now, I' ve always just done my homework at home. Now I can do homework anytime I'm free, which lets me make better use of my time.

¹⁴⁹ Interviews\\Time 1\\G1_Chika

G1_Chika: Usually, Mai, tells me after she does her homework, and I do it after my homework. She does not say please check that, but I want to check her answer as soon as I can. Mobile phone is easy to access your homepage.

¹⁵⁰ Final Questions G1_Mai Question 3

今までは学びは普段の生活から少し離れてる気がしたけど、携帯電話を使うことで、生活の一部として気軽に組み合わせた。 This way of learning feels a bit less familiar to the way I've normally done things, but being able to use my mobile phone like this has made some parts of my life easier.

¹⁵¹ Final Questions G2_Yuka Question 3

はい。特にこの授業は topic を web 上で発表するため、topic を確認するためだけに一度 web のアクセスする必要があります。その作業を携帯で行えることはとても便利で、意欲向上にもなりました。 Yes. Especially because the class presents homework topics on the web, we have to access the web at least once simply to see what the topic is. Being able to do this on my mobile phone has been very convenient, and increased my desire to do the homework.

¹⁵² Interviews\\Time 2\\ G2_Ayaka

I: Why do you use a mobile phone at home if you have a PC?

G2_Ayaka: My PC is in the living room. I don't have my PC in my room, so it is easier to do homework by using mobile phones.

I: What do you mean easier?

G2_Ayaka: Easier means I can enter the - decide as soon as we - because I can from email and, also, I don't have to go into the living room which is where the PC is.

I: Okay. So, doing the homework at home with a mobile, does that make you want to do homework more?

G2_Ayaka: Yeah. I don't feel that homework is troublesome because it is easier to do homework by using iPhone. So, maybe.

I: But PC is more troublesome?

G2_Ayaka: Yeah. In my opinion.

¹⁵³ Interviews\\Time 2\\ G2_Eri

I: So you like your mobile phone.

G2_Eri: Yes.

I: How do you describe your mobile phone? Why do you like it so much? What's your feeling?

G2_Eri: It's easy. How can...?

I: Is it easy? Convenient?

G2_Eri: Convenient, yeah.

I: Using your iPhone is easy. Using your iPhone for homework, does that make homework easier?

G2_Eri: Yes.

I: Easier homework - does that make you want to do homework more?

G2_Eri: Yes.

I: Using mobile phone for homework makes it easier, which makes you want to do it more. That helps you to learn?

G2_Eri: Yes.

I: The material?

G2_Eri: Yes.

¹⁵⁴ Interviews\\Time 2\\ G4_Saori

I: Do you think of your Ketai differently now after one year using Kai Tai for homework? Do you think about Ketai differently?

G4_Saori: Yeah.

I: How?

G4_Saori: Ummm [pause] before I think Ketai is [pause] not suit for study but now I think it is comfortable to study.

I: Can you tell me why?

G4_Saori: Especially homework. Last year I took Steve's class [pause]. We [pause] taught use mobile phone for learn more idiom. So putting idiom or...

I: You use mobile phone?

G4_Saori: Yeah. Some people use but many people use PC [PC site accessed with mobile]. So [pause] few people use mobile phone for it, so I think study on mobile phone don't suit for study actually but this year we use mobile phone for study, especially homework on the website. I think mobile phone [pause] it's suit for study but actually, [pause] for communication. .

I: With - so you mean communication with mobile phone is good?

G4_Saori: Yeah. [Pause] So this class homework is connected with communication, so it influence was communication and study.

I: Mobile phone helps with communication?

G4_Saori: And study, both.

¹⁵⁵ Final Questions G4_Saori Question 3

この宿題に関しては変わりました。他の授業では宿題で携帯を使用することはないので、もしインターネットを用いた宿題を利用する場合はこのスタイルを採用してもいいと思いました。My thinking towards homework has changed. I've never had a class before where we did homework via mobile phone. I think it's good to adopt this method of doing homework by using the internet.

¹⁵⁶ Interviews\\Time 1\\G1_Erika

G1_Erika: Yes I like it, because it's convenient to do homework by mobile phone because I bring mobile phone - always bring it - and I can do homework whenever I want to do it. So it's convenient I think.

¹⁵⁷ Interviews\\Time 1\\G2_Hitomi

G2_Hitomi: Always I have a iPhone, at school, at home, so very easy.

I: When you answer, when you do the homework, you write your comment, is it easy to do on Ketai, or...

G2_Hitomi: Yes, Ketai is easy for me.

¹⁵⁸ Final Questions G3_Yui Question 3

課題=レポート、パソコンでの投稿等のイメージだったので、携帯で文章を投稿してディスカッション形式での課題は新しいと思いました。In my mind, I've had the idea that "homework = report," that a paper is to be typed up on a PC. I think it's a new thing to be able to have discussions via my mobile phone, and to type up papers as well.

¹⁵⁹ Weekly E-journal Comments

G2_Eri 2011-06-30 グループのメンバーが多すぎて色々な意見は出て面白いのですが、その一方で、”宿題の目的である1つの意見に決定する”というのが難しかったです。[ENGLISH: Because there are so many members in a group it is good to have various opinions, on the other hand it was difficult to determine a single opinion which was the purpose of the homework.]

¹⁶⁰ Final Questions G3_Akiko Question 5

Using my phone to do homework has made me feel more involved with my homework than ever before. Up until now, I've always just done my homework at home. Now I can do homework anytime I'm free, which lets me make better use of my time.

¹⁶¹ G3_Fumie 3. 変えた。なぜなら、宿題に対するマイナスなイメージを少し変えたいし、宿題を学校や会っている時以外でも友達と取り組めるのはよい。やはり好きな時間に空いている隙間時間にでも宿題をやることができ、相手から返信がくるのが嬉しく、それが楽しみとなる。だから自分も気付いたらすぐに返信をしたくなる。いつでも携帯を持ち歩いているから、すぐに返信もできるしチェックできる、それが携帯で宿題ができる長所であると思う！忙しい毎日の中で忘れずに宿題ができるのは、以外と無駄してしまいう隙間時間を有効に使えるおかげである。少ない時間でも宿題ができるのは、携帯の場合だけだと思

う。そしてなかなか宿題をやるのを忘れないのは、いつも携帯を持ち歩いていて、携帯が思い出させてくれるおかげだと思う。It changed. It changed the negative image I had towards homework. I think it's good to be able to work on the homework with friends outside school and when you can't meet up with them. It was nice to be able to do homework whenever I wanted to, or whenever I had just a little free time. It made me happy when someone responded to what I said about the homework, and made me look forward to reading the response from others. So as soon as I realized that I had a message, I wanted to send a reply right away. I was able to check my messages and respond anywhere and anytime because I always have my phone with me. That's the benefit of doing your homework with a mobile phone! To not forget about your homework in the middle of a busy day is something that I think only the mobile phone is capable of. It's thanks to the mobile phone that I'm able to remember my homework, because I've got the phone with me everywhere I go.

¹⁶² Weekly E-journal Comments

G4_Yuri 2011-05-24 先週の宿題とは反対に、今回は英訳するのが難しい日本語を見つけるという内容でした。先週よりはスムーズに答えを出せたし、より良い意見を出し合えたので良かったと思います。
[ENGLISH: Opposite from last week's homework, this week's homework was to find a Japanese word that is difficult to translate to English. This is why I could submit my answers easily when compared to last week. Also, I think it was good to exchange better opinions with others.]

¹⁶³ Interviews\\Time 1\\G1_Erika

G1_Erika: For example I post this week's homework Japanese idiom - difficult to translate into English. My example is [unclear], but I not sure it's correct answer, but if I read others posts it helps me to think the correct way of create one's opinion. So others opinions help me to correct way of thinking so I can check that my answer - even if I already post...

I: Okay, so the more times you check, the more times you read other answers or comments, the more helpful it is for you?

G1_Erika: I think so.

¹⁶⁴ Final Questions G1_Erika Question 5

Did it help you learn? Yes, it has. It changed me to be hard to deal with homework. I could be hard to find useful example around Tokyo.

¹⁶⁵ Final Questions G2_Lulu Question 3

Has using a mobile phone for your homework changed the way you think of your school homework? Yes. I would be afraid I cannot get any hint of the homework when I meet difficulties of the homework. I can talk about it with my friends. And also, we can find a perfect answer in every homework according to the talking with others.

¹⁶⁶ Final Questions G2_Lulu Question 5

Did it help you learn? Yes. Since I use the mobile phone, I have more chances to communicate with other students. Every time, from the message of other, I can understand the questions more deeply.

¹⁶⁷ Interviews\\Time 1\\G1_Erika:

I: So have you done your homework with mobile phone before my class?

G1_Erika: Never.

I: Oh okay. What do you think? Do you like doing homework with mobile phone? I know typing is difficult, but besides typing do you like the idea of doing homework on mobile phone?

G1_Erika: Yes I like it, because it's convenient to do homework by mobile phone because I bring mobile phone - always bring it - and I can do homework whenever I want to do it. So it's convenient I think.

¹⁶⁸ Interviews\\Time 2\\ G1_Atsumi:

I: Because you can enter the site with mobile you can do your homework at this time in the morning?

G1_Atsumi: Yes.

I: Is that new for you?

G1_Atsumi: Yes, the way of handing the homework to the website, it's new.

I: Do you like it?

G1_Atsumi: Yes, I really like it.

¹⁶⁹ Interviews\\Time 1\\G1_Toshinao:

I: Have you used mobile phone in other classes to do homework?

G1_Toshinao: No.

I: Would you like it if other teachers put homework through mobile phone, some, like both options, computer and mobile phone?

G1_Toshinao: If we students have both options, both computer and cell phone, I think it has no problem.

¹⁷⁰ Final Questions G1_Mai Question 4

今まで「携帯電話」と「勉強」は全く関係のないものだと思ってたけど、今は携帯電話もパソコンと同じように課題を提出する1つの手段と考えるようになった。Up until this point I've always thought that learning and the mobile phone had nothing to do with each other, but now I see the mobile phone as another means to turn in assignments, just like the PC.

¹⁷¹ Interviews\\Time 1\\G2_Eri:

I: Have you used mobile before for homework - different year, different school?

G2_Eri: No, first time.

I: How do you feel about it?

G2_Eri: Very easy - convenient.

I: Would you like it if other teachers made homework for mobile?

G2_Eri: Yes, I hope so.

¹⁷² Interviews\\Time 1\\G2_Hikaru:

I: Do you use cell phone for homework in other classes?

G2_Hikaru: Other class - no only this class.

I: Would you like to use cell phone for different class homework?

G2_Hikaru: Yes.

¹⁷³ Interviews\\Time 1\\G2_Ayaka:

I: Have you used mobile website before for homework in different class, just mobile website?

G2_Ayaka: No.

I: Would you like other classes to offer homework on PC and mobile? Would you like if more classes have mobile...

G2_Ayaka: Yes. I like it. Because I like to watch everywhere, anywhere. Wherever I am, I can study English or I can do homework. It's good for me to improve my English skill, I think.

¹⁷⁴ Interviews\\Time 1\\G3_Ayaka:

I: So you're posting many messages which is good. Do you use your mobile phone for other homework - different class? Only my homework?

G3_Ayaka: Yeah, only your homework.

I: Have you used mobile phones for homework before my class?

G3_Ayaka: Your class before and I only use your homework and other teachers [unclear] communicate to English ... the homework is only internet [plus on] PC so I can't use mobile phone to do homework.

I: Okay, would you like it if other teachers had homework with mobile phone? Would you like it?

G3_Ayaka: I like your homework with mobile phone because I can do homework anytime, anywhere.

I: Is it easy for you to communicate

¹⁷⁵ Final Questions G3_Akiko Question 4

今までの携帯に対するイメージは「通話・メール」でしたが携帯で宿題が出来るという事は、忙しい時や通学時間でも宿題を確認できるようになったので、すごく便利であると実感しました。また携帯の新たな便利な点を見つけることができました。Until now, I've only seen the mobile phone as something for talking on and sending messages. To now have the ability to do my homework when I'm commuting to class or while I'm busy with something else is amazingly convenient. We've found a new use for the mobile phone [i.e., found another way of using of the mobile phone that makes life more convenient].

¹⁷⁶ Interviews\\Time 1\\G4_Asako:

I: Have you used mobile phone for homework before?

G4_Asako:No I can't.

I: Okay. Would you like to other classes, to have homework on mobile phone?

G4_Asako:Yes.

¹⁷⁷ Interviews\\Time 1\\G4_Yuan:

I: Okay. Would you like it if more teachers put the - made their homework so you can do from your mobile phone?

G4_Yuan:Yeah, yeah. Now I very like, I hope every teacher.

¹⁷⁸ Final Questions G4_Saori Question 4

携帯電話と勉強が、この授業によって結びついたと思います。I think that the use of the mobile phone and our studies [i.e., how much we learned] were tied together through this class.

¹⁷⁹ Final Questions G3_Ayaka Question 4

はい。携帯電話を使い学習することは非常に効率的であり現代的である。Yes. I think using my mobile phone to study is extremely effective, and the modern way of doing things.

¹⁸⁰ Interviews\\Time 1\\G3_Fumie

G3_Fumie: I think if I miss doing my homework, during my time on train time, use cell phone answer and do homework, can do homework, so very convenient for me. So good idea using mobile phone.

¹⁸¹ G3_Fumie 4. 変えた。携帯はさらに役に立つようになったと思うし、なおさら電池はなくさないように、必ず充電器を持ち歩くようにさせ、よりたくさんの時間を費やすようになった。それが宿題の場合は、本当に一つ携帯で宿題を終わらすことができ嬉しい。It changed. I see the mobile phone as an even more useful device. I've always got my charger with me so that my batteries don't run out, and I spend more time [using the phone]. When it comes to homework, it makes me really happy that I can do it all on a single mobile phone.

¹⁸² Final Questions G1_Atsumi Question 4

携帯に対しては、便利という印象が増した。Using it for homework gave me an even stronger impression of how convenient [the mobile phone] is.

¹⁸³ Final Questions G1_Chika Question 4

携帯に一時的なメモをしたり写真をとる事があったので、携帯は通信手段だけでなく記録手段だと感じました。Because I was able to take photos and jot down memos right away, I now feel that the mobile phone isn't just a communication device, but it's also a record-keeping tool.

¹⁸⁴ Final Questions G2_Lulu Question 4

Has using a mobile phone for your homework changed the way you think of your mobile phone? Yes. Using mobile for is not only for searching the information or calling, but also we can use it to do the homework. In that case, we can save a lot of time to do some others not waiting until I we go back home. We can do the homework every time.

¹⁸⁵ Final Questions G3_Yui Question 4

携帯電話で文章を投稿してやりとりすることは今までにもあったので特に変化は感じませんでした、携帯電話で宿題が出来るのは便利だと思いました。I've had discussions and typed up longer texts like this before, so I didn't feel any particular change [with how I normally do things], but the idea of submitting my homework via my mobile phone was useful.

¹⁸⁶ Final Questions G4_Yuri Question 4

スマートフォンにかえてから、携帯電話の新しい可能性を感じたので良かったです。I think it's great that I can see the possibilities with mobile phones since I've started using a smart phone.

¹⁸⁷ Interviews\\Time 1\\G1_Atsumi

I: How do you connect to Mixi?

G1_Atsumi: With mobile phone.

I: What percentage computer or mobile phone?

G1_Atsumi: 100% mobile phone.

I: Why?

G1_Atsumi: It is just for killing time. For me the computer is very complex to use and so for me it is better to use a cell phone. I like mobile phone more than computer so I use mobile phone only when using Mixi.

¹⁸⁸ Interviews\\Time 1\\G1_Erika

I: Okay. So why do you use mobile phone for Twitter or whatever - Facebook?

G1_Erika: Just to kill time.

¹⁸⁹ Interviews\\Time 1\\G3_Yurina

G3_Yurina: Because I can't use mobile phone during walking so in the train I haven't nothing to do so it is inconvenient for me to use the PC - mobile phone and login to website.

¹⁹⁰ Final Questions G2_Yuuri Question 4

更に便利になったと言えば聞こえがいいが、携帯電話に対する依存が増えたようには思う。また、携帯アプリやネットサーフィンなど魅力的なことが同機でできるため人によっては、その誘惑に打ち勝つのが難しいのではないかと思う。It sounds nice if you say, "even more convenient," but there are an increasing number of people who are addicted to their mobile phones. And with new apps and net surfing, isn't this making it harder to overcome the lure of our phones?

¹⁹¹ Final Questions G2_Yuka Question 4

はい。大変便利なものであり、より一層手放せないものとなりました。Yes. It's incredibly convenient; it's increasingly hard for me to put it down.

¹⁹² Interviews\\Time 2\\ G3_Akiko

I: Okay. So what you talk about with these two, is it the same as what you talk about with these people? The same questions?

G3_Akiko: No.

I: What's different?

G3_Akiko: Because I solve my problem where I talk about my problem with them. So I understand your homework, so understand. [Unclear].

I: Okay. So you - if you had to put a question on my website that you don't understand, is that okay?

G3_Akiko: No.

I: You don't like that?

G3_Akiko: Hmm.

I: Why?

G3_Akiko: [so yu commento wa shita iiu desu ka?] Can I make such a comment? [Kore wa answer dake i re ru website kato omotte ita.] I have been thinking this is a website only for submitting answers.

¹⁹³ Interviews\\Time 2\\ G3_Akiko

I: Okay. So why do you talk face to face?

G3_Akiko: It's easy to communication with that.

I: And?

G3_Akiko: I often meet with them and sometimes I go to a cafe that they're always there. So I eat lunch with them.

I: What do you ask them? What kind of questions do you ask them?

G3_Akiko: What do you mean? This example is correct.

I: Why don't you ask the other people those questions?

G3_Akiko: I hardly ever meet with them. I don't have any chance to meet them and for me, but Fumie, Yui are in same class, I take the same class with them so I have a chance to meet them so I can. I also have a chance to comment [unclear].

¹⁹⁴ Interviews\\Time 2\\ G3_Yui:

I: Do you feel more comfortable sometimes communicating face to face or communicating email with some people?

G3_Yui: Yes.

I: Which one?

G3_Yui: Akiko.

I: Akiko is what, face to face or email?

G3_Yui: Face to face.

I: More comfortable?

G3_Yui: I think.

I: Why?

G3_Yui: We can talk a lot.

I: You're friendly?

G3_Yui: Yeah. Fumie is also.

I: Anyone else?

G3_Yui: Nothing.

I: These other people, what's the most comfortable way to communicate - face to face or mobile website that were email or...

G3_Yui: Email or website.

I: That's more comfortable?

G3_Yui: I think.

I: Why?

G3_Yui: I can understand what they wanted to say with [sentence].

¹⁹⁵ Interviews\\Time 2\\ G1_Atsumi:

I: So you can use this time but you couldn't use it before for homework?

G1_Atsumi: Yes, I don't use this for homework, just for study for the test.

I: Six, seven, eight, nine, commuting time?

G1_Atsumi: Yes.

G1_Atsumi: Maybe - I often eat lunch with friends and we can communicate there and we can talk about the homework and we can discuss about the homework there with eating lunch, with talking different topics.

I: Why are you using mobile phone when you're face to face?

G1_Atsumi: No, just opening that website, just seeing.

I: So you're looking at the homework website and then talking face to face?

¹⁹⁶ Interviews\\Time 2\\ G1_Mai:

I: Okay, why do you think so many people are using mobile phone?

G1_Mai: Because most of my friends eating lunch is having mobile phone.

I: Okay. At the same time?

G1_Mai: Yeah, and talking and eating and using mobile phone.

¹⁹⁷ Interviews\\Time 2\\ G2_Ayaka:

G2_Ayaka: I eat lunch, I check my mobile phone or talk with my friends or do homework.

¹⁹⁸ Interviews\\Time 2\\ G2_Lulu:

I: Because you can use the website does that help you to learn better?

G2_Lulu: Yes, absolutely. It's very convenient, especially in this term. I can feel the closeness between our group [members] compared to the last time, because we exchange the idea often because of the website.

I: Why are you closer second semester than first? Why did you become close?

G2_Lulu: I think after doing the homework for many times, we exchange the idea many times, we can get familiar with other people. Although in the class, of course, we cannot meet everyone, but from the comment I can feel some characters of them.

I: So you get better with them.

G2_Lulu: Yes.

¹⁹⁹ Interviews\\Time 2\\ G2_Eri:

I: This is your group. This is all group for semester. This is separate groups, second semester. Who did you communicate with first semester, so when everyone...?

G2_Eri: Hitomi, Ayaka, Ah and Hikari, Yuka.

I: Did you communicate with them - how did you communicate with them? The same way or differently?

G2_Eri: Same way - face-to-face or mobile phone.

I: What about the other people? Did you communicate with them?

G2_Eri: Actually not.

I: Why?

G2_Eri: Because we - I don't get on with...

I: So you're not friends.

G2_Eri: Yeah.

I: Did you communicate with them on website?

G2_Eri: Yes.

I: Not face-to-face.

G2_Eri: Not face-to-face, yeah.

I: Not face-to-face but on website. So did you feel more comfortable on website?

G2_Eri: Yes.

I: People who are not your friends, you communicate on the website. Did that help you to finish the homework?

G2_Eri: Yes.

I: If you did not have mobile phone website, how would you - would you communicate with these people you don't know?

G2_Eri: I have to talk with them.

I: Would you talk with them?

G2_Eri: No.

²⁰⁰ Interviews\\Time 2\\ G2_Hitomi:

I: Okay. So how did you communicate with these people?

G2_Hitomi: For the homework two is face to face. And Eri also face to face. Here it just on internet. Eri Asaka is face to face. Uri face to face.

I: So internet means my website?

G2_Hitomi: Yeah.

I: Okay. So why are these people only website and these people are face to face?

G2_Hitomi: These people classes same and usually with lunchtime.

I: So you don't eat lunch with these people?

G2_Hitomi: Yes.

I: Okay so these people are your friends and these people you don't - not...

G2_Hitomi: Not friends.

I: If you talk to these people face to face would you feel comfortable?

G2_Hitomi: Not comfortable because not close friend so [unclear] these more good. There's no opportunity to talk with...

I: Yeah no opportunity?

G2_Hitomi: Yeah just homepage website talk with them. So yeah...

²⁰¹ Interviews\\Time 1\\G1_Takashii

G1_Takashii: Help - directly they can't help me because we are doing only homework on the website not face to - sometimes we talk each other face-to-face, but talk about not more deeply, so for example we talk a about how you think of it or how do you do this homework?

G1_Takashii: When I only look at other students' opinions - maybe I think how the homework proceeds, so check how proceeds. If the opinion is zero or I think it's not good.

²⁰² Weekly E-journal Comments

G3_Akiko 2011-06-25 について今回の宿題も面白かったです。今回の宿題を通して、通訳の難しさをより実感しました。得にイディオムは外国人は知らないなので、説明は大変だなとすごく感じました。通訳をする際には本当に色々な事に気を配らなくてはならないんだとあらためて思いました。今回の宿題は今まで知らなかったイディオムを知る機会にもなり、とてもよかったです！ [ENGLISH: This homework was also interesting (homework 5). Through this homework I really felt the difficulty of translation, especially that foreigners do not know about idioms so I felt it is difficult to explain them. Also, I thought when we will translate then we really need to take care of various matters. it was very good because this homework became a good opportunity to know idioms which i had not known before. So I feel it was good!]

²⁰³ Interviews\\Time 1\\G2_Yuuri

I: Why do you only post your opinion? Why don't you discuss on the website?

G2_Yuuri: I tend to post my opinion for incorrect answers - others' incorrect answers, so I want to say to others you are wrong, your answer is wrong. I think it is discussion. Disagreement is important I think.

²⁰⁴ Interviews\\Time 2\\ G2_Lulu

G2_Lulu: I remember the one time I made a mistake. They pointed for me. Then I did it again. I corrected.

I: Do you feel comfortable doing that?

G2_Lulu: Yes.

I: Does it make you feel uncomfortable?

G2_Lulu: I appreciate...

I: Oh you like it?

G2_Lulu: Yes, thankful, grateful for them because they pointed out my mistake.

²⁰⁵ Interviews\\Time 1\\G3_Ayaka

I: Okay, so do you talk about school in Mixi at all? Not my homework but school?

G3_Ayaka: I often ask favour [from other students] when should I hand in report and sometimes I use Mixi as a - where do you - when should I hand in report or when should I do a test or something.

I: Okay. All right, how do you access Mixi? Do you use PC or mobile phone?

G3_Ayaka: Mobile phone.

²⁰⁶ Weekly E-journal Comments

G4_Eri 2011-06-23 課題の意味がよくわからなかった。授業の意味があまり理解できずにいたからなので、メンバーに聞きたいとおもいます [ENGLISH: I do not understand well about the meaning of this question. The reason is that I could not understand well the meaning in the class, so I would like to ask my group members.]

²⁰⁷ Interviews\\Time 1\\G1_Atsumi:

G1_Atsumi: When we have the same class. Translation class or writing. I always feel upset if there is no comment on this website. If there is no comment I will communicate with other members face-to-face and say, "Oh there is no comment."

I: Why is it not good if they do not comment? How does that affect you?

G1_Atsumi: It is very...it may be strange but I want to write my idea after I see the comments from others. I am really afraid of making mistakes and others thinking my comments are really bad. So I don't [being] the first one. But this is not a good idea.

²⁰⁸ Interviews\\Time 1\\G4_Eri:

G4_Eri: Because we are friend and - friend so harder to say. Please - could you please type your opinion, hard to say.

G4_Eri: So if I don't type very - I worry about because I don't have time and I want to type fast computer, so [unclear]. Next day, next day, next day. So five members group is a little hard.

G4_Eri: And maximum three, three comments is a little difficult because everybody maximum three comment is a - if someone types comment, if someone don't write comment, can't continue. So...

²⁰⁹ Interviews\\Time 1\\G4_Asako:

I: Is there any bad point about doing that homework?

G4_Asako: Some people in my group didn't reply, so [unclear].

I: Okay, all right. So when people don't reply what happens?

G4_Asako: I want to discuss more deep so I want to join us some people.

²¹⁰ Weekly E-journal Comments

G3_Fumie 2011-05-29 今回の宿題は前回の宿題のテーマの逆だったので前回とは違い混乱することなくわかりやすく考えることができたと思います。また、ネット上での宿題を通してのやり取りも気軽にみんなとコミュニケーション取れる場として利用できてよかったです。周りの話とかを聞くと、同じグループの人が全然返信をしてくれないため進めずに答えをだすことができなかつたという話を聞いて私は恵まれていると思いました。 [ENGLISH: I think that I can think easily without confusion, which is different from the former times homework because this time it is opposite from the former theme. [Japanese answer instead of English] Also, it was good to use it as the place where we can communicate in a relaxed environment with everyone through the homework on the net. Since I heard talk [gossip] around me in which they mention they could not proceed because there are people who did not answer correctly. So I think I was lucky with my group.]

²¹¹ Interviews\\Time 1\\G2_Asaka:

G2_Asaka: Sometimes I ask too much questions Yuuri, and some - maybe I guess he sometimes gets upset, because of my too much questions, so I want to know how he feel during the conversation

²¹² Weekly E-journal Comments

G2_Ayaka 2011-06-29 I think my group is too large to discuss. My group members have a lot of idea, so it is difficult for me to reach the conclusion. Also, I think 5 or 6 people is the best.

²¹³ Weekly E-journal Comments

G2_Yuka 2011-06-30 今週の課題は身近な内容だった為議論しやすかった。しかし、身近な話題なだけあって意見が割れ、まとまりがなかったかのように感じた。 [ENGLISH: It was easy to discuss because the question of this week is close to our everyday life. However, because this is a topic close to our life so there is a wide variety of opinions from group members so it is difficult to get a consensus form the group.]

²¹⁴ Weekly E-journal Comments

G3_Yui EJ 2011-07-06 今週の課題は、説明が難しくて一人が一気に説明してしまうと、大抵内容が同じようなものだったので他は意見が被ってしまい投稿しづらかつたと思います。でも前回と違い、問題の容としては理解しやすかつたです。 [ENGLISH: In this week's homework it was difficult to explain, so single people at once explained a lot, and others opinions were similar and overlapped. This is why it was difficult to submit. However, compared to the former homework it was easier to understand for me the context of the question.]

²¹⁵ Interviews\\Time 1\\G1_Chika:

I: So you don't ask questions on the website?

G1_Chika: Ah. I ask questions probably to Mia. I don't have to ask everyone so I don't use the online, instead I use face-to-face.

I: What do you mean you don't have to ask everyone?

G1_Chika: So If I ask everyone, maybe they probably understand everything but sometimes they say different things. So I don't want to be confused by that.

²¹⁶ Interviews\\Time 1\\G2_Hikaru

G2_Hikaru: I think it is difficult to tell about homework on Mixi because homework content is difficult so I can understand easily face-to-face condition.

²¹⁷ Final Questions G3_Fumie Question 1

詳しく説明するとき。なぜかというメールだとなかなか、長文などを使って説明をいれたいと思っても長くしすぎると相手に否定的に(うんざり)させやすいと考えてしまう。また、気持ちなどを伝える面でもってメールより、直接会って言う方が正しく伝わると思う。 When explaining something in detail. This is because an email with such information would be so long that it would probably get a negative reaction from the

other person. Also, when you need to really show how you feel about something, it's more proper to meet directly with that person than sending an email.

²¹⁸ Final Questions G1_Erica Question 1

When I have some troubles which is difficult to solve by myself. I might get more specific solution by face-to-face than email.

²¹⁹ Final Questions G2_Yuuri Question 1

すぐに返事がほしい時や、聞きたいことが多い時。また、なにかの操作手順を教わる時。When I need an answer right away, or when there's something [important] I want to ask. Also when I need directions on how to operate something [complicated].

²²⁰ Final Questions G2_Lulu Question 1

When I need some more detailed answers, I would like to face-to-face communication. Because in that case, we can understand the answer easily. For email, it is limited to type on such more words.

²²¹ Final Questions G2_Yuka Question 1

Topicが複雑なため、mailで打つと長くなり面倒です。その点ではface to faceの方が好ましかったです。It's a hassle to try typing an email for a complex issue, it just gets too long. I prefer face-to-face communication for such situations.

²²² Final Questions G3_Yui Question 1

話したいことがある時に、その内容が文章だけでは伝えにくい時。When there's something I want to discuss, and with issues that are hard to express in writing.

²²³ Interviews\\Time 1\\G1_Takashii

G1_Takashii: Talking about homework on website it's [unclear] or limited because we have type a lot.

²²⁴ Final Questions G4_Saori Question 1

その場に相手が居る時。理由は、直接話した方がメールをするより楽だから。When the person I want to talk to is in the same place as I am. In such situations it's easier just to [go over and] talk to the person directly.

²²⁵ Final Questions G3_Akiko Question 1

面談の場合、コミュニケーションがe-mailよりも早く行われるので質疑応答の場合など、早く回答がほしい場合は面談の方がいいと思います。また写真やグラフを見せる際は面談の方が相手が理解しているかなど、表情などで読み取ることができるので好ましいと思います。I think face-to-face communication moves faster than email, so I'd say that it's better to discuss things in person when you need to have a question-and-answer session, or when you need an answer right away. Also, if you've got a photograph or a graph to show someone, then doing it face-to-face is a better approach because it will help the other person understand more clearly, and you can read their expressions [more easily].

²²⁶ Final Questions G4_Yuri Question 1

質問内容によりますが、質問されるほうも、質問するほうに疑問がある場合は、すぐに確認できるので面談のほうがいいと思います。It depends on what the topic is, but if I get asked a question by someone and I have a question in return for them, then it's better to just go confirm things face-to-face.

²²⁷ Final Questions G1_Atsumi Question 1

ビジネスなどで契約をかわす時など、とても大事なことを決めたり話し合ったりするときには、その時の行為を目で見てしっかり確認ができる面談の方が信用がある。For important decisions and discussions such as when breaking a contract in a business situation, face-to-face communication is more reliable. It allows both parties to look clearly at one another other to confirm what's going on [actually says, "to see the behaviour of the other person with their own eyes"].

²²⁸ Final Questions G1_Mai Question 1

相手の考えてることをすぐに知りたいときや、相手の気持ちを正確に理解したいときには、面談の方が好ましいと思う。理由は相手からの返事がすぐに返ってくるし、表情によってより正確に相手の考えを理解できるから。I prefer talking face-to-face when I need to know right away what someone is thinking, or when I want to accurately understand what the other person is feeling. [By discussing things in person], I can get an immediate answer, and through the expressions of the other person I can get an accurate understanding of what they're thinking.

²²⁹ Final Questions G1_Chika Question 1

相手への交渉などの大切な時や、会話など日常的なもの。→ボディランゲージや表情など、細かいニュアンスも伝えることができるから。When it's important that I negotiate something with the other person, and for everyday things, like having a conversation with someone. Face-to-face discussion allows me to use body language and [facial] expressions to get across subtle nuances.

²³⁰ Final Questions G1_Toshinao Question 1

活字では伝わらない、自分の声・表情・感情を伝えたいとき。メールはもちろん活字だけなので、さまざまな解釈が生まれてしまい、相手に誤解を与えてしまうことがしばしばあるから。When printed words don't get the message across, when I want to say something aloud, [showing] my expressions, my emotions. Of course email is limited to text, so there are many ways of interpreting it, leading to occasional misunderstandings between people.

²³¹ Final Questions G3_Ayaka Question 1

勉強教えてもらったり、相談にのってもらう時は面談のほうがいい。なぜなら感情を文字で表すのは難しいし相手の表情や雰囲気を感じながら会話を進めるのが好ましいから。It's better to do things face-to-face when I'm being taught something or when I need to consult with someone [about something important]. This is because it's difficult to express how you feel in writing, and it's more desirable for the conversation to progress while the participants can understand each other's emotional expressions and vibe.

²³² Interviews\\Time 1\\G2_Ayaka

I: When did you get your first mobile phone in your life?

G2_Ayaka: When I was nine years old. Yes. So my parents gave me and I use it when I call my mother or my father. When I back to - come back to - when I'd like to come back to home, I use mobile phone.

²³³ Interviews\\Time 1\\G2_Yuuri

I: When did you get your first mobile phone in your life?

G2_Yuuri: Fifteen years - when I was 15 years old.

I: Why did you get it?

G2_Yuuri: I have to go to high school and I have to be at school for a long time and maybe I want to send email to my family.

²³⁴ Interviews\\Time 1\\G3_Eri

I: Okay, when did you get your first mobile phone?

G3_Eri: I get 10 years old. Yeah, because I go to a school so I always get the train so after the class I call my mum so I use it.

²³⁵ Interviews\\Time 1\\G3_Yurina

I: When did you get your first mobile phone in your life?

G3_Yurina: Maybe, it was when I was 15 years old.

I: And why did you get it?

G3_Yurina: I asked my parents to give me a mobile phone so...I wanted email or telephone with my friends.

²³⁶ Interviews\\Time 2\\ G4_Midori

I: What do you do with your mobile phone? Not homework.

G4_Midori: Send email and [unclear] my family and tweet, use the Twitter ... Facebook and so on.

I: Is that your friends?

G4_Midori: Yes.

I: Anything else?

G4_Midori: write my blog

I: That's fun?

G4_Midori: Mmm.

I: It's your fun thing. So you do that with mobile phone, it's fun.

G4_Midori: Yes.

I: Okay....

G4_Midori: My mobile phone system is [unclear] email to my friend and ... menu ... I connect to Twitter - Twitter ... so now email so...

I: What about my website, can you do my website? Homework?

G4_Midori: Yeah, website.

I: Okay, so it's very easy to change?

G4_Midori: Mmm.

I: Because it's easy to change blog, email, homework, does that make it easier for you to do homework?

G4_Midori: Yes.

²³⁷ Interviews\\Time 1\\G2_Yuuri

I: So when you bought your iPhone, you were thinking about homework?

G2_Yuuri: To do my homework.

I: You would like to do homework in other classes if possible?

G2_Yuuri: Yes.

²³⁸ Interviews\\Time 2\\G2_Yuuri

I: Why do you think you enter it more often with a mobile phone than with a PC?

G2_Yuuri: I don't need to worry about it - others - other people's - if I use PC next to people, pass on things, pass on...

I: Watching?

G2_Yuuri:...watching the screen, I don't like that so I can use mobile phone and I don't worry about that.

I: So it has more privacy?

G2_Yuuri: Yes.

²³⁹ Interviews\\Time 2\\ G4_Asako

G4_Asako: PC? When I want to go on the website I use the PC and typing is the PC but ... email or telephone or sometimes to play the games is mobile phone

I: Okay so you like mobile games?

G4_Asako: Hmm - so, so [yes, yes].

²⁴⁰ Final Questions G3_Yui Question 6

やることなく暇な時などに簡単に他の人と連絡が取れるので人気があるのだと思います。

6. I think it's become popular because you can contact someone easily when you're free and have nothing to do.

²⁴¹ Interviews\\Time 2\\ G4_Eri

I: Now what's the difference with mobile phone doing homework? What you're feeling different?

G4_Eri: Mobile is I finished the connect computer so [unclear] next page for example, fashion page or Mixi... so this is... same network same feeling if I use iPhone.

I: That's very interesting. So if you use mobile phone for homework you get the same feeling as if you were - you can quickly change to your fun things?

G4_Eri: Yes.

I: Fun meaning personal things, website.

G4_Eri: Yes.

I: Mixi, shopping, fashion?

G4_Eri: Yes.

I: So then you use mobile phone, homework and Mixi, shopping and fashion are the same?

G4_Eri: Yeah I can collect.

I: So nice feeling?

G4_Eri: Yes. Compared to personal computer.

²⁴² Interviews\\Time 2\\ G4_Eri

I: Does it make it easier for you to do homework with Ketai? Does Ketai homework make it easier for you than PC homework?

G4_Eri: Yeah.

I: Ketai easier?

G4_Eri: Yeah.

I: Why?

G4_Eri: Ketai is tool of play, so easy to connect.

I: Can you say this in Japanese - tool of play?

G4_Eri: [unclear].

I: What do you mean? Can you say your meaning in Japanese?

G4_Eri: Tool of play.

I: What is that?

G4_Eri: [Asobi no dogu] tool of play.

I: Okay - and that's good?

G4_Eri: Yeah. Actually I want to say Japanese but I can't translate to English.

I: You can in Japanese and later I will translate it.

G4_Eri: [Asobi no encho senjyo] extension of play.

²⁴³ Interviews\\Time 2\\ G4_Yuri

I: What else do you use your mobile phone for on the train? Not homework, other things, just fun? Yeah, iPhone, what do you do with it?

G4_Yuri: I often watch Twitter or Facebook, checking email and playing games and so on.

I: So, Facebook, Twitter, email, games, homework. So, Twitter, Facebook, email, games, that's fun? That's personal, not school? That's just a fun thing?

G4_Yuri: It's just fun.

I: Just fun. Your entertainment?

G4_Yuri: Yes, it's my entertainment.

I: I see. Fun, I mean personal life, not your - well, thanks anyway. Now, because you're on the mobile phone, sometimes on the train are you doing Facebook and you think I'll change email, I'll change game and then you think I'll change homework, game, Facebook, homework, game, game, game, game, game, game. So, you can go dah, dah, dah, dah, dah, game, homework, Facebook, Twitter. You're changing a lot, are you?

G4_Yuri: Yes, I change a lot but I'm mostly using Twitter or Facebook and communication websites.

I: Okay, so that's fun. Social networking. Yeah, popular. So, because you're using a mobile phone for those things, does it make it easy to go games, homework, game, game, homework?

G4_Yuri: Easy. Yes, very easy.

I: If you did not have a mobile phone would it be as easy to change to homework and back to games?

G4_Yuri: Yes, inconvenient to use.

I: What about in your mind, you're feeling - homework feeling, is it oh homework? Usually, students think, oh homework. But, because you can use a mobile phone for fun things, is it a little easier to go oh homework; a little different? Because you can use fun, fun, homework, fun, fun, homework, fun? Does that make doing, or starting, homework, a little easier?

G4_Yuri: Yes, I think so. Yes.

I: I don't know. What's your feeling? Not just easy to do; useful, your emotion. Hmmm, I should do homework.

G4_Yuri: Many students think homework is a duty. So, duty and - sorry, troublement [sic]. But, even homework is doing website. So, I think this way is more fun, yes. Your homework feels good to another way to homework. For example, writing a report, or preparing presentations.

I: Is that because of the homework question or because you can do mobile phone? Because homework question you like?

G4_Yuri: No, mobile phone homework, I like that.

²⁴⁴ Interviews\\Time 2\\ G3_Akiko

G3_Akiko: I want to your other website if I have a cell phone.

I: So with cell phone you want to enter the website.

G3_Akiko: As other the website.

I: Okay so at the same time you sort of other website, my website, other website.

G3_Akiko: [Unclear].

I: If I can remember this. Okay so you enter...

G3_Akiko: Twitter, mixi Facebook.

I: So you enter my website around the same time you're looking at other websites.

G3_Akiko: Hmm.

I: So that means it's easy to go to my website because you're looking at other websites and then you just click and go to my website. Sorry. But is that why - because you're looking at other websites is that why it's easy to go to my website? Like other mine, other. You said before that - only three minutes so mine's three minutes other websites....

G3_Akiko: Yeah.

²⁴⁵ Interviews\\Time 2\\ G2_Eri

I: Do you use your mobile phone for homework at eleven o'clock?

G2_Eri: Yes.

I: Why? When?

G2_Eri: Before I go to bed I do homework and maybe at eleven o'clock.

I: Why?

G2_Eri: Maybe most people have time to do homework. So we can talk on the website. If I send - I hand in homework - my friends hand in homework soon, so maybe - limit...

I: Deadline.

G2_Eri: Yeah, deadline.

²⁴⁶ Interviews\\Time 1\\G2_Lulu

G2_Lulu: It really helped us greatly. At first time in the class we don't know each other greatly, but because the homework and we talk about to each other, and maybe at - in the class and when we see each other, we can try to - oh, I saw your reply yesterday on the website and this is - and after that we can gradually know each other - first remember their name and then talk more and more directly. That is - and other direction it helps us a little build up a friendship with each other.

²⁴⁷ Interviews\\Time 2\\ G2_Eri

I: Did you communicate with them - how did you communicate with them? The same way or differently?

G2_Eri: Same way - face-to-face or mobile phone.

I: What about the other people? Did you communicate with them?

G2_Eri: Actually not.

I: Why?

G2_Eri: Because we - I don't get on with...

I: So you're not friends.

G2_Eri: Yeah.

I: Did you communicate with them on website?

G2_Eri: Yes.

I: Not face-to-face.

G2_Eri: Not face-to-face, yeah.

I: Not face-to-face but on website. So did you feel more comfortable on website?

G2_Eri: Yes.

I: People who are not your friends, you communicate on the website. Did that help you to finish the homework?

G2_Eri: Yes.

I: If you did not have mobile phone website, how would you - would you communicate with these people you don't know?

G2_Eri: I have to talk with them.

I: Would you talk with them?

G2_Eri: No.

²⁴⁸ Interviews\\Time 2\\ G4_Saori

I: I mean why is it more comfortable to communicate with mobile Ketai...with people you don't know? So you said with your friends Face-to-Face okay? But people you don't know you prefer Twitter and Mixi. Why?

G4_Saori: I can't speak - talk to people who [pause] I don't know.

I: A little shy?

G4_Saori: Yeah.

²⁴⁹ Interviews\\Time 2\\ G2_Hitomi

I: Okay. So how did you communicate with these people?

G2_Hitomi: For the homework two is face to face. And Eri also face to face. Here it just on internet. Eri, Asaka is face to face. Uri face to face.

I: So internet means my website?

G2_Hitomi: Yeah.

I: Okay. So why are these people only website and these people are face to face?

G2_Hitomi: These people classes same and usually with lunch time

I: So you don't eat lunch with these people?

G2_Hitomi: Yes.

I: Okay so these people are your friends and these people you don't - not...

G2_Hitomi: Not friends.

I: If you talk to these people face to face would you feel comfortable?

G2_Hitomi: Not comfortable because not close friend so [unclear] these more good. There's no opportunity to talk with...

I: Yeah no opportunity?

G2_Hitomi: Yeah just homepage website talk with them. So yeah...

²⁵⁰ Interviews\\Time 1\\G2_Hikaru

I: Where do you usually use mobile phone for homework, where?

G2_Hikaru: On the train or in the Toyo University. Sometimes home, at home.

I: Why do you use it at home?

G2_Hikaru: I - if I use computer, personal computer, I need lot of time, but cell phone I need little time.

I: What do you mean little time - why does it take little time?

G2_Hikaru: I can open the website easily using cell phone.

²⁵¹ Interviews\\Time 2\\ G3_Akiko

I: So in the morning...

G3_Akiko: I don't go to use the computer... ..Because it is very busy in the mornings so [i do shi nagara mo] in the meantime of also moving.

I: So you use mobile.

G3_Akiko: Hmm.

²⁵² Interviews\\Time 2\\ G4_Eri

I: Did you use your mobile phone inside to do homework?

G4_Eri: Inside, yeah.

I: Where did you use your mobile phone inside?

G4_Eri: Home in bed, [fast food] shop and so on. But just work is where [unclear] wherever.

I: Just looking?

G4_Eri: Yes.

I: Looking at comments other students...

G4_Eri: Yes.

I: So you use it at a restaurant. If no [Ketai] could you look at homework in a restaurant?

G4_Eri: No.

²⁵³ Interviews\\Time 1\\G1_Erika

I: Do you use mobile phone at work?

G1_Erika: Yes. To tell the boss the sales.

I: Do you communicate with people at work on your...

G1_Erika: Ah yes.

I: Yeah. Okay. Do you talk about homework sometimes?

G1_Erika: Sometimes, ah yes, sometimes. Mainly email or phone call.

I: Okay and your group people?

G1_Erika: Yes mainly, yeah.

I: Why at work? How can you communicate at work?

G1_Erika: When the rest time.

I: And usually from mobile or PC?

G1_Erika: Mobile.

I: Why?

G1_Erika: Easy to check.

²⁵⁴ Final Questions G1_Erika Question 4

Has using a mobile phone for your homework changed the way you think of your mobile phone? Yes, it has. I found that using a mobile phone for homework is good for using time effectively. For example, I could do homework while I take rest time at my part-time job. By doing so, I could use my time for some things except homework, after I finished my job and go home.

²⁵⁵ Interviews\\Time 1\\G2_Hikaru

G2_Hikaru: I can do my homework every time.

I: Why is that important, any time?

G2_Hikaru: I have little break time - 10 minute or 20 minutes. I often have - so I can use this time for my homework.

²⁵⁶ Interviews\\Time 2\\ G3_Ayaka

G3_Ayaka: Mobile phone. Maybe, and semester 2 at deadline 11:00 pm. When I use mobile phone to do homework maybe I was the working place and when I do homework by using computer maybe when I was in home.

I: So that's why computer is bigger...

G3_Ayaka: Yes, yes. So this time to do homework by using computer. Weekdays I was in working place so I often use mobile phone this time - during this time.

I: Between four and five...

G3_Ayaka: Yes because this [less time]. Yeah. So [unclear] less time I often do homework by using mobile phone.

I: That's second semester?

G3_Ayaka: Second - only second semester.

I: On break time.

G3_Ayaka: Yeah.

²⁵⁷ Interviews\\Time 1\\G1_Atsumi

I: So one mixi you never talk about Homework?

G1_Atsumi: Yes.

I: Why?

G1_Atsumi: For me Mixi is just for fun. I don't want to think about homework in Mixi.

I: So Mixi is just fun and homework is just ...

G1_Atsumi: The other thing. It is my assignment. The thing other than my fun things. So I separate it from this. Can you understand?

I: I see. Why do you need to separate them?

G1_Atsumi: Because if I always think about my assignment and fun as the same thing then my life will be very boring.

I: When you are on Mixi for fun, do you communicate with students?

G1_Atsumi: Yes. My classmates or local friends, many friends.

I: So you talk to classmates [on Mixi] but you never talk about homework?

G1_Atsumi: Yes.

²⁵⁸ Interviews\\Time 1\\G2_Ayaka

I: Why don't you talk about homework so much on Mixi or Twitter?

G2_Ayaka: I - my friends or my senior always comment about homework and I - after I read the comments of my friends and I recommend his or her comment. Why? But content - we don't talk about the contents of homework, just it is hard or it is difficult to do my homework, something like that.

²⁵⁹ Interviews\\Time 1\\G2_Lulu

G2_Lulu: My group - sometimes I use the Facebook, like Facebook or Skype to connect with them.

²⁶⁰ Interviews\\Time 1\\G3_Yurina

I: When you use mobile phone on the train do you only do homework or do you do other things with mobile phone?

G3_Yurina: Tweeting and do homework or tweeting.

I: Do you use Twitter with your group for homework?

G3_Yurina: I don't.

I: Why?

G3_Yurina: Why? I think Twitter is my private so if possible I don't want to tell my Twitter for other people.

²⁶¹ Interviews\\Time 1\\G3_Fumie

I: Mixi. Do you talk about homework on Mixi?

G3_Fumie: No, no, no, no homework.

I: Do you talk with your classmates or your group members on Mixi?

G3_Fumie: Yeah. So, voice, do you know Mixi is voice?

I: Okay I see. Alright. How do you access Mixi? PC or mobile?

G3_Fumie: Almost all mobile phone.

²⁶² Interviews\\Time 1\\G4_Yuri

I: I see. Is Twitter private?

G4_Yuri: Yes. But another group member watch my activity and so...

I: Your other group members. You mean group 4?

G4_Yuri: Yes.

I: But can other people, strangers, see your Twitter?

G4_Yuri: Yes. But they don't understand my meaning, how I mean.

I: So you hide the meaning?

G4_Yuri: Yes [laughs].

I: Okay, I see. So if I made Twitter account just for your group do you think your group might sometimes use it?

G4_Yuri: Yes. I usually log into Twitter so...

²⁶³ Interviews\\Time 1\\G3_Yui

G3_Yui: My group members is almost same class, so we can talk face-to-face. I often use Mixi on the internet - social network. I use it very much.

I: How do you connect to Mixi? Do you use computer or mobile phone?

G3_Yui: Mobile phone.

I: Maybe. So why do you use mobile phone for Mixi?

G3_Yui: It's easy to use.

I: Okay, so on Mixi do you talk about homework?

G3_Yui: Yes. For example do comment or do reply on homework one or two or [laugh].

I: Why do you use Mixi for that?

G3_Yui: It's my custom, like my custom.

²⁶⁴ Interviews\\Time 2\\ G3_Eri

G3_Eri: Maybe Facebook or [Mixi].

I: For homework? How did you use that for homework?

G3_Eri: I ask other people about my homework, so not research member.

I: In the class, or other students from a different class?

G3_Eri: Different class, and not this university student.

I: Oh, completely different students, different people. Okay. Do you use mobile phone for Facebook and Mixi?

G3_Eri: Yes, also computer.

I: Which one more?

G3_Eri: Mobile.

²⁶⁵ Interviews\\Time 1\\G1_Erika

I: Okay. So why do you use mobile phone for Twitter or whatever - Facebook?

G1_Erika: Just to kill time.

²⁶⁶ Interviews\\Time 1\\G3_Fumie

G3_Fumie: Train time is long. Sometimes I am on the train so long and I think on the train is my free time, so I think on the train is good using cell phone [unclear]. G3_Fumie: I think if I miss doing my homework, during my time on train time, use cell phone answer and do homework, can do homework, so very convenient for me. So good idea using mobile phone.

²⁶⁷ Interviews\\Time 1\\G1_Atsumi

I: When do you log into my website?

G1_Atsumi: Where is anywhere I can use cell phone. And time is when I can have free time, anytime maybe, but mostly in the train

I: Why in the train?

G1_Atsumi: In the train I have nothing to do, and I couldn't do large things on the train. Using mobile phone in the train is very good to kill time so I often use it.

I: And you do homework then [on the train]?

G1_Atsumi: Yes.

I: And do you do fun things on the mobile?

G1_Atsumi: Yes. After the homework.

²⁶⁸ Interviews\\Time 2\\ G1_Atsumi

I: suddenly six, seven, eight and nine there is a lot.

G1_Atsumi: Maybe they are in the train and going to school.

I: Do you think they have access to computer at this time?

G1_Atsumi: No, I think they're in the train or some people.

I: So if you did not have mobile phone could you access the website at this time?

G1_Atsumi: No.

I: If you did not access the website at that time, what would you do on the train?

G1_Atsumi: I would sleep.

I: Because you can enter the site with mobile you can do your homework at this time in the morning?

G1_Atsumi: Yes.

I: Is that new for you?

G1_Atsumi: Yes, the way of handing the homework to the website, it's new.

I: Do you like it?

G1_Atsumi: Yes, I really like it.

I: So you can use this time but you couldn't use it before for homework?

G1_Atsumi: Yes, I don't use this for homework, just for study for the test.

I: Six, seven, eight, nine, commuting time?

G1_Atsumi: Yes.

²⁶⁹ Interviews\\Time 1\\G3_Yurina

G3_Yurina: Because I can't use mobile phone during walking so in the train I haven't nothing to do so it is not convenient for me to use the PC - mobile phone and login to website.

²⁷⁰ Interviews\\Time 2\\ G1_Mai

I: Okay, so, yeah okay. What about this one here? 12 and one o'clock there's another large number of mobile.

G1_Mai: During lunch time.

I: Lunch time. Why would they, can you use a personal computer at lunch time? PC?

G1_Mai: Yes, I, ah in technology square in Tokyo University or some friends bring their computer in to school so they can use computer.

I: Okay, why do you think so many people are using mobile phone?

G1_Mai: Because most of my friends eating lunch is having mobile phone.

I: Okay. At the same time?

G1_Mai: Yeah, and talking and eating and using mobile phone.

I: Okay good and then here, at lunch time you use it a lot, so 12 o'clock, one o'clock, two o'clock. One o'clock mostly. What's going on there?

G1_Mai: I think on the Wednesday after second period I think the homework would be on website so I maybe check the homework.

I: So if you did not have a mobile phone at that time could you check the homework?

G1_Mai: No, I would never check. I think I didn't do my homework during this time. I just check homework and think my opinion.

I: Okay. Check homework means? I see, check it. So, if you did not have mobile you would not check at this time?

G1_Mai: Yes.

I: If you did not check at this time would you be thinking about the homework?

G1_Mai: No.

²⁷¹ Interviews\\Time 2\\ G3_Eri

I: Then again at 12 and one o'clock.

G3_Eri: Lunch time.

I: So do you use your mobile phone at lunch time?

G3_Eri: Yes.

I: For homework?

G3_Eri: Sometimes I use, but I often talk with my friends, so I don't use mobile phone at lunch usually.

²⁷² Interviews\\Time 2\\ G2_Hitomi

I: Semester one you did a lot; semester two what's happened?

G2_Hitomi: I think I decide I don't want to - homework lunchtime.

I: Okay so you...

G2_Hitomi: I wanted to be with my friends.

I: Okay. Why did it change? Just no reason?

G2_Hitomi: Yes.

²⁷³ Interviews\\Time 2\\ G3_Ayaka

I: Okay. So when I give you the homework, usually on a Monday, sometimes I give you homework find example [unclear] right? How do you find an example? How many - when do you look and where do you look?

G3_Ayak:a: ...I often walk on the road, look around the city, for example in the toilet, toilet and station. Maybe in toilets and the station there are many good examples. It's easy to find - look for these examples.

I: Okay. How often do you look? When do you usually look?

G3_Ayak:a: Many times.

I: So many during the week?

G3_Ayak:a: Yes, during the week and do homework at this Saturday and the Sunday. I: So this time you find examples...and this time you do what?

G3_Ayak:a: Yes, do homework. Do comment. Comments.

²⁷⁴ Interviews\\Time 2\\ G3_Eri

I: Okay. This comment, "easy to find cool locations, looking around town". So this is the homework where you had to find examples around Tokyo, I think, with cool locations. So what do you mean, easy to find examples? You found a lot of examples around Tokyo?

G3_Eri: Yes.

I: So when you found an example, what did you do?

G3_Eri: I take a picture. It's easy to do homework, picture is easy to understand what I wrote about the homework.

I: So second semester, a lot of the homework you could do pictures and write. You liked that?

G3_Eri: Yes.

I: So that helps you to understand?

G3_Eri: Yes. So other my research members also upload pictures so I can understand very easily.

²⁷⁵ Interviews\\Time 1\\G2_Eri

G2_Eri: Because if I have a time, I can do this homework every time, everywhere. For example, I wait my friend, I do homework.

²⁷⁶ Interviews\\Time 1\\G3_Yui

I: Who do you communicate with on Mixi? Your group members?

G3_Yui: Yes, and many people in total university.

I: Okay, so your group members and other students.

G3_Yui: Yes.

I: Okay. Do you communicate with other friends as well? Other friends, non-student friends?

G3_Yui: Yes.

²⁷⁷ Interviews\\Time 2\\ G3_Eri

G3_Eri: Maybe Facebook or [Mixi].

I: For homework? How did you use that for homework?

G3_Eri: I ask other people about my homework, so not research member.

I: In the class, or other students from a different class?

G3_Eri: Different class, and not this university student.

I: Oh, completely different students, different people. Okay. Do you use mobile phone for Facebook and Mixi?

G3_Eri: Yes, also computer.

I: Which one more?

G3_Eri: Mobile.

²⁷⁸ Interviews\\Time 2\\ G4_Midori

I: There's also a lot of mobile activity here with you so you're not using computer on Saturday but you use mobile for homework. What's happening here? What's happening for semester 2, on Saturday.

G4_Midori: I usually go out on Saturday so I can't open my PC.

I: So you do homework?

G4_Midori: Yes. Yes.

I: Really? You go out and do homework? What do you mean go out, what's that mean?

G4_Midori: Go out, play with my friends.

I: Just fun?

G4_Midori: Yeah. So not to go back my home.

I: Why do you go to my website?

G4_Midori: The day before deadline so must do comment.

I: So you're out with your friends for entertainment but you think oh, I have to do comment?

G4_Midori: Yes.

I: Okay. Does having mobile phone make this homework easier...

G4_Midori: Yes.

I: ...at this time?

G4_Midori: Mmm.

I: Then homework 4 a little bit and 5 a lot. What happened here, homework 4?

G4_Midori: I forgot but maybe this time I am at home but maybe this time is I go to outside.

I: What do you mean outside?

G4_Midori: Play with my friends all night so I can't open my PC but deadline is approaching so I must send comment.

²⁷⁹ Interviews\\Time 1\\G1_Erika

I: Okay, so the more times you check, the more times you read other answers or comments, the more helpful it is for you?

G1_Erika: I think so.

²⁸⁰ Interviews\\Time 2\\ G1_Erica

I: Okay. So why do you go short time, leave, short time, leave, for mobile?

G1_Erica: To look notebook and on mobile phone. I mean, if I log in to your website I need to open several pages, so I take iPhone photo on the page of homework subject and then log it out and look notebook and just think about homework.

I: Oh, it saves website page.

G1_Erica: Yes.

I: So like a notebook.

G1_Erica: Yes, and I can come up with answer to homework, I log in again.

I: I see. Okay, and yes. So, do you think with computer one time...

G1_Erica: Yes.

I:...with mobile several times.

G1_Erica: Yes.

²⁸¹ Interviews\\Time 1\\G2_Eri

G2_Eri: Yes. But I don't have long time, just only one time, so I read - I check the mobile phone, I check the website many times, and after that I think about what should I write to other people - others [unclear]. After that, I do the homework, so I check, check, check, check, check many times and after that I answer and answer.

²⁸² Interviews\\Time 1\\G2_Ayaka

I: Many times you log in and you go to homework, but you don't type or read other students' comments. Here you made - green means you made an answer. Why so many times checking, checking and then answer?

G2_Ayaka: Because I like to know comment of - comment which my friends upload, but I cannot explain comment to my friends' comment. I always thinking about the - how can I answer it, so, many times I watch the website Maybe I always thinking about the answer with looking at comment, and I sometimes forget the contents of the comment of my friends, so I always look at the comment.

I: Because mobile phone you can go to website many times in day, going many times, does that help you understand the homework?

G2_Ayaka: Yes.

I: Can you tell me example how?

G2_Ayaka: I have more - I can have more opportunity to think about the homework, so I can have more time to understand or more time to come up with opinion or answer, so - helpful.

²⁸³ Interviews\\Time 1\\G4_Yuan

I: Okay. Now one more question, when you read someone else's answer and you log off and then you log on and read someone else's answer. Could you do that from a computer?

G4_Yuan: No, no, no I can't. I think the mobile phone is often to log in, yes and read. That's common I just open, I can see all round, on other opinion.

²⁸⁴ Interviews\\Time 2\\ G2_Hitomi

G2_Hitomi: Because PC is very text kind and mobile phone is really easy to connect internet.

I: Now with mobile you look...

I: So with mobile between look and answer is there more? More time than with PC, between look and answer? Because PC you're on same time.

G2_Hitomi: Yeah more time.

I: More time. So if there's more time does that mean you can think more?

G2_Hitomi: Yes think more. Yeah. It depends on the situation.

I: Sometimes. Does it give you more chance to look for examples - this space?

G2_Hitomi: Yes.

²⁸⁵ Interviews\\Time 2\\ G4_Asako

I: If you did not have mobile phone - smart phone would you read their comments and think about them as much with only PC?

G4_Asako: Only PC? Mobile phone can much more.

I: So you can connect many more times?

G4_Asako: Yeah.

I: After you read you think about it?

G4_Asako: Yeah.

I: Does that help you to learn?

G4_Asako: Mmm, mmm, yes, yes.

²⁸⁶ Interviews\\Time 2\\ G3_Yui

I: Ketai only, mobile phone only. This is 31 to 60 seconds, so about one minute. The number of times people - so most people are about 10 minutes, something like that, here, most people. A little more, some people - actually a lot of them are only three minutes, something like that. How about you? How long with your mobile phone do you stay on website?

G3_Yui: Five minutes I think. Five minutes or - two minutes to five minutes.

I: Two to five minutes. How about computer?

G3_Yui: Computer I think I watch five to 10 minutes.

I: When you do homework on mobile phone, do you finish all the homework at one time?

G3_Yui: No.

I: With computer, do you sometimes finish all the homework?

G3_Yui: Yes.

I: With mobile phone, you stay on shorter time?

G3_Yui: Yes.

I: Then you finish homework.

G3_Yui: Yeah. I watch this mobile phone - this website many times. Whether I correct or not, I check.

I: With computer, so you try to finish at one time?

G3_Yui: Yeah.

I: Do you also check for correctness?

G3_Yui: Yes and for long time check, many time check.

I: So mobile phone short time, off, short time off, short time, off. This time are you thinking about homework?

G3_Yui: Yes and use my email and make message and send this website, copy and...

I: You like your mobile phone?

G3_Yui: Yeah.

²⁸⁷ Interviews\\Time 2\\ G2_Lulu

I: If you use the home computer how many times do you enter to do homework? One time or many times?

G2_Lulu: Sometimes many times. If I put up the homework early and other students have it and didn't put up the homework I will check it later and see what other people's ideas.

I: So later means later - a different day or later in the same day?

G2_Lulu: It may be a different day.

I: You said that short time - mobile phone only has short time to do homework.

G2_Lulu: Yes.

I: Do you like to do homework at once, if possible - one time; a long time; one time?

G2_Lulu: Just 30 minutes every time.

I: So to finish homework takes about 30 minutes?

G2_Lulu: Yes.

I: With the computer?

G2_Lulu: Yes. If I use the mobile phone - the train - my train - from my home to my workplace it just cost 15 minutes, so I cannot finish in the limit time. I should stop...

I: So with the mobile phone you have to do short time stop?

G2_Lulu: Yes.

I: Short time...Stop.

G2_Lulu: Yes. So in order to make the homework - I do the homework at once. For me, I choose to use the computer. It's better.

I: Why don't you like this way?

G2_Lulu: In this way my idea will be cut - cannot coherent...

I: So your idea is you cut...

G2_Lulu: Yes.

I: You forget?

G2_Lulu: Yes. Maybe I forget. When I do other - second time - I will try to think about what I thought the first time. When I saw what I did the first time it also cost more time, I think, to do, to finish, continue it.

I: Just here you think about homework and stop, think about homework and stop.

G2_Lulu: Yes.

I: Okay, so here you can think about it maybe one time.

G2_Lulu: Yes.

²⁸⁸ Interviews\\Time 1\\G2_Yuuri

G2_Yuuri: I usually read others' comments and...

I: Why do you read others' comments?

G2_Yuuri: I want to reply to others and I want to have information about the topic.

I: What kind of information do you want?

G2_Yuuri: I just want to know others' opinion and I want to know how to write and how to make sentence.

²⁸⁹ Interviews\\Time 1\\G2_Asaka

G2_Asaka: I type answer after I read other students' answer.

I: Does that help you?

G2_Asaka: Yes. The words - the answer told me what kind of thing - what kind of words I should put on the website.

²⁹⁰ Interviews\\Time 1\\G2_Lulu

G2_Lulu: I can see others' opinion - other student opinion.

I: Why do you look for other student opinions?

G2_Lulu: Because I want to know what other - I want to know whether my idea is correct or not. You know, this translation has some relationship with the Japanese, so, as for me Japanese is a little difficult, so I would like to maybe get some points from other students. They are better than me I think...

I: Because you're Japanese. Good, so you - when you look at another student's answers, what are you thinking - what are you looking for?

G2_Lulu: I just think looking for and what he or she has written, and then the reply of other students, and compare of them, compares their ideas. If I don't understand I would check it on the computer.

²⁹¹ Interviews\\Time 1\\G1_Chika

I: When you log into the website and read other student's answers, do you write your answer before you read them or after?

G1_Chika: I read all the answers first and then I type my answer. I don't want to write the same answer so first I check then write my answer.

I: Ok. Does that help you think of an answer?

G1_Chika: Yes.

I: Why?

G1_Chika: First my idea sometimes is different from the question, so everyone's answer is an example for me.

I: So it helps you to think of an answer?

G1_Chika: Yes. To think of and answer and to check my answer is correct.

²⁹² Interviews\\Time 1\\G1_Chieno

I: Oh, you did not do it before.

G1_Chieno: Yes.

I: Why do you think it is interesting?

G1_Chieno: I can see another student's idea and I can have discussion.

I: So, do you like seeing another student's idea?

G1_Chieno: Yes.

I: Why?

G1_Chieno: If I do homework by myself I have only one idea of two, but this kind of homework I can learn many ideas.

²⁹³ Interviews\\Time 1\\G4_Eri

I: Okay. So on the train, access web page, Ketai. What do you do after you log in with your K-type?

G4_Eri: Only other people's comment read and thinking I - what I will - I must to write about this work.

I: So when you're on the train you're looking at other people's answers. Do you sometimes write answer, or only look?

G4_Eri: Only look.

²⁹⁴ Interviews\\Time 1\\G2_Hikaru

G2_Hikaru: Very good communicate. If I take comment I - if I take my opinion to website, they give answer about my opinion. I can get many opinion, others opinion and I can think about this topic so it's good discuss. I - usually I get - I think one idea or own idea but other student put many comment, I can think about other opinion. I can think others opinion.

I: When you think of other opinions, peoples' opinions, how does that help you?

G2_Hikaru: How does it help - others opinion give me new idea, so I - before I get others answer, I have only one idea, but after group members give many answer, I can have other idea.

²⁹⁵ Interviews\\Time 1\\G1_Mai

I: My homework is group together making answer. This is called collaborative. What do you think of that?

G1_Mai: It is very interesting because I can know easily what my group members are thinking about. So I like it.

I: What do you mean you know what your group members are thinking?

G1_Mai: We can easily exchange our idea so I think it is interesting.

I: Why interesting? How is it different from single person homework?

G1_Mai: Because single person homework is only explain my idea but in this class this homework is my- what my group members think about my opinion. So I think it is very interesting.

²⁹⁶ Interviews\\Time 1\\G1_Takashii

I: Okay. My homework is collaborative - there's a group working together one question, okay? What do you think of that type of homework?

G1_Takashii: Mm, I think that's good because if it's not member, only one do, one person. It's - I have to think about more and more, but we can see that other students' opinion so it's related to - you know if we do the homework in the group I can get a lot of information I have never known. Also, we can comment each other, so from the comment I can think of other opinions, so I think that's good...

I: Okay, so how do you feel about reading other students' answers?

G1_Takashii: Yeah, I think other student idea - it's so good because I haven't think of the other idea like they have, so I have the opinion like they have, because my idea it's not specific or not good sometimes, so I envy their ideas.

I: So does it help you answer?

G1_Takashii: How? Well I think, I guess the other student - when the other students' have their opinion, maybe they use other text or other something extra work, so I can know how they get the information. Sometimes they say according to my English dictionary or something - I don't use dictionary, so I can be convinced of their, how they get the information.

G1_Takashii: Mm. So I am flexible, so if I decide one thing I can see other, so they help me to look other opinion or other method.

I: So sometimes you log-in, you look at the answers - other students' - then you post your answer. You look at answer; post your answer; look at answer. But this time you only looked at answer. So which - why did you only look at answer? And here also, only look...

G1_Takashii: When I only look at other students' opinions - maybe I think how the homework proceeds, so check how proceed. If the opinion is zero or I think it's not good.

I: Okay so you check if your members answered?

G1_Takashii: Yeah.

²⁹⁷ Interviews\\Time 1\\G1_Erika

I: So when you read someone's comment how does it help you think of your own answer?

G1_Erika: Because - it helps me to think, to [remind the class], the topic of class or the way of thinking to do homework - re-thinking for me.

G1_Erika: For example I post this week's homework Japanese idiom - difficult to translate into English. My example is [unclear], but I not sure it's correct answer, but if I read others posts it helps me to think the correct way of create one's opinion. So others opinions help me to correct [my] way of thinking so I can check that my answer - even if I already post...

I: Okay, so the more times you check, the more times you read other answers or comments, the more helpful it is for you?

G1_Erika: I think so.

²⁹⁸ Interviews\\Time 1\\G3_Fumie

G3_Fumie: On website communicate with my classmates and share my ideas, so you don't go on website I can't get the other students' ideas. At the same time share and talk to - it's a good system.

I: So why do you like to share answers with other students?

G3_Fumie: I can't find example or I get - so I think this homework is a good chance to share others students' ideas.

I: So when you get other students answers, how does that help you?

G3_Fumie: I think I didn't know this answer, so I start more study - I can get good information.

I: Okay, why can you do more study?

G3_Fumie: I think the homework - I share - I do homework with other classmates. My motivation is more, because as a classmate with doing homework, so more special my idea, so try to do - my motivation is very up.

I: Why is your motivation up?

G3_Fumie: Compared to other students, so more good information than other classmates - my mind. I don't like fear, so more examples - so my motivation is up.

²⁹⁹ Interviews\\Time 1\\G4_Yuri

G4_Yuri: I like your homework because we cooperate with my group members in doing the homework and discuss the theme with them every week.

I: Okay. So why do you like discussing the theme with them?

G4_Yuri: So they give me new information I don't know.

I: Okay, good. So after you read another student's answer and it helped you, what do you do?

G4_Yuri: I read another answer. So I search it certain words, so myself, and I often using that.

³⁰⁰ Interviews\\Time 1\\G4_Asako

G4_Asako: Okay. So on the website you can read other students' homework.

I: Okay, what do you think about that?

G4_Asako: They find the new words, new idiom there I haven't heard ever. So it's interesting. How. I don't know. I didn't thought - think of the kind of idiom. For example culture or religion, or something like that. So I read the other people idea, I thought up idea.

³⁰¹ Weekly E-journal Comments

G3_Akiko 2011/07/ homework7 今回の宿題は、最初全然案が出なくて大変でしたが、みんなの意見を元に色々と考えてみると一人称だけでも様々な言い方が日本語にはあって、びっくりしました。私達は気づかない間に色々を使っているんだなと思いました。一方、英語の一人称は"I"だけです。その物語やその状況により上手く訳していくのは大変であり、確かに訳す際の問題になるなと思いました。この宿題を通して、改めて自分の母語である日本語を見つめなおす事ができ、面白かったです [ENGLISH: Homework 7. This homework was difficult to not have any idea at first. However, based on other member's options I started to think about various members opinions and I was surprised to notice that there are several ways to represent first person pronouns in Japanese. So I noticed we use various ways which I had not noticed. On the other hand English first-person [grammar] is only "I". Therefore based on the story and based on the status it is difficult to translate well and this will be a problem to translate. Through this homework I was interested in observing my mother tongue, Japanese, again.]

³⁰² Interviews\\Time 2\\ G2_Hitomi

I: Okay. So you would - if you have mobile phone you start looking everywhere until you find example. Then you take note with mobile phone.

G2_Hitomi: Yeah. Or take picture.

I: Okay. For a PC would you do all the homework at one time at home? Find example, log on, type, finish.

G2_Hitomi: I want just one time. Just...

I: What about mobile?

G2_Hitomi: Mobile is okay. Many time okay.

I: Why?

³⁰³ Interviews\\Time 2\\ G4_Asako

I: If you're using only PC would you have as much time to think?

G4_Asako: Maybe not because PC I have to use inside - difficult...

I: Difficult to think?

G4_Asako: Difficult to think. [She is referring to thinking of examples.]

I: Okay but mobile is outside so easier to think.

G4_Asako: Yeah.

³⁰⁴ Interviews\\Time 2\\ G3_Ayaka

G3_Ayaka: The most useful - the most useful things to have a Smartphone or iPod Touch is I can do homework or research every time and everywhere. So I think it's very useful for me to do so, know everywhere - any time, everywhere, to do something, everything. If I have no mobile phone I have to go to PC Learn or [unclear] of the computer so it's need to a lot of time to - so it's need not time. It need not time to the homework.

I: So do you think using a mobile phone for your homework increases the time that you spend on homework?

G3_Ayaka: Yes, increase the homework and the think about homework.

³⁰⁵ Interviews\\Time 2\\ G1_Chika

I: This is page three, here are your comments that you sent to me and yours says in English, I could enjoy because the context is not thought of so much before. What does that mean?

G1_Chika: Your homework is like looking outside, so I don't care about that, I don't care some advertisement or that kind of thing, so your homework make me work outside. We don't care about some advertisement, we only looking like...

I: Looking outside on the street for example is interesting?

G1_Chika: Yes.

I: Does that change the way you think of your homework? You said it's interesting, it's different, why?

I: Looking for examples on the street is new for you?

G1_Chika: Yes.

I: What do you think differently about desk work homework and looking on the street, for example, homework?

How do you feel differently about them?

G1_Chika: To tell you the truth desk work homework is so boring I think. Escape thinking and doing that. Yes of course sometimes, so desk work homework is I can do that when I want.

I: You can escape it?

G1_Chika: Yes.

G1_Chika: Yes and looking outside homework I have to think about homework when I'm walking the street, so I can't escape thinking about homework like this is good example and this is not good, or something. That's different I think.

I: You think about your homework more?

G1_Chika: Yes.

I: Does that help you learn?

G1_Chika: Yes.

I: Does it help you understand a little more?

G1_Chika: Yes but sometimes I become panic, this is example I think, so it's helped me take many times for homework but it also makes me panic.

³⁰⁶ Interviews\\Time 2\\ G1_Erika

I: How often did you look for examples?

G1_Erika: So if I find an example I don't stop searching and I will keep finding some examples and I will choose after. More better one.

I: Okay. So, you're always looking for better examples?

G1_Erika: Yes, if homework is.

I:...does that help you, does that make you think about homework more?

G1_Erika: Yes, I think so.

I: Okay. Now does thinking more about homework help you to understand the topic?

G1_Erika: Yes, I strongly think so.

³⁰⁷ Interviews\\Time 2\\ G3_Eri

I: No - so you have to find examples walking around Tokyo, so does it change the way you think about homework?

G3_Eri: Yes.

I: So when you're looking for examples around Tokyo, how often do you look?

G3_Eri: How often? I always looking around.

³⁰⁸ Interviews\\Time 2\\ G4_Midori

I: So in my homework you have to find examples, you said you look on the train and walking, that's where, when do you look?

G4_Midori: Evening when go back to my home. Not only but many times.

I: What do you mean many times?

G4_Midori: Many times I would do the example but I take the picture only the day before the deadline.

I: So you go by many times but you never take picture?

G4_Midori: Yes.

I: Do you think about looking for examples every day?

G4_Midori: Yes.

³⁰⁹ Weekly E-journal Comments

G3_Akiko 2011-06-07 homework 3 今回は広告などのキャッチコピーということで大変難しかったです。その理由としては私達は広告などをあまり注目して見ていないし、見つけても、そのキャッチコピーが面白い表現なのかよくわからなかったからです。その一言でその会社を相手にイメージさせることは大変な事であると思いました。[ENGLISH: It was very difficult because it was the "catch-copy" of advertisements in this time. The reason why it was difficult for me is that we do not focus to see advertisements. Usually when we watch such advertisements we do not think if it is interesting "catch-copy" or not. I thought it was very difficult to let people imagine about the company by using a single term.]

³¹⁰ Weekly E-journal Comments

G4_Yuri 2011-05-31 面白い広告を探して、その意味を考えるのはなかなか難しかった。しかし、探してみると、その広告に隠された意味を知るきっかけとなったので、興味深かった。[ENGLISH: It was difficult to find interesting advertisements and to consider the meaning. However, when I tried to find it then it will be the opportunity to discover the hidden meaning of the advertisement so it was interesting.]

³¹¹ Weekly E-journal Comments

G4_Yuan 2011-05-31 My phone works very well, just it's slowly to login and I usually have to wait about one minute! The homework in this week is very interesting, I think! I noticed the advertisement that I never noticed before, have many funny phrases! I feel we should pay more attention to some funny things in your life. Sometimes it can help you have a very good idea! o(^▽^)o

³¹² Interviews\\Time 2\\ G1_Chika

I: If you did not have mobile phone with your example, would you look at your example the same number of times?

G1_Chika: No.

I: Why?

G1_Chika: I say mobile phone is reminder for me and I use that reminder so maybe I can - wait a minute - so if it's my reminder, so I can think more. [unclear] In my case I think.

I: Do you think mobile phone increases the amount of times that you think about your homework?

G1_Chika: Yes.

³¹³ Interviews\\Time 2\\ G3_Fumie

G3_Fumie: Maybe. If I have homework I always find the answer - but mobile phone is - always I have. Difficult to forget compared with the other way. So I often forget some homework but the mobile phone - so I think I must do - so mobile phone is - I remember - so if I take notes - something I find - I can find. But I also forget some notes but the mobile phone make me remember. So then if I want to do homework - I always do homework soon - so very convenient.

I: Okay, so why does the mobile - so you always carry mobile phone?

G3_Fumie: Yes.

I: So if you do homework with mobile phone, you remember you have to do homework?

G3_Fumie: Yes.

I: If you did not have mobile phone, what would happen?

G3_Fumie: Maybe I forget the - so maybe I spend a long time on doing homework. So thanks to mobile phone, I did homework a lot.

I: Okay, and doing homework a lot helped you to learn?

G3_Fumie: Yes.

³¹⁴ Interviews\\Time 2\\ G2_Ayaka

I: Does having the mobile phone - does that remind you to do homework?

G2_Ayaka: Yes. Of course.

I: What do you mean?

G2_Ayaka: If I have my reminder saying the homework at the same time I receive this homework email, so, if I forgot to do the homework, I am reminded when I see this friend's homework.

I: Are you reminded by PC email?

G2_Ayaka: PC? No.

I: Do you check PC emails or not?

G2_Ayaka: Yeah. PC. I don't check...

I: Okay. So, having a mobile phone, do you carry it all the time? Your mobile phone?

G2_Ayaka: Yes.

I: Having a mobile phone all the time, you get email, you're reminded to do homework...

G2_Ayaka: Yes.

I: Does that increase your thinking about homework?

G2_Ayaka: Yeah. I think so.

I: If you did not have a mobile, what would you - when would you think about homework?

G2_Ayaka: Maybe the due day. Only due today.

³¹⁵ Interviews\\Time 2\\ G2_Hikaru

I: You carry mobile phone every day, you can do homework on mobile phone, and does that help you to remember to do your homework?

G2_Hikaru: Yes, I remember.

I: So, does it remind you? When you look at your mobile phone, do you think homework?

G2_Hikaru: Yes.

I: You do? Can you tell me example?

G2_Hikaru: I have - I bookmarked this website so if I access other website, I remind this homework in the bookmark.

I: So do you remember you have homework, like, oh, deadline.

G2_Hikaru: I often see this website because I have mobile phone every day and use it every day so I do my homework.

³¹⁶ Interviews\\Time 2\\ G2_Yuuri

I: So you're always carrying mobile phone, you can do homework on mobile phone. Does that remind you?

G2_Yuuri: Yes.

I: Can you just a little tell me...?

G2_Yuuri: I can keep the page on the top screen with my iPhone so I can remember about homework with iPhone.

I: So do you - because you can remember, you're always carrying iPhone and you can remember. So do you think about homework more than if you did not have iPhone?

G2_Yuuri: Yes I think so.

I: You think so. Okay so it helps you to remember homework and that helps you to learn does it?

G2_Yuuri: Yes, of course.

³¹⁷ Interviews\\Time 2\\ G4_Yuri

I: So, having iPhone, does it remind you, I have homework?

G4_Yuri: Yes, because I check the schedule deadlines for homework.

I: Schedule on my website?

G4_Yuri: Yes.

I: If you did not have a mobile, would you check homework as often?

G4_Yuri: I don't think so. Maybe I couldn't check your website.

I: Would you remember homework as often, or would you sometimes forget?

G4_Yuri: I forget, maybe.