Graduate School of Education

Incorporating Sustainable Development in Social Studies and Citizenship Education Curriculum: A Collaborative Community of Practice Case Study in a Saudi High School Context

Submitted by

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Signature of the candidate

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ABSTRACT

This study shows how a qualitative case study approach can be used to explore current practice regarding the incorporation of sustainable development (SD) into the Social Studies and Citizenship Education (SSCE) curriculum in the Saudi 10th grade. In addition, it seeks to understand and gain experience of how building a community of practice and using Problem-Centred Design can promote the incorporation of SD into the SSCE curriculum in the Saudi 10th grade as well as to identify the factors that foster or hinder this aim. The study is divided into two phases in order to achieve its objectives. Data was gathered using the nominal group technique (NGT), semi-structured interviews, a research diary, teacher field notes and photography.

One of the key findings of Phase 1, which gathered data on teachers' and students' perceptions of sustainable development and how it might be incorporated into the Saudi curriculum, is that current educational policy does not support explicitly, actively or comprehensively Education for Sustainable Development (ESD), whether in terms of circulars that are issued by the Ministry of Education, insufficient CPD programmes and the top-down approach of leadership. It is hardly surprising, therefore, that teachers' and students' understandings of sustainability were limited. Nevertheless, students were positive about having SD incorporated into the (SSCE) curriculum. Teachers, however, although positive about developing themselves within their setting in a collaborative manner, lacked the knowledge of how to do this professionally, as well as of how to gain support from senior managers and local educational administrators.

One of the key findings of Phase 2 was that building a community of practice and using Problem-Centred Design for incorporating SD into the SSCE curriculum in the Saudi 10th grade through implementing cutting-edge knowledge in terms of integrating SD through developing systems thinking and interpersonal competences was challenging. Although the roles of teachers within the emergent community of practice in both cases had the potential to develop these competencies among students, both internal and external factors were only taken into consideration in Case M. It can be claimed that this study contributes to the body of knowledge through providing several insights that can be valuable for ESD,

as well as proposing an emergent community of practice model for integrating SD into the curriculum. Finally, this study can inspire educational actors in the field of ESD to benefit from this study through rethinking the roles of both teachers and students and providing spaces for them to use all their potential abilities and competencies in order to contribute to SD. Several areas of research are recommended for further investigations in the field of ESD.

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1. INTRODUCTION TO THE STUDY

1.1 Introduction

This chapter discusses the background to the study, thus identifying the research gap, and also explains my motivation. In addition, it presents the purpose of the study, the research questions and the significance of my research within the education system in my country, Saudi Arabia. This chapter provides as well an outline of the structure of the thesis, including details about the content of each chapter.

1.2 Background and Research Gap

Global environmental, economic and social practices have become a concern for many countries especially the members of United Nations (UN). Higher educational institutions have sought to address this concern through various philosophical and academic activities. Examples of these activities can be found in discourses such as Sustainable Development (SD), Education for Sustainable Development (ESD) and Environmental Education (EE). Even though these discourses are contested, they enrich the literature in ecological, developmental and social fields (Hofman, 2015; Lélé, 1991; Jickling, 1992; Smyth, 1995; Sauvé, 1996; Wals and Jickling, 2002; Dillon and Huang, 2010; McKeown and Hopkins, 2003; Hofman, 2012; Tomislav, 2018). Some authors draw a distinction between ESD and EE (Jickling, 1992), while others are concerned that ESD will dominate many important features of the EE field (McKeown and Hopkins, 2003), because

ESD "would weaken the established fields though depleting membership in existing professional organizations and increase competition for participants" (p. 123). In fact, this argument can be rejected as "in spite of such misgivings there does appear to be considerable momentum amongst environmental educators who wish to teach sustainable development" (Jickling, 1992, p. 5). In addition, McKeown and Hopkins (2003) state that "EE has had tremendous influence on ESD. ESD is also shaping EE; however, we do not see ESD replacing EE" (p. 123). Originally, the SD concept "was set generally and broadly and did not focus on specific areas and objects, nor did it set any deadlines" (Tomislav, 2018, p. 82). This can in part be explained by understanding the goals of sustainable development as a subjective matter which would change from time to time and from place to place. Hofman (2012) discussed this subjectivity by asserting that some countries are more concerned with developing democracy and equality, while others are more concerned with environmental issues. For example, a goal of SD that "attempts to reduce unsustainability" (Ehrenfeld, 2009, p. 9), has been critiqued as reductionist because its single focus on, "reducing unsustainability, although critical, does not and will not create sustainability" (ibid, p. 7).

Due to the fact that sustainable development issues are complex and actions towards sustainable development require considerable and constant work, it seems that all the rhetoric and struggles to shape the world to be sustainable are not enough (Koroneos and Rokos, 2012). Although SD did not create major effects on a global scale, its implementations locally have been found to be positive (Tomislav, 2018); what people are doing towards SD locally is appreciated for its benefits, but if SD is to have a major influence on the global community, it needs highly strategic, flexible approaches that extend beyond the local. Therefore, it is better to "work with the assumption of an evolving field rather than a static conceptual framework" (Nikel, 2007, p. 547-548). Thus, in this study the researcher has tried to be mindful of these differing SD discourses, while in general being support-

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ive of the idea of sustainability as requiring a balance across the three dimensions of development, namely social, economic and environmental. Politically, governments have attempted to encourage public awareness of sustainable development (SD) through media campaigns, civic education and integration in all educational systems such as primary, secondary and higher education (Sola, 2014), including in Saudi Arabia. This interest is unsurprising since environmental issues in Saudi Arabia have heavily impacted on natural resources and governmental budgets (Husain and Khalil, 2013). It has been argued that education, which is a prominent public service, might be used to support sustainable development in any society (Aminrad et al., 2013). Moreover, educational actors potentially have a major effect on national economies by contributing to increased awareness of sustainable development and consequently influencing public practices (Foo, 2013; Gombert-Courvoisier et al., 2014). Hence, the declaration of the United Nations' "Decade on Education for Sustainable Development" (UNDESD 2005–2014) is one example of the importance of education as a tool for supporting sustainable development (Cebrián and Junyent, 2015). This decade saw a proliferation of scholarship in the field, showing the efforts that have been made in terms of the contributions to the body of knowledge as well as the gaps that need to be filled.

Notably, most of the research in education for sustainable development has been conducted in higher education settings (Blake et al., 2009; Burmeister and Eilks, 2013b; Esa, 2010; Karpudewan et al., 2009; Kostoulas-Makrakis, 2010; Lasen et al., 2015; Sterling, 2011; Summers, 2016; Vanassche and Kelchtermans, 2014; Aznar Minguet et al., 2011; Corney, 2006). This context of SD in higher education settings is of particular interest to many authors (Latz et al., 2015; Liu, 2009; McNaughton, 2012; Mills and Tomas, 2013; Muthersbaugh and Kern, 2012; Redman, 2013; Rusinko, 2010; Taleb, 2014; Zehetmeier and Krainer, 2011), while little research has been conducted in general education (Borg et al., 2014; Burmeister and Eilks, 2013a; Owens and Legere, 2015; Wright and Horst,

2013).

The results of these research papers in the higher education settings explicitly and implicitly reveal that there is a need for conducting research in general education contexts in order to prepare future graduate students who have a sound background in the fundamental elements of sustainable development. Moreover, educational researchers and curriculum designers need to perceive the interdisciplinary nature of the curriculum in a high school setting, which requires the pursuit of development and innovation (Nagle, 2013). This innovation should not only be at the level of educational materials, but also at the level of educational processes as a whole, which include purpose, content, methods of teaching-learning and evaluation that are all based on sustainability literacy and competencies (Payne, 2010; Vega-Marcote et al., 2015; Cebrián and Junyent, 2015). Promoting education for sustainable development through the curriculum is seen as one of the most effective ways to achieve Education for Sustainable Development (ESD) (Woo et al., 2012).

1.3   Statement of the Problem

In this section, the research problem is set out in relation to the researcher's own experiences, the literature, and the specific context of Saudi Arabia.

1. High schools in Saudi Arabia need to produce graduates who are sustainability literate. Graduate students in general have a low level of awareness and understanding of central concepts of sustainable development compared to traditional environmental concepts (Karpudewan et al., 2013). A study by Altaher (2013), found that in the Saudi context, TV and the Internet were the main sources of information on sustainable development available to students rather than the educational efforts which are supposed to fulfil this role. It also suggested that educational textbooks must be

chosen with more attention in order to improve students' knowledge and attitudes towards sustainable development. Moreover, the study emphasized that the students' sources of knowledge which relate to sustainable development are claimed to be developed mainly from the media or other personal information channels, rather than school initiatives or educational curriculum (ibid).

2. There is a demand in the literature for research into educational curricula that incorporates a focus on sustainable development. Most articles have highlighted the need for curriculum change and there have been very few studies that have showed how this change could occur and how it would be achieved by a course design or through explicit educational paradigms (Figueiró and Raufflet, 2015). Furthermore, these articles stated that there were very few studies that integrate the three essential levels of educational philosophy, programme design and teaching and learning (ibid). There is therefore also a need for research into sustainable development pedagogies; for example, some studies suggest that teaching methods should be based on authentic learning experiences, reflection and mutual learning (Woo et al., 2012), all of which are methods not commonly used in Saudi Arabia.

In the same vein, it seems that there is a gap between approaching sustainable development in general and in connection to local contexts or more precisely in connection to children's real-life experience (Falkenberg and Babiuk, 2014). Education has been critiqued regarding the integration of sustainability, as the word 'sustainability' has featured and been used in the names or titles of departments, projects, units or activities, but little has truly been reformed to present new social learning methodologies (Tilbury, 2007). It is clear, then, from this discussion, regarding the curriculum in higher education and the general education in Saudi Arabia, that both

need to reconsider their roles and efforts towards their contribution to sustainable development.

3. There is a demand for research in general education settings through the development of curricula in high schools, especially in Social Studies (Geography, History and Citizenship Education) that develop students' sustainability literacy and competencies. Firstly, in global terms, there is a belief that Geography has a major responsibility in delivering ESD, especially given that area and space are vital dimensions of the geographical concepts of sustainable development (Sánchez, 2011). Similarly, with Citizenship Education, preparing young people for current issues and the uncertainties of daily life through critical thought and innovative methodologies is prevalent, especially in a sharply changing world (Kerr, 1999).

Moreover, Kolnik (2012) argues that there is a close relationship between Geography and Citizenship Education that enhances sustainable development principles. For example, Esteves (2012), in his article entitled *Geography Education and Citizenship Education in Portugal: A Challenge for the 21st Century*, states that the contribution of Geography to the comprehension of the world also implies Citizenship Education through Geography. Thus, students should be stimulated to explore and develop knowledge, understanding, competencies, attitudes and values. However, in the context of Saudi Arabia, geography does not exist as a separate area of the curriculum; it is subsumed within Social Studies and Citizenship Education (MoE, 2016). A number of studies have demonstrated that Geography education has slowly integrated the concerns of sustainable development into curricula. For example, a study by Kolnik (2014) illustrated that, although the Geography curriculum is satisfactory as a basic pedagogical document for Geography classes, change in the primary and secondary curriculum (which were recently revised) is still required.

On the other hand, Grindsted (2015) emphasized that geographical imaginations are unquestionably vital to make sense of sustainable development challenges. For the purposes of this study, it will therefore be important to consult geographical education literature as well as the literature in the field of ESD.

4. Finally, further research is required to examine curricula and strategies that concern the integration of education for sustainable development with the challenges that schools face when they are trying to implement ESD (Dambudzo, 2015). Not enough research has been done on the effectiveness of implementing ESD on competencies in learners (ibid). It is recommended that Citizenship Education curriculum content should be seen as supporting the progression of specific and general sustainable development literacies and competencies in order to guarantee sustainable development for all (Lukman and Audu, 2014).

   Kolnik (2012) asserts that there is a need for sustainable and literate citizenry that is locally, regionally and internationally aware and this reflects Saudi Arabia's stated intentions regarding the role of education in meeting the global sustainable development goals, as shown in 'Vision 2030' (UNICEF, 2017; Kinninmont and Kinninmont, 2017; Saudi, 2018). Having set out the contextual reasons for conducting this research, the next section will focus on the researcher's personal and professional motivations.

1.4   Research Motivation

I am motivated to conduct this study for both personal and professional reasons. From a personal perspective, I have had opportunities to travel around the world and meet well-educated people who have concern for the Earth, society and the environment. Until

2009, I lacked opportunities that would allow me to recognise my international role, which is to belong to the worldwide community and work for it positively. During 2009, I wrote my MA dissertation, which concerned the development of responsibility among primary school children from the perspective of Islamic education and its applications in family and school. In the summer of that year, I was invited to visit France and stayed there for one month. The experience I gained from that visit has had a remarkable impact on my life. I started thinking about my international role and responsibility towards all these matters, namely the Earth, society and the environment. After I finished my MA, I received a call from the Director of the Graduate School of Education at Umm Al- Qura University urging me to conduct my Ph.D. thesis at his institution. I expressed my appreciation for the invitation but explained that I had an alternative direction in mind, which had emerged as a result of my visit to France. The visit had inspired me to positively discover and explore other perspectives around the world.

With respect to my professional life, the field of education is extremely challenging to simplify but I will endeavour to do so. A philosophy that has a particular view of people who engage in educational activities renders more complex professional life. Thus, I have spent my most productive time in education viewing through the lens of humanism rather than materialism, which can be hard to control and is unpredictable, but which can facilitate an understanding of intended change and development. I frequently face realistic challenges regarding what we are doing as educators, teachers and educational researchers for our society. In addition, I have considered the worth and value of our educational research from society's point of view via press media and social media. As I was a teacher in secondary school, I noticed that we were not meeting society's requirements, in terms of providing education for sustainable development. This included all educational aspects such as curriculum, instructional aspects, teacher education, leadership and planning and assessment. Thus, as a member of the international and local

community, I considered it my duty to conduct this research in order to fill the gap in one of the educational areas, namely ESD, and provide thought, experience and insight for policy makers, developers, designers and practitioners in the education sector.

1.5   Purpose of the Study

The main purposes of this study can be summarized as follows:

- To explore the current practice regarding the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi 10th grade.

- To understand and gain experience of how building a community of practice and using Problem-Centred Design can promote the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi 10th grade.

- To identify the factors that foster or hinder the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi 10th grade.

1.6   Research Questions

1. What is the current practice regarding the incorporation of sustainable development in the Saudi Social Studies and Citizenship Education curriculum?

2. How does building a community of practice and use of Problem-Centred Design promote the incorporation of sustainable development in the SSCE curriculum in the Saudi 10th grade?

3. What are the factors that foster or hinder the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi 10th grade?

1.7   Significance of the Study

This research is expected to be significant for many aspects:

1. Contributing to the body of knowledge in the Saudi context regarding many areas, such as education for sustainable development, teacher professional development, curriculum, pedagogy, strategies and adult learning.

2. Supplying the Ministry of Education (MoE) in Saudi Arabia by filling the gaps in the literature regarding using community of practice for incorporating sustainable development in the Saudi secondary schools based on empirical data.

3. Contributing to the body of knowledge with respect to proposing an emergent community of practice model for integrating sustainable development into the Saudi curriculum that can be applicable in other contexts. This study also contributes to the body of knowledge by developing Sustainable Pedagogical Content Knowledge (SPCK) that engages external experts of sustainable development projects to be an integral part of the pedagogy that is used for integrating SD in the Saudi curriculum.

4. Highlighting major areas that various stakeholders in the Saudi educational context need to consider while designing and implementing the incorporation of sustainable development in the SSCE curriculum in the Saudi 10th grade. This should include policy makers and planners, designers and planners of curricula, professional teacher development departments, administrative offices and school leadership teams.

1.8   Structure of the Thesis

This section introduces the layout of the thesis, which comprises eight chapters as follows:

Chapter One: Introduction to the Study

The introductory chapter provides the general background to the study, as well as highlighting the motivation behind the research and a statement of the problem. It sets out the aims, research questions and the significance of the study. It concludes with an outline of the structure of the thesis and its chapters.

Chapter Two: The Context of the Study

The context of the study is discussed with regards to the situation in Saudi Arabia in terms of the local policy and curriculum with explicit attention to the references to ESD within the rhetoric of vision and policy. In addition, greater reference has been made to the current global policy context for sustainability including the United Nations Sustainable Development Goals (UNSDGs) and Global Action Programme (GAP) that helped the researcher to choose the two sustainability competencies, which focused on the curriculum design.

Chapter Three: Literature Review

This chapter critically analyses and evaluates the literature with regard to sustainable development and its dimensions, followed by sustainability literacy, sustainability competency, the sustainability competencies that reflect the thesis's perspective and what competencies the thesis is supporting and why. This chapter also includes how the sustainability competencies can be integrated through curriculum, which has been elaborated through discussing the definition of the curriculum, its models and Problem-Centred Design and its elements in particular. In order to activate the scheme work of the curriculum units that are designed by this study, looking for effective approaches and pedagogies for enhancement and development of key sustainability competencies in the current cur-

riculum is essential. Thus, this chapter highlights this matter through discussing CPDs, particularly training, cascade and community of practice models. In addition, pedagogies such as Thinking Actively in a Social Context (TASC), which presents as SPCK, is discussed. This chapter ends by providing an overview of the literature and the questions the current study will address.

Chapter Four: Methodology and Methods

This chapter describes the research methodology and methods in order to make sure that the research is following the approaches that are suitable for investigating the research questions identified at the end of the literature review. The outline of these elements are theoretical and philosophical assumptions, research methodology and methods, the study participants, the researcher role and research design. In addition, they include the pilot study, data analysis procedures, methodological issues (quality and trustworthiness and ethical considerations) and finally the summary of this chapter.

Chapter Five: Phase One: Results and Implications

This chapter presents the Phase 1 results which attempt to answer the research question number one that explore the current practice regarding the incorporation of sustainable development in the SSCE curriculum in the Saudi 10th grade. The findings of the analysis of the data collected from nominal group technique (NGT), semi-structured interviews and research diary are presented. This chapter is only description, surface (semantic) interpretations of data while the Discussion Chapter is concerned with (latent) interpretation and theorisation of the concepts that emerge from Phase 1 and 2. The intention in doing this is to let the readers engage progressively with the original data.

Chapter Six: Phase Two Results

This chapter presents the Phase 2 results which attempt to answer research questions numbers two and three. Question two investigates how building a community of practice and use of Problem-Centred Design promote the incorporation of sustainable develop-

ment in the SSCE curriculum in the Saudi 10th grade, while question three investigates the factors that foster or hinder the incorporation of sustainable development in the SSCE curriculum in the Saudi 10th grade. The findings of the analysis of the data collected from nominal group technique, semi-structured interviews, research diary, teacher field notes and photography are presented here. The same analysis processes that have been conducted in Phase 1 were conducted in this phase.

Chapter Seven: Discussion

This chapter discusses the main findings of the study from Phase 1 and 2 in relation to the existing literature and the context of the study. The four themes in Phase 1, which are the conception of sustainable development, the current (SSCE) curriculum and sustainable development, the need to change for sustainable development to be incorporated in the SSCE curriculum and the current implementation of continuing professional development CPDs, are discussed professionally. Phase 2 discusses the use of a community of practice model in the Saudi context to incorporate SD in the SSCE curriculum and factors that foster or hinder the incorporation of SD into the Saudi SSCE curriculum.

Chapter Eight: Conclusion

The aim of this chapter is to summarise the key findings and the limitations of the study, as well as to identify recommended areas for further research. The key findings are presented through matching them with the research questions and are followed by a discussion of their contribution to the current body of knowledge in various dimensions. It concludes by a reflection on the research process.

1.9   Summary of the Chapter

This chapter has provided the rational reasons to conduct this study, its purposes, questions and significance. It concludes with an outline of the structure of the thesis and its

chapters. The next chapter focuses on a discussion of the literature, which relates to the context of the study.

2. THE CONTEXT OF THE STUDY

2.1 Introduction

This chapter first provides a general background to the Saudi context, followed by a discussion of identified challenges relating to the context in which this study is undertaken. These challenges are divided into two sections. The first discusses social change in Saudi Arabia in order to understand why the Saudi government has paid attention to sustainable development. The second analyses how SD was promoted in the Saudi education context in terms of the situation in Saudi Arabia with respect to local policy and curriculum, including explicit attention to the references to ESD within the rhetoric of Saudi vision and policy. Furthermore, the current international policy context for sustainability, including the UNSDGs and GAP, assisted the researcher to support his choice of the two sustainability competencies, namely systems thinking and interpersonal competences, as the focus of this study. The chapter concludes with a summary of the relevant points it raises.

2.2 Background of Saudi Arabia

On September 23rd 1932, King Abdulaziz Ibn Saud united the different states of the Arabian Peninsula, thus creating the Kingdom of Saudi Arabia (Alghamdi, 2012). Then, gradually the KSA became an influential country worldwide because of its religious, economic and strategic geographical position. The Kingdom of Saudi Arabia is the homeland of Islam, which was founded in Makkah, and the home to two of the holiest Muslim sites,

the holy Mosque in Makkah and The Mosque of Prophet Mohammed peace be upon him in Madinah (Kroessin, 2008).

This has made the Kingdom of Saudi Arabia the main spiritual centre for Muslims globally (ibid), and on the occasion of the Hajj it sees one of the largest yearly religious mass gatherings in the world, when more than 2 million people from more than 184 countries come on pilgrimage (Memish et al., 2014). In terms of its economy, Saudi Arabia is one of the world main exporters of petroleum liquids. In fact, it holds 16% of the global proven oil reserves and often holds 50% of global spare capacity (Pickard and van der Burg, 2014). Added to which, geographically, Saudi Arabia has a unique location with direct land, air and sea links connecting to Asia, Africa and Europe, which is an inviting environment for foreign direct investment and the private sector (Abdul Latif, 2018). It is worth noting that wherever the researcher uses the terminology of private sector in this thesis he refers to "organizations that have a core strategy and mission to engage in profit-seeking activities, whether by production of goods, provision of services, and/or commercialization" (Di Bella et al., 2013, p. 1). Therefore, the researcher does not use the term "the private sector" in this thesis to refer to private schools.

2.3   Social Change in the Saudi Context

Understanding the social change in the Saudi context is vital for integrating the concept of sustainable development into the Saudi national curriculum in general and into the SSCE curriculum in particular. It is believed that Saudi culture is a complex mixture of Islamic and traditional values to a degree that makes it hard to distinguish between 'the religious' and 'the social' values (Al Lily, 2011). Moreover, Saudi culture is a distinctive combination of Islamic world-view and Arabic tribal traditions, which forms the behaviour and mind-set of the Saudi citizens (Almutairi and McCarthy, 2012). Although it might be seen that

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Saudi Arabia is a homogeneous desert territory, the influence of long-term and recent migrations, as well as the regional and social diversity of the country, contribute to making SA a country that is culturally diverse (Al Dossry, 2012).

Further, despite the fact that Saudi Arabia turns towards modernisation such as Western fashion, modern technology and luxury cars, it faces many tensions and conflicts as a result; Saudi society is still loyal to the Islamic religion as a basic doctrine (ibid). The teachings of Islam are not only relevant to SD but also SD's "principles have existed for centuries in the Holy Qur'an and the Hadith" (Aburounia and Sexton, 2006, p. 757) which are the main sources of Islam (Hanzaee and Ramezani, 2011). Therefore, Islam takes the view that human actions should not compromise the basics of natural, social or economic systems, either in present or in the future (ibid). The general statement of aims for the curriculum are supportive of SD:

> *To have students understand Islam in a correct and comprehensive manner; to plant and spread the Islam creed; to provide the students with the values, teachings, and ideals of Islam; to equip them with various skills and knowledge; to develop their conduct in constructive directions; to develop the society economically and culturally; and to prepare the individual to be a useful member in the building of his/her community. (Al-Awaji, 1972, p. 28)*

However, the current SSCE curriculum does not make explicit provision for SD but emphasizes the economic aspect of SD and does not mention its social and environmental aspects. This is due to the Saudi educational policy makers being concerned mainly with the economic aspects, as will be discussed in Chapter 7. Saudi society has gone through two stages of change that are relevant to this thesis, namely the drive to increase oil revenues (Al Dossry, 2012), and then the Saudi Vision 2030 which is Saudi's local interpretation of the UN's SDGs (UNICEF, 2017).

2.3.1   Oil's situation

In the earlier years following the establishment of Saudi Arabia, oil revenues had a hugely beneficial effect on society. However, the dramatic drop in oil prices in recent years has depleted Saudi Arabia's cash reserves by US $150 billion and driven the government to make an alternative plan (Rakesh, 2016). On April 25, 2016, Crown Prince Muhammad bin Salman announced the "Vision 2030" plan to end Saudi dependency on oil. However, Rakesh (2016) has criticized the plan as being unlikely to be achievable.

2.3.2   Saudi Vision 2030

Saudi Arabia is fast emerging as a most important global logistics hub (Abdul Latif, 2018). Moreover, the location of Saudi Arabia is propitious with the demand for producing renewable energy as "it is located in the so-called sun belt, which has led it to become one of the largest solar energy producers" (Almasoud and Gandayh, 2015, p. 153).

Figure 2.1 shows a map of the KSA which presents its 2030 Vision and stresses its location as one of the most critical elements of this vision (Saudi, 2018).
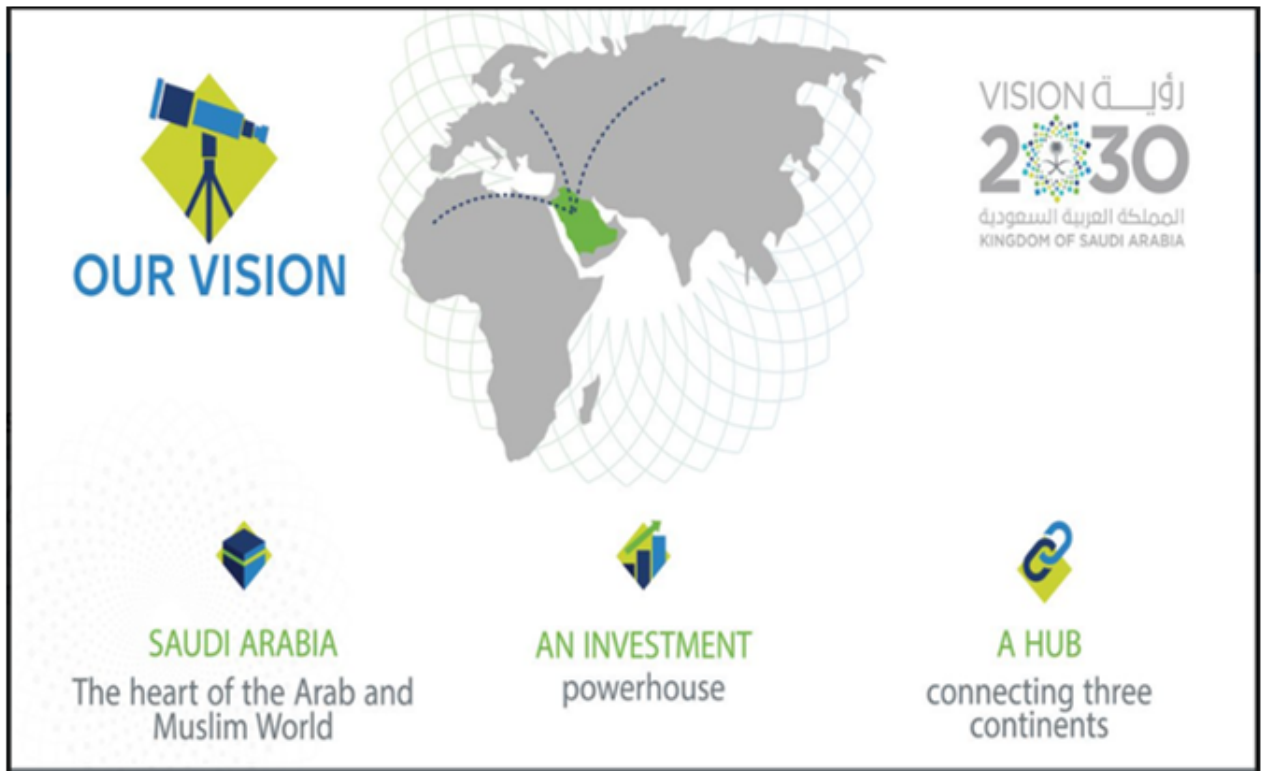
Fig. 2.1: Saudi's Vision map (Saudi, 2018)

The leaders and citizens of Saudi Arabia now must come to terms with a future in which oil resources play a secondary role in the economy rather than a primary role which has been the case previously (Kinninmont and Kinninmont, 2017). According to Saudi (2017), the 2030 Vision is built around three themes: a vibrant society, a thriving economy and an ambitious nation. The first theme is critical to accomplish the Vision and a strong element for economic prosperity in which members of society can play one of the main roles of achieving the Saudi 2030 Vision. In the second theme, a thriving economy offers chances for all by building an education system aligned with market requirements and creating economic chances for the large corporation and the small enterprise, as

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well as the entrepreneur. The third theme is ambitious as it is what the society wants to achieve through high performance, transparency, accountability and effectiveness of government. This vision seems to focus only on economic sustainability and makes social and environmental aspects secondary, an aspect that is discussed more fully in the following section.

2.3.3   Children and young people

It is argued that this transition will be a challenging one and will create winners and losers (Kinninmont and Kinninmont, 2017). The Saudi government is intending to privatize all public institutions (Alkhamis, 2017; Bokhari, 2018).

Thus, a less well-educated young person will find it extremely challenging to make an appropriate living in the private sector and will be more likely to require social and economic support. Saudi Arabia has been making changes to the education system for some time and now, as stated in Kinninmont and Kinninmont (2017), the Ministry of Education in SA is emphasizing the vocational and technical field. This will be of vital importance in supporting less well-educated young people, but reforming education is a slow process in any country, and especially in SA because of its challenging context such as having unqualified teachers, changing attitudes toward teaching as a profession, and providing an environment that encourages students' voices to be heard (Alnahdi, 2014). Al-Yami and Price (2006) conducted interviews with twelve experts who possess substantial experience of the Saudi Public Sector with regard to barriers of the implementation of sustainable construction in Saudi Arabia. They considered the lack of awareness, lack of government support and lack of regulations and policies to be barriers to implementing sustainable buildings. The question here is whether the Saudi education context is in a suitable state to promote this vision or not, an issue which will be discussed in the next section.

2.4 Sustainable Development Global Goals (SDGs) from Global Perspectives

United Nations members acknowledged the requirement for a more sustainable world in September 2015, which led to the adoption of 17 Sustainable Development Goals (SDGs) (Annan-Diab and Molinari, 2017). One of the SDGs commentators states that people live in unusual historical times, characterized by rapid changes at local and planetary levels, together with hyperconnectivity, contingency, complexity, systemic issues and critical problems (Sterling, 2016). An emergent question might arise which concerns with whether sustainability is compatible with growth. Some have argued that it might seem they are theoretically compatible in a specific case, but a low-risk future cannot be avoided (Diesendorf, 2016).

Although the SDGs endorse social protection as a way of tackling inequalities, "dominant economic/ political arguments are less inclined to accept the type of social protection required to address inequalities" (Plagerson and Ulriksen, 2016, p. 182). A further challenge to the SDGs is that the meaning of sustainability will differ according to each context in which they are implemented, requiring scholars to be as clear as possible when defining their terms. Shearman (1990) argues that it is not the meaning of sustainable development that alters with regard to context, but rather our comprehending of the context itself. "If this argument is correct, then we should be concerned not with the "meaning" of sustainability but rather to the implications of sustainability as they affect the status quo" (Shearman, 1990, p. 1). It is obvious that different countries encounter different policy priorities, so some of them might satisfy the necessities of environmental limits but not the necessities of ensuring social equity and human needs and vice versa (Holden et al., 2017).

Some have argued that the SDGs are world-wide and aimed at both developing and de-

veloped countries, taking national concerns and contexts into consideration as they are applied between 2016 to 2030 (Kunčič, 2018). Generally, moving from general outlines to practical actions is challenging and with the case of sustainable development, "answers are not always obvious, uncertainty fosters inertia, values are ambiguous and, perhaps most importantly, existing interests are threatened. In short, power is confronted" (Lockie, 2012, p. 4). SDGs need ownership by the countries, a great level of governmental support, human capacity development and institutional and comprehensive development processes, as well as mutual accountability (Jaiyesimi, 2016).

Educationally, there is a threat of the SDGs being influenced by an outcomes driven discourse, associated with the neoliberal marketization of education that some argue is also evident in their national curriculum and which is not based on contextualized knowledge (Karlsson Lohmander, 2017). In the same paper he also raises questions about the pedagogies that could or should be applied when implementing a national curriculum in the context of making progress towards the SDGs; for example, he states that it should "take local cultures and languages into consideration while offering challenging play and learning opportunities" (ibid, p. 810).

Moreover, the accomplishment of SDGs and the influence of worldwide and national policies should be measured via the incorporation of studies across societies and across time (Raikes et al., 2017). Thus, studies outside of Western nations, especially South America, Africa and Asia are required (ibid). With regard to the above issues, it seemed very challenging to make a significant difference with the given amount of time, merely 15 years (Sterling, 2016). Wu et al. (2018) agree with Sterling's statement as they state that SDGs essentially would still be presenting puzzling challenges:

> *In a long future human history, which should be far-far-far beyond 2030. Although UN only listed 17 SDGs in 2015, the number of global sustainability issues would be far-far-far more than 17. (p. 2401)*

Although the SDGs provide a wide ranging vision for a sustainable future, the transition to reach this vision requires commitments from countries and all segments of society as well as worldwide alterations in mind-sets and actions (Jones et al., 2016).

2.5   SDGs from the Saudi Context

UNICEF (2017) provides a comparison between the SDGs and the Saudi Vision 2030. The Saudi three themes that already mentioned in Section 2.3.2 are compatible with 2030 Agenda as "both the Saudi Vision 2030 and 2030 Agenda for Sustainable Development are grounded on the three dimensions of sustainability" (ibid, p. 1). On the other hand, leaders and citizens of Saudi Arabia now must come to terms with a future in which oil resources play a secondary role in the economy rather than a primary role which has been the case previously (Kinninmont and Kinninmont, 2017).

There is a major challenge that Saudi Arabia is facing in order to achieve its 2030 Vision which is that public awareness on the concepts of sustainable practices to be better socially, environmentally and economically are still insufficient (Al Surf and Mostafa, 2017). One might ask whether the Saudi Ministry of Education is able to contribute to raising awareness among its employees, Saudi citizens and students through its activities towards sustainable practices. Generally, the Saudi authority wants to maximize the individual action's strengths at national level and to expand on the role and scope of the civil society institutions, including academia, philanthropic bodies, the media, youth, children and women (UNICEF, 2017). This desire can be seen as a highly ambitious one according to the Saudi context regulation and practices, which uses a top-down style of leadership and this will be clear through linking SDGs with education for sustainable development in the Saudi context.

There are two external evaluations of the SA context, one by the United Nations Com-

mon Country Strategic Framework (UNICEF, 2017) and a second which focused on a number of critical success factors for the means of implementation of the SDGs (Izzet Ari et al., 2015). The UNICEF (2017) found that although Saudi Arabia has made progress, especially with respect to human development, several issues existed that need a considerable amount of work to be achieved. These issues include building Saudi human capacities, improving monitoring and evaluation mechanisms, improving the quality of data that includes timeliness of updating and level of disaggregation as well as having ability to integrate results of analysis into the rules and resource planning (ibid).

Izzet Ari et al. (2015), in their evaluation, found there was a lack of transparency and access to information, inefficient and ineffective public institutions, arbitrary bureaucratic practices, low institutional and human capacity, and lack of stakeholders' involvement in decision-making process. Therefore, it can be seen that one of the most challenging aspects which needs more close attention is the development of the capacity of Saudi citizens. This would entail Saudi Arabia at national and local levels going through a process in "which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time" (Wignaraja, 2009, p. 5). The goal of 17 is a crucial enabling tool for all the 16 SDGs (Izzet Ari et al., 2015; Jaiyesimi, 2016) by strengthening the means of implementation and activating global partnerships for sustainable development (WHO, 2016). Implicitly, this goal includes requirements such as enabling both individuals and social institutions properly to implement the 16 SDGs.

There is a vast literature on approaches that can be used in education to support the development of these capabilities; for example Reynolds et al. (2018) put forward the case for systems thinking for promoting competencies in individuals that enable them to implement the SDGs, while Brundiers and Wiek (2017) argue that systems thinking will also develop necessarily as interpersonal competences. At the collective, group level, Public-

Private Partnerships are suggested (Jomo et al., 2016).

UNESCO provides its own GAP on Education for Sustainable Development (UNESCO, 2018) which concentrates on creating and scaling up ESD action at all areas and levels of education by empowering students to transform themselves and the community they live in by developing competencies such as systemic thinking and interpersonal skills (ibid). As mentioned earlier, the Saudi vision wants to maximize citizens' strengths at national level in line with United Nations reform (UNICEF, 2017) which can be encouraged through various ways. Systems thinking and collaborative working are two competencies that are identified in this study as being particularly pertinent to the Saudi Arabian context since they will enable students to realize the interconnectivity between these different SDGs, and develop their capacity to work together using interdisciplinary and interpersonal competences to address these goals. This study investigates current practice regarding the incorporation of sustainable development in the SSCE curriculum through a focus on these two competencies.

It can be noticed that ESD is directly encompassed under SDG 4 which puts education at the centre of the scheme to encourage SDGs (Annan-Diab and Molinari, 2017). Moreover, "the Education goal–SDG 4–is not meant to be seen in a silo but, rather, to have implications for many if not all of the other 16 goals" (King, 2017, p. 801). However, Mochizuki (2016) argues that recently Education for Sustainable Development becomes weak because it is combined with Global Citizenship Education in one target of the SDGs. This indicates that ESD was effective when it was working according to its own agenda.

On the other hand, some scholars argued that the weakness of ESD is not related to its policy and practice only, but related to the concept itself, which is a contested concept (Selby, 2006; Dillon and Huang, 2010). One might argue that if the term ESD is contested, the applications of it would be varied and it would be hard to achieve the same outcomes. One might respond that the outcomes of ESD can be varied based on the

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context's needs; this can be seen in the argument of achieving SDGs (Shearman, 1990; Holden et al., 2017). Raikes et al. (2017) argue that SDG 4 on education and learning is more holistic than the education goal in the Millennium Development Goals (MDGs).

2.5.1   The Saudi educational policy and SD

In general, the educational policy in the Saudi context requires reform to deal with SD principles (Hashmi et al., 2015). For example, although at a global level many well-known universities are making commitments to sustainable development, these are efforts notably lacking in the Saudi context (Alshuwaikhat et al., 2016). One might expect the universities, which are high level institutions, would be the first to commit to sustainable development whether through producing policies or supporting practices.

As this has not happened, it is questionable whether to expect schools and school leaders to commit to sustainable development in their schools. A study by Alzaidi (2008) reveals that the school leadership lacks autonomy due to the centralization style of leading education activities that is used within the Saudi educational system. This style is more likely to deactivate their responsibility towards SD. More importantly, "it is noteworthy that the Ministry of Education has not revised and updated its general policies and goals since 1970" (Albahiri, 2010, p. 23).

On the other hand, teachers' viewpoints are important to be considered especially before producing and implementing a new policy through various ways. One way to reach this is that by conducting a conversation between the Ministry of Education and teachers, which "is practiced and reflected in western studies, but is not the case at present in Saudi Arabia" (Oyaid, 2009, p. 129). Although teachers can be seen as appreciated resources for the development and implementation of educational policies, the rules and processes of the Saudi educational system scarcely refer to teachers as curriculum designers (Al-Kathiri, 2016). The author emphasizes this issue clearly by saying "to go even further be-

yond, the system works as "a killer of teacher's creativity" regarding assessment, focusing mainly on one objective: how many pupils will pass?" (ibid, p. 91). Finally, Tayan (2017) provides a clear example of the top-bottom power and policy style in Saudi education and how the educational actors are treated "students, school teachers and management, even national committees, were not consulted or established to discuss the implications and limitations of ICT integration into the pilot schools"(p. 67). The example above conflicts with the seven concepts of sustainability, which encourage including the citizens to participate in social development and educational activities, which are examples of social development.

2.5.2   The Saudi educational curriculum and SD

The Saudi curriculum in general and the curriculum of SSCE in high school, particularly the 10th grade, will be discussed in this section. One can argue that considerable efforts are being made by the Saudi Ministry of Education to improve the Saudi education sector, especially with respect to curriculum, through various approaches such as expansion, integration, change, and development. However, these efforts are facing challenges in accomplishing their purposes and meeting the demands of stakeholders (Almannie, 2015). The attempt to put theory into practice can be seen as a challenge (Loepp, 1999). Yusuf (2017) examined the Saudi universities' curriculum in terms of the changes that need to meet the Saudi Vision 2030. The findings showed that there are certain challenges that might affect the implementation process of the Saudi Vision 2030 negatively, such as inappropriate curricula in the universities of the Kingdom, lack of opportunities for teachers to play active roles, such as curriculum designer, and an environment that enables students to act positively for a better future.

A study by Alhomairi (2018) aimed to achieve a consensus by a group of educational experts on the significance of providing the science curriculum for the upper primary grades

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with a content that can assist the requirements of Vision for 2030 to be accomplished. The results showed that the current science curriculum was ineffective in terms of providing the requirements of Vision for 2030. Almogbel (2015) investigated to what extent the current Social Studies curriculum includes global issues at different stages of general education in Saudi education. Significant issues were found to be absent in the curriculum, such as global thinking and a sense of belonging internationally, together with the principle of acceptance of others, respect for conscience, and providing solutions to global problems such as pollution and over-population. The author emphasized that the issues that are related to SD need to be included in the curriculum.

One of the key reasons for this is that the Saudi Ministry of Education has been developing the Citizenship Education curriculum using various approaches such as subject-based curriculum design and interdisciplinary integrated curriculum design. In doing so some of the direct references to sustainable development have disappeared. In 2008, the developed Citizenship Education curriculum included sustainable development issues in the tenth and eleventh grades' curriculum. Through looking at the content of these curriculum in terms of sustainable development issues, a need for development and improvement is identified.

However, in the most recent curriculum change, sustainable development was removed from grades ten and eleven, and placed in grade 9. This indicates a lack of understanding of the need to incorporate sustainable development throughout the whole curriculum. To place it in either one grade or another is not sufficient, because this brings a lack of consistency to how sustainable development can be addressed. The current curriculum, known as the integrated curriculum, combines Citizenship Education with Social Studies (history and geography). The integrated curriculum, in simple terms, concerns the creation of connections. These connections could be across disciplines, real life, and skill or knowledge-based.

The interdisciplinary design of this new curriculum and integrated learning should:

> *Develop and build student competence by consciously applying and utilizing the knowledge, skills, and methods of more than one discipline or subject matter to inquire about and explore an object, central theme, concept, topic, problem, issue, or experience. (Boston, 1996, p. xi)*

For example, it often integrates history, geography, economics and government in an interdisciplinary social studies programme. Additionally, it is argued that the perspectives of sub-disciplines can be incorporated in integrated sciences such as chemistry, earth/space science, biology and physics (Drake and Burns, 2004).

However, the developed SSCE curriculum does not align with the interdisciplinary integrated curriculum definition and its criteria. In particular, a review of the content of the 10th grade of the developed SSCE curriculum showed that the integration of Geography, History and Citizenship has reduced their visibility as separate areas of knowledge, which has in turn negatively affected the visibility of certain SD topics. Education is not visible as these subjects are represented in separate units within the same textbooks (MoE, 2016). Furthermore, there is a scarcity of information about teaching practice in terms of linking sustainable development issues in teaching and learning in the Saudi Arabian context (Alshuwaikhat et al., 2016).

A literature search was only able to find articles on sustainable development practices in other disciplines such as engineering, but not in education, e.g. (Al-Shihri, 2013). This is further evidence of the lack of attention to teaching of sustainable development in Saudi schools. To sum up, learning for sustainable development is not exclusively about integrating new content into the curriculum, but it is also about inventive teaching and learning approaches. Thus, when sustainable development is taught, the aim of teaching this content is to develop sustainability literacy as an outcome. The subject of SSCE in

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the Saudi 10th grade can be viewed to be underdeveloped in this context (Shayea, 2014; Almannie, 2015). Thus, this research aims to explore and to understand the potentiality of incorporating sustainable development, which can be integrated through its approach. This approach is sustainability literacy, which deals with a range of competencies (skills, abilities and knowledge), as well as attitudes, values and actions in subject of SSCE in the Saudi 10th grade. The chapter of the literature review will provide more detail of the sustainability literacy. The integration of sustainable development is intended to lead to the outcome of students who are sustainability literate.

2.6   Summary of the Chapter

This chapter has discussed two critical challenges relating to the Saudi context. These challenges are social change in Saudi Arabia and how SD is promoted in the Saudi education context. Islamic teaching is a significant influential factor for presenting sustainable development in a comprehensive way. This should lead the Saudi Vision to reflect this on its themes, so the curriculum in general and SSCE adapt them educationally. It has highlighted the children and young people's needs and how the Saudi education should deal with them. It is found that the UNSDGs and GAP on ESD helped choose systems thinking and interpersonal competences that were integrated in the SSCE curriculum. This chapter has concluded with the current situation of integrating SD in the Saudi education context in terms of the educational policy and curriculum. The following chapter will discuss the relevant literature on sustainable development, and the concept of curriculum and teaching methodologies in which they will be reviewed from various perspectives.

3. LITERATURE REVIEW

3.1 Overview of the Chapter

This chapter critically analyses and evaluates the literature on the concept of sustainable development, its dimensions and how it has been taken up in education, followed by an overview of sustainability literacy and sustainability competency, the distinctions between them, and which sustainability competencies the thesis is focusing on and why. The chapter then discusses the idea of curriculum, how the sustainability competencies can be integrated through the Saudi Arabian SSCE curriculum, models of curriculum design, together with Problem-Centred Design and its elements in particular. In order to implement the scheme work of the curriculum units that are designed by this study, it is essential to look for effective approaches for the enhancement and development of key sustainability competencies in the current curriculum context.

Thus, this chapter finishes by discussing the continuing professional development models that might be used to support teachers to do this task, and the Thinking Actively in a Social Context (Wallace et al., 1993; Wallace, 2000; Wallace et al., 2012) as a tool for developing the teachers' Sustainable Pedagogical Content Knowledge (SPCK). The chapter ends by providing an overview of the literature and the questions the current study will address.

3.2   Sustainable Development

This section starts with the concept of sustainable development and its dimensions, followed by sustainability literacy and sustainability competency, ending by introducing the sustainability competencies that reflect the thesis's perspective and what competencies the thesis is supporting and why.

3.2.1   The concept of Sustainable Development and its dimensions

The analysis of the theoretical concept of sustainable development has shown a number of significant features, including that it is a contested term. This section will outline the features of sustainable development first, and then present some of the arguments from scholars who contest the term. According to the literature the concept of sustainable development:

> *Emerged in the context of a growing awareness of an imminent ecological crisis, seems to have been one of the driving forces of world history in the period around the end of the 20th century. (Du Pisani, 2006, p. 83)*

However, it can be argued that the Brundtland Report 1987 was the first report with the fundamental principles of the concept of SD (Tomislav, 2018). It might be useful to recommend the article of Du Pisani (2006) *Sustainable Development–Historical Roots of the Concept* and the article of Tomislav (2018) *The Concept of Sustainable Development: From Its Beginning to the Contemporary Issues* as they provide more details about historical roots of the concept of SD, which include valuable historical debates of SD. Since the introduction of SD in the Brundtland Report of 1987, it has become increasingly complex with many definitions being provided (Dempsey et al., 2011; Reid, 2013).

For example, in the literature the term 'sustainable development' has more than 70 definitions (see Holmberg and Sandbrook, 1992 and Pearce et al., 1989), while Jacobs, 1995

cited in (Ciegis et al., 2009) suggests that there are more than 386 definitions. The concept of sustainable development "is publicly acknowledged and accepted by scientists engaging in different fields" (Misiūnas and Balsytė, 2014, p. 69), because it is optimistic and vague (Bartlett, 2006). However, one of the reasons for this was that:

> *The Commission probably felt that, in order to be accepted, the discussion had to be optimistic, but given the facts, it was necessary to be vague and contradictory in order not to appear to be pessimistic. (ibid, p. 22)*

For this thesis, sustainable development is defined in general terms according to the Brundtland Report, because Saudi Arabia, the educational context for this study, adopted Brundtland's definition (Shaawat et al., 2018). The Brundtland Report provides the most widely used definition, and defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Bruntland, 1987, p. 43).

Although this definition has been critiqued by many authors, namely Reid (2013) and Sneddon et al. (2006), it has become a guiding paradigm in policy and practice (Barkemeyer et al., 2014). However, it is regarded as a general rather than a specific guide (Ashby, 2015). Due to its broad nature, Bruntland's definition provides a space for creativity and innovation regarding how to tackle the issues of sustainable development. It is worth noting that every nation has different levels of development, various values, distinct cultures and norms, different institutions and sectors (Pearce et al., 1989) and (Boyko et al., 2006), so definitions of SD will vary according to the context within which they are defined. However, these are expressions or interpretations rather than different conceptualizations of sustainable development (ibid).

Therefore, the term sustainable development can be both broadly definable and have diverse meanings, subject to the circumstances in which it used (Pierantoni, 2004). Boyko et al. (2006), emphasize that all agree that it is necessary to consider the future of the

planet, and that there are approaches for humans to protect and support the earth while satisfying diverse stakeholder requirements. Ashby (2015) states that sustainable development dimensions can be summarised as the 3Ps which are prosperity, people and planet, and their interpretations as economy, society and environment, or as three capitals which are manufacturing and financial, human and social, and natural. However, some critics argue that the values of justice and living within natural limits can only be achieved, "if social, political, and economic systems have the flexibility to be redirected toward sustainability as well as integrated with each other and the environment" (Prizzia, 2007, p. 21).

It can be seen, therefore, that because the concept of sustainable development can be defined in so many ways, it is highly contested because it is still poorly understood (Dillon and Huang, 2010). This is true for both the concept of sustainable development, and education for sustainable development. As noted above, sustainable development "has come to mean all things to all people" (Jacobs, 1999, p. 21) but this does not mean that it is an empty concept that ceases to have any meaning. Jacobs (1999) argues that it is not so much the idea of sustainable development that is contested, but specific concepts within the idea, and the points of disagreement are broadly divided between those who are 'radical' and those who are 'conservative'. For example, radical groups such as environmental activists might have "egalitarian, strong, bottomup, and broad interpretations of sustainable development" (Jacobs, 1999, p. 38), while conservative groups might have "nonegalitarian, weak, topdown, and narrow interpretations" and these are generally held in common "by government and business interests" (Jacobs, 1999, p. 38).

For the purposes of this study, which intends to work with teachers and students on developing their understanding of sustainable development through real world scenarios, the position taken is more aligned with the radical, bottom-up approach. In this regard, the study will work to ensure that Saudi schools are not doing education *about* sustainabil-

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ity but instead education *for* sustainability, as outlined by Ofsted and QCA/QCDA in the British context (Dillon and Huang, 2010, p. 43). This approach of Education for Sustainability is discussed in the following section.

Education for Sustainable Development (ESD):

As already mentioned, in the same way that the idea of SD is varied and has been critiqued as contested and complex discourse, so the same situation arises with the concept of ESD. ESD is viewed as "a highly relevant, controversial, emotionally charged, and debatable topic at the crossroads of science, technology, and society" (Wals and Jickling, 2002, p. 123). McKeown and Hopkins (2003) argue that the apparent acceptance of the concept of ESD within United Nations documents is harmful because it cannot have universal application, however they also see an either-or debate over whose term should be implemented as futile. Instead, they argue for collective and domestic applicable action in both EE and ESD that is responsive to local contexts. While plural standpoints on ESD might be challenging for practitioners who are tasked with implementing it within the curriculum (Stevenson, 2006).

Gough and Scott (2008) believe that a plurality of standpoints can be inspiring because multiplicity requires deep consideration and is acknowledged by some as providing ""fuel" for critical reflection, discussion, contestation, and evolution" (Sauvé, 1996, p. 28). Perhaps more important than arguments over definitions is the general agreement that, like SD, ESD is supposed to address and provide a balance across the three domains of society, environment and economy (McKeown and Hopkins, 2003). In addition, Education for Sustainable Development focuses on the process, which is pertinent to all individuals:

> *Like sustainable development itself, it is a process rather than a fixed goal. It may proceed–and it will always accompany–the building of relationships between individuals, groups and their environment. (Sterling and Croall, 1992,*

p. 2)

This study therefore adopts a combination of two recent definitions of ESD, the first of which reflects the Bruntland definition of SD, and the second of which focuses on the processes and action-oriented dimension of ESD. ESD is the knowledge and skills "needed to work and live in a way that safeguards environmental, social and economic wellbeing, both in the present and for future generations" (Hernandez et al., 2018, p. 137). ESD is education that promotes changes in attitudes, values, knowledge and competencies to empower people to work towards a more sustainable and equitable society for all (Leicht et al., 2018). The first definition is seen as general and can be used for guiding and producing policy at high level of authority to plan and design of ESD, while the second is more likely to be implemented in operational and functional level that is suitable to be used in this study.

Seven key concepts of Sustainable Development:

In order to support teachers in interpreting and implementing ESD, the UK Sustainable Development Education Panel identified seven concepts that they considered crucial to any education for sustainable development (SDEP, 1998). These are:

-Sustainable change;

-Uncertainty and precaution;

-Citizenship and stewardship;

-Interdependence;

-Needs and rights of future generations;

-Quality of life, and equity and justice;

-Diversity (ibid).

SDEP (1998) claimed that any kind of interconnected problem could be addressed through the seven concepts. The concepts were not to be thought of as progressing

from one to the next, but were intended to work together in supporting understanding of real world sustainable development issues. Stables and Scott (2002) were supportive of these concepts and saw them as valuable in assisting educators and others to consider the extent to which they could reinterpret their subject specialisms in the light of these sustainable development concepts. However, Stables and Scott (2002) warned that even the most extremely interested educators committed to incorporating SD into their curricula would have to make a great deal of effort to understand such a framework that comes from outside their specialities and might appear as an imposed task lacking in clear clarification or justification. Thus, it can be seen that:

> *A teacher development priority must be the generation of means whereby teachers can begin to engage with ideas which will very likely lie beyond their experiences of working within their disciplines. (Stables and Scott, 2002, p. 59)*

In the context of this study, ESD is a relatively new idea to be included in the curriculum. For this reason, these seven concepts are viewed as a useful first source to inform the curriculum in the participating schools, but it is recognized that there will also be a need for professional development activities that encourage whole school improvement and its elements such as participation, consistency and coherence within and between curriculum, pedagogy and school ethos (ibid). Table 3.1 combines the seven concepts, generic learning outcomes of them which refer to skills and aptitudes and specific learning outcomes at UK Key Stage 4, which is equivalent to the focus on Grade 10 in this study.

Tab. 3.1: The seven concepts adapted from (SDEP, 1998, p 6-11)

Key Concept	**Skills and Aptitudes Ability to:**	**By the end of KS 4 pupils [the focus is Grade 10 in this study] should:**
Interdependence	Discern patterns of interrelationship between environment and development topics and between actions and consequences.	be able to critically consider choices and alternatives in the context of defining needs and wants; evaluate the benefits and drawbacks of the application of scientific and technological developments for individuals, communities and environments in relation to sustainable development.
Citizenship and stewardship	Find information, weigh evidence, and present reasoned argument on sustainable development issues; express and communicate personal responses to social and environmental issues be in a variety of ways.	understand and value the goal of sustainability and the collective decision-making processes required to achieve it; be prepared to work with others in partnership to resolve sustainable development issues; understand how values and beliefs influence behaviour and lifestyles, and how some behaviour and lifestyles are more sustainable than others; understand the rights and responsibilities that are emerging as necessary to achieving a sustainable society, and how they apply to themselves and other groups in the community and wider society.
Needs and rights of future generations	Consider the future direction of society and the environment, and personal role and contribution to the future.	appreciate that the quality of life of future generations is endangered or enhanced by actions taken now; understand that basic needs for a large part of the world's population presently go unmet; be able to analyse the impact of their actions and lifestyle on the environment and society and able to take informed decisions; know that human activity and natural history have combined to shape our current environment and society and understand that restraint in the use of natural resources is necessary to ensure quality of life in the future.
Diversity	Weigh impact on diversity of person and group decisions.	have an understanding of the paradox of increased consumer choice and communication and loss of cultural, economic and biological diversity through globalization and advances in technology.
Quality of life, equity and justice	Distinguish between wants and needs. Express quality of life in personal terms beyond consumption.	have a clear understanding of the role individuals can play in contributing to greater social justice and equity, and be willing to participate in this process; understand why social justice is an essential part of sustainable development; understand disparities in development, inequalities within and between societies, and the range and complexity of factors that contribute to the quality of life in different places.
Sustainable change	Question decisions, practices and processes which affect sustainable development issues and critically explore alternatives.	be able to question decisions, practices and processes which affect sustainable development issues and investigate alternatives.
Uncertainty, and precaution in action	Think critically and systemically about sustainable development issues. Respond positively uncertainty and to change in working more sustainable future.	be able to think critically, systemically and creatively about sustainable development issues, solutions and alternatives, through study of examples; understand that there are a range of possible pathways to more sustainable lifestyles and be willing participants in efforts to realise more sustainable futures through life-long learning and informed action; understand the value and use of the precautionary principle in personal, social, economic, scientific and technological decision-making in the light of uncertainty.

Finally, when considering the implementation of sustainable development into the Saudi Curriculum, the question of which pedagogical approaches might be suitable is raised. As already discussed, the study adopts the Education for SD orientation, but specific methods of pedagogies employed may vary according to the discourse of the discipline. A brief overview is therefore provided of the distinction between a scientific/ positivist discourse, which typically underpins the sciences, and an interpretative/qualitative discourse, which typically underpins the humanities and social sciences.

The traditional science discourse views the nature of what is being investigated as one standpoint that presents certain facts of reality as neutral, understandable through an objective observer (Whitehead, 2005). Epistemologically the aim of this perspective is to recognise the causes and effects of the phenomenon under investigation, through the insights offered by the research results (ibid). However, Funtowicz and Ravetz (2003) claim that the normative assumptions in the sciences are problematic when presented as unquestioned and unquestionable because this is not consistent with addressing sustainable development issues which are characterized as highly complex systems that require being approached with uncertainty and precaution (Table 3.1). Therefore, an image of reality that reduces complex phenomena to their simple, atomic elements in order to make effective use of scientific methodologies such as controlled experimentation, abstract theory building and full quantification, is questionable.

On the other hand, interpretative/qualitative discourse views sustainable development based on multiple standpoints, which view the nature of what is being investigated in a variety of ways because of the variety of experiential/personal, social, situational, political, or economic potential influences. Epistemologically, plurality requires investigative processes that are both an individual and collective creation, made up by the relationship between the research participants and the researcher (Whitehead, 2005).

This is an emergent perspective that is having some influence in the sciences as ev-

ident in the development of Post-Normal Science (PNS) which employs an interpretative/qualitative discourse for sustainable development. PNS "focuses on aspects of problem solving that tend to be neglected in traditional accounts of scientific practice: uncertainty, value loading, and a plurality of legitimate perspectives" (Funtowicz and Ravetz, 2003, p. 1). Recently, Bebbington and Larrinaga (2014) have emphasized the co-creation, interaction, engagement and participation methodologies that are becoming crucial for people who are dealing with sustainable development issues through what they call 'sustainability science'. Sustainability science can be defined as an emerging approach that strives to comprehend the fundamental attribute of interactions between ecology and society (Kates et al., 2001). For the purposes of this study, it is a reminder of the need to include new ways of knowing and seeking collaborations across disciplines and between education and external experts to explore, for example, how sustainability knowledge is created, validated and translated alongside policy and practice settings (Bebbington and Larrinaga, 2014).

3.2.2   *Sustainability literacy and sustainability competency*

This sub-section seeks to provide a clear idea about the meaning of literacy, competency and of sustainability literacy, sustainability competency and their meanings. It is important to distinguish between literacy and competency and which one of them is the most appropriate for the research's purpose and its scope before moving forward to consider the valuable meaning of literacy and competency in relation to sustainability, especially when the two terms come together as sustainability literacy, or sustainability competency. Literacy has two meanings, one being the basic concept of the ability to read and write, whilst the other is linguistic which is deeply philosophical and sociological. Paul Freire defined literacy as:

An active phenomenon, deeply linked to personal and cultural identity. Its power lies not in a received ability to read and write, but rather in an individual's capacity to put those skills to work in shaping the course of his or her own life. (Freire, 2000 cited in Dale and Newman (2005, p. 355)

Thus, Freire (2000) considers "his concept of literacy moves beyond the strict decoding and reproducing of language into issues of economics, health and sustainable development" (cited in Ritke-Jones (2008, p. 214).

On the other hand, competency can be defined as quantifiable, professionally relevant and behaviourally based attributes or capacities of individuals (Schippmann, 2013), that are contributory in the achievement of targeted outcomes or results (Bartram et al., 2002). Furthermore, competencies are understood to have both cognitive and social/emotional attributes or dimensions (Rychen and Salganik, 2003). Thus, a competency is more than just information and skills (Rychen, 2002); competencies can be summed up as a measurable set of skills, knowledge and abilities that enable creativity in problem solving and task performance (Wiek et al., 2015). Sustainability literacy can be seen as engendering the behaviours, capabilities, identities, principles and knowledge that are essential for living and flourishing in the decreasing circumstances of the world in means which slow down these decreases as much as feasible (Stibbe, 2009).

Hence, sustainability literacy is not a programme which just focuses merely on changing values, but instead concentrates on values articulation, making them explicit, developing the ability to place challenges and issues in diverse contexts. By doing this, the ability to solve an issue is a better measure of literacy than mastery of individual skills (Dale and Newman, 2005). Therefore, literacy is concerned with the overarching idea, while competency is the measurable skill/knowledge set that contributes to this literacy. Here it is worth noting that competency is one of sustainability literacy's components, with sustainability literacy being the competencies, expertise, characteristics, capacities and attitudes to as-

sist students and specialists in directing their path through the challenging circumstances of the twenty-first century and contributing to an advanced sustainable community (Ansari and Stibbe, 2009).

It can be argued that a literacy concept could be used as an abstract concept that encourages and supports people to move from a basic idea of something like awareness of sustainable development issues to the level of creativity and innovation. However, when it comes to educational programmes, the concepts and ideas should be measurable and observable especially nowadays with most educational systems being competency based (Paulo, 2014). Moreover, Frisk and Larson (2011) state that competency-based education draws attention to student output, whereas traditional, didactic approaches centre on teacher inputs. Whilst the input approach is frequently related to standards that the teacher has to cover, the output-oriented approach concentrates on student's attainment. To accomplish sustainable development, education needs to move into changing behaviours, which is integral to sustainability literacy with its focus on values and which actions are more sustainable than other actions. Thus, this research attempts to explore and understand how the current Social Studies and Citizenship Education subject deals with both sustainability literacy and competency. To sum up, this research adopts sustainability competencies concepts, as they are comprehensive and appropriate, whilst also fitting the research's purpose and its scope.

3.2.3 Key competencies for Sustainable Development

The key sustainability competencies are considered vital for sustainable development and have not been the focus of traditional education, so they require special attention (Wiek et al., 2011). This section identifies the various ways in which different authors have categorized sustainability competencies. It goes on to synthesize them by identifying where there are overlaps, and by considering which are most relevant to secondary school edu-

cation.

According to the literature, considerable efforts have been conducted to explore and identify a theoretical framework regarding key competencies for sustainability (cf. Lambrechts et al., 2013; Wiek et al., 2011; Novo and Murga-Menoyo, 2015; Cebrián and Junyent, 2015; Barth et al., 2007; Rieckmann, 2012; Guerra, 2012; Rauch and Steiner, 2013; Frisk and Larson, 2011; Lönngren and Svanström, 2016; Fischer and Barth, 2014; Schmidt and Kunzmann, 2007; Vega-Marcote et al., 2015; Warren et al., 2014).

For example, De La Caba Collado and Lopez Atxurra (2006) identify eight key competencies which are competency in foresighted thinking, competency in interdisciplinary work, competency in cosmopolitan perception, transcultural understanding and co-operation, participatory skills, competency in planning and implementation, capacity for empathy and finally capacity for solidarity. Alternatively, Wiek et al. (2011) identify five key competencies for sustainability which are: systems thinking, normative competence, strategic competence, anticipatory competence and interpersonal competence (Table 3.2).

Tab. 3.2: Wiek's, Withycombe's, and Redman's five key competencies

Competencies for sustainability	Explanation
• Systems-thinking competence: Similar terms from literature interconnected thinking, holistic thinking	is the ability to collectively analyse complex systems across different domains (society, environment, economy, etc.) and across different scales (local to global), thereby considering cascading effects, inertia, feedback loops and other systemic features related to sustainability issues.
• Normative competence: Similar terms from literature value-focused thinking, orientation thinking/knowledge, ethical thinking	is the ability to collectively map, specify, apply, reconcile, and negotiate sustainability values, principles, goals, and targets. This capacity enables, first, to collectively assess the (un-)sustainability of current and/or future states of social-ecological systems and, second, to collectively create and craft sustainability visions for these systems.
• Strategic competence: Similar terms from literature Action-oriented competence, transformative competence, implementation skills	is the ability to collectively design and implement interventions, transitions, and transformative governance strategies toward sustainability. This capacity requires an intimate understanding of strategic concepts such as intentionality, systemic inertia, path dependencies, barriers, carriers, alliances etc.; knowledge about viability, feasibility, effectiveness, efficiency of systemic interventions as well as potential of unintended consequences.
• Anticipatory competence: Similar terms from literature future thinking, foresighted thinking, transgenerational thinking	is the ability to collectively analyse, evaluate, and craft rich "pictures" of the future related to sustainability issues and sustainability problem-solving frameworks. The term "pictures" has been used (similar to "stories" or "images") as an open notion to include qualitative information, quantitative information, narratives, imagery, etc.
• Interpersonal competence: Similar terms from literature collaborative, participatory, interdisciplinary, civic competence	is the ability to motivate, enable, and facilitate collaborative and participatory sustainability research and problem solving.

Wiek et al. (2011) focus on the competencies required at institutional and societal levels, while Fischer and Barth (2014) identify competencies that are arguably required

at the individual level. They group their key competencies for and beyond sustainable consumption into three categories (ibid):

- Act autonomously, which includes the competency to reflect on individual needs and cultural orientations together with a competency to plan, implement and evaluate consumption related activities.

- Interact in heterogeneous groups, which comprises the competency to engage critically in a role as an active stakeholder in the market and the competency to communicate on the topic of sustainable consumption.

- Use tools interactively, which incorporates the competency to use, edit and share different forms of knowledge, the competency to use information and communication technology (ICT) interactively and the competency of visualisation and consideration of possible interrelatedness.

Lambrechts et al. (2013) provide yet another categorization of competencies for sustainable development (Table 3.3). This categorization seems to emphasise the competencies required at individual level, which we can argue is more helpful for implementation in school education.

Tab. 3.3: Lambrechts, Mul'a, Ceulemans, Molderez & Gaeremynck (2013) (sustainable development competencies (ibid, p. 13)

1	Responsibility: A sustainable professional takes responsibility for the own work i.e.: the sustainable professional can:
1.1	make a stakeholder analysis;
1.2	take personal responsibility;
1.3	render personal account to society;
1.4	critically evaluate own actions.
2	Emotional intelligence: A sustainable professional projects him/herself on the values and emotions of other people and cultures i.e.: the sustainable professional can:
2.1	recognize and respect values of him/herself and of other people and cultures;
2.2	recognize and respect action perspectives of him/herself and of other people and cultures;
2.3	listen to opinions and emotions of others;
2.4	distinguish between facts, presumptions and opinions.
3	System orientation: A sustainable professional thinks and works from a systems Vision i.e.: the sustainable professional can:
3.1	cooperate in an inter- and transdisciplinary way;
3.2	think in systems, zoom in and out, i.e. alternately think analytically and holistically;
3.3	think function oriented, innovative, creative, out of the box;
3.4	think chain oriented.
4	Future orientation: A sustainable professional thinks and works from a future oriented perspective i.e.: the sustainable professional can:
4.1	recognize and understand non-linear processes;
4.2	think in varying timescales; distinguish between short term and long term approach;
4.3	estimate consequence reach and consequence period of decisions;
4.4	think future oriented, anticipate.
5	Personal involvement: A sustainable professional dedicates him/herself personally for sustainable development i.e.: the sustainable professional can:
5.1	consistently involve sustainable development in the own work as a professional (sustainable attitude);
5.2	keep own knowledge and expertise up-to-date, even outside of the own discipline;
5.3	work with passion on dreams and ideals;
5.4	apply the own conscience as the standard.
6	Action skills: A sustainable professional acts decisively and competently i.e.: the sustainable professional can:
6.1	weigh unweighable aspects and make choices;
6.2	act when the time is ripe, not against the flow: "do without doing";
6.3	deal with uncertainties;
6.4	take decisions.

Rauch and Steiner (2013) present a model, which seems to combine the societal and institutional approach of Table 3.2 with the individual approach of Table 3.3. The model is shown in Figure 3.1.
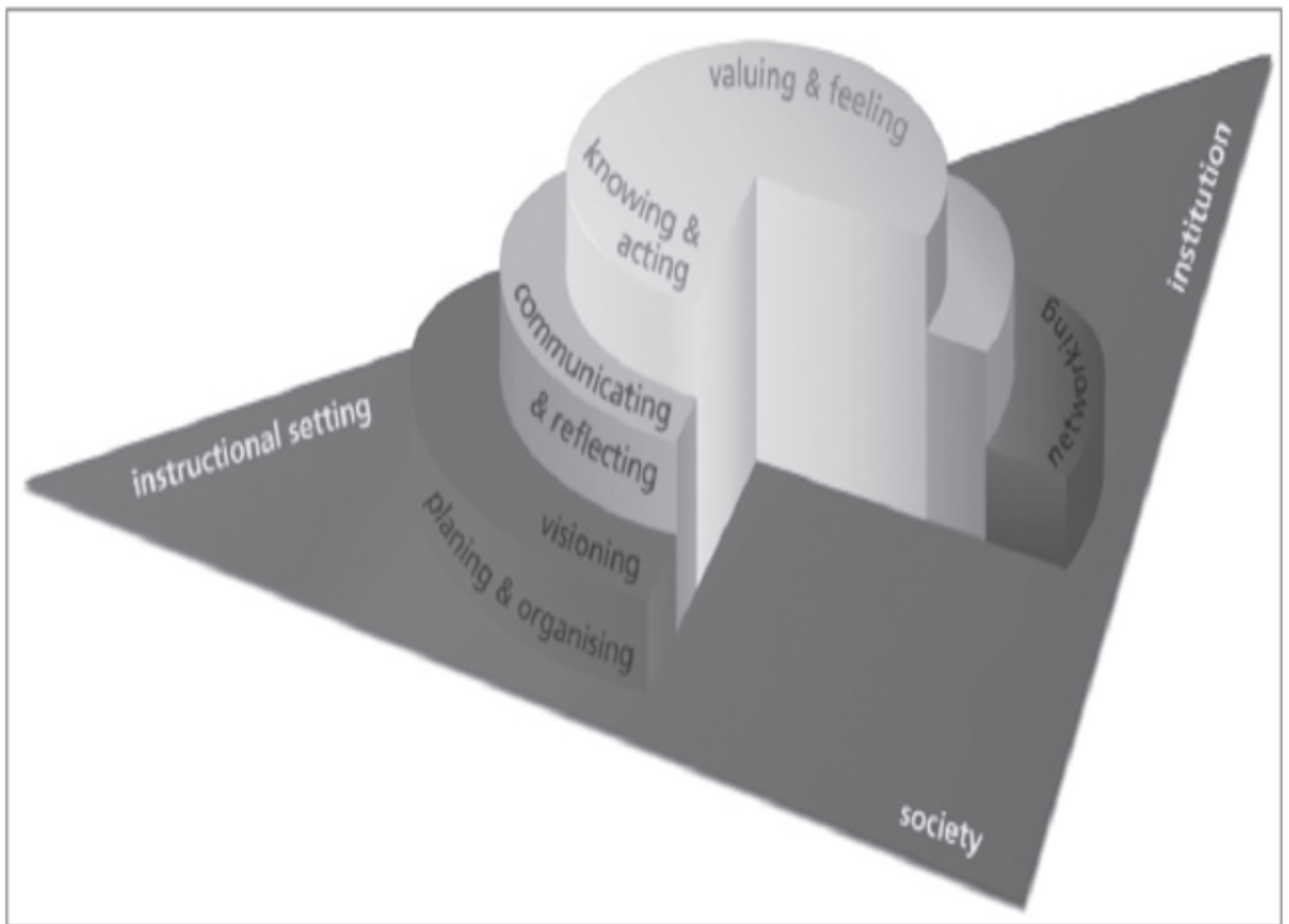
Fig. 3.1: Rauch's and Steiner's Model from (Rauch, Streissler & Steiner, 2008, cited in Rauch & Steiner (2013, p. 16)

As mentioned before, the numbers of ways in which sustainability competencies have been categorized are too numerous to mention, and there is considerable debate about which are the most important key competencies. However, Rieckmann (2012) conducted

a Delphi study with 70 selected educational experts in the field of sustainable development from Europe (Germany, Great Britain) and Latin America (Chile, Ecuador, Mexico). As a result of the Delphi process, the following competencies were identified as being of most importance: systemic thinking, anticipatory thinking and critical thinking. The question for this study is whether students should be required to gain all competencies.

Wiek et al. (2011) suggest that is should be possible to strike a balance between simplification and complication, if desired. Bearing in mind the time and resource restrictions on this study, it seems sensible that learners would obtain comprehensive skills in one or two key competencies. Systems thinking and interpersonal competences are found in Table 3.3 and Table 3.2 above as well as other studies, the ones most important to include in teaching and learning objectives globally (cf. De La Caba Collado and Lopez Atxurra, 2006; Wiek et al., 2011; Cebrián and Junyent, 2015; Lambrechts et al., 2013; Rauch and Steiner, 2013). These competencies are selected as the most useful and important sustainability competencies that need to be developed in 10th grade students in Saudi Arabia.

Firstly, these two competencies have particularly unique characteristics. Secondly, the direct targets of this study are 10th grade students, so the research takes into account their current abilities and capacities. In the researcher's own experience, systems thinking and interpersonal knowledge and skills are the competencies least developed in secondary schools in Saudi Arabia. Thirdly, anticipatory thinking can be considered a more advanced skill and one that would require more time than is available for this study. For these reasons, systems thinking and interpersonal competencies were the focus of the study, but the other competencies were not ignored. All competencies in Table 3.3 were used during the teaching programme, but research data were only gathered for the two focus competencies.

3.3 The Concept of Curriculum

In order to justify what is the most appropriate curriculum theories that can support the development and design SSCE, clarification of what is meant by curriculum is crucial. However, defining curriculum is a problematic philosophical matter about which many scholars have different point of views depending on how they view the nature of curriculum. Since the area of the curriculum has evolved, it has been suggested that the task of defining the concept of curriculum is problematic because the term curriculum has been utilized with a wide range of meanings (Glatthorn et al., 2012). Examples of definitions are: the content of a course, the total of learning programmes that can be provided by one institution, or the range of provision at a national level as is the case in the National Curriculum (Scales and Kelly, 2012). This generic conceptualization of curriculum does not, however, provide even the central debate of the issue. Glatthorn et al. (2012); Ellis (2014); Kelly (2009) and Lunenburg (2011) make a useful distinction between curriculum defined as prescriptive, curriculum defined as descriptive, or a combination of the two.

Ellis (2014) explains the first view of curriculum as a prescriptive (Table 3.4) that can offer educators an explanation of what should occur in settings such as courses or programmes, which are based on the experts' views. These are usually provided in government sanctioned curricula such as the Social Studies and Citizenship Education curriculum in Saudi Arabia. As with a medical analogy, both teachers and patients are provided with a prescription; however, each of them will ultimately choose whether or not the prescription will be fulfilled, and if fulfilled, each of them may choose whether to 'take' the fulfilled prescription in the way intended. Therefore, the curriculum designer in the education field offers a prescribed curriculum, but the educators/teachers may reject it or not because ultimately they are in control of what happens in their classroom (Ellis, 2014).

Tab. 3.4: Definitions of the curriculum as prescriptive, adapted, from (Glatthorn et al., 2012, p. 4) and (Wyse, Hayward, & Pandya, 2015)

Date	Author	Definition
1957	Tyler, 1957	"[The curriculum is] all the learning experiences planned and directed by the school to attain its educational goals". (p. 79)
1967	Bartram et al., 2002	"Curriculum is a sequence of content units arranged in such a way that the learning of each unit may be accomplished as a single act, provided the capabilities described by specified prior units (in the sequence) have already been mastered by the learner". (p. 23)
1997	McBrien and Brandt, 1997	"[Curriculum] refers to a written plan outlining what students will be taught (a course of study). Curriculum may refer to all the courses offered at a given school, or all the courses offered at a school in a particular area of study". (p. 59)

The focus of these definitions of curriculum (as prescriptive) is on the plans or contents, whilst other aspects such as the gap between intention of the planned curriculum and its reality are neglected (Pring, 2004). Scales and Kelly (2012) show how a government prescribed curriculum can be used by a specific educational institution to create a group of programmes that make the curriculum more accessible; although still prescribed, they are not curricula, they are directories or prospectuses (Scales and Kelly, 2012). A specific programme or course can then create a prescribed syllabus (ibid). The curriculum as descriptive view is one that emerged from the first view in an attempt to address the gap between prescription and implementation. Thus, the curriculum as descriptive (Table 3.5) is how the situation is in actual classrooms, rather than how matters *should* be according to professional guidance (Ellis, 2014). Curriculum in this view, is also called curriculum 'experience' (Ellis, 2014), since it comes into existence through the joint experience of the teacher and students.

Tab. 3.5: Definitions of the curriculum as descriptive, adapted, from (Glatthorn et al., 2012, p. 4) and (Wyse et al., 2015)

Date	Author	Definition
1918	Bobbitt, 2004	Curriculum "is the entire range of experiences, both directed and undirected, concerned in unfolding the abilities of the individual". (p. 11)
1937	Caswell and Campbell, 1937	"The curriculum is composed of all the experiences children have under the guidance of teachers. . . . Thus, curriculum considered as a field of study represents no strictly limited body of content, but rather a process or procedure". (p. 66, 70)
1977	Hass, 1977	"The set of actual experiences and perceptions of the experiences that each individual learner has of his or her programme of education". (p. 5)
1980	Tanner and Tanner, 1980	"The reconstruction of knowledge and experience that enables the learner to grow in exercising intelligent control of subsequent knowledge and experience". (p. 43)
2009	Silva, 2009	"An emphasis on what students can do with knowledge, rather than what units of knowledge they have, is the essence of 21st-century skills". (p. 630)

The focus of these definitions of curriculum is on experiences, interactive processes and is action orientated. They emphasise what can be done with the knowledge set out in the prescribed curriculum. Therefore, defining curriculum as simply knowledge–based (Table 3.4) is insufficient. The definition of curriculum goes far beyond this, to clarify and explain the aims of such transmission and to investigate the effects that experience of such knowledge and such subjects is likely to have, or intended to have, on its learners (ibid) as in Table 3.5.

Stenhouse (1975) provides a definition that is a combined view. Stenhouse (1975) provides a definition of curriculum that combines the prescriptive and descriptive. He defines it as an endeavour to link the vital features and values of an educational scheme in such an arrangement that it is open to critical examination and puts skilful operational interpretation into practice. This definition is adopted for this study because it views curriculum not as an inert entity, but as a process of co–creation between teacher and learner, in which

knowledge is not learned uncritically, but is subject to critical examination including how it might lead to changes in action (Abie, 2014). This is in accordance with the stated aim of the study which is to focus on the development of systems thinking and interpersonal skills with a view to making changes for sustainable development.

3.4 Curriculum Development and Design Models

Having established the definition of curriculum that will be used for this study, it is now necessary to discuss which model of curriculum design is best suited to a process in which the curriculum is co–created by the researcher and participating teachers. The following subsections will focus on components of curriculum design (horizontal and vertical), design dimension considerations and Problem–Centred Design.

3.4.1 Components of curriculum design

Tyler (1949) stresses that curriculum design should involve four elements: objectives, content, learning experiences and evaluation. These four broad components also appear in more recent general publications on curriculum design (Wiers et al., 2002). However, curriculum design also involves philosophical, theoretical and practical issues. It is claimed that a philosophy can influence the developed curriculum in a number of ways: interpretation and choosing of objectives, the choosing and forming of content, the deciding of pedagogical and strategical approaches for the presentation of content and findings (Hunkins and Ornstein, 2016).

3.4.2 Horizontal, vertical and curriculum components

Horizontal and vertical components are the two basic organisational dimensions of curricula. The horizontal organization blends curriculum elements such as History, Geography

and Citizenship Education to create the subject SSCE (Hunkins and Ornstein, 2016) and (Hassan, 2013). The vertical organization is concerned with sequencing curriculum elements, such as placing themes according to the students' social studies grades, starting from the basic level, then moving to a higher level (ibid). Therefore, the horizontal and vertical components are critical due to that the educational policy in general is concerned with students' Subject Matter Knowledge (SMK) which is presented here through vertical aspects, while this research is also concerned with horizontal aspects due to the twenty–first century's requirements that present sustainable development requirements as it is shown in Phase 1 results 5.5. It is argued that vertical integration increases motivation, prepares for lifelong learning, boosts deep learning and facilitates curricular reforms (Rafique, 2014).

Gilbert Ryle (1949) cited in Greenwood and Levin (2006), argued for an imperative distinction between "knowing that" and "knowing how". "Knowing that" is the key activity of traditional intellectual life in academia, and asserts the capacity to know the reason why a certain issue exists and what its definition is. A well–informed expert in "knowing that" is one who can orally argue in favour of what he or she believes, but not one who necessarily knows how to do anything in particular. Ryle (ibid) disagrees with the previous claim by stating that intelligence is more evident in the way we do than in the way we consider. "Knowing how" is apparent in intelligent actions that implement whatever capabilities and knowledge someone has; it appears through the application of knowledge in a given setting. In this study, there is an attempt to promote "knowing how" according to its scope.

3.4.3   Other design considerations

Curriculum design should accomplish the following elements: scope, sequence, continuity, integration, articulation and balance (Hunkins and Ornstein, 2016). With respect to the scope, which is frequently associated with horizontal curriculum design, continuity is reg-

ularly described as the vertical integration of the curriculum design (O'Neill, 2010). Therefore, the scope can focus on breadth and depth of content that reflects on the curriculum, whilst continuity is considered to be the updating and revision of previous concepts and skills (Hunkins and Ornstein, 2016). However, the sequence is based on the strategy of individual process knowledge such as whole to part, which can appear on these strategies such as Inquiry–Based Learning and Problem–Based learning (O'Neill, 2010) and (Hunkins and Ornstein, 2016). Thus, the integration is concerned with linking all kinds of knowledge and experiences enclosed within the curriculum plan; however, the curriculum integration is not merely concerned with a design dimension, but it also considers curriculum's sources and schools' purposes (Hunkins and Ornstein, 2016).

Finally, the last element balances the previous elements and there is a belief that curriculum designers should attempt to provide applicable weights to each aspect of the design and, therefore, students can obtain a practical knowledge in ways that develop their social, personal and intellectual aims (Hunkins and Ornstein, 2016).

3.4.4   Problem–Centred Designs

Problem–Centred Design (PCD) is not a separate thing from horizontal and vertical design, or from scope, continuity etc. Although Subject–Centred Design is the oldest and popular curriculum design, and provides considerable information, several authors have critiqued it (Henson, 1995; White, 2007; Hunkins and Ornstein, 2016). They argue that Subject–Centred Design does not give special attention to students' needs and interest. White (2007) argues that it is not acceptable to use this kind of curriculum designs because it does not copes with the challenges and the requirements of twenty first century. Thus, the lack of Subject–Centred Design has led to consider an alternative design that can be able to achieve the aims of this research. Problem–Centred Design focuses on

real–life problems of individuals and society (Hunkins and Ornstein, 2016). Furthermore, it is argued that Problem–Centred Designs vary from learner-centred designs in that they are prearranged before the students come (although they can then be adapted to students' interests and circumstances), and both place the student within a social environment (ibid). There are several kinds of Problem–Centred Design which vary depending on social or individual needs; however, this research is concerned with curriculum design based on social, contemporary problems or life–situations.

Hunkins and Ornstein (2016) assert that the design of real life–situations curricula includes three assumptions:

1. Dealing with continual life situations is critical to the successful functioning of a society, so the educational sense could form the curriculum around these situations.

2. If the curriculum is planned around aspects of community life, students will see the relevance of the content.

3. Providing students with opportunities to study social or life situations will directly engage them in improving society.

The main aim of using PCD is to rise consciousness of critical social challenges among the learners and develop competencies to assist them to solve these challenges (Sindhu et al., 2017). There is a belief that if curriculum is oriented to sustainable development then a social change can be stimulated with the ultimate goal of a healthier and more just society (ibid). Essentially, PCD engages the agency of the school to act for social change (ibid). The question is whether the Saudi SSCE teachers are able to implement PCD in this way and this study attempts to investigate this concern. PCD can be one way of providing an effective sustainability curriculum through an interdisciplinary approach. However, Caston (2013) warns that the approach of:

Interdisciplinary, while a step in the right direction, maintains the boundaries that traditionally exist between fields of study further exacerbating the siloing of knowledge for students. (Caston, 2013, p. 2)

Some argue for a transdisciplinary approach, but the context of the Saudi education system is still far from applying even an interdisciplinary approach. The SSCE curriculum requires teachers to integrate the disciplines of history, geography and citizenship and it is this that the teachers in this study will be adapting to in addition to learning how to incorporate sustainable development. On the other hand, Bas (2013) stated that if the teachers favours or accepts a Subject–Centred Design orientation, they would reflect their own style into the teaching practices in class regardless if the curriculum is developed based on a learner–centred design orientation. Moreover, if teachers have an undesirable attitude towards the curriculum design orientation, it seems impossible for that curriculum to be applied into the lessons according to the aims of this curriculum (ibid). It is argued that Problem–Centred Design can be used in elementary and secondary education to reflect the knowledge, skills and actions of the informed citizen (Conway and Little, 2000). In Problem–Centred Design, two forms of knowledge are emphasized: *"knowing that"* and *"knowing how"* (Glen, 1995).

Those who know how to do something do not therefore just know how to practice a technique, they also know how to carry out the act that they wish to perform in the circumstances in which they have to perform it. That often involves the exercise of judgment and discretion and much of their success derives from the degree of judgment and discretion that is brought to bear on their performance. (Winch, 2010, p. 559)

PCD arguably can be appropriate for the Saudi context, the purpose of ESD and developing the two key competencies that identified previously in Section 3.2.3. The existing lit-

erature regarding the integration of sustainable development in educational programmes, which includes curriculum and pedagogies, has been presented briefly in Chapter 1. The following section considers which approach to continuing professional development is best suited to the Saudi context of this study and the sustainability content knowledge that teachers will require. In the final section the approach to pedagogical content knowledge that is considered most suitable for sustainable development will be discussed.

3.5   Continuing Professional Development (CPD)

Through an extensive review of the literature, it can be seen that teacher professional development has many terminologies and some of them are used interchangeably. For the purposes of this study, the term continuing professional development (CPD) will be used since it is the most recent and commonly used term. CPD can be defined as all actions which teachers become involved in professionally, which are designed to improve their work (Day and Sachs, 2004).

It is claimed that CPD of teachers is one of the most vital elements to improve teacher quality and the quality of education (Harris et al., 2006; Macheng, 2016). A variety of models of CPD exist including: award–bearing, training, cascade, deficit, coaching/mentoring, standards–based, action research, community of practice and transformative (Kennedy, 2005). The two most commonly used CPD models in Saudi Arabia for teachers development are training and cascade. Alharbi (2011) argues that the training model is often described as one size fits all approach which may account for its popularity, because it is the easiest most cost–effective approach. However, in the kingdom of Saudi Arabia, the professional development training programmes that Local Education Authorities (LEAs) provide are designed nationally and therefore do not necessarily meet the needs of the local teacher population, who do not have an input into their design (Alharbi, 2011). The

community of practice model has been chosen for this study because it has several elements that might provide spaces for teachers to engage with integration of SD and have ownership in the processes of learning and decision–making. The next subsection will discuss the community of practice model in more detail.

3.5.1   Community of Practice

In recent years Lave and Wenger's (1991) concept of communities of practice (Kimble, 2006) has gained in popularity and been used in many academic areas such as curriculum development and curriculum implementation (Edwards, 2012; Thomas and Judd, 2015; Fritz et al., 2015). Communities of practice can be defined as groups of people who share a desire or an interest for something and who work collaboratively to develop their knowledge and skills by learning from each other (Wenger, 2011). It has also been defined as a:

> *Persistent, sustained social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history, and experiences focused on a common practice and/or mutual experience. (Barab et al., 2004, p. 55)*

Edwards (2012) argues that adopting a community of practice approach facilitates school change processes and implementation of a revised curriculum through the development of community members' capabilities and proficiency in school curriculum design. Edwards adds that CoPs are an effective local solution to forming and managing groups of teachers to work together to improve students' outcomes (ibid). The concept of community of practice has its roots in the attempts to develop a clearer understanding of the social nature of human learning and is influenced by anthropological and social theories such as Lave's and Wenger's (1991) situated learning theory, Giddens' (1984) structuration theory

and Vygotsky's (1978) cultural historical activity (Wenger, 2010).

Furthermore, community of practice is "largely based on the educational philosophy of John Dewey (1938) who maintained the importance of the process of actual experience on learning" (Al-Deen and Hendricks, 2011, p. 132). Diverse kinds of learning theories, each one with its own underlining particular facets of learning, are consequently working to achieve several different aims. These variances are the result of deep reflection on the multidimensional issues of learning, especially those regarding the nature of knowledge, of knowing and of the knower and thus about what matters in learning (Wenger, 1998). Thus, community of practice establishes a conceptual framework from which to originate a steady set of general principles and references for comprehending and facilitating learning. However, the anthropologists Jean Lave and Etienne Wenger coined the term of community of practice during their studying of apprenticeship as a learning model.

Key elements of Community of Practice Theory:

The concept of community of practice has evolved in four stages, the recognition of which can provide a clear idea of the concepts involved and when it can be used in an appropriate way. These key elements were developed over time as shown below (see also Appendix B).

1. Lave and Wenger (1991) in *Situated Learning: Legitimate Peripheral Participation*, first characterized how groups are renewed with newcomers joining and ultimately replacing existing members. 'Old-timers', who have considerable experience of the work practice, collaborate with newcomers who learn through this collaboration, which enables them eventually to become competent enough to undertake more important and critical tasks. The newcomers are not merely learning the domain skills associated with the practice, but also learning other features such as the

language of the community, its values and its attitudes.

The collaborative practices with the newcomers offers them a form of induction through participation, so the newcomers change from peripheral positions to more central ones and as such in time become old-timers (Hildreth et al., 1999). Handley et al. (2006) argue that Lave's and Wenger's work "offers a radical critique of cognitivist theories of learning, emphasizing the relational aspects of learning within communities of practice in contrast to the individualist assumptions of conventional theories" (p. 642). This perspective understands that conflict exists during the process of legitimation, and provides an approach to socialisation into a practice through peripheral participation which enables participation but does not destabilise the integrity of the core identity of the community (Cox, 2005). More specifically, joint legitimation and sharing determine the distinguishing means of belonging to a community (Kimble et al., 2001). It is also a view that considers social practice as a mainstream, reproductive phenomenon, with one of its features being learning (Lave and Wenger, 1991).

2. Brown and Duguid (1991), in *Organizational Learning and Community of Practice: Toward a Unified View of Working, Learning, and Innovation*, concentrated on the processes involved in the generation of new knowledge through description and improvisation by specialists in a community. Thus, within this version of community of practice model the possibility of conflict inside the community is forgotten, but the association between the community and other entities is discovered (Cox, 2005). This work and the previous one are approaching communities of practice to some extent in different ways, but both of them are mainly concerned with theories of learning (Kimble, 2006).

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3. Wenger (1998) in his later work *Communities of Practice: Learning, Meaning and Identity*, responded to criticisms of the concept of legitimate peripheral participation by elaborating on the concepts of communities of practice and identity (Graven and Lerman, 2003). Wenger (1998) identified a universal social phenomena where there is sustained shared commitment to an original enterprise, principally seen from the point of view of implications for social identity, using such concepts as trajectories, multi-membership and boundary work (Cox, 2005). Additionally, the community of practice in this work viewed learning as a self-directed process, which has a start and finish, preferring to be separated from other events (Wenger, 1998).

4. Wenger et al. (2002) in *Cultivating Communities of Practice: A Guide to Managing Knowledge*, developed the idea of a community acting as a vehicle for teamwork, allowing participants to be actively involved and develop positive relations with other members (ibid).

Notably, while Lave and Wenger (1991) notice the significance of power in framing the legitimacy of peripherality and participation, "they fail to explore the implications of the distribution of power when discussing their case studies of communities of practice" (Roberts, 2006, p. 627). This failure applies to all other versions and Roberts goes further to argue that the issue of power is "relegated to footnotes in Wenger's (1998, 2000) later work" (p. 627). This is an important issue that is returned to later in Section 7.2.1. Wenger's assumption regarding the nature of knowledge, knowing, knower and to what matters about learning is based on four premises:

- People are social beings, so this fact is a central aspect of learning;

- Knowledge is about competence regarding valued enterprises;

- Knowing is about participating through following up such enterprises and being actively involved in the world;

- Meaning is an individual's capability to understand their connection to the world and its significance, eventually what learning is yielded (Wenger, 1998).

These assumptions have led Wenger (1998) to identify four components of his social theory of learning that should be integrated in order to characterize social participation as a process of learning and knowing. These elements are presented in Figure 3.2 adapted from (Wenger, 1998, p. 5).

Fig. 3.2: The four components of Wenger's social theory of learning (Wenger, 1998)

The four components of Wenger's social theory of learning are: (Wenger, 1998):

- Meaning: a way to conduct conversation about how people adapt and develop their capabilities, personality and collective working skills in order to experience the world in a more meaningful way.

- Practice: a way to conduct conversation in order to share ideas that can sustain mutual involvement in action.

- Community: their collective learning becomes a bond among them over time (experienced in diverse methods) (Wenger-Trayner, 2011).

- Identity: a way to conduct conversation about how learning modifies, supporting everyone in the community to discover themselves, their abilities, roles in the community and tracking their starting point and their progress.

  Therefore, the analytical power of the community of practice concept is in integration of these four components. Any organisation or institution that wishes to establish an effective community of practice should consider these in conjunction with the dimensions of joint enterprise, mutual engagement and shared repertoire of techniques for working on tasks (ibid) (Figure 3.3).
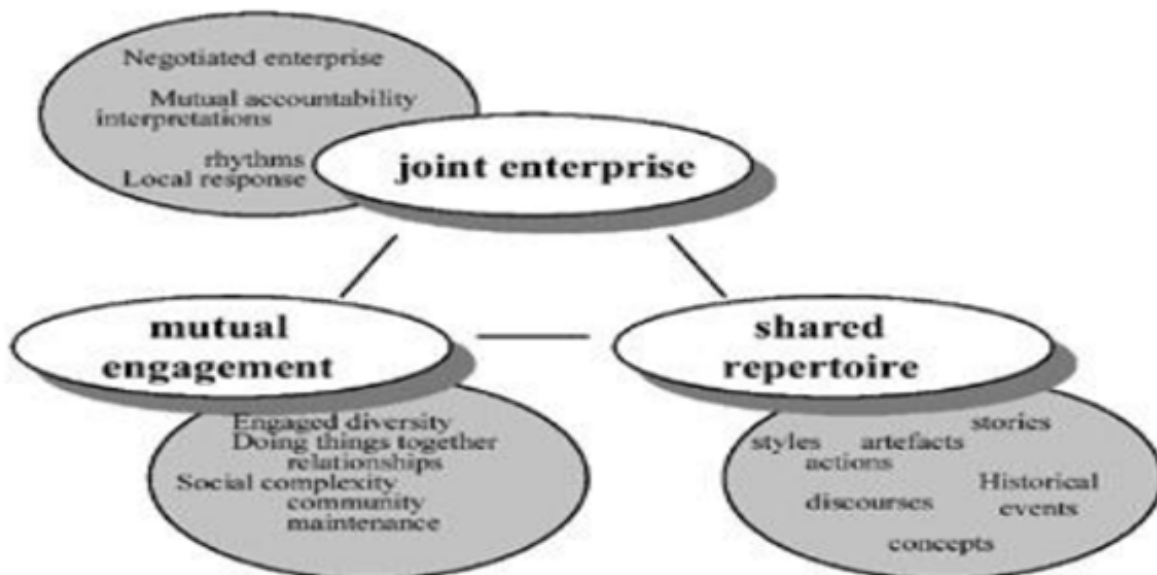
Fig. 3.3: The dimensions of practice adapted from (Wenger, 1998, p. 73)

Moreover, Wenger (1998) argues that an established history of shared meetings for a joint enterprise is necessary for this approach if it is to develop cutting-edge knowledge,

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and that it requires robust links of shared aptitudes along with an appreciation of experience. In this study, the community of practice will be newly established and so unlikely to reach the level of developing cutting-edge knowledge. Nevertheless, it is the combination of these elements that facilitates the production of knowledge which makes it worthwhile elaborating on each dimension as follows:

- Mutual engagement, which means that intellectually experience might not appear, but in reality, it exists because individuals are involved in activities, which are discussed as part of a team.

- Joint enterprise, which is the consequence of a joint process of compromising that provides focus the full complexities of mutual commitment. Joint enterprise defines the contributors in their pursuit of each process and as such their responses to the given situation are discussed in a thought provoking manner (Wenger, 1998)

- Shared repertoire means that a community of practice consists of stories, categories, activities, habits, differences of opinion, signals, signs, instruments, notions or methods of doing things that the community has generated or acted on in the process, which consequently forms part of its practice (ibid).

Thus, the theory of a community of practice is used in this research to serve as a lens which can address the two issues of practice and identity, given that learning is situated in-between these two aspects. A community of practice can be seen to engender in novices the development of appropriate practices, whilst through the same process leads to the changing of identities and to new insights (Wenger, 1998). Although participants work daily on actual contexts, the social structures of shared means, by which members form and manage their practice, mutual relationships, and understandings of the domain, are crucial (ibid). Following this, the theories of identity that deal with the social construction of

the individual, the cultural interpretation of the self, the formation and practice of markers of membership, such as social class in order to comprehend each individual, are shaped through the multifaceted relations of mutual constitution between individuals and groups (Wenger, 1998).

Finally, Amin and Roberts (2006) have identified four kinds of knowledge community task/craft based communities, professional communities, expert or creative communities and virtual communities. These are described as discrete categories with overlapping knowledge dynamics. For example, virtual communities overlap with many of the first three communities, but they are distinguished from them by using information and communication technology for facilitating the exchange of knowledge (ibid). Furthermore, task/craft based communities of practice need the development of aesthetic and kinaesthetic knowledge through the reiterated practice of definite tasks under close supervision from core members of the community. Neither task/craft based communities nor virtual communities are the type of community of practice that will be appropriate for this study, hence, Table 3.6 provides an overview of professional communities and expert or creative communities due to their elements being best suited to the professional and creative elements that will be required for design-based curriculum work.

Tab. 3.6: The two kinds of knowledge community adapted from (Amin & Roberts, 2006, p. 7)

Activity	Type of knowledge	Social interaction			Innovation	Organisational dynamic
		Proximity/ nature of communication	Temporal aspects	Nature of social ties		
Professional	Specialised expert knowledge acquired through prolonged periods of education and training. Declarative knowledge. Mind-matter and technologically embodied. (Aesthetic and kinaesthetic dimensions).	Co-location required in the development of professional status for communication through demonstration. Not as important thereafter.	Long-lived and slow to change. Developing formal regulatory institutions	Institutional trust based on professional standards of conduct	Incremental or radical but strongly bound by institutional/ professional rules. Radical innovation stimulated by contact with other communities	Large hierarchical managed organisations or small peer managed organisations Restrictions on the entry of new members.
Expert/ Creative	Specialised and expert knowledge, including standards and codes, (including meta-codes). Exist to extend knowledge base. Temporary creative coalitions; knowledge changing rapidly.	Spatial and/or relational proximity. Communication facilitated through a combination of face-to face and distanciated contact.	Short-lived drawing on institutional resources from a variety of expert/ creative fields.	Trust based on reputation and expertise, weak social ties.	High energy, radical Innovation.	Group/project managed Open to those with a reputation in the field Management through intermediaries and boundary objects.

Critique of a Community of Practice approach

Although the literature is more likely to favour the optimistic outcomes with the CoP approach, it is vital that a community of practice be comprehended in terms of its drawbacks, which are often ignored (Kerno Jr, 2008). CoP has several limitations that need to be addressed to gain maximum expectations of it. Kerno Jr (2008) states that managerial hierarchies, time restrictions and regional culture are emphasised as the key limitations of CoP. Therefore, it is useful to take these limitations into consideration when organizations are endeavouring to promote, cultivate, and develop communities of practice. These cautious recommendations are helpful especially in a context like Saudi Arabia that is not familiar with this kind of approach to CPD. This study will therefore pay close attention to how these limitations are experienced in the particular context of Saudi Arabia. Firstly, especially in the Saudi educational system is based on a managerial hierarchy where power is highly centralized. As mentioned in Chapter 2, "negotiation may be limited to key

figures of authority within the organization, the voices of members of a community may be somewhat muted" (Roberts, 2006, p. 628). Ideally, a community of practice should provide a space free "from the power construct evident in the formal organizational structure, offering a space for experimentation and creativity" (ibid, p. 628), raising questions about whether teachers get chance to have a free space to enact sustainable development within the curriculum of SSCE. It will be necessary to entertain the possibility that this may be a challenge for this study.

Coopey and Burgoyne (2000) have pointed out the influences of pressures on the CoP space whether from external causes or from internal causes such as leaders and specialists "can inhibit the will and capacity of employees to communicate freely their representations of key experiences and associated emotions" (p. 877). Another limitation of CoP is the issue of readiness as the members of community might become entrenched with respect to their own knowledge and resist to change their mind-sets (Roberts, 2006). Knowledge that reflects the current identity and practices of a community is more likely to be accepted by its members than knowledge that challenges present identity and practices (ibid). This issue can be linked with earlier point that related to the teachers' preference and attitude when they deal with curriculum design that they are not familiar with or do not prefer. It is believed this issue will need especial attention when integrating the new SD concepts that are complex and require teachers to be willing to adapt them in their teaching practice.

3.6   Teaching Methodology

This section presents the teaching methodology that is appropriate for integrating sustainable development in the curriculum which is Thinking Actively in a Social Context

(TASC). TASC and its elements, which can be argued as a Sustainable Pedagogical Content Knowledge (SPCK), can develop key sustainability competencies such as systems thinking and interpersonal competences which are the focus of this study, as well as knowledge, attitudes, values and actions in subject of SSCE in the Saudi 10th grade. The next paragraphs discuss TASC in more detail.

3.6.1   Thinking Actively in a Social Context (TASC) as (SPCK)

This section is concerned with the suitable Sustainable Pedagogical Content Knowledge that can activate Problem-Centred Designs in meaningful ways. TASC can be seen as a coherent framework that can be utilized as the foundation for reflection with regard to the development of problem solving and thinking skills pedagogy (Wallace et al., 1993) and (Wallace, 2000). SPCK has two functions in this study: one is concerned about how the teacher could present sustainable development issues professionally through support from external experts; the other is concerned with how the teachers support the students to comprehend sustainable development issues through TASC. Developed to support curriculum developers, teachers and parents in improving the thinking capability of learners in primary and secondary schools (Adams and Wallace, 1991), the TASC framework seems to provide a suitably systematic approach for supporting the teachers in this study when implementing their collaboratively designed, problem centred curriculum units.

Theoretical background to TASC

The TASC approach was based on the work of three seminal works: Sternberg's (1985) *Triarchic Theory of Intelligence*, Bandura's (1962) *Social Learning through Imitation* and Vygotsky's (1980) *Mind in Society: The Development of Higher Psychological Processes*,

which highlighted the importance of social interaction and dialogue. Sternberg (1985) led the way in arguing that intelligence is the capability of using thinking and problem-solving skills in all aspects of life. Moreover, all learners can be taught to develop and extend their working repertoire of abilities for planning, monitoring and reflecting on their progress and transferring these skills in all other fields (Wallace, 2000).

Bandura (1962) advocates the role of modelling through imitating and copying others' behaviour and highlights that innovative forms of performance can be developed through direct practice in community learning organisations, or by noting the action of others. However, Vygotsky (1980) emphasizes that creative teachers always develop their language through guiding classroom conversation, students' interaction and the democratic sharing of thoughts, and argues that this is not only educationally sound, but also vital for effective learning (ibid). Therefore, it is believed that it is significant to highlight that advancing a skill-based curriculum not only aids development of autonomous learning skills among the more capable students, but also promotes progress of the less talented (Wallace, 2000). Whilst most students can think, their thinking can be boosted and developed through carefully selected practices that encourage every child to become an active thinker. This process is critical if children are to function and society is responsible for supporting this by engaging them in activities that encourage intellectual problem solving, and therefore allowing them to observe that these thinking activities are uniquely distinguished from practice and rote learning (Wallace et al., 2012).

Wallace (2000) argues that the processes embedded in the TASC framework correspond with the latest theories of neuroscience that affirm how children best learn and consequently how teachers best teach (Wallace et al., 2012). They also emphasize the importance of colour coding all the steps of the processes in TASC to highlight and celebrate the thinking and to distinguish the thinking steps and the ultimate product (ibid). The overall TASC model is presented as a cyclical process as shown below in Figure 3.4.

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Learn from experience
What have I learned?
How have I changed?
What do I think and feel now?
How can I use what I learnt?
How would I do this again?

Gather/Organise
What do I know about this?
Where have I met this before?
What information do I have?
How much do I understand?
What questions can I ask?

Communicate
Who can I tell?
How can I tell or present?
What should I say?
How can I explain?
How do I interest others?

Identify
What is the task?
What are my goals?
What are the obstacles?
What do I need to know?
What do I need to do this?

Evaluate
What have I done?
How well did I do?
How could I do better?
Did I solve the problem?
Did I work well in my group?

Generate
How many ideas can I find?
Who can help me?
Where can I find out more?
What do other people think?
Is there another way?

Implement
Let's do it
How do I check my progress?
Am I doing it correctly?
Is my plan working?
What do I do next?

Decide
Which ideas are important?
Which is the best idea?
What will happen if...?
What is my plan?
What else do I need to do?

Fig. 3.4: TASC Wheel that includes eight steps adapted from (Wallace et al., 2012, p. 61)

TASC offers a systematic set of procedures and organisational steps that allow the creation of potential solutions to given problems in the form of open-ended issues or as future scenarios. It is believed that the whole problem-solving wheel should be introduced to learners in addition to group work being applied as regularly as possible, so that learners can negotiate meaning and understanding amongst themselves (Wallace et al., 2012)

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(Appendix A). Moseley et al. (2005) argue that teachers should find the TASC cycle easy to understand, allowing for adjustments to fit the requirements of learners in different areas of the curriculum. It does, however, present major challenges in which teachers are expected to model the processes they wish to develop, so as to offer many opportunities for learners to practise problem-solving in order to engender greater learner autonomy (ibid).

Wallace et al. (2012) state that all learners require chances to negotiate the themes of their investigative work; they then have ownership of their learning, which leads to increased motivation and attention. Moreover, this form of personalizing learning leads to increased confidence and a sense of self-esteem and self-worth. It also leads to personal development, by the posing of questions and the pursuit of possible answers to those questions (ibid). TASC therefore emphasizes the skill of learning to work with others, a key factor in emotional and social development, as well as an understanding of the high significance of the social context, interaction, sharing and co-operation to learning. Thomson (2006) found that within the TASC model, both the level of cooperation among students and the level of independent activity were much higher than students who were working without direct teacher support. In addition, the sense of responsibility of learning was built as well as the standard of work was improved (ibid).

It has been found that within the TASC model teachers are reassured when recognizing that this approach offers positive management of lessons (Mohammad et al., 2014). Because TASC learners are focused on the given problems that support their attention during the activities, an additional benefit is that many behavioural problems disappear as students become more involved and responsible for their decision-making (ibid). Another study by Ardaiz-Villanueva et al. (2011), uses TASC and other tools to stimulate the generation of notions and originality by university students, who were divided into groups according to their indexes of creativity and affinity as well as the evaluation of the

classroom atmosphere. Their findings reveal that the tools assist learners to generate, evaluate and select the most relevant notions, enabling the formation of teams for project implementation. They also have found that teams with high indexes of creativity and affinity attained the best grades in academic performance and project originality. Additionally, findings show that these tools create a constructive classroom climate for students.

In the Nigerian context, a study by Rosidi et al. (2013), used TASC to evaluate the increase of creative thinking skills of students through using a pre-test-post-test design applied to 30 students. The findings through using statistical tools reveal that the learning performance of students was respectable (3.82) in the score range 1–4, as well as demonstrating an increase in the capability to think creatively. The study concludes by highlighting that learning with TASC model can develop the creative thinking capability of senior high school student. It can be noticed that most studies have been conducted in European contexts that resulted in positive outcomes of implementing TASC, but TASC has not been implemented yet in the Saudi context which might provide similar results or not.

Interaction between micro and macro level implementation of Problem-Centred Design

Bringing things together, it is argued that the design of learning material is one of the most important aspects of facilitation of learning; furthermore, the design of learning materials happens at both micro and macro levels of the curriculum (Conway and Little, 2000), in which there is a blending of curriculum design with instructional design (Hunkins and Ornstein, 2016). At a micro level or instructional design level, TASC comprises packages which are essential driving units for the student's learning. These packages draw on real-life situations to produce learning outcomes that are reflective of the professional knowledge, skills and actions that mimic the thoughts and actions of, for example, a historian, a nurse and a doctor (Wallace, 2000; Wallace et al., 2012; Hunkins and Ornstein,

2016). Well-designed learning packages can therefore remind students to recognise that learning issues can be directly related to both their professional role, lifelong learning as well as the acquisition of desired concepts (Hunkins and Ornstein, 2016).

A well designed learning package involves material for both the students and facilitators. For instance, the student material might embrace a list of notions for thinking and investigating, learning objectives that point to "application of the concepts, the stimulus material (i.e., scenario and related information), instructions for approaching learning and suggested resources to support learning" (Conway and Little, 2000, p. 170). On the other hand, it is suggested that the selection of situations for integration in the curriculum, at the macro or curriculum level, should be based on pre-set criteria from the conceptual framework of the discipline and the context (ibid). The prescribed curriculum for Year 10 is the Sustainable City and Positive Citizens units. Problem-Centred Design was used within a CoP to develop these units as a locally relevant syllabus, and TASC was used as the key pedagogical approach to implement the syllabus. Both micro and macro implementations of Problem-Centred Design need practice-based situations which can drive the students' learning; however, macro level curriculum development should concentrate on the consequences of the whole course, not just a particular unit of learning (Conway and Little, 2000).

3.7   Overview of the Literature and the Questions the Current Study Will Address

As discussed in Section 1.3, this research addresses a gap in the knowledge as to how educational curricula might promote sustainable development. In particular, as mentioned in Chapter 2, that the current Social Studies and Citizenship Education subject based on an integrated curriculum approach should be developed and redesigned in the light of key

sustainability literacy and competencies. According to the sustainability literacy and competencies perspectives, knowledge is not perceived as merely certain and limited, as it is in the case of the current curriculum, but rather as emerging and changeable. Based on all of the above, the reviewed literature has helped in formulating the research questions for this study as follows:

1. What is the current practice regarding the incorporation of sustainable development in the Saudi SSCE curriculum?

2. How does building a community of practice and use of Problem-Centred Design promote the incorporation of sustainable development in the SSCE curriculum in the Saudi 10th grade?

3. What are the factors that foster or hinder the incorporation of sustainable development in the SSCE curriculum in the Saudi 10th grade?

3.8   Summary of the Chapter

Based on the literature review, the main distinction between the current study and previous literature is that it takes into consideration certain features of the recent trend of developing the curriculum based on the twenty-first century's requirements which fit with sustainable development requirements. Thus, in order to bring to life these elements, teachers need a proper continuing professional development model that can deal with these complex educational actions. A community of practice has the potential to facilitate this task in meaningful ways. In addition, integration of sustainable development requires appropriate curriculum design which can be Problem-Centred Design that fits with this study.

Moreover, the curriculum design cannot by itself achieve its aims without support from

Thinking Actively in a Social Context (TASC) as a Sustainable Pedagogical Content Knowledge (SPCK). This study seeks to understand this complex phenomenon authentically and provides insights and lessons learned for other educational contexts. The next chapter will describe the methodology and methods used in this study, including an overview of philosophical assumptions, research methodology and methods, the study participants, the researcher role and research design in order to answer the research questions.

4. METHODOLOGY AND METHODS

4.1   Overview of the Chapter

This chapter elaborates the research methodology and methods in order to ensure that the research is following approaches suitable for investigating the research questions identified at the end of the literature review. The chapter covers theoretical and philosophical assumptions, research methodology and methods, the study participants, the researcher role and the research design. In addition, it includes the pilot study, data analysis procedures, and a discussion of methodological issues (quality and trustworthiness and ethical considerations).

4.2   Philosophical and Theoretical Assumptions

It is important to clarify the philosophical issues such as ontology, epistemology, and axiology due to the fact that "methodological considerations involve examining positionings and tensions" (Dillon and Wals, 2006, p. 550) in these issues and their relevance to this research. The term ontology has been used with diverse senses in various communities and the focus here is on the philosophical perspective. Guarino et al. (2009) define ontology as the division of philosophy which deals with the nature and structure of reality. According to Aristotle, ontology concentrates on the nature and structure of things autonomously of any additional thought and even independently of their actual existence

(ibid). Similarly, Blaikie (2009) defines ontology as statements and suppositions that are conducted about the nature of social reality, assertions about what exists, what its appearance is, what components are included and how these components cooperate together. Briefly, ontological beliefs are interested in what is creating social reality, and how much confidence it instils in us (ibid). The ontological argument is concerned with whether reality is objective, monological, and tangible, or whether it is subjective, manifold, and created by individuals through their interactions and actions (Atiq, 2014). Blaikie (2009) identifies six kinds of ontological assumptions, which are shallow realist, depth realist, cautious realist, conceptual realist, subtle realist and idealist.

An epistemological stance, on the other hand, is concerned with the nature and structure of knowledge and can be defined as a manner of comprehending and clarifying how we know what we know (Crotty, 1998). Epistemological assumptions have six kinds of assumptions, namely empiricism, rationalism, falsificationism, neo-realism, constructivism and conventionalism (Blaikie, 2009). For the purposes of this study, the idealist is chosen as the ontological assumption and constructivism/interpretivism as the epistemological assumption. The rationale for this is that idealist ontology views social reality as constructed of shared understanding that social players generate and regenerate as they carry on living their daily lives (Blaikie, 2009), while the constructivism/interpretivism epistemology views that:

> *All knowledge and therefore all meaningful reality as such is contingent upon human practices, being constructed in and out of interaction between human beings and their world and developed and transmitted within an essentially social context. (Crotty, 1998, p. 42)*

It is believed that research activities, ontological insights, epistemological positions, methodologies, methods and techniques for data collection and their justification should be thoroughly aligned (Bracken, 2010).

Cohen et al. (2013) identify two broad methodological paradigms, interpretive and positivist. The interpretive paradigms attempt to know and comprehend the world with regard to its players, while positivist paradigms seek, among other aspects, neutrality, objectivity, quantification, anticipation, modelling, creating of rules, and laws of behaviour. The idealist ontology and the constructivist epistemology can be seen to be located within the interpretive paradigm, which is in keeping with the purpose of this study, which is to seek insight into teachers' and students' perspectives through a community of practice, and not to try to find 'the truth' or factual information.

Another branch of philosophy is axiology which studies judgements about value (Saunders et al., 2009). Duffy and Chenail (2009) emphasized that axiology is concerned with an enquiry into "what values or ethical principles should be adhered to in conducting our research" (p. 23). It refers to the investigators' view of the role of values in research, and the role their own values play throughout the stages of the research process (Saunders et al., 2009). For example, the researchers' choice of a philosophical stance is a reflection of their values, and by conducting research where they place great standing on collection data through interview shows that they value personal interaction with their participants more than participants' views expressed through an anonymous questionnaire (ibid). Wilcock (1999) mentioned three perspectives regarding axiology: value free, value laden and value bound. Each one represents specific philosophical points of view.

The meaning of value free is that researchers should be completely neutral and objective (Jupp, 2006), so that "the researcher is independent of and neither affects nor is affected by the subject of the research" (Remenyi et al., 1998, p. 33). Value free presents a positivist perspective (Flick, 2014). This viewpoint of being value free in conducting research, even with rigour and scientific techniques, has been critiqued. It is argued that to exclude all subjective factors is impossible (Saunders et al., 2009) and that values inevitably are involved in any kind of research in a variety of ways (Phillips, 2000). Lekka-Kowalik (2010)

argued that "science is not and cannot be value-free, and that relevant values are both cognitive and moral" (p. 33). Therefore, scientific rationality can no longer be seen as only instrumental and independent, as it should include a full horizon of values as well as broad responsibility in scope and type (ibid). This can be true if we conduct scientific research that relates to sustainable development, which is based on the value of, and responsibility towards, the current generation's needs and those of future generations.

When the research is value laden, "the researcher is biased by world views, cultural experiences and upbringing" (Saunders et al., 2009, p. 119). Bias is defined as "any tendency which prevents unprejudiced consideration of a question" (Pannucci and Wilkins, 2010, p. 619). Although value-laden research is commonly accused of being biased, the other kinds of research also have some degree of being biased (Anderson, 2004). Smith and Noble (2014) argued that even though different research designs have particular methodological challenges and limitations, bias can occur at all stages of the research process. Therefore, researchers should attempt to minimise bias in each stage of the research process (ibid).

The value bound research considers that "the researcher is part of what is being researched, cannot be separated and so will be subjective" (Saunders et al., 2009, p. 119). Subjectivity, as opposed to the objectivity of quantitative research and usually qualitative research, depends on interpretations and explicitly acknowledges that these will be value bound (ibid). There are possible techniques that have been suggested in the literature in order to facilitate the use of subjectivity in a research context such as peer debriefing (Drapeau, 2002) and others that are mentioned in Section 4.7.1.

This study is value-bound because the researcher is part of what is being researched, a role that will be elaborated in more detail in Section 4.4.2. In summary, the researcher is aware of the various methodologies that can be used for conducting research in EE and ESD, such as positivist, interpretive and pragmatic.

However, the researcher is clear that his philosophical stance is based on idealist and construitivist paradigms, and he therefore uses a qualitative, interpretative methodological approach that is appropriate for providing in depth information of a complex educational phenomenon. Thus, the study seeks to find answers to these questions: What is the current practice regarding the incorporation of sustainable development in the Saudi SSCE curriculum, and how does building a community of practice and use of PCD promote the incorporation of sustainable development in the SSCE curriculum in the Saudi 10th grade. The researcher argues that the idealist ontology, the constructivist epistemology and value bound as the axiological value of this study align with communities of practice, which has been explained in the literature review, Chapter 3. In addition, reflecting on the epistemological perspectives, CoP is a constructivist theory that is conducted in a real life social context, which lends itself to being studied through a case study approach. Hence, this research uses the case study to investigate how a community of practice can use Problem-Centred Design to integrate sustainable development in the SSCE curriculum in the Saudi 10th grade. The researcher's role and the participation of the members of the community in this case study are critical, which can be viewed as participatory community research since the current phenomenon requires this kind of collaboration. Further detail on this point can be found in Section 4.4.2. Crotty (1998) defines four key components that need to be considered in the research design: the philosophical stance, the epistemological perspective, the methodology and the methods for gathering data. In this section, idealist as the philosophical stance and constructivism/interpretivism as the epistemological perspective of this research have been explained. The next section explains the methodology of this research. Crotty (1998) identifies the relationship between philosophy and methodology as a methodology that is supported by the philosophical posture behind it.

4.3   Research Methodology

This research uses a qualitative research methodology approach, which is in keeping with the interpretive paradigm and the ontological, epistemological and axiological positions discussed above. Qualitative research methodologies can include a naturalistic and interpretive view to the world, allowing researchers to investigate issues qualitatively in their authentic contexts and to provide a framework to attempt to understand, or deduce phenomenon with respect to the values that individuals convey (Crotty, 1998) (Table 4.1).

Tab. 4.1: A summary of the elements of qualitative research adapted from (Miles & Huberman, 1994, p. 6-7)

N	A summary of the elements of qualitative research
1	Qualitative research is conducted through an intense and/or prolonged contact with a "field" or life situation. These situations are typically "banal" or normal ones, reflective of the everyday life of individuals, groups, societies, and organization.
2	The researcher's role is to gain a "holistic" overview of the context under study: its logic, its arrangements, its explicit and implicit rules.
3	The researcher attempts to capture data on the perceptions of the local actors "from the inside", through a process of deep attentiveness, of empathetic understanding, and of suspending or "bracketing" preconception about the topic under discuss.
4	Reading through these materials, the researcher may isolate certain themes and expressions that can be reviewed with informants, but that should be maintained in their original forms throughout the study.
5	A main task is to explicate the ways people in particular settings come to understand, account for, take action, and otherwise manage their day- to- day situation.
6	Many interpretations of this material are possible, but some are more compelling for theoretical reasons or on grounds of internal consistency.
7	Relatively little standardised instrumentation is used at the outset. The researcher is essentially the main "instrument" in the study.
8	Most analysis is done with words. The words can be assembled, sub-clustered, broken into semiotic segments. They can be organized to permit the researcher to contrast, compare, analyse, and bestow pattern upon them.

Here is how each point in the previous table is relevant to my study:

1. The researcher was a participant researcher working with teachers for 9 months in total. The approach to working was based on the concept of community practice.

The aim of conducting these case studies was to investigate how a community of practice can use Problem-Centred Design to integrate sustainable development in the SSCE curriculum in the Saudi 10th grade.

2. The above aim cannot be addressed without a shared understanding of the roles among the members of the community and the researcher. The researcher's roles were critical with respect to challenging the top-down hierarchical vertical approach of changing and learning.

3. The researcher attempted to capture data on the teachers' and students' understandings of the concept of sustainable development and current practice. This was done through appropriate methods such as NGT, semi-structured interviews, a research diary, teacher field notes and photography.

4. The data has been translated from Arabic to English. Translating data from one language to another is a critical issue, especially when the paradigm of the study is interpretive as it is concerned with the meaning of words. Although the literal translation process was mostly close to the original data, it still needed to be presented through the lens of the original meaning.

5. Through its methodological elements, the study was able to explore and uncover the current phenomenon, which can be described as complex.

6. The researcher, literature, and participant voices are reinterpreted to provide latent interpretive and meaningful conceptual categories in order to build a model for understanding the questions of the study.

7. Although this study is based on an interpretive paradigm, it attempted to minimize subjectivity and provide reliable data.

8. Using Constructive Grounded theory (CGT) was a useful qualitative data analysis framework throughout its three processes since it systematically analysed the participants' words in order to construct a theoretical framework.

It is critical to distinguish the difference between the methodology and methods as they are not the same (Saunders et al., 2009). For example, methods have been misunderstood with regard to quantitative and qualitative approaches, thus leading to some confusion. Dillon and Wals (2006) and Wood and Welch (2010) found that quantitative research is commonly used as a synonym for any data collection instrument such as a questionnaire or a data analysis technique like inferences. A similar situation can happen with qualitative, as it is commonly used as a synonym for any data collection tool such as focused group or a data analysis method like coding.

This study has been more careful in using these terminologies. The term methodology in the literature has a more theoretical definition and often refers to the approach that underpins the research (Hughes, nd). Moreover, the research methodology can be defined as "the strategy, plan of action, process or design lying behind the choice and use of particular methods, and linking the choice and use of methods to the desired outcomes" (Crotty, 1998, p. 3). On the other hand, the term methods refers to tools employed for data collection or data analysis (Dillon and Wals, 2006; Saunders et al., 2009). This study employs a case study approach in which there are elements of implementation processes through using Problem-Centred Design within a community of practice in two phases. The unit of analysis is the foundation for the case and might be:

> *An individual person (such as a business leader, or someone who has had an experience of interest), or an event, (such as a decision, a programme, an implementation process or organisational change), or an organisation or team or department within the organisation. (Rowley, 2002, p. 19)*

The unit of analysis in Phase 1 is the Saudi secondary school teachers in Jeddah who teach the SSCE curriculum, and students in the 9th grade. Therefore, the case in this phase is concerned with people (teachers and students) and their perspectives on current practice and potential for sustainable development to be integrated into the SSCE curriculum. The unit of analysis in Phase 2 is two secondary schools in North Jeddah and the teachers and students in grade 10. Therefore, the case in this phase is concerned with both organizations and people, and focuses on the implementation process of the integration of sustainable development into the syllabus of each school during the autumn term.

Case study methodology

A case study is conventionally claimed to be a qualitative strategy that is developed from an interpretive/constructivist epistemology (Stake, 1995; Yin, 2014). Case studies are commonly employed in educational research and, more particularly, in curriculum fields such as curriculum inquiry, curriculum development and curriculum implementation (McKernan, 2013).

Notably, through reviewing the literature concerning case studies, it seemed that some researchers are confused as to whether the case study is a methodology or a method (Hyett et al., 2014). This ambiguity, which can be seen as one of its limitations, leads some scholars to question its credibility and usefulness in qualitative research practice because it might prevent researchers from developing a mutual understanding of practice and rigour (ibid). Another issue relating to the case study is whether the results can be generalized (Gomm et al., 2000), depending on the aim of the case study and its relation with theory.

Firstly, from a philosophical perspective the aim of a case study is to deeply understand the phenomenon in an authentic context, which in fact aligns with an interpretative

paradigm that views the world as "too complex to be reduced to a set of observable 'laws'. Generalizability is therefore considered less important than understanding the real workings behind 'reality'" (Gray, 2013, p. 35). Secondly, a distinction can be made between analytic generalization and statistical generalization. Yin (2003) states that, "in analytical generalization, the investigator is striving to generalize a particular set of results to some broader theory" (p. 36), so the investigator generalizes from case study to theory; while in statistical generalization, "an inference is made about a population (or universe) on the basis of empirical data collected about a sample" (ibid, p. 30).

This study is based on analytical generalization and it seeks to generalize from a specific set of outcomes to some comprehensive theory. The case study in this research is therefore seen as a methodology, not as a method, and the next paragraphs will discuss this point in more detail. There are multiple definitions and understandings of a case study, which makes it somewhat challenging in terms of gaining a clear understanding of its meaning. According to Bromley (1990), a case study is a methodical investigation into an occasion or a group of interrelated actions, with the purpose of defining and clarifying the situation under observation. A case study can also be defined as a realistic examination, which explores a current phenomenon in profundity and within its authentic context, particularly when the boundaries between context and phenomenon are not noticeably clear (Yin, 2009).

Similarly, Creswell (2012) states that a case study is a comprehensive investigation of a bounded system such as an event, individuals, a process, or a constructed activity with the aim of obtaining as much data as possible. Bounded means that the case is divided into the research activities that are bounded in place and time. A case study is phenomenological in that it describes the world as the research participants and the investigator interpret it. Consequently:

> *Case study research is a qualitative approach in which the investigator ex-*

plores a bounded system (a case) or multiple bounded systems (cases) over time through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audio-visual material, and documents and reports) and reports a case description and case-based themes. (Creswell et al., 2007, p. 245)

The researcher considers this definition of a case study to be a comprehensive one, as it enables the investigation of a phenomenon from inside its setting through employing a diversity of sources of evidence. This guarantees that the issue is not investigated through one perspective, but rather from a range of perspectives, which facilitates the uncovering and comprehending of the phenomenon (Baxter and Jack, 2008).

Case study types or categories

With respect to the orientation of the types or categories of the case study, there are several types or categories, such as the instrumental case study approach (Stake, 1995), the exploratory and descriptive case study (Yin, 2009) and the interpretive case study (McDonough and McDonough, 2014). This case study is instrumental in that it is concerned with developing a better and broader understanding of how to integrate sustainable development processes into the practice of SSCE subject through a case study.

It is exploratory in nature because it explores the feasibility of incorporating sustainable development into the SSCE curriculum in the Saudi 10th grade. It is a descriptive case study in that it presents an actual practice, in which an intervention is conducted or a phenomenon is identified (Nkwake, 2015). It is interpretive in that it is concerned with the participants' meanings (Walsham, 1995), their voices and their contextual conditions regarding sustainable development, which is required for depth investigation. Furthermore, it analyses the desires and needs that need to be incorporated into this area

of the curriculum to better prepare future learners with the necessary skills to contribute to sustainable development. It examines how building a community of practice can promote the incorporation of sustainable development into this area of the Saudi 10th grade curriculum, and lastly attempts to identify factors that foster or hinder this. In order to accomplish a deeper understanding of this relatively new phenomenon of incorporating sustainable development into the SSCE curriculum in the Saudi 10th grade, it has been decided to conduct a multiple case study design.

Case study design

The case is the implementation process used by two schools to incorporate sustainable development into the SSCE curriculum. Before providing detail of the case study design, it is necessary to describe the boundaries of the specific case under study (Table 4.2).

Tab. 4.2: Defining the boundaries of case study

Phase	Boundaries	Authentic Context	Participants
Phase 1	Saudi Arabia Jeddah City 6 schools	Exploratory Intermediate (9th grade)+ Secondary schools (10th grade) (SSCE) Curricula	142 Students (boys) 25 Teachers (males)
Phase 2	Saudi Arabia North- Jeddah City 2 schools	Development+ Implementation Secondary- M Secondary- O (SSCE) Curricula	300 Students (boys) 5 Teachers (males)

Here is a brief description of the school system in Saudi Arabia, which is composed

of four stages. According to Alnesyan (2012) and Alsenaidi (2012), in the first stage, pre-school, the age of children in this stage is between 3-5 years old, whilst in the second stage, primary school, the age of children in this stage is between 6 and 12 years old. In the third stage, the intermediate stage, children are 13 to 15 years old and in the last stage, secondary school, 16 to 18 years old. Moreover, boys are educated separately from girls (Alquraini, 2012).

This study uses a multiple case study design for several reasons. First, it includes two case studies in order to gain a better understanding of the current phenomenon from different angles and perspectives. The use of a multiple case study design can also provide advantages such as exploring the differences and the similarities between and within the cases, cross examination of data between, within and across them and thus produce evidence which can be considered more robust and reliable (Yin, 2009; Baxter and Jack, 2008).

This study uses a two step-process: (1) an exploratory phase, in which the researcher gathers data on the perspectives of participants and the context of the two cases; and (2) a development and implementation phase when data is gathered on the processes, factors that foster or hinder the implementation and lessons learned of the Problem-Centred curriculum Design. This study includes two cases, M and O. Both M and O's case studies are conducted in secondary public schools that are located in North of Jeddah city, which is one of the biggest cities in Saudi Arabia. The participants in the two cases are five teachers of SSCE, who already participated in Phase 1, and 10 classes of Grade 10 that include 300 students, some of whom participated in Phase 1. All the participants were volunteers and the researcher obtained their permission through a process of informed consent (see Appendix I and K). To sum up, the description of the boundaries and authentic context of the case study have been presented. The next sections will discuss the study participants, the researcher role and sampling technique.

4.4 The Study Participants and the Researcher Role

The two are discussed together because the researcher was also a participant in the community of practice, and because the teacher participants also gathered data (teacher field notes, see Section 4.4.3).

4.4.1 The study participants

A vital element in a case study approach is to define the unit of analysis and to give a clear description of the sample. It is argued that in qualitative research, researchers choose individuals and locations that can be right for comprehending the event (Creswell, 2012). Thus, this research uses a purposeful sampling technique in order to learn, comprehend, and obtain deep intuitive thoughts about integrating sustainable development into SSCE curricula in secondary schools in Saudi Arabia. The location selected is therefore a city in Saudi Arabia (Jeddah) and 21 schools located in both the Northern, Central, Eastern and Southern areas of the city. The 25 teachers came from 21 schools and some of them came from the same schools such as schools K, M and O (Table 4.3).

Tab. 4.3: The profile of the semi-structured interviews with teachers

N	Name of the Participant	Years of Experience	Speciality	Locations	Name of schools	The period & Time
1	Ph1. T1	24	Geography	North of Jeddah	School A	The duration: 11/04/2016 to 11/05/2016. The interview took roughly 45-60 minutes.
2	Ph1.T2	7	History	South of Jeddah	School B	
3	Ph1.T3	22	History	South of Jeddah	School C	
4	Ph1.T4	20	Geography	North of Jeddah	School M	
5	Ph1.T5	12	History	Central of Jeddah	School D	
6	Ph1.T6	22	History	North of Jeddah	School O	
7	Ph1.T7	24	Geography	Central of Jeddah	School E	
8	Ph1.T8	12	History	North of Jeddah	School F	
9	Ph1.T9	15	History	Central of Jeddah	School G	
10	Ph1.T10	15	Geography	North of Jeddah	School H	
11	Ph1.T11	7	History	East of Jeddah	School I	
12	Ph1.T12	13	History	Central of Jeddah	School J	
13	Ph1.T13	21	Geography	East of Jeddah	School K	
14	Ph1.T14	25	Sociology	East of Jeddah	School K	
15	Ph1.15	12	Geography	South of Jeddah	School L	
16	Ph1.16	24	Geography	East of Jeddah	School N	
17	Ph1.17	20	Geography	North of Jeddah	School P	
18	Ph1.18	19	History	East of Jeddah	School Q	
19	Ph1.19	19	History	North of Jeddah	School R	
20	Ph1.20	20	History	East of Jeddah	School S	
21	Ph1.21	8	History	East of Jeddah	School T	
22	Ph1.22	19	Geography	Central of Jeddah	School U	
23	Ph1.23	7	Geography	North of Jeddah	School M	
24	Ph1.24	7	History	North of Jeddah	School M	
25	Ph1.25	17	History	North of Jeddah	School O	

■ (green) Teachers from schools M and O participated in Phase 1 and 2.

■ (black) Teachers from different schools participated only in Phase 1.

The 142 students came from a sample of 6 schools among the 21 schools. The individuals selected are teachers and students in these schools in grades 9 (intermediate school) and 10 (secondary school). Purposeful sampling is based on the evaluation of the investigator, which can be criticised because of the potentiality of investigators' bias, particularly when compared with probability sampling methods that are designed to eliminate these biases (Sharma, 2017). The potential weakness of purposeful sampling can become a reality if the selection is based on ill-considered or unclear criteria (ibid). In this case, the selection of the locations of Saudi Arabia and Jeddah were due to the investigator's own experiences as a secondary school teacher in Saudi Arabia and the goal he identified of improving the integration of SD in the curriculum. Jeddah was selected as the city he was familiar with and the 21 schools would provide a sufficient variety of types of school and perspectives on SD from the teachers and students within those schools. The sample was therefore purposely chosen as showing the potential to yield the best possible insights (Merriam and Tisdell, 2015) through the two phases of the research.

Selection of study participants in Phase 1:

I contacted the local educational authority (the department of planning and development) in Jeddah in order to contact teachers who might be interested in taking part in this research as well as schools. They agreed to allow me to contact the teachers, students and schools, but I had to bring a letter from the Saudi Arabia Cultural Bureau in London that provides information about my request. I sent them this letter and then they sent me back their permission to conduct my research.

After that, I contacted the direct supervisor of the SSCE in Jeddah education in order to find the right teachers who might provide me with rich data about the current practice of incorporating SD in the SSCE curriculum. He recommended me the best teachers based on their annual performances and achievements. Therefore, the teachers who

participated in the interviews in Phase 1 were selected as the best teachers in Jeddah city according to their supervisors' records and based on their achievements. The unit of analysis in Phase 1 includes 25 Saudi secondary school teachers who teach SSCE, and 142 students in the 9th grade, aged 15 years. Students in 9th grade were selected because Phase 2 of the study would take place with the 10th grade students. 9th grade students' views were therefore critical for informing the development of the curriculum to be implemented in Phase 2. The 142 students were interviewed using a Nominal Group Technique. They were in six schools, two in South Jeddah (schools 1 & 2) and four in North Jeddah (school 3-6) (Table 4.4).

Tab. 4.4: NGT students sample in Phase 1

Intermediate School and location	Numbers of students interviewed using NGT method
School 1 South Jeddah	27
School 2 South Jeddah	27
School 3 North Jeddah	25
School 4 North Jeddah	25
School 5 North Jeddah	17
School 6 North Jeddah	21

Students from intermediate schools 3–6 moved to two secondary schools in the North of Jeddah in autumn of 2016. These two schools became the case study schools for Phase 2 of the research (school M and school O as described in the section below). Therefore, some of the students who took part in Phase 1 also participated in Phase 2 of

the study.

Selection of study participants in Phase 2:

The teachers interviewed in Phase 1 were asked at the end of their interview if they would be interested in taking part in Phase 2. Ph1.T4, Ph1.23, Ph1.24, Ph1.T6 and Ph1.25 said they would be interested and these 5 were selected on the basis of being teachers in the two schools M and O which would form the case study schools for Phase 2. Seven teachers out of 25 and seven students out of 142 took part in the initial Development Phase (summer holidays 12/5/2016–14/9/2016) and two of those teachers were representative of schools M and O. Then 5 teachers in schools M and O continued the development of the scheme of work and made sure it fitted their specific school contexts (15/9/2016–12/10/2016).

The same scheme of work was developed for both schools through this CoP. The implementation then took place between 15/10/2016–09/1/2017 (the autumn term). Twenty five students from each school also participated in the second Phase (Table 4.5). Thus, the school sites were selected based on the SSCE teachers who were willing to participate in this study. According to Hammersley and Atkinson (2007), individuals are commonly more worried about what kind of person the investigator is than with the inquiry itself, even if they have information about the nature of social research.

Tab. 4.5: The profile of Case M and O

Case	Name of Teachers	Years of Experience	Speciality	NGT with the 10th grade students	Locations	The status of the building	The period
Case M	Ph2.T23	7	Geography	25 Students	North of Jeddah	Rented	15/10/2016-09/01/2017
	Ph2.T24	7	History		North of Jeddah		
	Ph2.T4	20	Geography		North of Jeddah		
Case O	Ph2.T6	22	History	25 Students	North of Jeddah	Rented	15/10/2016-30/11/2016
	Ph2.T25	17	History		North of Jeddah		

The interview was conducted with five teachers and NGT was conducted with 25 of the 10th grade students in each case. The final phase was gathering evidence through semi-structured interviews with members of the collaborative community of practice (five of the 10th grade teachers) in order to obtain theoretical perspectives regarding the factors that foster or hinder the implementation of such an integrated curriculum. In addition, NGT was conducted with 50 of the 10th grade students to gain their theoretical perspectives regarding the collaborative community of practice for developing their understanding of the concepts of sustainable development.

The multiple qualitative case studies data analysis included the collaborative community of units of analysis (phases). Under these phases, there are subunits such as 10th grade teachers and 9th grade students in order to identify possible consistent patterns of evidence across units within a case (Yin, 2009). In order to gain the trust of the participants the investigator first introduced himself to the school leadership and the participants of the study (Guba and Lincoln, 1981), in this case these were the teachers of SSCE subject and 10th grade students. Teachers in schools M and O teach in rented buildings, which means that they do not have many facilities that could help the teachers to do their work

properly. With respect to the school leadership, and following research protocol in Saudi Arabia, the researcher provided a letter from the local educational administration permitting the research to be conducted in the school. The leader of this school welcomed the idea and was willing to support it. In addition, the targeted teachers were invited and encouraged have a talk with the researcher without management interference. This enabled the teachers to ask questions about the types of activities the investigator would ask them to participate in, and the forms of data that would be collected.

Since the school leadership and teachers collaborated with the researcher in providing access to the school and becoming familiar with targeted teachers, this minimized any undesirable impact or bias in the researcher's role in conducting this research. In fact, the expectation was that the targeted teachers would agree to work and collaborate on this project immediately after the talk. However, this expectation proved to be somewhat optimistic, as clarification was sought through a series of conversations in order to understand the project and their roles in it. This meant a week was dedicated to meetings to answer questions and concerns. To an outsider arguably these participants could have been considered to be wasting valuable research time, but in reality this was not the case because these teachers were aware of the responsibilities entailed. Thus, they had questions about the project in order to agree to participate in it under clearly defined expectations.

This was just the beginning of conducting the research that attempts to identify changes in educational matters through action. In fact, those meetings were invaluable for helping to achieve the aims of the project, providing sources of data as well as the opportunity for collaborative planning and reflection on the research diary and photographic data (Section 4.4.3). With regard to students, the community of practice in both schools M and O included the researcher and five SSCE subject teachers. It was decided to briefly present the idea of the project to the students on an introduction day, together with an explanation

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of the roles of both researcher and teaching staff. In this type of research it is generally helpful to make students aware of what is happening, for them to know who the researcher is, to understand the purpose of the project and what is expected of them. In addition, students can often be concerned and anxious about an investigator's identity, as was the case in each ethnographic inquiry in secondary schools (Wilson, 1977).

4.4.2   The researcher role

In order to provide a healthy environment for the community of practice in the two case study schools and according to the guidelines and values of qualitative research and its methodologies (Guba and Lincoln, 1981), the researcher's role was that of a participant researcher who is participating in the project but is not working as a teacher. The rational of being as a participant researcher is to understand the case from the perspective of an insider who is involved in the constructive social learning community rather than being an 'objective' outsider. The researcher is aware that being a participant researcher can be a threat regarding the quality of research and the production of reliable data. The research uses a value bound approach as the axiological perspective, as has already been mentioned in the philosophical section. The researcher's and team members' beliefs and own biases, relative to the phenomenon under the study, are explicit and several steps were taken to eliminate their impact on the quality of data (Sargeant, 2012) (see Section 4.7.1 for more detail).

In practice, the members of the community enacted the project in healthy, democratic and sustainable ways that aimed to develop a horizontal, distributed approach to the production and ownership of knowledge, as opposed to a vertical hierarchical approach in which the researcher would have held ownership as the expert. The members of the community were considered experts in their discipline, eliminating the need to gather data about their teaching by direct observation, especially given that this might lead to normal

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practice being abandoned in order to please the researcher. This enabled the members of the community of practice to develop their work inside the class naturally (Wenger, 1998). Nevertheless, the teacher members of the community often asked the researcher for feedback, both before and after lessons, and in this interaction the researcher took on the role of researcher and colleague rather than consultant. Walsham (1995) argues that:

> *Whatever the decision made by the individual researcher, it is essential that the choice is made in an explicit and reflective way, and that the reasons are given when reporting the results of the research. (p. 78)*

The design and development processes of the sustainable development curriculum project was therefore enhanced by the researcher being a participant researcher. It was convenient for him to be engaged in the day-to-day actions of the design team from the viewpoint of an insider, in a way which was not possible if he was an outside observer (ibid).

4.4.3   Research design and methods of data collection

In Phase 1, the exploratory phase, due to the complexity of the research issue, multiple methods for collecting relevant data were employed to gain evidence of teachers' and students' conceptions of SD, and what current practice in schools was with respect to incorporating sustainable development in SSCE subject in the 10th grade (see question 1 in Table 4.6). These methods were nominal group technique (NGT) used with the students, semi-structured interviews used with the teachers, and a research diary. Another reason was that the researcher did not want to bring something new to the teachers to do it as an expert and then leave them, but instead he participated in this task in order for the teachers to be able to do it by themselves and continue doing it after he left them. In Phase 2,

the development and implementation phase, methods of data collection were used to gain the teachers' and students' perspectives on how successful they were able to incorporate SD in the SSCE curriculum during the autumn term 2016. During the development part of the phase, the researcher worked with the teachers using a CoP approach to develop a syllabus topic from the SSCE grade 10 curriculum.

As the researcher was fully immersed in the curriculum planning group, he was not able to collect data on how the group had developed the two units of sustainable development (sustainable city and positive citizens) in both schools M and O. However, emails and WhatsApp, as it shown in Appendix P.2 and Appendix Q.2, were used to facilitate communication across the CoP during the development and implementation of the units. The emails and WhatsApp exchanges provide some evidence of mechanisms that supported the CoP, although it is recognized that the lack of data on the processes of development of the units is a limitation in this study. During the implementation phase, and to answer research questions number 2 and 3 (Table 4.6), data were collected using a nominal group technique with the students, semi structured interviews with the teachers, a research diary, teacher field notes and photography.

Tab. 4.6: Research Design

Phase	RQs	Period	The Sustainable Development Curriculum project	Research Methods				
				NGT	Semi-structured interviews	Research Diary	Teacher field notes	Photography
Phase 1	What is the current practice regarding the incorporation of sustainable development in the Saudi SSCE curriculum?	One Month 11/04/2016 to 11/05/2016	Exploratory Worked with teachers and pupils to explore what current conceptions of SD are, and current practice and their views of feasibility to incorporate SD into SSCE curriculum and how to enact toward it.	√	√	√		
Phase 2	2-How does building a community of practice and use of Problem-Centred Design promote the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi 10th grade? 3-What are the factors that foster or hinder the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi 10th grade?	Five Months 12/05/2016 to 12/10/2016	Development Based on the above phase, the community members, as mentioned in Section 4.4.1, have developed of SD themes, teaching tools and activities.	One of the study's limitations				
		Three Months 15/10/2016 to 09/01/2017	Implementation Process School M (Implementing Curriculum Project that includes two units, sustainable city, and positive citizens). School O (Implementing Curriculum Project that includes two units, sustainable city, and positive citizens).	√	√	√	√	√

Before conducting nominal group technique and semi-structured interviews in Phase 1, the researcher identified SD themes and dimensions in the 9th and 10th grades' curricula. This consisted of non-systematic identification of opportunities in current curriculum for teachers to teach about sustainable development as well as for students to learn about SD. This identification was through the textbooks of current SSCE curriculum and teachers' lesson plan as is shown in Appendix O, O.1, O.2 and Table 5.8. The purpose of conducting this identification was to prepare for nominal group technique and semi-structured interviews.

Nominal Group Technique (NGT)

The nominal group technique (NGT) is recommended as an appropriate decision-making tool (Odu and Okereke, 2012) that is particularly useful for generating ideas (Boddy, 2012), in exploratory studies (Vander Laenen, 2015) and is considered to be an effective instrument for attaining group consensus (Potter et al., 2004; Harvey and Holmes, 2012; Radomski et al., 2014). NGT can be defined as a set of processes, which include problem identification, solution generation and decision making (Williams et al., 2006). More importantly, NGT is extensively employed as a tool in curriculum evaluation (Dobbie et al., 2004).

Furthermore, the NGT method is called nominal since there is constrained interaction among participants throughout the procedure (Odu and Okereke, 2012). NGT can be seen the best option when compared with other methods such as brainstorming, the Delphi technique and focus groups (Odu and Okereke, 2012). NGT was therefore considered to be a suitable technique to use to gain students' perspectives on incorporating SD into the SSCE curriculum because they would be more likely to take part in a group situation, NGT gives more structure than a focus group interview, and the researcher had the specific purpose of asking students to make judgements about SD and its suitability in the

curriculum. This is supported by Dobbie et al. (2004) who consider NGT an evaluation method that gives semi-quantitative and rank ordered feedback about a group of learners' point of views regarding the strengths and weaknesses of an educational programme. Furthermore, NGT is an active method that can facilitate mutual decision making among individuals when they are meeting face to face (Odu and Okereke, 2012), and it supports the use of a bottom-up approach to gaining access to the students' voices. NGT has been criticised on the basis that its procedures may seem to be too mechanical, the views of participants might not come together in the voting phase, and their ideas may be constrained (Sample, 1984). In this study, because it is located in Saudi Arabia and students are not used to being asked for their views, they may be been unwilling to given their honest opinions. It was therefore considered that the NGT's structured approach would be beneficial and enable students to reveal their ideas in a safe atmosphere that was supported by the researcher. A further criticism is that the outcomes of NGT might not be able to be generalized to a bigger population (Jacobson et al., 2005).

The purpose of the NGT in this study was not to generalize to a wider population, but to use the results of the NGT in Phase 1 to inform the development of the units of work that would be taught in Phase 2, and to use the results of the NGT in Phase 2 to look at points of comparison between the students' and the teachers' perspectives on the success of the project. It can be acknowledged that because the time for gathering NGT data was limited to a single occasion, the findings in Phase 2 are not as in depth as the findings for NGT in Phase 1.

The Nominal Group Technique uses a standard protocol that includes five steps (Figure 4.1), which were followed for this study (Harvey and Holmes, 2012; Potter et al., 2004; Abdullah and Islam, 2011). The NGT questions used are shown below after explaining its five steps, and an example of conducting NGT in a real setting in one of the six schools is shown in Appendix S, including all the information about the time, date, location, and

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numbers of students, which were written by the school staff. In Phase 1 the NGT method was applied in two ways: four groups all interviewed using NGT on the same day; and four groups each interviewed using NGT on a different day. After trying to use NGT with four groups on the same day it was considered too complicated to arrange and so afterwards each group of students was interviewed on a separate day.
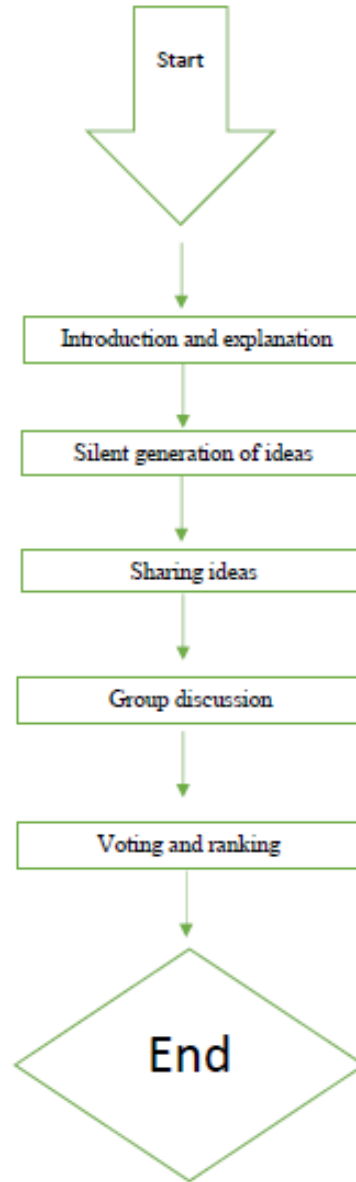
Fig. 4.1: The NGT standard protocol that includes five steps

1. Introduction and explanation: An explanation was given in Arabic to the participants of the aim and procedure of the meeting, outlining how the NGT steps would be applied, as is shown in Appendix C. Participants were given an information booklet as explained below.

2. Silent generation of ideas: Each participant was provided with a pencil/pen and booklet, and instructed to individually write answers to a set of given questions over a 10–minute time period.

3. Sharing ideas: Participants shared ideas in a round-robin feedback activity in order to record every individual's ideas, and present them on a flip chart that allowed everyone in the group to see them. Each participant had the right to take enough time to present his ideas. This stage of 20–25 minutes was just for the recording of ideas, not for discussing or debating them.

4. Group discussion: Participants were invited to start engaging in a friendly manner to seek verbal explanation or further details about any of the ideas listed on the flip chart. Each participant had the right to take enough time to present his inquiry or thought. This stage took roughly 40 minutes.

5. Voting and ranking: In the final step in the protocol, each participant prioritized their recorded ideas about each question discussed by ranking them on a scale from 1–5, with one being the highest and five the lowest priority.

Table 4.7 gives an example of the outcome after voting of NGT for Q1: What does sustainable development mean to you? The example is taken from student partici-pants who took part in the NGT activity from school N6 in Phase 1.

Tab. 4.7: An example of the outcome of NGT for question 1 after voting

Participants using NGT technique from school (N6) of which the upcoming student of secondary school (O).

Q1: What does sustainable development mean to you?

Number	Generated ideas	Voting and ranking
1	Development and huge growth	18
2	Development of thinking, work, production at a large and more comprehensive scale.	19
3	Development of ideas.	11
4	Self-Development.	7
5	Positive cooperation.	10
6	The continuation of intellectual works production.	9
7	Effort is held for the development of important matters while maintaining its development.	1
8	Developing new ideas.	2
9	Development of products and work.	16
10	Beneficial development.	8
11	Increasing and developing production.	4
12	Development that is beneficial in the long term.	15
13	Development of skills in collaboration with others.	3
14	Keeping natural environmental sites intact and developing them.	17
15	Exchanging opinions with others.	6
16	Sustainable and continuous development of community.	5
17	Developing something and improving it provided that you do not depend on it.	13
18	High quality development that comply with environmental needs.	14
19	Improving technical aspects.	12

An interview method

Janesick (2015) defines an interview as two individuals discussing notions and knowledge through queries and responses, with the aim of creating mutual understanding of a specific issue. Hence, interviews can be considered as a useful tool to aid the meaning-making process as Seidman (2013) emphasises. Seidman describes his experience of the interview process as an attempt to extract individual's stories. Once individuals talk about their stories, they pick particular experiences from their flow of consciousness (ibid) and the story-telling element is fundamentally a process of making sense of those life experiences. It is argued that interviews are one of the most common data collection instruments in qualitative research as they are appropriate for uncovering and yielding rich understandings of people's experiences, perceptions, opinions, meanings, values, definitions of situations and feelings (Punch and Oancea, 2014; May, 2011). Therefore, this study took into account the conditions of the Saudi context in order to yield the potentially rich data that this tool can facilitate.

Types of interview

There are three main types of interview; structured or official; the unrestricted, unofficial or informal interview; and the semi-restricted, semi-concentrated or semi-structured interview (Berg et al., 2004). The structured interview is used when the researcher is asking predetermined questions and this process is conducted with all interviewees (Savin-Baden and Major, 2013). Thus, it can be seen that a standardized interview is, principally predetermined administered questionnaires that are conducted verbally and the scope for follow-up questions for further investigation is unlikely (Gill et al., 2008). Therefore, the structure interview is not suitable for my study because it uses an inflexible format, so different opinions among participants are limited and this can lead to of lack richness and

depth information (Alsaawi, 2014).

Second, un-standardized or unstructured interviews, is the complete opposite of the previous interview as here the scope of the interview is open, free and not organised (Klenke, 2016). The unstructured interview is good for PhD research, but it requires considerable time that conflicts with the time limit that is given for conducting this research. On the other hand, the unstructured interview has been used during the application of the programme for action purposes and provide feedback for the community's members (weakness, strengths and motivation), so the purpose of it is only for the programme itself not for the research.

Thirdly, there is the semi-structured interview, which contains a number of key questions that assist in defining the topic to be discovered, but also there is flexibility that allows the interviewer or interviewee to diverge in order to follow an idea or response in more detail (Gill et al., 2008). The semi-structured interview arguably is suitable for exploring the current practice of SD and the SSCE curriculum as it functions as an exploratory interview. However, this kind of interview also has been critiqued, as have other kinds of interviews, as it might consume considerable time, includes the possibility of bias (Al-shenqeeti, 2014), and may highlight a lack of interviewing skills (Hofisi et al., 2014). The researcher attempts to manage his time wisely to gain as much insight into the teachers' views as possible and so it needs to be flexible enough to respond to what they said, but not too flexible that the conversation could go anywhere (i.e. off topic) (Robson and McCartan, 2016; Rubin and Rubin, 2011; Savin-Baden and Major, 2013).

Moreover, this study used several techniques to eliminate bias such as peer debriefing, audit trial and member checking. The researcher participated in several workshops to be skilful in conducting interviews professionally. Thus, such interviews were conducted individually face–to–face with 25 teachers in Phase 1 and with five in Phase 2, but the questions and aims are different which can be seen in the actual interview schedules of

both phases in Appendix V. It was appropriate for achieving the aims of exploring and understanding the insights of the theoretical perspectives regarding practice and process of incorporating a sustainable development SSCE curriculum, as well as influential factors after its integration. Additionally, it enabled a clearer understanding of how current practice can be developed by designing and building a collaborative community of practice. This was very helpful in terms of focusing on a complex educational phenomenon, particularly the relationships and interactions among many elements in intermediate and secondary schools in general education.

Research diary

Diaries can be defined as "first-person observations of experiences that are recorded over a period of time" (Krishnan and Lee, 2002, cited in (Yi, 2008, p. 1). It is believed that the research diary is a useful research tool for several reasons (Nadin and Cassell, 2006; Altrichter et al., 2005; Engin, 2011; Jacelon and Imperio, 2005; Välimäki et al., 2007; Silverman, 2013). First and foremost, using a research diary is grounded in the epistemological position of social constructionism (Nadin and Cassell, 2006).

The diary researcher can therefore reflect on how his own knowledge is created (Engin, 2011), as well as how the knowledge is created among the members of the participant community, for example the researcher can write down the community thinking process and reflect on these processes (Silverman, 2013), in a systematic way (Nadin and Cassell, 2006). Since the research diary can provide rich in–depth knowledge and add validity to the data, it is argued that it is a valued tool for qualitative data collection (Nadin and Cassell, 2006; Jacelon and Imperio, 2005; Välimäki et al., 2007). The researcher used his reflexivity during his fieldwork to learn from authentic experiences in the Saudi context and to consider to what extent the current situation of integrating SD is compatible with the

aims of ESD and the ways to improve it, which eventually can provide insights for others about this unique context. Becoming a reflexive researcher is acknowledged within social science research, which shows the criticality of reflection (Mauthner and Doucet, 2003) as well as the fact that "voicing the unspoken can empower both researcher and participant" (Finlay, 2002, p. 531). The role of a diary in an implementation process is critical as "it makes visible both the successful and (apparently) unsuccessful routes of learning and discovery so that they can be revisited and subject to analysis" (Altrichter et al., 2005, p. 12).

The research diary method was used weekly during the implementation phase which provided rich data and proved to be a reflexive and learning method of its own. Finally, the research diary method has some weaknesses such as consuming considerable time and including the potentiality of bias (Sheble and Wildemuth, 2009). The outcomes of the research diary have been shared with the participants in order to receive their feedback as well as to minimize bias.

Teacher field notes

This method provides valuable features such as practices, thoughts, worries, errors, uncertainty, innovations and challenges that emerge during an investigation (Spradley, 2016). The researcher gained access to the teachers' field notes in two ways, by firstly emphasizing the importance of teachers' roles in this research and then encouraging them to have a sense of ownership as active participants, which led them to collaboratively provide their notices of the project. It is difficult to verify research field notes because researchers cannot repeat the event, so the valuable details are more likely to be incomplete, or biased. Thus, some authors argued that field notes should be used beside another research method (Tessier, 2012) which this study did. This method incorporates everyday weekly meetings with members of the community as well as keeping a weekly

diary. The members of the community, as well as the researcher, have used the weekly diary frequently in order to update the research issues and challenges in order to help overcome these challenges and to use them later in the research findings as evidence (see 6.5, 6.5.1 and Appendix R).

Photography

Images can be a useful source of evidence, such as drawings, artwork, cartoons and maps (Leavy, 2014). Photography can be viewed as a data collection tool, but not all images are utilised as data to be analysed (ibid). It is argued that photography is commonly used for illustrative documentation purposes in social science research (Tok et al., 2010; Leavy, 2014). However, it is noticed that using photography can cause a disturbance in the situation that is observed (Kanstrup, 2002). The photographic method is not able to capture each idea relevant to the data of the study (Hartel and Thomson, 2011). Hence, some authors argued that using it as an isolated technique for both data collection and analysis is problematised (Kanstrup, 2002). Therefore, this research used photography with other methods as well as providing a background location to the study (ibid).

This study "could benefit from the inclusion of photographs to track contemporary change processes in an organization and change processes over time" (Ray and Smith, 2012, p. 288), specifically in the current phenomenon as the teachers are not familiar with the introduced concepts such as sustainable development, community of practice model as well as the application of TASC. In this research, images are not used originally as it had been taken during Phase 2. Instead, images have been blurred out in order to keep the anonymity of the research participants and the locations where the photographs were taken (Ford et al., 2017). In addition, it is argued that after using blur-out of the faces, "this allowed photos of people to be used without obtaining permissions from everybody included" (Leavy, 2014, p. 389).

4.5 The Pilot Study

The pilot study was conducted in 01/02/2016 before starting Phase 1 to see the functionality of the methods, with respect to such features as clarity of language, the methods' structure and their link to the research questions. It used the two methods of semi-structured interviews and NGT. Semi-structured interviews were conducted with teachers, who are experts in the Saudi Arabian educational context. Further, NGT was used with two groups in an intermediate school.

After conducting the pilot study, a number of insights emerged which were very helpful to improve the research methods as well as the main study. One of these insights was that the study should take into consideration the level of participants regarding the questions included in semi-structured interviews and NGT. For example, the participants in the pilot study asked many questions in order to understand the questions provided in the NGT and interviews. In addition, participants in the NGT required time to have it explained in a simplistic way. The topic of sustainable development itself necessitated patience and time given that the participants had never worked on this type of project previously. As such, adaptations were made in order to ensure the methods were much easier and clearer for the participants to understand in the main fieldwork. Therefore, the language that was used in the pilot study was changed accordingly to the level of the participants. It also provided opportunities for the participants to ask any questions during and after applying these methods using PowerPoint to help simplify the aspects of NGT for intermediate students.

To summarise, the following changes were made:

1- The language that was used in NGT became more understandable and close to the participants' level, the structure of presenting NGT was revised and the use of technological aids such as PowerPoint was introduced.

2-The language that was used in the interview became more understandable and close to the participants' level as well as the fact that the structure of the questions were ordered logically.

4.6   Data Analysis Procedures

This section is concerned with preparing the data through data transcriptions and translations, followed by choosing the most appropriate analysis approach, including choosing the most suitable software to support digital analysis of the data.

4.6.1   Data transcriptions and translations

An important issue to consider in this type of study is that of translating data from one language to another, especially when the paradigm of the study is interpretive as it concerns the meaning of words. Thus, having reviewed the current debate surrounding these issues great care was taken to attempt to present the data as much as possible in a way that retained the original words and their meanings. Starting with literal translation word-by-word, the results were then given to specialists in English-Arabic translation. Although the literal translation process was mostly close to the original data, it still needed to be presented through the lens of the original meaning. Van Nes et al. (2010) strongly recommend that researchers should not translate and analyse data when both participants and the researcher have the same non-English native language and when the non-English data will eventually lead to submission to an English publication.

4.6.2 Introduction to methods of data analysis

In order to analyse the data appropriately, an extensive review of the most common methods used for analysing qualitative data was required. These methods are Content Analysis (CA), Thematic Analysis (TA) and Grounded Theory (GT). Braun and Clarke (2006) argued that TA and CA are simplistic, with respect to the processes, steps or analytical procedures, and that they do not allow for the depth offered by grounded theory. For example, a constant comparative method is at the heart of grounded theory (Lacey and Luff, 2001), which is not the case within TA and CA processes. Furthermore, a constant comparative method can be done within the codes themselves, the codes with themes, themes with themes, incident with incident or earlier data and later data (Charmaz, 2006, 2008).

Therefore, it is apparent that CA and TA function best for analysing qualitative data descriptively rather than analytically, for developing formal or even substantive theory. Thus, they are appropriate for researchers who wish to employ a descriptive level of interpretation, whereas grounded theory is required for higher levels of interpretive complexity (Vaismoradi et al., 2013).

The review of the literature on qualitative data analysis had the aim of finding a method that is compatible with the interpretive paradigm. The social construction of reality is referred in the educational field as constructivism since it is evidently situated under the philosophical world-view named interpretivism (Suter, 2011). This world-view appreciates the comprehending of an entire phenomenon through the viewpoint of those who truly experience it, meaningfully interpret and construct it (ibid). According to Glaser and Strauss (1967) theories should be developed from research grounded in data instead of developing them based on inferring testable assumptions from available theories (Charmaz, 2006).

One of the issues with the three versions of GT is that the concept of 'emergence', because the building of theory from concepts that emerge from the data can limit creativity with respect to the consequent construction of theory. It was Glaser and Strauss (1967) who came up with this concept of 'emergence', which has since been met with criticism that challenges the idea that a researcher should have a creative role to play in the research process (Charmaz, 2006). Grounded theory can be defined thus, as a "method begins with inductive strategies for collecting and analysing qualitative data for the purpose of developing middle-range theories" (ibid, p. 397). In addition, it can be defined as "a method of conducting qualitative research that focuses on creating conceptual frameworks or theories through building inductive analysis from the data" (Charmaz, 2006, p. 187). Thus, grounded theory targets the integration of an investigator's understanding to create theoretical frameworks by signifying compositions and making procedures apparent, rather than concentrating solely on defining connections and presenting participant reactions (Parker and Roffey, 1997).

It can be clearly seen that the purpose of grounded theory is to create theory with a focus on analytic induction, so it is not like other qualitative analysis methods, which may legitimately stay at the parameters of simple reporting or modest interpretation (Lacey and Luff, 2001). Moreover, grounded theory is interested in using data to develop conceptual framework models and is appropriate when the research aims to uncover fundamental social processes (Charmaz, 2008) as is the case of this study. Due to the analytical, procedural and epistemological limitations of CA and TA methods, the researcher argues that the Constructivist Grounded Theory (CGT) method can fit properly the research purposes of this study, which is looking for a comprehensive method under interpretive paradigm. However, procedures in the two GT versions and plus CGT are commonly "seen as time-consuming and convoluted, involving a multitude of rules that come across as challenging and even obtuse" (Timonen et al., 2018, p. 1). Grounded theory involves a series

of processes and uses technical terminology such as: generating theory, the distinction between substantive and formal theory, theoretical sampling, saturation, constant comparison analysis and memos. Given that this technical terminology is used in the data analysis, it needs to be clearly explained to readers.

4.6.3 Technical terminologies of CGT processes

1. Generating Theory

   Grounded theory typically offers an inclusive clarification regarding a specific phenomenon, it being inclusive since it accepts and acknowledges different interpretations instead of supposing that there is a one-size-fits all response to a study inquiry (Birks and Mills, 2015). CGT distinguishes between substantive and formal theory and it can generate substantive theory, which is applicable only to this specific field. Hence, it can be a basic start from substantive (local) to formal (all-inclusive) theory and demands a further study (Kenny and Fourie, 2015). Therefore, the current study is aiming to construct a substantive (local) theory, which can be useful for a similar context as well as it is theory building not as testing theory that can open interest for further investigations. Furthermore, it is believed that theory-building is vital since it offers a framework for analysis, enables the effective advancement of the field, and is required for the suitability to everyday realistic issues (Gay and Weaver, 2011).

2. Theoretical Sampling

   Theoretical sampling is the gathering of data to produce theory. Data is simultaneously gathered, coded, analysed and used to decide what further data is then required in order to create emerging theory (Glaser and Strauss, 1967). Thus, a research sample cannot be predetermined or selected but rather has to be a theoretical sample, which is essentially led by the evolving theory to the point of saturation

(Kenny and Fourie, 2015).

3. Theoretical Saturation

There are three stages to theoretical saturation. The first is that of raw data when it does not seem to generate any new category. Secondly, when the category is advanced with respect to its dimensions and features representing differences. Thirdly, the connections between categories are well affirmed and validated (Lawrence and Tar, 2013). There are certain methodological approaches as well as data collection methods that can be used to reach saturation. This study used the case study, which is a good example of a methodological approach that typically collects considerable amounts of data over an extended period of time, employing different tools to collect the data and therefore consequently usually achieves saturation (Stake, 1995; Yin, 2014). This study used an interview method, which is a good example of a tool that can help achieve data saturation (Fusch and Ness, 2015). Essentially, in order to obtain data saturation, triangulation has been used in this study, which played a great role in terms of the quality of the research (ibid).

4. Writing Memos

The writing of memos is considered important in the whole research processes especially in grounded theory. Birks and Mills (2015) state that memos represent continuous activities that capture the researcher's thoughts from start to finish when employing a grounded theory approach right through to completion and is a vital procedure since it contributes to deep analysis of data aiding decision making at later stages in the process and giving direction (ibid). Consequently, this study has used the memo-writing technique throughout the analysis process. It is a continuous conversation between the researcher and data, recording reflections of possible interpretations, refining emerging categories and primary theory (Charmaz, 2006).

This technique facilitates analysis, interrogation and the clarifying of possible meanings generated from the accounts of participants and the analytical interpretations of the researcher (ibid).

5. Theoretical Sensitivity

Theoretical sensitivity refers to the individual quality of the investigator. It points out a consciousness of the hidden meaning in data. An individual can come to the investigation circumstance with several degrees of sensitivity, which are based on preceding interpretations and knowledge relevant to the area of concern (Strauss and Corbin, 1998). In addition, it can refer to deep intuitive understandings of the capability to make sense of data, the ability to comprehend, and the competency to isolate the relevant data from that which is not. These efforts should be conducted conceptually rather than tangibly (ibid). Therefore, Charmaz (2008) emphasizes that the analyst must learn to accept ambiguity as well as become open-minded to identify emergent categories and concepts.

6. Constant Comparative Method

Constant comparative method is a fundamental technique that is used within grounded theory for analysing data. It produces sequentially more intangible concepts and theories through inductive procedures of comparing data with category, category with concept, category with category and data with data. Comparisons then create each phase of analytic progress (Charmaz, 2006). This technique helps to see the whole picture of the data and reconsidering it from different perspectives such as those of participant, researcher and contextual eyes. To sum up, this section has offered definitions of key terminology, which is required before starting CGT processes in the following paragraphs.

4.6.4   Using CGT for the data generated by this study's research methods

As previously mentioned in the limitation section of the two versions of grounded theory, all three versions include three stages and each of them has its own labels of stages. This section elaborates on the constructive grounded theory processes, whose three stages are initial coding, focused coding and theoretical coding. It is important to note here that there are two chapters (5 and 6) for data analysis of Phase 1 and Phase 2, which focus on the data analysis that emerged from the use of these tools, see Table 4.8 and Table 4.9 below.

Tab. 4.8: Data analysis methods

Phase	Research Questions	Research Methods	Data analysis methods
Phase One	What is the current practice regarding the incorporation of sustainable development in the Saudi SSCE curriculum?	Nominal Group Technique	According to Aspinal, Hughes, Dunckley and Addington-Hall (2006), NGT allows data to be generated in order to limit the amount of analysis needed after done the five steps of it.) ⟶ (Focused coding /CGT)
		Semi-structured interviews	Constructive Grounded Theory (CGT)
		Research Diary	Altrichter & Posch 1993 state that data from research diary can increase depth and scope in the process of generating findings and developing interpretation and understanding (Focused coding /CGT).
Phase Two	How does building a community of practice and use of Problem-Centred Design promote the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi 10th grade?	Nominal Group Technique	According to Aspinal, Hughes, Dunckley and Addington-Hall (2006), NGT allows data to be generated in order to limit the amount of analysis needed after done the five steps of it.) ⟶ (Focused coding /CGT)
		Semi-structured interviews	Constructive Grounded Theory (CGT)
		Research Diary	Altrichter & Posch 1993 state that data from research diary can increase depth and scope in the process of generating findings and developing interpretation and understanding (Focused coding /CGT).
	What are the factors that foster or hinder the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi 10th grade?	Teacher field notes	They were used as evidence to support other results come from other methods in (Focused coding /CGT).
		Photography	It was used directly as evidence for community process in (Focused coding /CGT).

In the table below the processes of CGT, in more detail, adapted from different resources such as (Charmaz, 2006; Saldaña, 2015) are shown.

Tab. 4.9: The processes of CGT in detail

Real										Abstract
Data		**Initial Coding**		**Focused Coding**				**Theoretical Coding**		
		Code 1						Concept 1		
T. Interview 1		Code 5		Directed, Selective, & Conceptual codes	NGT (Finding)	Category & Sub-category				
		Code 10						Concept 2		
		Code 60								
T. Interview 3		Code 222		"Through focused coding, you can move across interviews and observations and compare people's experiences, actions, and interpretations" (Charmaz, 2006, p, 59).		Category & Sub-category		Concept 3		**Model**
T. Interview 5		Code 342						Concept 4		
T. Interview 7		Code 443				Category & Sub-category				
T. Interview 19		Code 512						Concept 5		
T. Interview 25		Code 601								
Particular										General

It is argued that all types of qualitative data such as interviews, observations, and documents must be turned into results in order for such data to be useful in improving programmes, solving problems, or explaining what happened (LeCompte, 2000). This process of shifting data into study outcomes is called analysis (ibid). As Table 4.8 and Table 4.9, each phase has its instruments and these tools have certain methods for analysing data that emerges from them. These methods of data analysis vary, depending on their purpose. Furthermore, the data that emerges from NGT in all phases and photographs in Phase 2 are used to directly support or contradict the results that come from other instruments, so it used on Focused coding /CGT. On the other hand, semi-structured in-

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terviews, the research diary, and teacher field notes are analysed through Constructive Grounded Theory (CGT).

4.6.5   Constructive Grounded Theory coding

1. Initial Coding

   The CGT analysis processes were applied through MaxQDA software programme. MaxQDA is a software programme designed for computer assisted qualitative research and used for data analysis in this research. MaxQDA is a prevailing tool for text analysis since it has straightforward interfaces consisting of four main windows displaying the text itself, imported texts, the coded text segments and codes (Creswell, 2012). MaxQDA does not actually code data for the researcher since this function is the researcher's responsibility. An explanation of how this research uses CGT analysis, together with examples of how the coding is carried out in this research through MaxQDA is provided in Appendix D and Appendix E.

   The initial coding is the first process of CGT and starts by looking carefully at the emerging data word-by-word, line-by-line and incident-by-incident in order to fulfil the two criteria for completing a grounded theory analysis which consist of finding a fit and relevance (Charmaz, 2006). Finding a fit here means the study is congruent with the observed world when researchers have created codes and developed them into categories that are forming the observers' experiences. The second criteria for completing a grounded theory analysis is relevance, which means researchers must provide an insightful analytical framework that interprets what is occurring (ibid). For explanatory purposes, the three stages of CGT are separate, but in reality should work dynamically in unison. For example, memo writing and constant comparison are conducted throughout the study to help the analysis process. Furthermore, during the initial coding stage, the aim was to remain open to all potential theoretical

directions specified by readings of the data.

Open coding inspires original notions and inspirations to emerge (ibid). Initial transcription and translation of data enables observation of any possible emerging themes. In addition, there are some points which need to be clarified in relation to translation issues of the raw data, analysed and coded in Arabic by the researcher at the open coding stage. The codes and the quotations of the respective codes developed from open coding were translated into English, with the raw data remaining in Arabic for further checks and comparisons. Furthermore, for consistency translations of the data have been carried out solely by the researcher, with random sections then being checked by a bilingual colleague to verify and attempt to ensure legitimacy, accuracy and readability. Moreover, in order to ensure an independent audit trail, discussions of translated sample interviews with my supervisors allowed for explanations of the line-by-line coding stage process (see Appendix F for an example of the coded interview transcript). Data collection and initial analysis were undertaken concurrently.

2. Focused Coding

Focused coding entails the identification and use of the most important and/ or common earlier codes for sifting through the considerable quantity of data. One aim of doing this is to assess the effectiveness of the codes. In this stage, it is necessary to decide which preliminary codes are the most appropriate for classifying the data precisely and fully (Charmaz, 2006). Thus, it can be seen that in this stage, codes are more directed, selective and conceptual than word-by-word and line-by-line (ibid). Constructive Grounded Theory provides guidelines for the focused coding stage in which the relationships between subcategories of a category are identified, which in turn leads to reflections on how to make sense of the data (Charmaz, 2006). More importantly, in this stage, observations, interviews and comparisons of individuals'

activities, practices and interpretations can be simultaneously conducted (ibid).

3. Theoretical Coding

In this stage, potential relationships between categories that were developed in the focused coding stage are specified and categories are moving to a higher stage, which can develop into concepts through exposing them to additional critical refinement, and displaying their relationships to other concepts (Charmaz, 2006). Furthermore, theoretical codes can be drawn from existing theories to support theoretical incorporation processes thus adding instructive legitimacy to the ultimate outcome by positioning it within scholastic contributions to the theoretical body of knowledge (Birks and Mills, 2015). On the other hand, Charmaz (2006), reports that, theoretical integration begins with focused coding and proceeds through all subsequent analytic steps.

There are several possible outcomes of data analysis depending on the insights into the collected data, with the discovery that the analysis may take into account several forms of coding (ibid). The author provides some examples to clarify the general context and specific conditions, in which a certain phenomenon is evident. It is possible to specify the condition and changes, which might affect the framework. They may learn its temporal and structural orderings and explore participants' strategies for coping with them (Charmaz, 2006). Finally, for constructivists, theoretical concepts assist as interpretive frames to provide insights into abstract relationships; theoretical concepts incorporate less significant categories, which by comparison hold more significance, justification for more data and often are more evident (ibid). See Table 4.10, for an example of CGT in use.

Tab. 4.10: A real example of using CGT

	Data (quotes)	Initial coding	Focused Coding		Theoretical coding	
			Sub-categories	categories	Sub-concept	Main concept
Interviews Data	The Training programmes at the present time do not have anything to do with the development process, development and simulation of sustainable development and these training programmes do not seek for this in any way. In addition, I will be frank with you, these training programmes do not seek for providing a sophisticated and renewed teacher. The goal of these training programs is to prove for those in charge that they are conducting training programmes, but these training programmes do not meet the needs of the teacher in his field.	Do not meet teachers' need It is far from its purpose it is to prove for those in charge	Training contribution	Training model	CPDs	Teacher Development
NGT Data	Development of teachers and make them shareholders in development. Develop teachers for their contribution to sustainable development.	Need of teacher development				

4.7   Methodological Issues

This section is concerned with quality and trustworthiness in this case study research, as well as ethical considerations which are presented in the next paragraphs.

4.7.1 Quality and trustworthiness in this case study research

Alongside theoretical and philosophical assumptions, research methodologies and methods, establishing the trustworthiness in any kind of research is critical. The importance of establishing quality research in order to make this research acceptable in the scholastic research community is high. Epistemological perspectives such as positivism and interpretivism have their own appropriate methodological views such as qualitative or quantitative, which can reflect their own perspectives (Blaikie, 2009; Cohen et al., 2013). In addition, both of these methodological views have their own criteria, which should be used to ensure the quality and trustworthiness of research (Lincoln and Guba, 1985; Flick, 2014). According to Ledford and Gast (2018), trustworthiness or credibility of research outcomes in behavioural sciences is based on the rigour of the scientific techniques used and the extent to which the research design can control alternative explanations. It is claimed that in order to make considered decisions of the quality of research, there are certain features such as the degree to what data gathering methods, data analysis and data reporting are regarded as neutral, dependable and effective and the degree to which it is considered that the research could be repeated to produce similar results (ibid). Johnson and Duberley (2000) believe that qualitative research should be judged by the same criteria of quantitative research.

While Krefting (1991), Lincoln and Guba (1986) and Agar (1986) emphasize that the criteria of quantitative research would be inappropriate for several reasons. First, the nature and purpose of the quantitative research differs to that of qualitative research, and therefore it is considered inaccurate and incompatible to employ the quantitative criteria of worthiness in the qualitative research (Krefting, 1991; Altheide and Johnson, 1994). While Agar (1986) argues that the terminological aspects such as reliability and validity that fit with a quantitative view are not comparable with the details of qualitative research.

It is important to state that according to the literature, there is no general agreement or consensus on which criteria should be used to test the rigour of qualitative research (Elder and Miller, 1995; Hammersley, 2016; Malterud, 2001). However, the model of Guba and Lincoln (1981), for ensuring trustworthiness of qualitative research is widely used (Wolcott, 1994; Morse et al., 2002; Shenton, 2004).

Guba's (1981) model for ensuring trustworthiness of qualitative research:

Guba and Lincoln (1981) identify a model based on four criteria of trustworthiness that are relevant and applicable to assess both quantitative and qualitative research. These four criteria are truth value, applicability, consistency and neutrality. They contend that these criteria should be defined differently for both quantitative and qualitative research according to their philosophical views. Table 4.11 shows these criteria and their equivalent strategies that need to be used by qualitative researchers.

Tab. 4.11: Criteria of assessing trustworthiness in qualitative research adapted from Guba (1981)

Criteria of trustworthiness	Qualitative strategies
Truth value	Credibility
Applicability	Transferability
Consistency	Dependability
Neutrality	Confirmability

This research uses the four qualitative strategies of credibility, transferability, dependability and confirmability. The explanations of these strategies and their link with this study are presented in the next paragraphs.

Credibility strategy

Lincoln and Guba (1985) contend that ensuring credibility is one of the most essential factors in establishing trustworthiness. Credibility is to assure that the results of the study

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correspond with informants' reality (Merriam and Tisdell, 2015). In addition, as mentioned earlier in this chapter, the interpretive perspective is not interested in capturing and describing the nature of reality, but rather in capturing different perspectives of reality. It is claimed that in order to ensure that the results of a study to be trustworthy from this viewpoint, the informants in the study are the ones with validity to make such a decision (Johansson, 2016). On the other hand, Lincoln and Guba (1985) have recommended using various techniques such as prolonged engagement, persistent observation, triangulation, member checking and peering debriefing in order to ensure credibility.

It can be argued that the aim of long participation is to make the researcher open to the various influences such as circumstantial factors and the mutual formers, which impact on the event being investigated (ibid). They believe that the aim of continual observation is to classify those features and components in the circumstance that are of great relevance to the issue or event, which is being followed and concentrated on in depth (ibid). Hence, in this study the researcher has used both prolonged engagement and persistent observation in the years 2016-2017 to provide scope and deeper understanding of the study phenomenon which was the integration of sustainable development in such a unique context. Furthermore, triangulation is the combination of diverse methods, participants, domestic and chronological situations, and various theoretical perceptions in dealing with an event (Flick, 2014).

Specifically, Denzin (2017) identifies four types of triangulation, which are method triangulation, investigator triangulation, theory triangulation and data source triangulation. This research applies two of these triangulation processes, those of method triangulation and data source triangulation. Consequently, it has applied method triangulation by collecting data through several methods such as nominal group technique, semi-structured interviews, a research diary, teacher field notes and photography. Furthermore, data source triangulation has been employed, which involves the use of a wide range of informants,

for example, 25 teachers and 142 students from different districts and schools and both being asked the same questions to gain different views of the research topic.

These viewpoints and experiences can be verified through each other and, eventually, offer a rich picture of the attitudes, needs, or behaviour of those under scrutiny and may be constructed based on the contributions of a range of people (Flick, 2014). In addition, the study has applied member checking, which is a method for discovering the trustworthiness of results as well being known as respondent or informant validation. Data or findings are returned to informants to check for exactness and correctness with their expertise (Birt et al., 2016).

Member checking was carried out by sending the raw transcript of the interviews as well as field notes to the research participants in order to verify accuracy. Participants were asked to return these transcriptions with their views on them as well as providing feedback on the emerging themes. The researcher has received some feedback on themes that emerged as well as a few amendments that need to be carried out in the transcriptions. These member-checking processes were helpful for ensuring accurate data. Furthermore, a copy of the results and findings of the completed research will be provided for the participants. Peer debriefing has been used, which Lincoln and Guba (1985) define as a procedure of revealing a researcher's work to an unbiased peer, following the same path of conducting the analysis stage and with the aim of discovering features of the study that may otherwise stay only tacit within the investigator's mind. The researcher applied peer debriefing through reviewing the two phases, the two case studies as well as discussing the findings with supervisors and other PhDs students. Furthermore, some results of the research were presented to a seminar on Meeting the UN's SDGs in ITE (UK): Progress and Opportunities in Edinburgh 2017, as well as to several international conferences.

Transferability strategy

The second strategy for ensuring trustworthiness is transferability. According to Merriam and Tisdell (2015) nowadays, when rich and thick description is employed as approach to enable transferability, it refers to a description of the site and members of the research and a detailed description of the outcome with satisfactory evidence offered in the form of quotations from participant conversation, field notes and documents. Thus, this research provides rich and thick descriptions. The process of providing rich and thick descriptions can enable readers to decide if the prevailing context is similar to other circumstances which they are familiar with and whether the findings can be justifiably applied to the other settings as well as to make a naturalistic generalization (Stake, 1995; Shenton, 2004).

Dependability strategy

The third strategy for ensuring trustworthiness in qualitative research is dependability. It refers to the constancy of data over a period of time and over circumstances (Lincoln and Guba, 1985). It means that the study can be replicated elsewhere and expect to achieve the same results. This leads to a reminder of the nature and purpose of this study, which deals with capturing different perspectives on reality and arguably that reality is socially constructed and persistently changes. Thus, in qualitative work, meeting the dependability criterion is a challenge, even though researchers should at least attempt to enable a future investigator to repeat the study (Shenton, 2004). It recommends applying two processes to increase dependability through (1) employing detailed procedural descriptions to enable the research can be reduplicated and (2) overlapped techniques (ibid). It is obvious that this chapter has attempted to provide deep methodological descriptions for future researchers, who wish to replicate this study and to obtain similar results. The findings

of this research can be valuable for similar contexts such as Gulf Cooperation Council countries (GCC) which have considerable shared features in areas such as institutional, cultural, social and economic fields (Ramady, 2010; Rogmans, 2012).

Confirmability strategy

Sandelowski (1993) states that confirmability is largely an issue of presentation. However, Fink (2000) believes an investigator's role and viewpoint of experience is extremely difficult to control. It has already been acknowledged that researchers can collect data through many techniques such as document review, interviews and observations (Creswell, 2012). Researchers are generally very aware of how some issues such as background, teaching experience and beliefs might influence the research processes such as data collection and analysis. Although these possible biases are unavoidable, it is important to minimize any negative effects through various strategies (Flick, 2014).

Examples of these are an audit trial, member checking and providing an example of processes description of the ways that data is collected and analysed as well as using a coding process (Guba and Lincoln, 1981; Lincoln, 1995; Shenton, 2004; Merriam and Tisdell, 2015). This study makes use of peer debriefing to aid transparency of the research processes both during and after. Secondly, the use of member checking enabled participants to review the raw interviews descriptions and field notes. In addition, some of them were able to provide feedback on the themes that emerged. Provision of examples of raw records, field notes, the coding process and data collection methods facilitated transparent description as well as to create an audit trail for other researchers interested in the findings of this research.

It has also used an audit trail through reviewing the two phases, two case studies and discussing the findings with supervisors and other PhDs students in order to make the research process consistent with methodological views as well as ensuring that the re-

sults conform with current literature. In addition, it has conducted systemic inductive data analysis though Constructivist Grounded Theory (CGT) (Charmaz, 2006, 2008). Furthermore, it has used the MaxQDA software programme for assisting the analysis of interview data, which is an appropriate tool for data retention, retrieval and future audit checks, thereby increasing the level of trustworthiness of the study. Lastly, discussions with the supervisory team, feedback and their comments can help ensure rigour in the research process as a whole.

4.7.2 Ethical considerations

This research adheres to the Economic and Social Research Council's (ESRC), principles of research ethics (Stanley and Wise, 2010). It is presented in a dynamic, explicit, suitable, compatible and efficient format to facilitate ethics review, approval and governance. Throughout the course of conducting this research, the importance of how to treat interviewees and considerations of data collection methods in line with respecting the rules of research ethics became apparent. It is stated that ethical responsibility is:

> *Essential at all stages of the research process, from the design of a study including how participants are recruited, to how they are treated through the course of these procedures, and finally to the consequences of their participation. (Miller and Brewer, 2003, p. 95)*

Furthermore, it is stressed that certain critical ethical challenges should be taken into consideration throughout conducting qualitative research, and the processes of gaining informed consent, and ensuring anonymity and confidentiality (Richards and Schwartz, 2002; Sanjari et al., 2014).

The following paragraphs show how these challenges were addressed in this study. First of all, the researcher took part in ethics training workshop at the University of Exeter enti-

tled The Research Integrity Ethics and Governance in 25/01/2016 before conducting the fieldwork to be aware of the ethical considerations and how to deal with them. Secondly, the educational authority in Jeddah, Saudi Arabia agreed to cooperate and provide the researcher with access to contact teachers who might be interested in taking part in these interviews and facilitate the implementation phase.

Evidence can be found in the letters of obtaining permission as well as the proof of finishing the Phase 1 and 2 fieldwork in Appendix G and H. Moreover, according to British Educational Research Association (BERA) guidelines and University of Exeter good practice in the conduct of research, this research will include vulnerable young people (children ages 15-17 years old) as subjects of the research context who are indispensable. Therefore, the researcher confirms the responsibility for making sure that participants are protected and respected. As the participants' rights is a key concern, they were thus informed about the nature of this research and its purpose. More importantly, they were informed about their right to withdraw from this research at any time.

The researcher provided the consent form and information sheet to students in order to obtain their signatures and hence their consent (see Appendix I). The parents' consent form and information sheet were given to them by their sons (see Appendix J). Also, the teachers were provided with the consent form and information sheet in order to obtain their written consent (see Appendix K). The purpose of the information sheet and consent form was to inform the participants about the purpose of the research and their right to withdraw from the research at any time. Furthermore, the information sheet and consent form contained the researcher's contact details in case there was any concern or query regarding the research. With respect to assessment of possible harm to students, the researcher took into account that some of the participants might feel worried or concerned that their participation might negatively affect their relationship with their teacher or their marks.

However, the researcher worked effectively to eliminate that potential harm by assuring the participants that their participation will not affect their relationship with the teacher or their scores. With respect to assessment of possible harm to teachers, it was possible that some of the participants might be concerned about taking the responsibility of implementing new aspects related to community of practice. In more details, they might change some of their own familiar practices and thus be annoyed or feel discomfort. However, the researcher worked effectively to eliminate any potential harm by assuring the participants that their efforts are highly appreciated and they would not be blamed and assessed.

In terms of data protection and storage, consent was also obtained to make an audio tape recording of the interview and NGT only for the purpose of the research. The data collected from the interviews, NGT and the research diary were transferred by using a USB cable to the University U- drive and protected by a password. Therefore, they were saved in the researcher's files (data). This can be accessed as follows:-

1- Save the data in USB.

2- Transfer the data from the USB to U-drive by logging into iExeter.

3- Go to to my files, then log into my account and drop the files from the USB to U-drive. It is automatically backed up. Then it will be in a secure and safe place to save the data.

In Appendix L it is shown how these processes were conducted. In order to ensure anonymity, each participant was labelled with the phase number and Teachers' numbers such as: Ph1.T1 and Ph2. T1 and so forth. At the end of this research, the written data collected will be destroyed if this data is no longer needed. Moreover, the College of School Science and International Studies Graduate School of Education committee has approved this research to be conducted (see Appendix M).

Overall, this research is designed in a way to strive for maximum quality, clarity and accuracy. Given that participants are volunteers, data collection and its use must be sensitive to this and follow ethical guidelines. Obviously, the sample was fully aware of the purposes

of research and data collection, and information from the sample was ethically and confidentially handled. Participants have the right to see the data and results of the study at all times, to refuse the giving of information or to participate from the beginning or during an interview, NGT and all other processes such as in the development and implementation phases.

4.8   Summary of the Chapter

This chapter has presented the essential elements of the research and its processes to enable readers to judge its values and merits. These elements included descriptions of theoretical and philosophical assumptions, research methodology and methods, the study participants, the researcher role and research design, the pilot study and the rigour of data analysis procedures to maximise the trustworthiness of this case study research. They include methodological issues (quality and trustworthiness, and ethical considerations). The following chapter presents the findings of Phase 1.

5. PHASE ONE: RESULTS AND IMPLICATIONS

5.1   Overview of the Chapter

Phase 1 attempts to answer research question number one: What is the current practice regarding the incorporation of sustainable development in the Saudi Social Studies and Citizenship Education curriculum? This chapter is a description of surface (semantic) interpretations of the data while the discussion (Chapter 7) is concerned with deep (latent) interpretations. This chapter presents the findings of the NGT with the 142 ninth grade students in six intermediate schools, and the findings of the interviews with 25 10th grade teachers who teach the SSCE curriculum.

Where relevant, evidence from the research diary is also provided. These three sources provide a form of triangulation of the data and thus increase confidence in the findings. The analysis of the NGT and teacher interviews identified categories as described in Chapter 4. Four categories emerge from analysis of the data from Phase 1 and will be addressed in the following sections. They are conception of sustainable development, the current (SSCE) curriculum and sustainable development, the need to change for sustainable development to be incorporated in the SSCE curriculum and the current implementation of continuing professional development (CPD). The four categories that emerge from the data are shown in Figure 5.1.
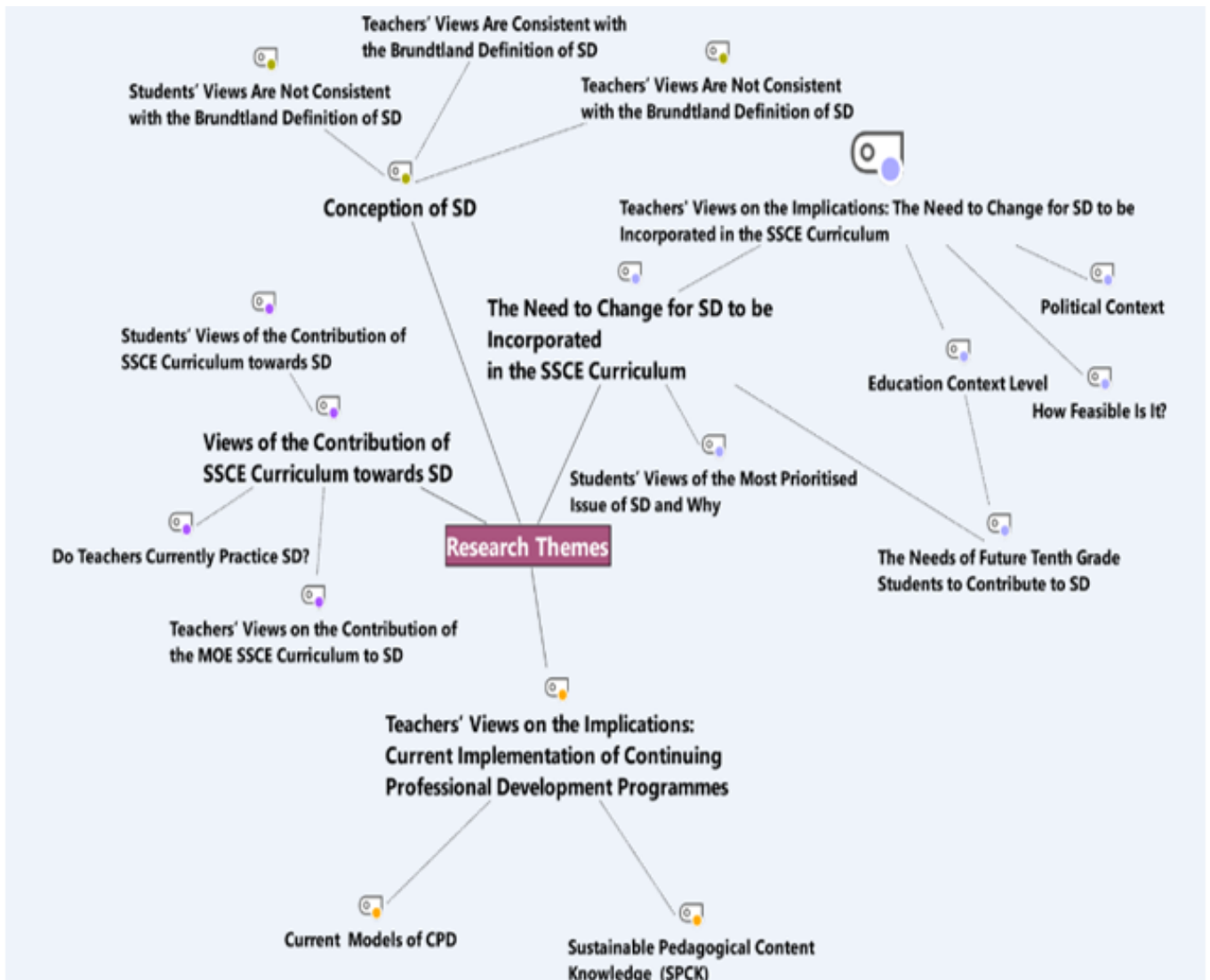
Fig. 5.1: The Phase 1 findings

Each of these four categories are reported in more detail in the following sections.

5.2   Students' NGT Results

The NGT results with the ninth grade students are presented in this section by analysing

the results of the six questions that the students answered in Phase 1.

5.2.1 Students' views are not consistent with the Brundtland definition of SD

Most of the students provided a partial or generalized definition of sustainable development (Table 5.1).

Tab. 5.1: Q1. What does sustainable development mean to you?

Priority	response of school (1)	response of school (2)	response of school (3)	response of school (4)	response of school (5.1)	response of school (5.2)	response of school (5.3)	response of school (6)
First priority	Intentional efforts aimed to improve the life and many people benefit of them	Developing society in all fields.	Organized efforts to improve and develop all areas of life	The development of all life dimensions such as security, politics and society.	The development of the things around us.	Development which can change in the areas of life.	Permanent development in all areas.	Effort is held for the development of important matters while maintaining its development.
Second priority	Developing ideas for the development of the community consistently	Revitalization of the ideas	Renewable ideas that can be applicable	Lighten the mind in all areas.	Providing developmental ideas which can be applicable.	Development ideas to the fullest extent in the community through studies and discussions.	Encourage minds to be open-minded, enlightened and interactive.	Developing new ideas.

For example, they thought that SD is anything related to developing individuals' lives. Interestingly, students considered intellectual life and its activities, which are related to creating ideas and providing new knowledge, as a way of defining SD. Although students did not provide a definition that was consistent with the Brundtland definition of SD, their views indicated how intellectual activities are critical to reflect their positive side when they create sustainable development ideas.

5.2.2 Students' views of the most prioritised issue of SD and why

Even though the students did not prioritise any issue that they have been given, they considered the lack of suitable environment that supports intellectual activities for sustainable development to be the first priority (Table 5.2).

Tab. 5.2: Q2. Which of these issues such as well–being, energy, water, waste management, green lands or air pollution should have priorities and why?

Priority	response of school (1)	response of school (2)	response of school (3)	response of school (4)	response of school (5.1)	response of school (5.2)	response of school (5.3)	response of school (6)
First priority	Lack of an environment for the development of the intellectual for sustainability.	The lack of a suitable environment to support sustainable development	Lack of support by members of the community	The lack of environment which can help for education and sustainable development	Lack of suitable educational environment which can contribute to sustainable development.	The lack of a positive environment for their contribution to sustainable development.	Lack of curriculum and school's environment which work accordance with requirements of sustainable development.	Lack of innovation and entrepreneurship culture.
Second priority	Lack of wise planning for natural resources.	There is no reliance on domestic production in the diversification of income.	Thinking about certain aspects of the sources and neglecting other sources	There is no thinking about alternatives and new sources of income.	Dependence on specific sources	There is no an appropriate investment for resources which can support sustainable development.	Lack of sufficient resources.	No diversification of sources of income and dependency on oil as the only primary source of income.

Students highlighted the lack of entrepreneurship and innovation culture as a prioritised issue that needs to be considered within the Saudi policy and regulations. Moreover, due to the fact that Saudi Arabia is heavily dependent on natural resources which are not renewable, considering diversification of sources of income is prioritised. The development of human resources can be a solution for diversification of income. This project reflects the demand for developing human resources by integrating the concept of sustainable development.

5.2.3   Potential roles of education context

Students indicate value information regarding the educational context as it should be the place for creating sustainable development mind-sets (Table 5.3).

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Tab. 5.3: Q3. How can education in Saudi Arabia develop Saudi citizens to contribute to sustainable development?

Priority	response of school (1)	response of school (2)	response of school (3)	response of school (4)	response of school (5.1)	response of school (5.2)	response of school (5.3)	response of school (6)
First priority	Pay attention to the ideas of young people and their views.	Listening to the views of the students and discussing it with them.	Investment of the talents of students and their ideas.	Pay attention and listen to the students.	Continuous materialistic and psychological incentives for students and their opinions.	Education must support students in order to think in a positive way and do not underestimate of student's thought which can be later helpful for developing or changing.	There should be a positive interaction from teacher towards his students, which can lead to understand and respect their views.	Education has to pay attention to students' ideas and not ignoring them.
Second priority	Providing a teacher who is renewable in order to contribute to the development of education.	Development of teachers and make them shareholders in development.	Provision of teachers who have high expertise in sustainable development.	Provision of teachers who support the students.	Develop teachers for their contribution to sustainable development.	Providing a teacher who is familiar with interesting ways of teaching.	Availability of talented teachers who use modern ways to teach the curriculum and its application.	A teacher should be continued researching of advanced ways of teaching.

Furthermore, the data in the table above emphasized the importance of considering the value of the students' ideas and their potential roles, and this should be at the top of the educational policy priorities. Moreover, from the students' point of view, teachers are the most important factor in developing human resources, which indicates the roles that teachers can play as well as the close attention that they need from the Saudi policy makers. More efforts are needed in preparing future teachers to be an integral part of the sustainable development process. In order to approach this, teachers' roles need to be consistent with twenty first century competencies that align with sustainability competencies. Therefore, the education policy should re-arrange the CPD programmes that promote sustainability competencies.

5.2.4 Students' views of the contribution of SSCE curriculum towards SD

Most of the students view the contribution of the current curriculum towards SD is average (Table 5.4).

Tab. 5.4: Q4. As students in the 9th grade, do you think that Social Studies and Citizenship Education curriculum is supporting Saudi students to contribute to sustainable development? Why?

Priority	response of school (1)	response of school (2)	response of school (3)	response of school (4)	response of school (5.1)	response of school (5.2)	response of school (5.3)	response of school (6)
	The current curriculum contribution is average due to the following:							
First priority	It urges to maintain public places and its importance economically	It focuses on the geographical location and the economic dimension.	It focuses on the economic aspects and neglecting other developmental aspects.	It provides lessons, which help the economic stimulus for sustainable development.	It refers to services of health, social, educational, and economic.	It contributes for awareness to preserve the tourist sites from the economic perspective.	It talks about some of the elements of sustainable economic development, such as tourist places and the geographical location of the Kingdom of Saudi Arabia.	It addresses economy.
Second priority	It provides information on the population and the role of young people in the future.	It helps students to cope up with the environment and reality.	It urges young people to participate in developmental projects.	Current lessons address the problem of unemployment.	It provides some of the elements of sustainable development such as tourist places and the role of young people.	The current curriculum contributes through providing a new vision, which can help students to understand the issues affecting them.	It raises various issues, which concern to young people.	It focuses on youth-related issues.

In this table, it is evident that the students mentioned economic development more than any other form of development. The SSCE curriculum does give information that talks about some issues related to SD, yet not comprehensively. Practical applications in the current curriculum still need to be addressed towards SD. This indicates that the students' voices are crucial and the students can participate through providing their feedback as well as their suggestions. Logically, this demand should be addressed by providing spaces for them since the students are the final product of the educational processes.

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5.2.5 Students' views of the contribution of the school environment towards SD

Most of the students view the school environment through its current programmes is not encouraging students to contribute to sustainable development (Table 5.5).

Tab. 5.5: Q5. As students in the 9th grade, do you think that the school environment is supporting Saudi students to contribute to sustainable development? Why?

Priority	response of school (1)	response of school (2)	response of school (3)	response of school (4)	response of school (5.1)	response of school (5.2)	response of school (5.3)	response of school (6)
	The contribution of the school environment is low due to the following:							
First priority	There is no potential for the development of students' abilities to understand the sustainability issues.	There is lack of learning resources room.	The school focuses on the content more than the practical side and activities.	There is lack of a stimulating environment for understanding sustainable development issues.	There is lack of programmes on sustainable development.	There is complex curriculum and the same time there is a lack of modern educational means.	There is lack of programmes, which can discover students' skills.	There is lack of programmes or educational means, which can assist students in understanding sustainable development issues.
Second priority	There is lack of an interactive environment.	There is no an interactive relationship between the teacher and student.	There are no incentives such as activities, search, and competitions.	There is lack of teachers who care and stimulate students.	There is lack of teachers who have huge experiences regarding interacting with students.	The school environment is not good at public schools, as they do not have incentives.	There is lack of expert teachers who have abilities to interact with students.	There is no an interactive environment between students and teachers.

Students emphasized the lack of motivation in the current educational environment to support their competencies that could help them understand the sustainable development issues. For example, interpersonal competences did not support students to interact with each other and participate actively in the lessons. Moreover, the students mentioned lack of resources, few incentives in public schools, teachers who do not have the knowledge or skills to teach about SD, and a lack of interaction between teachers and students. All of these things support the idea that professional development for teachers in both curriculum and pedagogy is essential if SD is to be incorporated into the SSCE curriculum. For instance, the culture of interaction in the school environment should be promoted by the

school ethos. By doing so, it can provide the basic elements of thinking and reflections towards SD issues.

5.2.6 The needs of future tenth grade students to contribute to SD

Students report the two factors that need to be considered for integrating sustainable development in the SSCE curriculum, which are teachers and sustainability competencies. Most of the students believe there are some factors which need to be changed in order to incorporate SD in the SSCE curriculum. One of them is the teachers themselves through their roles, which is seen as critical for promoting students toward understanding the concept of SD and participate actively in its process (Table 5.6).

Tab. 5.6: Q6. As you will be in 10th grade the next academic year, what do you need from the SSCE curriculum, pedagogy, and class environment to provide for you in order to prepare you to contribute to sustainable development?

Priority	response of school (1)	response of school (2)	response of school (3)	response of school (4)	response of school (5.1)	response of school (5.2)	response of school (5.3)	response of school (6)
First priority	A teacher should pay attention and care of the opinions of students.	Providing an interactive environment which pay attention to students' opinions.	There should be attention to social and psychological aspects of the students and their opinions in order to grasp of sustainable development issues.	Pay close attention to the opinions of students with respect to sustainable development.	There should be attention to provide teachers who possess expertise in sustainable development as well as how to interact with students.	There should be incentives for those who contribute to express an opinion or an idea for solving a problem.	Allowing students to find unusual ideas and presenting them in front of students and teachers.	Pay close attention to the opinions of students.
Second priority	There should be attention to the development of the curriculum so that it is compatible with sustainable development issues.	There should be attention to design of curriculum, which should be attractive and simple.	The curriculum should be developed and presented the issues of sustainable development.	There should be attention to provide new information with respect to sustainable development.	There should be attention to development of social studies and citizenship education curriculum, which can serve sustainable development.	There should be attention to provide lessons, which can be easy to grasp the concept of sustainable development through using appropriate ways.	There should be attention to improve textbooks to provide more information on sustainable development.	There should be attention to development of curriculum.

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The realization of teachers' roles and translating them into their teaching practices is a significant factor in promoting SD. In fact, qualified teachers and a well-developed curriculum are the two most enabling factors for presenting SD that should be taken into account from the students' point of views. Students also showed their desires to activate their roles within their society by motivating them to express their opinions freely and participate intellectually with regard to SD issues. This indicated the need for developing interpersonal competences in general to enable them to enact their roles properly. Students specified the general needs of young people, but these needs did not mention in detail how they can be addressed within the SSCE lessons (Table 5.7). Therefore, they have a lack of basic knowledge about how they develop their skills to deal with SD issues. These skills according to the literature are called sustainability competencies, which need to be taken into consideration when there is an intention on the part of curriculum designers to integrate SD into the SSCE curriculum.

response of school (1)	response of school (2)	response of school (3)	response of school (4)	response of school (5.1)	response of school (5.2)	response of school (5.3)	response of school (6)
Providing appropriate curriculum which is interested on the issues of the moment related to youth.	Providing issues which are concerned with our current society such as youth issues.	Awareness programs and seminars on sustainable development and the role of youth by a teacher.	There should be encouraged for social, national studies and youth issues.	Providing educational and cultural programmes for young people and sustainable development.	Providing additional sessions to improve youth's understanding of their roles towards sustainable development through citizenship education.	Support for extra-curricular activities that contribute to the understanding of issues related to youth and sustainable development.	Concentrating on youth issues.

5.3   Teachers' Views of Sustainable Development

It can be argued that the conception of any terminology is a basic element of any discussion or action. Thus, exploring teachers' conceptualizations of sustainable development can be seen as the beginning of understanding the process of sustainable development. The data shows that the teachers have different conceptualizations of sustainable development and their views can be grouped to two sub-categories: views that are consistent with the Brundtland definition of SD and views that are not. The supporting evidence is presented in turn.

5.3.1 Views which are consistent with the Brundtland definition of SD

One third of the 25 teachers conceptualize SD that is consistent with the Brundtland definition of SD. However, as the following quotes show, these views focus on certain elements of the Brundtland definition of SD, but not all of them, indicating that most teachers had only a partial conception of SD. Three teachers define sustainable development from a future orientated aspect. Ph1.T23 asserted that *"In the future, there will be aspects that people need such as providing clean air and finding new energy solutions, thus, continuously developing them is critical"*. In addition, Ph1.T2 said that sustainable development is *"Meeting the needs of the future according to the current time"*.

However, the above conceptualizations are partially consistent with SD but not fully. One teacher only among the 25 teachers provided a definition which combined all three dimensions of the Brundtland definition of SD, that is to say, environmental, social and economic. This indicates the lack of the personal knowledge toward sustainable development. As a result, more efforts should be applied by the education policy to include and to expand this knowledge. Teacher Ph1.T21 believed that:

> *"It is supporting efforts to address specific dimensions whether economic, social, or even environmental, to reach the best solutions towards achieving a decent human life in all aspects".*

In addition, three teachers emphasized one or two of the three dimensions of sustainable development. Ph1.T24 focused on the economic aspects by saying:

> *"It is a transmission of expertise, connection between the current generation and the future generation, taking advantages of the developmental and economic aspects in the country in this period but does not contradict or detract next generation support".*

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Whereas Ph1.T10 focused on natural resources and their sustainable use by mentioning:

"It is a proper utilisation of resources so it does not prejudice the right of the future generations. Thus, there should be planning, clear goals and they should be drawn up to utilize the natural resources properly in order to gain their benefits".

On the other hand, Ph1.T7 emphasised the social dimension by claiming: *"It is how to develop individuals to contribute to the development of the country".*

5.3.2 Views which are not consistent with the Brundtland definition of SD

Twelve of the teachers provided surface conceptions of sustainable development. Six of them provided a general definition that was very vague, as in the examples. Ph1.T14 mentioned that *"It is development of the country in all fields and services"*, while Ph1.T18 added that *"Sustainable development is a big name, the achievement we wish to see in this country"*. However, six teachers provided a definition that focused on educational processes rather than SD processes, such as Ph1.T5 who viewed the sustainable development as educational processes and particularly identified it with the Social Studies curriculum. Moreover, six of the teachers have no idea about the sustainable development concept because it is new to them. Ph1.T8 claimed that *"I have no background about it"*. Similarly, Ph1.T12 claimed, *"This is the first time I heard about sustainable development"*. This section shows how the teachers conceptualize sustainable development and the differences and similarities between their views.

5.4 Teachers' Views on the Contribution of the MoE SSCE Curriculum to SD

This section is concerned with the current official curriculum of SSCE and sustainable development. It presents through two subsections, which are teachers' views on the contribution of the Ministry of Education (MoE) SSCE curriculum to sustainable development and the current situation whether teachers are able to practice SD, or not.

5.4.1 Teachers' views on the contribution of the MoE SSCE curriculum to SD

The MoE claims that the current SSCE curriculum contributes to SD. This claim is partially true through the SSCE general objectives and its broad topics (Table 5.8).

Tab. 5.8: The actual Ministry of Education (MoE) SSCE curriculum

SSCE Grade Ninth Units	SSCE Grade Tenth Units
1-The Natural Characteristics of Saudi Arabia	1-History of Prophets and Messengers
2-History of the State of Saudi Arabia (1)	2-Jurisprudence of the Biography of the Prophet
3-History of the State of Saudi Arabia (2)	3-World events affecting the world
4-The regime in Saudi Arabia	4-Some Arabic, Islamic, and international organizations
5-Human rights	5-National issues
6-The Shura	6-The Arabic World
7-Population of Saudi Arabia	7-The Palestine issue
8-Natural Resources in Saudi Arabia	8-Islamic minorities
9-National Issues (Work and Labours)	9-The influential forces in the world
10-Services in Saudi Arabia	10-National Issues (Human Rights)
11-National issues (security and safety)	
12-Modern communications and Technology	

Natural Resources in Saudi Arabia (e.g. detail)

Water	The Saudi government contributions towards these resources	Potential Ways of Saudi citizens' contribution towards these resources
Petroleum		
Gas		
Mineral resources		
Green land		
Livestock		
Fishing		

The Arabic World (e.g. detail)

Economy in the Arabic World 1 (Agricultural wealth)		Potential Ways of increase of these economic activities
Economy in the Arabic World 1 (Livestock)		
Economy in the Arabic World 2 (Mineral Resources)		
Economy in the Arabic World 2 (Industrial Wealth)	Economic integration between Arabic countries	
Economy in the Arabic World 2 (Agricultural wealth)		
Economy in the Arabic World 2 (Livestock)		

However, teachers' views indicated that the general SSCE objectives and its broad topics need reconsidering in order to be helpful for them in their everyday teaching practices. For example, the goal of the content does not reflect the concept of sustainable development as Ph1.T10 stated that:

"There is no focus on sustainable development, if there is a focus, objectives and special themes would be better. If the picture is unclear in the curriculum, how will a teacher present it? A teacher can present, but what should he present".

The Ministry of Education (MoE) also claims that the current SSCE curriculum is based on an integrative approach standard, and teachers have expressed their opinions with regard to this claim. The current integrated curriculum is not satisfied as Ph1.T9 believed as well as revealed by the research diary. He stated that:

"Indeed, the new curriculum is not integrated correctly and it should take part of historical and geographical aspects and then link this with what our duty is towards our country".

The integrated curriculum still needs to be improved as it should take into account all aspects of the integrated curriculum comprehensively, for example, by using Problem-centred Design as one of the integrated curriculum approaches. In an attempt to find solutions for this un-integrated curriculum Ph1.T22 added, *"I never saw this thing, its themes are not interconnected, and I was calling the Ministry of Education and I was thinking about sending a letter to them with respect to this issue".* Furthermore, there is great difficulty with the current curriculum as Ph1.T3 stated. He preferred to teach the previous SSCE that was a subject-based curriculum *"The separate subject-based curriculum approach with its disadvantages is much better than the current integrated curriculum".* He also explained this issue in more detail by claiming:

"The new curriculum is only visible and configurable because it has integrated these subjects through collecting their materials, putting them together and calling this integrated curriculum. In reality, they are separate lessons in history, geography and citizenship".

The topics also were not helpful to allow integration into the curriculum. Ph1.T2 taught the historical topic separately from other topics, and the reason for that as he claimed, is that the theme itself does not provide an opportunity for integration into the current curriculum. Furthermore, teachers are concerned with another issue related to the current curriculum, which is the lack of progression in knowledge, skills and understanding. For example, Ph1.T17 stressed that:

"In the current curriculum, there is no connection between the units. The first unit addressed an issue, and then I moved to the second unit, which talked about another issue that did not have any link with the first unit".

Therefore, linking the units would improve the students' understanding. While Ph1.T22 provided more details from his teaching experience as he taught this curriculum three years ago and has many notes, units are not interconnected between each other, so each unit has a very different direction from the other and there is no connection between notions and each unit has its own notion. This can distract student's thinking or even his grasping of information. The division of topics may affect the integrated curriculum both historically and geographically. This is the reason of inconsistency in units as Ph1.T2 argued.

Ph1.T16 agreed with Ph1.T2 in the significance of consistency between units and inter-related in order to lead to integration. The curriculum of Social Studies did not mention sustainable development although presenting its issues is important, attractive and interesting. This what Ph1.T13 claimed, yet he mentioned that scientific disciplines have some topics about sustainable development. Interestingly Ph1.T15 stated that:

"Notably, it seems that the current curriculum got rid of the subject of citizenship education. Thus, students may not respect their country's resources as well as appreciate human resources".

Teachers suggest some proposals for developing the current SSCE curriculum, which are applied in Phase 2. The following quotes are what teachers recommended. Initially, Ph1.T1 recommended having a special curriculum to sustainable development by claiming:

> *"I hope that there will be a special curriculum for sustainable development, if you want the curriculum to contribute towards the development of the country. The new curriculum should affect the choice of specialization and the future of the student".*

On the contrary, Ph1.T14 recommended using English terminologies within a new curriculum by recommending to *"Use academic terms in English in the new curriculum".* Giving the teacher some freedom in addressing the topics according to the state of his student is what Ph1.T9 concluded with. He stressed that at secondary stage, teacher should be given only the main topics, head-notes and choices to use the means and ways that are appropriate to teach the subject. At the same time, teachers should take the given time into account in order to teach those subjects and give them their rightful attention. Overall, the teachers' views have been presented in this section with regard to the current official curriculum of SSCE and sustainable development. This leads us to investigate if the teachers are able to participate and practice SD in their teaching practices or not, which is presented in the next subsection.

5.4.2   Do teachers currently practice SD?

The data shows that the teachers were not able to practice and participate actively towards supporting their students regarding understanding SD and its overall process. The main reason of this was due to the fact that the current curriculum did not support them to apply this task according to the research diary. For instance, Ph1.T6 analysed the current

curriculum with a group of teachers and they came up with the idea that:

> *"It has weaknesses, and now we have 3 years of the textbook, which is a trial version. We have criticized the current curriculum and we have done content analysis. Therefore, we found that there are too many mistakes and the topics do not belong to sustainable development".*

Additionally, the researcher received an email that provided the teachers' needs analysis of the current SSCE curriculum (Appendix P.1). While Ph1.T8 gave an example from the tenth grade stating that *"There are no topics related to sustainable development, truthfully"*, according to the research diary, Ph1.T17 talked about the information that is introduced in the textbooks as he claimed that it does not have a significant role in sustainable development.

In the same vein, Ph1.T19 highlighted the uselessness of the SSCE's textbook as it focuses on theoretical aspects more than anything. Whereas Ph1.T22 argued that the information that is provided in the textbook distracts students, he also added, *"There is a lot of stuffing that can be enriching for students, but it has different directions, and this can be considered as a distraction to students"*. In summary, teachers expressed their concerns with respect to highlighting the sustainable development in the content of SSCE. Ph1.T1 stated that sustainable development was not highlighted in the current curriculum and there is an urgent need to address the issues of sustainable development and highlight them in the curriculum in a holistic manner.

5.5 Teachers' Views on the Implications: The Need to Change for SD to be Incorporated into the SSCE Curriculum

Teachers had many views about the requirements that need to take place for sustainable development to be incorporated into the SSCE curriculum in the Saudi context. These re-

quirements can be divided into two: the political context and the education context. Each of these requirements has its own set of responsibilities that need to be put in practice, which is discussed in the next subsections.

5.5.1   Political context

The role of the Saudi government and political priorities are critical regarding making sustainable development alive through several actions. These actions are: having proper planning for the sustainable development process, viewing teachers as active agents not passive deliverers of content and reconsidering the importance of specialisation in curriculum development.

5.5.1.1 Proper planning is a prerequisite for SD

Teachers believe that proper planning should be done at the governmental level as one of sustainable development requirements. For example, Ph1.T19 emphasized the values of research, which can assist the visioning of sustainable development, stating:

> *"If we have completed studies on those issues that were dealing with future issues in that time beforehand, they would not happen now. Now those problems, which were future problems, become present issues and there are no alternatives, now we are looking for solutions!".*

Importantly, planning and development in Saudi Arabia is based on oil revenues and limitation of economic resource as Ph1.T19 indicated. On the other hand, Ph1.T21 regarded this as *"A big mistake!"* He finished by justifying his statement through pointing out that oil is fluctuating in terms of prices, so linking development to oil is a great risk. He provided evidence to support his argument by mentioning the fact that many countries in the world

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are seeking to find alternative energy resources instead of oil.

In addition, there is a lack of proper planning for sustainable development as Ph1.T14 stated that *"We do not have neither short-term plans nor long-term plans"*. Moreover, the lack of harmony between the Saudi ministries in operational levels was an argument that Ph1.T14 pointed out *"There is no harmony between the ministries with respect to sustainable development, each one does as it likes"*. More particularly, poor planning within the Saudi Ministry of Education resulted in useless outcome as claimed by Ph1.T19 who stated that there are no open options on which the student can be guided through to build his future. There is no curriculum to support these visions. With respect to operational levels within the Ministry of Education, Ph1.T1 expressed that:

> *"Sustainable development process must be organised and supervised by the Ministry of Education within the comprehensive system from the ministry to supervisors and teachers to the final product, who is a student. This process must be cohesive".*

Ph1.T21 indicated to the importance of sustainable development as it is a great project when there is a proper planning for it. Teachers touch on a central point that relates to educational policy regarding its regulations which are seen as barriers towards sustainable development, and they believe that the educational policy needs to be changed. The Saudi government can be represented by the Ministry of Education, so it is essential to re-structure this ministry. One way is to look at the circulars that are issued. Many of them are not in favour of the teachers, students, or the curriculum. I am in the field watching and noticing that many of these circulars are unfair to the teachers and unfair to the subject itself, Ph1.T19 noticed. He added that:

> *"We expect the experts and decision makers to seek the development of the ministry, like other ministries, such as the Ministry of Health. Despite its down-*

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sides, the Ministry of Health excelled us in the field of education. Therefore,

the Ministry of Education needs to be developed in all educational aspects".

Ph1.T10 stressed that the issue of sustainable development is still totally absent from education. He noticed other sectors such as media talking about this subject, but he did not see education talk about this issue. The educational policy should generate regulations that support sustainable development principles as the teachers believed.

5.5.1.2 Role of teachers

In this point, teachers highlighted the importance of viewing teachers as active agents not a passive deliverers of content. Ph1.T8 and Ph1.T9 emphasized the role of teachers in the education for sustainable development process by claiming, *"The teacher's role is important in presenting sustainable development concept clearly"*, whereas Ph1.T14 highlighted a central point with respect to teacher professional development as he claimed that teachers are not prepared in advance, even in initial teacher programmes. Similarly, Ph1.T7 requested teachers to be *"Graduated with a high degree of professional competence. The accurate tests for choosing the best teachers should exist".*
People now are not searching for the best school, but they are searching for the distinctive teacher, as stated by Ph1.T10. Additionally, Ph1.T19 expressed some concerns of teacher professional development requirements by expressing that:

> *"The teacher is confined to the curriculum, confined to classroom, stripped of*
>
> *his will power by the school management, and stripped of his will power by the*
>
> *educational administration".*

Ph1.T20 considered that there should be *"Self-development of the teacher"* indicating the necessity of encouraging teachers to update their skills and more recent topics and methods. About the role of the education ministry, Ph1.T19 wondered:

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"With all the capabilities of the Ministry of Education, what is the reason that prevents it from developing a teacher? It looks at the teacher as a technical tool and this tool must be working and directed through the circulars issued by the ministry. A teacher only has to hear, obey, should not object and should not discuss".

He suggested that a solution might be to provide some scope to the teachers, and to use their creativity. However, teachers currently have no authority for changing and reforming, as Ph1.T3 stated. He added that teacher is limited in what he can do and has no voice. Supporting the previous claims, Ph1.T19 stressed, *"The teacher does not express his thought although he may be better than the experts who work in the ministry".* He said, *"Experts do not want to hear from him because of differentiation and variation in positions".* Moreover, Ph1.T9 expressed his view by stating:

"There are several circulars, which oblige the teacher to complete the curriculum and the content in a timely manner. Thus, he cannot address the issues geographically, historically and nationally because this may take a lot of time".

This study attempted to provide spaces for the teachers to be involved in curriculum development in the Development Phase (Phase 2) because the researcher believes that there is significant value in involving the teachers regarding integrating SD in the SSCE curriculum.

5.5.1.3 The importance of specialisation in curriculum development

Teachers clearly stressed the importance of specialisation in curriculum development. Ph1.T19 was concerned with the curriculum being developed by unqualified people. He said:

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"Honestly, it is shameful and unfortunate if I told you that the field of education becomes a field of experiments made by people who may not have experience and from people who may not be involved in the field of education, but they have been given positions".

He commented, *"This is so critical to education, especially education matters are assigned to unqualified people"*. Ph1.T19 attempted to provide more details as the changes that often occurred in the curriculum were subject to the changes of the team responsible in the ministry and these changes happened quickly and apparently without planning. He added:

"In addition, when orders are issued to introduce a new curriculum or curriculum development or the work of a new version of the curriculum, we have got used to see such a change overnight sometimes".

The participant believes that:

"The reason that somebody is gone and someone came is that he wanted to change the curriculum. Do you think that the new curriculum has been tested, applied in their subjects, and has been experienced, never".

The lack of experience affects the curriculum development as Ph1.T20 claimed. Also, Ph1.T20 explained that there is no communication between experts in the Ministry of Education and educators in the field. Furthermore, Ph1.T19 pointed out this concern by saying:

"There is no department in the Ministry responsible to study the current and contemporary issues that are more critical to students and based on which themes we gave in the curriculum, these themes are really what we need right now".

5.5.2   Education context

The education context is the second requirement that needs to be activated for sustainable development to be incorporated in the SSCE curriculum in the Saudi context. Under this requirement, there are two main points which are the role of education and approaches to possible solutions. The education context needs to activate its responsibility and provide these requirements which are: reconsidering its actual role; reforming in order to deal with sustainable development issues; and having a relationship with other societal institutions. In the following paragraphs, these sub-elements are presented in more detail. The teachers also offered their views on possible solutions to these issues which are also presented below.

5.5.2.1 Reconsidering the actual role of education

Teachers emphasized the role of education towards sustainable development as Ph1.T4 expressed that *"A country with an advanced education will have sustainable development while a country without an advanced education will not have sustainable development"*. The role of education in developing sustainable aspects was mentioned by Ph1.T6 in which he argued that *"Sustainable development whether in healthy, scientific and creative aspects can only be achieved through education"*. In addition, Ph1.T21 provided an example from his experience regarding the educational role from another country:

> *"In Japan, in terms of oil and resources, does not have great natural resources, but there are scientists and creative minds. Where did these minds come from? They came from education and schools"*.

Furthermore, Ph1.T24 linked education to basic life issues by saying *"With the importance of energy in the development of societies, there is a need to educate and work to solve*

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its problems". Interestingly, Ph1.T21 shed light on the education factor by claiming that:

> *"Education is the basis of every development. I do not mean education is just*
> *a literacy. I mean serious education, the education that develops the best, the*
> *education that is not only for having a certificate or a job but also for serving*
> *the country in which I live in".*

Finally, Ph1.T25 concluded by stressing the fact that education is the basic in any process and it is one of the most significant pillars upon which any country depends with respect to development.

5.5.2.2 Reforming education in order to deal with sustainable development issues

Teachers expressed the view that the Saudi education sector needed to reform and re-think education so that it could have a positive role towards sustainable development. Ph1.T3 said, *"The problem that needs to be addressed is education"*. According to the research diary, Ph1.T9 believed that the Saudi Education sector by itself should compre-hend this problem before any other sector or citizens. This responsibility emerges as a duty of educational institutions towards sustainable development issues. The following quote mentioned one of the reasons that Saudi education needs reforming, which is the absence of sustainable development in the education agenda. The issue of sustainable development is still completely absent from education as asserted by Ph1.T10. In addi-tion, Ph1.T8 emphasized the previous view as he freely expressed that:

> *"First, the concept of sustainable development is almost absent among the*
> *members of society. Thus, it needs clarification in education in general. Ninety*
> *five percent of the community may have no background about sustainable de-*
> *velopment".*

Furthermore, Ph1.T24 indicated some points the Ministry of Education has to consider, such as the lack of awareness regarding sustainable development issues as he stated that:

"Underground water is little; on the other hand, there is clear squandering in society at the same time there is a lack of awareness and culture in this matter".

5.5.2.3 The relationship between education and society

Teachers consider the importance of having a positive relationship between educational institutions and society from the above governmental levels to operational levels for sustainable development, which is under the education context level. Ph1.T20 believed that everyone is responsible, community, school and family. It is argued that there should be cooperation between the institutions of society, education and media as mentioned by Ph1.T12. Likewise, Ph1.T22 agreed with the statement above by saying that *"For sustainable development there must be interconnected ideas, common elements and a spirit of understanding among the members of society"*. While other teachers consider the operational level as Ph1.T23 expressed that there should be an integrative process between teachers, students and family, and Ph1.T20 pointed out that school leaders should take on their role in contributing to the connection between the teacher and the community with regard to SD.

5.5.2.4 Approaches to solution

The second point of the education context is that teachers identified various approaches to solutions that the Saudi education sector could use for promoting SD. Teachers consider that the following elements are significant for this task: changing mind-sets and convinc-

ing citizens of the importance of SD; the role of students and young people in developing sustainable citizens; investing in the religious side of sustainable development; developing students' identities towards sustainable development; and social ways of changing attitudes towards sustainable development.

5.5.2.4.1 Changing mind-sets and convincing citizens of the importance of SD

Although this sub-subsection did not have a lot of evidence, it is believed that it is important in the study context. Some teachers believe that in order to achieve sustainable development, members of society should be convinced of the importance of sustainable development. Ph1.T10 stated, *"If a citizen, a teacher, a student, school director are not convinced, change cannot occur"*. Therefore, from this point of view, educational actors should take into account the principle of persuading members of society through various methods to engage them actively in sustainable development processes.

5.5.2.4.2 Role of students and young people in developing sustainable citizens

Teachers consider the student and youth roles which need to be taken into account when there is an attempt to have sustainable development. Ph1.T18 argued that when a student has awareness and has already thought about the value of sustainable development, he will have a significant role in the sustainable development process. Ph1.T14 explained how students are not seen as trustworthy agents that could participate actively in the SD by saying *"Sometimes we do not trust our youth"*. Based on the research diary, students are restricted to a curriculum which is not related to their reality and ability which generates a lack of interest and engagement in the students, as stated by Ph1.T19.

Ph1.T20 was concerned with the level of the Saudi youth in terms of their culture towards SD, as he believed that if it were measured, the results would be insufficient. He believed

that *"Other sustainable issues can be compensated, but the question is how the society can re-establish a generation that can contribute to SD positively"*. Moreover, Ph1.T21 emphasized the human role as an enquirer, as he stated:

> *"It is important that the student understands what the role of the human in sustainable development is. The human is the basis of sustainable development, and sustainable development cannot be carried out unless he has the data".*

On the other hand, according to the research diary, Ph1.T1 affirmed that the importance of students' voices should be taken into consideration in the sustainable development process. He suggested that the solution of our problem is to see students' perspectives and then guide them to sustainable development issues so that they would then have a clear picture of it.

5.5.2.4.3 Investing in the religious side of Sustainable Development

This sub-subsection discusses the effects of religion as a factor to enhance and support sustainable development in the Saudi context. This point is one of the proposals that teachers recommend to be taken into consideration within the new curriculum which is developed from this phase. Ph1.T13 considered the Saudi context as a factor that encourages sustainable development by stating *"The religious reason to raise your country and the personal desire is to boost this country and serve it"*. Ph1.T19 supported Ph1.T13 by saying:

> *"We are seeking to develop our future, renewing our future while maintaining what we have done in the past. Due to the past is linked to our religion, we cannot abandon it. We have our own civilization, glory and others civilizations were built based on this civilization".*

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Further, Ph1.T14 argued that establishing the students' religious sense resulted in better conserving and investing in natural resources. The religious aspect was what Ph1.T1 indicated to be a future support for sustainable development.

5.5.2.4.4 Developing students' identities towards Sustainable Development

An unexpected finding that appeared from the data was about developing students' identities towards sustainable development, which was considered as one of the requirements needed for sustainable development. The following quotes are examples of the lack of developing the student's identities. For example, Ph1.T19 emphasized that some students are aimless. He stated:

> *"When students graduate from secondary school, they do not know where to*
> *go. There is no guide for them, there are no open choices which they depend*
> *on. This is indeed the truth".*

Further, recognising ability and skills has the same importance as knowledge, as mentioned by Ph1.T1. Moreover, Ph1.T19's concern was moving from accessing the knowledge to developing students' identities by having various resources from which to acquire the knowledge. Soon, Ph1.T19 stressed that having a constrained curriculum will not help in building the student creativity toward sustainable development. Students need chances, as they have proved that they can reach advanced positions in international competitions, as Ph1.T21 argued. On the other hand, Ph1.T19 and Ph1.T25 highlighted that students need to develop the skills of research rather than to do activities that were more typical of school work, such as studying and memorising from textbooks.

5.5.2.4.5 Social ways of changing towards Sustainable Development

Teachers' interviews provided examples of how changing the curriculum could lead to changes in society that might improve sustainable development. For example, Ph1.T13 mentioned, *"We hope that sustainable development issues are going to be in our minds and in our curriculum"*, and, Ph1.T6 supported this by recommending, *"To develop a curriculum that serves sustainable development, serves the student's future as well as society"*. Ph1.T12 pointed out that citizenship education can be used to improve the sustainable development through choosing its topics, which can promote the students' thoughts in order to develop their country. The role of building responsibility among citizens was addressed by Ph1.T21 as he claimed that:

> *"The first matter we have to do is that we need to refine the citizen who belongs to the country and he is responsible for the country as he is responsible for his own house. If our responsibility inside our homes exists outside of them and inside society, we will evolve significantly".*

Furthermore, Ph1.T4 said, in order to sustain important elements in this life, the community requires constant awareness. The Saudi education sector *"Should educate and develop the sense among its workers and staff, regarding sustainable development issues which are affecting society"* as Ph1.T9 recommended. Ph1.T21 concluded by saying that only when the Saudi education system has appropriate teaching strategies, which are far from the process of indoctrination and the giving of certificates at the end of the year, will we solve many things.

5.5.3 How feasible is it?

During their interviews, teachers discussed whether it was feasible to incorporate SD in the curriculum through developing the current curriculum and the school environment.

5.5.3.1 Developing the curriculum

Teachers consider the development of curriculum as one of the requirements for having sustainable development. For example, Ph1.T1 emphasized the need to address sustainable development in the curriculum by stressing:

"There is an urgent need to address the issue of sustainable development and to highlight it in the curriculum in a holistic manner, and this is because of the country's situation".

Moreover, the importance of integrating sustainable development issues in the curriculum was the point that Ph1.T9 started with, as the curriculum should address sustainable development issues such as natural factors and social factors that society needs. He added that even a small amount of sustainable development should be presented in the entire curriculum, such as chemistry, physics, and social studies.

About the advantages of including sustainable development in the curriculum, Ph1.T7 stated that *"If sustainable development is integrated in the curriculum, there will be a great dialogue and debate on sustainable development issues".* Similarly, Ph1.T9 brought another advantage that is the extent in which:

"The curriculum helps teachers through providing them a piece of focused knowledge, which integrated sustainable development while at the same time forcing them to address these issues by teaching".

Ph1.T13 raised the issue of resources and teaching approaches, saying that the role of media in introducing sustainable development is better than using textbooks because media simulates the students' lives, desires, and interests. Talking about how to renew the curriculum, Ph1.T24 recommended that these issues could be best addressed by focusing on them through pedagogy. Whereas Ph1.T15 argued that:

"The truth is that curriculum should be transformed from quantitative episte-mological views to qualitative ones, especially with the availability of the In-ternet and developed countries, which link their curriculum with the reality of students".

Although teachers considered the importance of developing the current curriculum of SSCE, they did not provide enough information of how to apply the principles of SD in the curriculum. This leads us to look at the data more carefully to provide a compre-hensive answer to the question of how a scheme of work might be developed that would integrate SD into the SSCE curriculum and that they could try out in their schools.

Ph1.T1 mentioned that SD needs to be integrated in the SSCE curriculum holistically but without emphasizing which areas of SD require more attention to fulfil their local needs. On the other hand, only seven of the twenty-five teachers during the interviews showed their interest in sustainability competencies, such as systems thinking and interpersonal competences, that needed to be developed within the SSCE curriculum. Ph1.T9 believed it is vital to use systems thinking to deal with different issues of SD such as water sys-tems: *"Water is the basis of life, and we suffer from lack of fresh water. No water no life".* Ph1.T10 added that all elements in life are connected with each other: *"Fresh water contributes to solving many problems such as greening the land and desertification and it will address those problems automatically".* While Ph1.T16 gave an example of using a higher level of systems thinking by analysing the current situation:

"Because of the lack of rain, the expansion of desertification is continuing. In addition, due to the drought, it will devour large areas as it did in other countries, perhaps this because of the general climate change, which led to high desertification and lack of rain. The lack of rain leads to drought and drought leads to desertification. Desertification cause havoc, reduce human settlements, and thus is not helpful for human beings".

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Furthermore, applying systems thinking within a social context was considered by Ph1.T4, who suggested a community as a system that can be developed through *"Benefiting from knowledge and exchange of experiences among community members"*. Ph1.T25 also considered the educational process as a system by emphasizing the importance of the relations between the education's elements to make systems thinking work in an educational environment:

> *"It is related to the scientific approach, especially in relation to education, a strong relationship between the student and the curriculum in activating many things of the objectives and strategies of the curriculum that the student should study".*

Ph1.T19 proposed pedagogies such as Problem-Based Learning and Collaborative Learning to be used inside the class to increase systems thinking and interpersonal competences by saying:

> *"Encourage students to search and be creative. Try not to constrain them, just give them a chance. Let students to go ahead, say I have a problem with desalination, oh youth can you look for this topic, tomorrow we discuss it, or next week. Say to students, can you create alternatives solutions of this problem, can you look for studies, rely on everything, like previous experience, the Internet, researching, books, libraries, do something and act".*

Ph1.T19 highlighted that there is a lack of agency and empowerment among SSCE's students in terms of interpersonal competences:

> *"When the student comes to grade tenth, and asked what your ambition is and where do you want to go to. He does not know. His dream and his goal is just graduating from high school, and then goes to the street".*

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There are internal and external conditions that need to be considered to make teachers able to participate in systems thinking activities, namely the role of leadership and family. For example, Ph1.T20 believed that *"A school leadership should contribute to the connection between the teacher and the community"*. Moreover, Ph1.T23 considered that In order to make systems thinking and interpersonal competences work:

> *"There should be an integrative process between a teacher and a student and family, through communication between the teacher and the student and the family"*.

5.5.3.2 School environment

Teachers perceive the school and classroom environment as one of the requirements that needs special attention. Ph1.T21 affirmed the significance of school environment in producing good outcomes for SD. Also, Ph1.T8 supported the statement above by expressing that:

> *"The school environment should motivate students to do so, for example, to preserve the remains of food. The school environment can promote teachers to prepare well and use technology to deliver knowledge in an interesting way"*.

Enhancing and training teachers and educators toward sustainable development has a role in formulating a healthy environment, as Ph1.T1 indicated in his interview. In addition, Ph1.T14 talked about challenges within the school environment, such as frustration from the surrounding environment for both students and teachers. Ph1.T20 also believed that the school leader has a vital role in the school environment and the school administration should be a firm management. Notably, Ph1.T21 emphasized this point by saying that:

> *"I am against the idea or the view that our students have no desire in schools, have no desire for lessons, have no desire to study, on the contrary, I see that*

if the student has been provided good ways, I am sure you will find a student who has a great degree of knowledge".

He attempted to convince educators, who merely have excuses through blaming students without having themselves made any efforts:

"For example, a kindergarten child initially refuses to go to school, but just after a short period, he wants to go because he likes the kindergarten, why? Because there is a smart environment and a variety of activities that make the child love the school".

Then he concluded by stressing that:

"Did you notice that there is a very big difference between the beginning and the end, why? This is because the child is attracted to environment and its tools, so if these are available to the student in primary, middle, and high school how will our education be! Magnificent, and there will be a very excellent educational product".

The teachers' views have been presented in terms of the need to change for sustainable development to be incorporated into the SSCE curriculum and its two main requirements for change which are the political and educational contexts.

5.6   Teachers' Views on the Implications: Current Implementation of Continuing Professional Development Programmes

In this section, teachers provide valuable perspectives regarding the current implementation of continuing professional development (CPD) programmes in Saudi Arabia, which are based on training and cascade models. They express the view that teachers are

capable of their own self-development and this leads to a discussion of their views on Community of Practice (CoP) as the most appropriate CPD model that can be used for implementing a Problem-Centred Design approach to integrating SD in the SSCE curriculum. In addition, they provide enabling elements that support CoP in order to provide comprehensive system for integrating SD such as using Sustainable Pedagogical Content Knowledge (SPCK).

5.6.1   Current models of CPDs

5.6.1.1 The Training Model of CPD

In their interviews, teachers expressed their opinions on the training model of CPD including: trainer's goals, qualification of the trainer, the content that is presented in the training programmes, the trainee's goals and their roles and the contribution of training to CPD of the teachers. The teachers also identified some challenges within the training programmes which include lack of incentives, the desire for Self-Development, the possibility of the implementation in their schools, lack of support beyond the training programmes, lack of quality and further challenges that related to the school.

Ph1.T12 argued that *"The trainer, who gives the course, is aiming just to give it in order to be recorded in his official record. It is as ink on paper, but the benefits from such courses are rare"*. Teachers think that these trainers are not qualified to run these training programmes. For example, Ph1.T15 showed how some trainers copied information from the Internet because they did not have sufficient knowledge and that *"Being trained by such people is completely unacceptable!"*. Interestingly, Ph1.T6 believed that *"Some trainers need to be trained before they train teachers"*. Teachers mentioned the content of the training programmes was one of their concerns. Ph1.T12 stated that:

"The content is not suitable. It is only lecturing and listing huge information

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and items without providing space for explanations or implementations, which can assist understanding the content and then applying it".

Further, Ph1.T22 and Ph1.T14 supported the previous claim by Ph1.T12. Teachers highlight their aims to attend such training programmes as Ph1.T4 stated:

"Most of the teachers are taking these courses in order to collect the amount of training hours to be counted later in the competition for career advancement in order to become a deputy director, a director of a school or teaching outside the Kingdom of Saudi Arabia".

Teachers stated that they did not participate in those training programmes as they should do. Ph1.T9 expressed that:

"The teacher's role here is the recipient, not as a participant and his experience is not taken into consideration. Teacher, in fact, is the one who implements educational processes more often than anyone else, so his voice is supposed to be heard and enhanced in such courses".

Teachers show their experiences with respect to the contribution of these training programmes. Ph1.T3 attended more than 33 courses and he found only 20% tackled educational issues. In detail, Ph1.T6 justified Ph1.T3's view by arguing that *"80% of the courses do not serve the curriculum, the teacher, and the development of country"*.

Teachers identified some challenges within the training programmes. Firstly, according to the research diary, teachers believe there should be incentives to encourage them to attend these training programmes. Ph1.T9 stated that if a teacher were provided with the appropriate conditions such as comfort, security, and reduced depression, he would be able to focus on improving himself professionally.

Secondly, Ph1.T3 indicated that the teacher's motivation for his continued development is

an important factor.

Additionally, Ph1.T9 supported Ph1.T3 through his statement *"You have to fully believe that all the conditions will be available and the solutions will not work, unless the teacher has the desire and the sense to develop"*. Thirdly, teachers were dissatisfied with the training programmes because it was difficult for them to apply what they learnt from these programmes in their schools. For example, Ph1.T4 stressed that:

> *"The problem is that teachers are not applying what is taken in these courses in their teaching practices. If you ask a teacher who took five courses last year, did you apply them into your teaching practices, the answer is no"*.

Another challenge is that teachers claim that there is no support after having training programmes. Ph1.T10 said, *"Do not tell me do such and such and then leave me, telling me your performance is not correct after a period. We are in trouble"*.

A fifth issue is that teachers think that these training programmes do not fit with educational purposes that consider the needs of teachers, students and curricula as Ph1.T14 stated *"There are courses but they do not achieve the educational purposes"*. Yet another challenge is that the quality of training programmes and its elements such as the time that is provided in these courses *"Is short and is not enough to cover a subject"* as Ph1.T10 noticed through his participation in these courses. Finally, teachers face some challenges within their schools regarding the curriculum and students. As Ph1.T7 stated, *"You can imagine if I took a course outside of school for a week, this affects the functioning of the curriculum and students"*.

5.6.1.2 The Cascade Model of CPD

With regard to cascade model, Ph1.T4 provided a general idea about it:

> *"Cascade model can be used for teacher development, which can be defined*

*as one teacher from the school sent to the training centre in order to be a
trainer after he masters the course, and then returns to the school and trains
his colleagues".*

However, the teachers considered the cascade model of CPD to be unsuitable. For example, Ph1.T10 believed that a cascade model is still not the right one for teacher development programmes as:

*"Colleagues have a wonderful response about using a cascade model in
school, but this has a negative impact on schoolteachers with respect to the
absence of those who attend these courses".*

A similar view was introduced by Ph1.T12 who supported Ph1.T10 by saying:

*"Training courses moved from the training centre to school with all ideas, its
advantages and disadvantages, but it may be the teacher that can deliver the
course content better than supervisors can in the training centre".*

5.6.2   Alternative models of CPD

During the interviews, the teachers were asked whether there were other forms of CPD that they thought would be more useful. Their ideas are presented below. Teachers think that there are other ways to overcome the disadvantage of the current CPDs' models through teacher development, self-development, motivation and sharing expertise with others.

Ph1.T3 emphasized teacher self-development as a central point is *"The most important thing is the teacher's desire for his continued development. This is an important factor".* While Ph1.T21 associated teacher development to the teacher's wishes. He supported Ph1.T3 stating that if the teacher has the desire to develop, he could see that the doors

of development are opened and everywhere. Furthermore, Ph1.T13 stressed that *"The foundational stimulant for the teacher should be from inside him before our educational policy"*. Additional ideas are provided by Ph1.T7 as he recommended taking experience from other departments and discussing new things. Also, Ph1.T13 repeated Ph1.T7's idea by saying *"Sharing ideas and experience from outside the department is also important. It is a nice step for combining the internal and external experiences"*. This idea can be linked positively with the next CPD's model, which is Community of Practice.

5.6.2.1 Model of a Community of Practice for interpersonal competences

In their interviews, teachers pointed out the idea of working collaboratively together to integrate SD into the curriculum. This idea was interpreted by the researcher as a community of practice notion. They recommend a collaborative model as a possible way for this project. Elements of the CoP model were evident in the teachers' data, even though at the time they did not call it that. They showed ideas relating to the potential advantages of using a collaborative Community of Practice model.

Teachers believe that there is a need for this kind of model for teacher development as a way to promote interpersonal competence within the working environment as follows. For example, Ph1.T1 hoped to have a collaborative working community to develop the teachers' interpersonal competence but unfortunately, it does not exist. There was a similar argument by Ph1.T7 who said that a collaborative community is not implemented, and unfortunately, there is a flaw in the non-applicable side of a collaborative community. The reflection of the teachers' relationship on developing their teaching was what Ph1.T7 pointed out. He said:

> *"The issue of harmony exists in the school and among teachers, but not in the field of improving ourselves in terms teaching practices. There are social*

relations, but they are not reflected in improving our work".

Whereas Ph1.T17 wished to have this kind of teacher development model, Ph1.T19 gave advice on how to apply a collaborative community of practice model:

> *"At least in the same school, two or three teachers from the same subject can make it, even without having external members from the Ministry of Education or any other places".*

Teachers show the importance of having a collaborative community of practice model. *"Collaborative work is very important and useful"* is what Ph1.T3 opened the discussion with. In more detail, Ph1.T4 said *"It will be a good idea if it will be applied, and it is a good principle because teachers have many experiences"*. Moreover, Ph1.T4 added:

> *"It is very fabulous, especially in a working environment, which a person can work through collaboratively, and this person accepts critiques from his colleagues because the goal is seeking development not only for criticism".*

In addition, Ph1.T5 expressed this from his experience *"Collaborative work is important and better than isolationism and unilateralism, especially when there are colleagues who have experiences that you do not have"*. In a comparison between training courses and a collaborative community of practice, Ph1.T14 believed that a collaborative community of practice model can be much better than the training course because it is focused on practical applications rather than the training course, which is dominated by the theoretical aspects. Finally, Ph1.T15 concluded by agreeing with Ph1.T14 as he thought it is much better than the current professional courses.

5.6.2.2 The potential advantages of using a collaborative Community of Practice model

Teachers provide many potential advantages of using a collaborative community of practice model. For example, Ph1.T4 said:

"There is diversity and exchange of expertise through working in collaborative community. It generates success, cost-benefit in time, and effort, especially in schools".

While Ph1.T7 provided more explanations:

"There are teachers who are unique in the paperwork and organising daily work, but they are not performed well inside the class. In addition, other teachers are the opposite; they are performing well inside the class, but have a lack of coordinating aspects".

Also, Ph1.T14 supported Ph1.T7 by commenting that he can benefit from colleagues through observation, sharing teaching methods and organisation. Further, Ph1.T11 looked at it from a different angle at the impact on hosting teachers *"Teachers are visiting each other and having practical cooperative lessons, would have a great impact on teachers who have been visited"*. Ph1.T1 provided a new thought with regard to the potential advantages of the collaborative community of practice model as it might get to the idea or project, which will have an impact in the near future. Ph1.T6 added other benefits by expressing this:

"Perhaps the teacher is frustrated, or a new teacher needs help by our department or colleagues, this problem can be addressed. In addition, there will be goodwill, attraction, cooperation, affinity, familiarity and love".

Similarly, Ph1.T7 asserted the above benefits by saying that teacher is functioning normally, without official complexities when he is performing through collaborative work. Finally, Ph1.T16 concluded by stressing that this can resolve the differences between the teachers and performance will increase. The next subsection presents the enabling element that supports CoP in order to provide comprehensive system for integrating SD, which is using Sustainable Pedagogical Content Knowledge (SPCK).

5.7 Sustainable Pedagogical Content Knowledge (SPCK)

Teachers consider the importance of Sustainable Pedagogical Content Knowledge as the area that needs to be considered when there is an attempt to integrate sustainable development in the curriculum. In the context of this project and its location in Saudi Arabia, each word has a particular meaning. Sustainable refers to the specialist knowledge in sustainability that teachers may not be expected to have, but that is knowledge held by experts external to the school, in the wider society, who are professionals working on sustainable development projects. Pedagogical refers to the specialist knowledge in teaching and learning held by teachers. Knowledge refers to the content knowledge that has to be taught in the SSCE curriculum and the SD knowledge and skills that needed to be integrated during the Development Phase.

Although teachers did not have specialist knowledge in SD (see Section 5.3), they do have knowledge in pedagogy and curriculum content and provided the following views on these aspects. Ph1.T2 was concerned that *"Historical issues can be difficult to be employed from teachers and be linked with citizenship education"*. Utilizing new teaching methods was the key argument for Ph1.T8 as this affects the student much more than didactic methods. Furthermore, Ph1.T9 explained how a teacher can use various teaching methods:

> *"Now, unfortunately, it relies on stuffing information in the minds of students without using the best practice and the practical application of knowledge. With simplistic topics codified, teachers can assist students to have first-hand experience of these issues and implement what they have learnt in the classroom naturally".*

The implementation of new teaching methods resulted in producing ideas through brainstorming, student participation, and diversity of ideas. In addition, involving the students

actively in lessons helps them to consider others angles of thought, as Ph1.T15 high-lighted. Ph1.T11 suggested ways to incorporate sustainable development even when it is not explicitly mentioned in the textbooks:

"The current curriculum does not mention sustainable development, but the teacher can be creative through the general guidelines, which can allow him to assign a student to conduct research in such topics like rationalization, development, and finding a solution to a particular problem".

Ph1.T19 wondered why students are not given a chance to try solving sustainable development problems. Ph1.T22 stressed that is necessary to let teachers keep track of the growth of their students, while Ph1.T13 emphasized that sustainable development issues need to be connected with students' life, *"The way that themes are presented should be linked with student's life".* Ph1.T7 argued that it was important to link historical aspects to sustainable development, something that this study aimed to implement in Phase 2. Finally, Ph1.T22 summarised this discussion by reminding us of the role of education and the importance of presenting the knowledge in an accessible way.

5.8   Summary of Phase One Findings and Implications

The key points of the results of Phase 1 can be summarised in the following points:

- Although both teachers and students had a general understanding of the SD concept, which is the first step for integrating SD in an educational agenda and curriculum, they did not provide information that was consistent with the Brundtland definition of SD;

- Only one teacher was able to provide sufficient information about the definition of SD that was consistent with the Brundtland definition, which indicates the need for

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developing subject matter knowledge among teachers and students in terms of SD meaning;

- Teachers and students cannot be blamed because the current educational policy does not support ESD explicitly, actively and comprehensively whether in terms of circulars that are issued by the Ministry of Education, insufficient CPDs programmes and the top-down approach of leadership;

- Although the challenges of integrating SD in the Saudi education context and particularly in the SSCE curriculum, such as an inappropriate school environment and the content of SSCE seeming difficult and complex, teachers' and students' agency and empowerment can help to apply a bottom-up approach to changes;

- Teachers and students indicate their desire to activate their roles to work with SD but they do not have enough cutting-edge knowledge with regard to sustainability educational areas and approaches that they apply in their schools;

- Although teachers' beliefs indicate the importance of all social institutions to participate in the integration of ESD processes, there is a lack of initiatives that can show how this can be achieved in real world educational settings;

- Although interpersonal competences did not develop among students appropriately, there is an opportunity to improve these competences among them;

- Although developing these competencies is needed to integrate SD in the SSCE curriculum, only few teachers showed interest in developing them;

- Teachers want to use innovative pedagogies to assist them to develop and to increase these competencies among students such as Problem-Based Learning and Collaborative Learning;

- Although teachers are not satisfied with the current CPDs that they are using due to some challenges such as an inappropriate content, the qualification of trainers, the role of teachers in these CPDs programmes, their proactive ways to develop themselves professionally seem weak;

- Although teachers are positive about developing themselves within their setting in a collaborative manner, they lack the knowledge of how to do it professionally, as well as how to get support from senior managers and local educational administrations;

- These key findings will be taken into consideration in Phase 2, the Development and Implementation Phase (Chapter 6, Section 6.2).

6. PHASE TWO: RESULTS

6.1 Overview of the Chapter

Phase 2 attempts to answer research question number 2: How does building a community of practice and the use of Problem-Centred Design promote the incorporation of sustainable development in the SSCE curriculum in the Saudi 10th grade? In addition, it attempts to answer research question number 3: What are the factors that foster or hinder the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi 10th grade?

These two questions were investigated in two case studies called Case M and Case O and for the purpose of analysis each one of them has its own section (see Sections 6.3 and 6.4). This chapter presents the Nominal Group Technique (NGT) with 50 of the 10th grade students, 25 students in each of the two cases, the interviews with five teachers in both cases, photographs, teacher field notes and the research diary.

6.2 Description of the Project: (The Development Phase)

Here is a summary of Phase 1 findings which can be helpful for this phase (Figure 6.1).
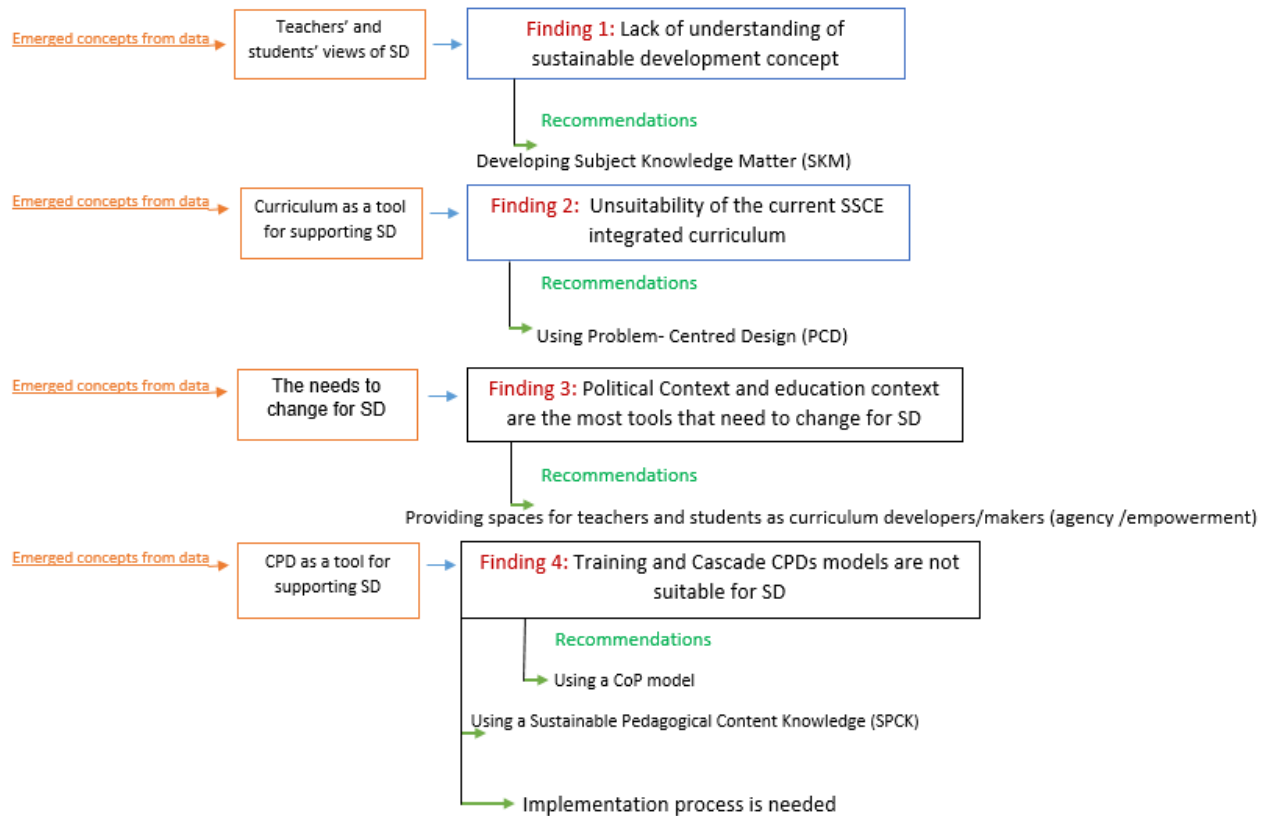
Fig. 6.1: Diagram showing the findings of Phase 1

After conducting Phase 1, the researcher created a curriculum planning group, which consisted of the researcher and selected participants. The participants (teachers and students) were selected based on their interest in working together to create two sustainable development units. As discussed in Chapter 4, the development of the sustainable development units took over five months and was conducted in two stages. The first stage developed a broad outline for two units with the wider group of 7 teachers and 7 students (summer holidays 12/5/2016– 14/9/2016), and the second phase developed specific schemes of work for the two units with teachers from schools M and O (15/9/2016– 12/10/2016).

The role of the researcher in the Development and Implementation Phase was both a

project coordinator and a participant researcher. Due to the joint role and the time needed for the research to collaborate on the development of the units with the teachers and students, data were not gathered during this phase because being coordinator and researcher was not manageable. The researcher immersed himself in the development of the schemes of work within the community of practice (CoP). He did not bring a pre-defined set of units for the teachers to implement because this was not an intervention project. He worked with and alongside the teachers to collaboratively create the units as part of the sustainability of the process. The main aim was to eventually make his role redundant.

Therefore, the teachers and students participated in co-creating and co-constructing the sustainable development units so that they intentionally incorporated SD competencies into these units in the tenth grade. During this Development Phase, the work involved the use of systems thinking skills and interpersonal competences in order to put the sustainability competencies into practice.

It was decided that the students should first focus on developing a clear concept of sustainable development before starting to engage with real life problems through a Problem-Centred Design approach.

Moreover, the curriculum planning group took into consideration the proposals that participants suggested in Phase 1. Therefore, two units called 'a sustainable city' and 'a positive citizen' were co-created, which were considered to be relevant, contextual and supportive for authentic learning. Also, they provided potential to include a Problem-Centred Design towards the end of each unit. The designed curriculum evolved and changed due to the generated ideas by students that fitted with the themes, so it needed to pay close attention to students' ideas and to use them for next lessons which need flexibility. An overview of what was created with the teachers during the development of the two units is provided below.

- (A) A sustainable city includes a sustainable:

  - Housing system;

  - Energy system;

  - Water system;

  - Transportation system;

  - Clean air system;

  - Food system (fruit and vegetable);

  - Food system (chicken and fish);

- (B) A positive citizen and sustainable city includes a:

  - Youth and investment system;

  - Youth and future challenges system;

  - Youth and sustainable entrepreneurship system;

These topics are the results of the feedback received from the participants, both teachers and students (see Appendix T). Working with schools M and O, the topics were further refined to incorporate the seven concepts of sustainable development (Table 6.1):

1. Sustainable change;

2. Uncertainty and precaution;

3. Citizenship and stewardship;

4. Interdependence;

5. Needs and rights of future generations;

6. Quality of life, and equity and justice;

7. Diversity (SDEP, 1998).

Tab. 6.1: An overview of the two units (SD competencies and concepts are shown in bold)

Questions of the curriculum plan Unit One	Answer
What units of SSCE were taught?	Based on the SSCE general objectives, there was a possibility to incorporate SD in the Saudi MoE Curriculum for SSCE, especially within: 1-National issues 2- The Arabic World 3- World Events as is shown in Table 5.8.
Which topics?	We created this unit which is called a sustainable city that included seven topics (Figure 6.2).
What SD concepts + competencies were integrated?	**SD competencies:** Focus: **systems thinking** and **interpersonal competences.** As is stated in the literature review Chapter, these two competencies were the focus of the study, but the other competencies were not ignored. All competencies in Table 3.3 were used during the teaching programme, but research data was only gathered for the two focus competencies. **SD concepts:** all the seven concepts were used but there was an emphasis on **uncertainty and precaution.**
What pedagogical tools/methods were used?	**Systems thinking** was developed through TASC, while **interpersonal competences** were developed through (identity and community).
Questions of the curriculum plan Unit Two	**Answer**
What units of SSCE were taught?	Based on the SSCE general objectives, there was a possibility to incorporate SD in the Saudi MoE Curriculum for SSCE especially within National issues.
Which topics?	We created this unit which is called a positive citizen that included three topics (Figure 6.3).
What SD concepts + competencies were integrated?	**SD competencies:**
What pedagogical tools/methods were used?	Focus: **systems thinking** and **interpersonal competences.**

These combined efforts were helpful and guided the choice of the topics for the two units and their sub-topics. There is a belief that criticality "situates the systems thinker within the systems they are studying" (Clark et al., 2017, p. 2). These sub-systems enable students to understand life systems as well as providing an opportunity for students to use their systems thinking abilities and interpersonal competences to deal with these sub-systems. Finally, it was decided by teachers in school M and school O that these two units would be presented to the 10th grade students through Articulate Storyline (Figures 6.2 and 6.3).
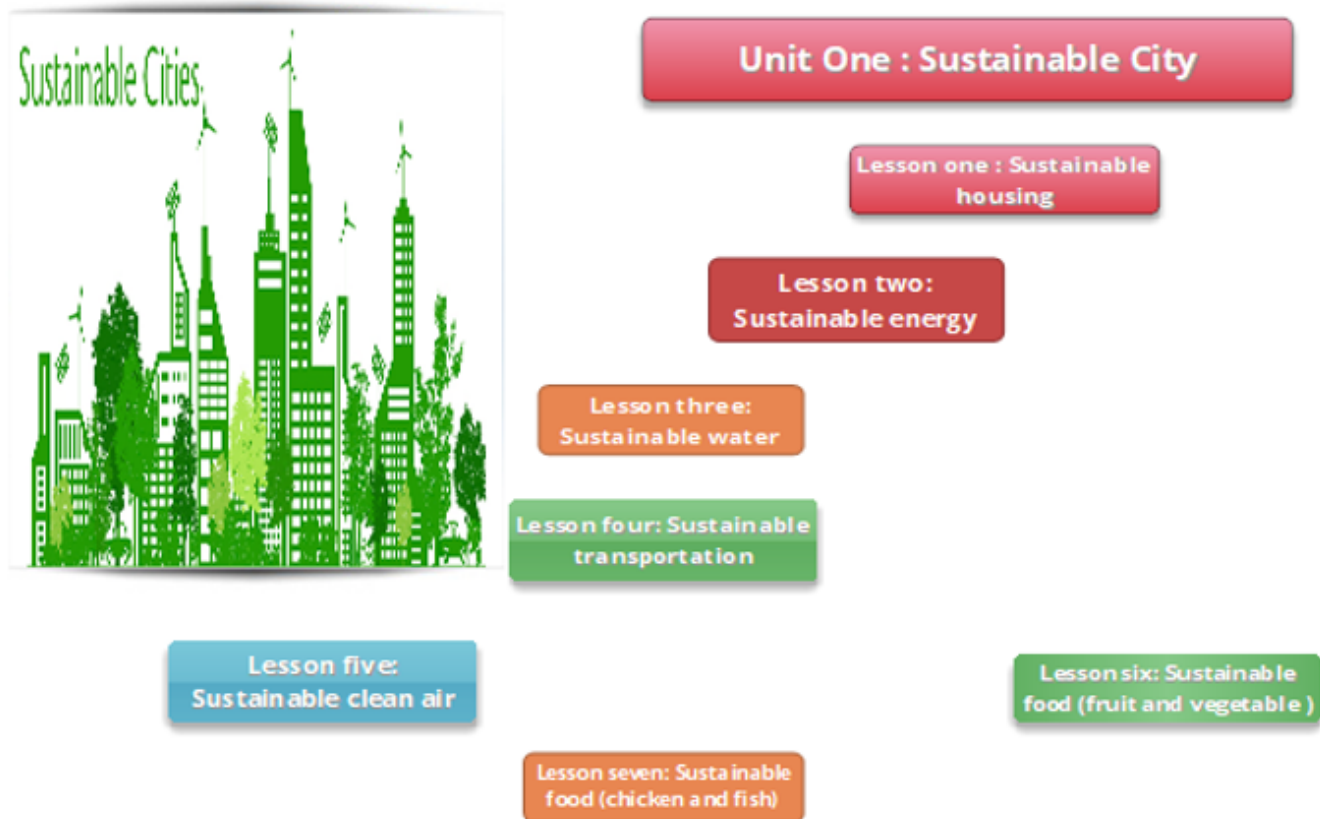
Fig. 6.2: The first unit presented through Articulate Storyline

Fig. 6.3: The second unit presented through Articulate Storyline

In the digital age, students require easy access to a curriculum that has been designed in a digital format. Therefore, the planning group decided to use the Articulate Storyline 2 software programme in order to facilitate accessing the content of Problem-Centred Design on-line, as well as to support the development of the community of practice. It is argued that once information and communication technology (ICT) facilities are fully used, interactions between teacher and learner, learner and learner and teacher, learner and parent are maximized (Wallace et al., 2012).

A further pedagogical tool, Thinking Actively in a Social Context (TASC), was also used to present the curriculum to the students in interesting and attractive ways. These tools were implemented within a collaborative community of practice case study in two Saudi high schools and were also chosen for their ability to support

the development of the target competencies of interpersonal communication (Articulate storyline) and systems thinking (TASC). This was at beginning of the first semester in the academic year 2016–2017 (15/10/2016–09/1/2017). The findings of the implementation of these two units in schools M and O are presented in the next sections.

6.3   Case M

The data for case M will be presented under two main headings: students' perspectives and teachers' perspectives.

6.3.1   Students' perspectives

Students' perspectives are presented in this section through the findings of the final NGT method in which the students were asked about their experiences of taking part in the project. As discussed in Chapter 4, the researcher acknowledges that because the time for gathering NGT data was limited to a single occasion, the findings in Phase 2 are not as in depth as the findings for NGT in Phase 1.

6.3.1.1 Understanding the meaning of the concept of SD before and after implementing the project

Through the NGT method, students provide similar responses to the teachers at this point as they were asked about their notion of the concept of sustainable devel-

opment and how this concept has become more understandable after applied the programme:

"Our understanding of sustainable development before the programme was just a simplistic one, which was too general and incomprehensible. However, after going through the programme of sustainable development, the concept of sustainable development has become more understandable, including, for example, the recycling of resources which we can reuse wisely for several situations. In addition, it includes working for next generations, thinking of future problems and trying to find solutions".

Applying the programme made a big difference to the students' understanding of the concept sustainable development (SD). While they thought that it was all about simple ideas in one field, the explanation through the programme corrected their thoughts. They then understood that SD not only relates to the environment, but also includes even the way of thinking and how to find a sustainable solution for life problems.

6.3.1.2 Developing students' identities towards SD through various strategies

Students added different view about developing students' identities towards SD through various strategies through the NGT method:

"A variety of supporting teaching methods were used, which have provided great opportunities for students' intellectual development, learning and self-expression. There were presentations on YouTube in English but with Arabic subtitles, which were very exciting and motivating to further actions".

The student here indicate a very important point with regard to the diversity in teaching methods. Students enjoyed the new technology that was used through the programme. It also helped to make the process of learning more applicable and sustainable. We should note that the students are hungry to learn what is happening in other cultures and how to understand other languages. This indeed enhances their improvement and skills.

6.3.1.3 Did interpersonal competences develop among students?

The NGT method provided many benefits to students by using interpersonal competences as follows:

"Relatively it was good. It facilitates in many learning processes such as participating, understanding, thinking, developing skills and sharing ideas with others".

Students also note that the interpersonal competences assist them in developing their technical way of learning. Indeed, interpersonal competences would be a good method to exchange thinking methods and skills.

6.3.1.4 Did systems thinking develop among students?

Students reported through NGT how teachers performed within CoP principles to activate their systems thinking to present the project and how this affects students' motivation in their learning:

"Teachers' performance was wonderful because they presented the information easily and there was a catalyst for the programme, they encouraged the students, not like the rest of the other teachers who tend to de-

motivate students. Teachers had a very important role in the programme
in terms of the programme organisation, coordination and arrangement of
its utilized materials".

The role of the teachers was very effective while using the CoP process especially in developing systems thinking among students. Students think that by organising the process in the programme the teachers encourage the learning process and support them for more improvement.

6.3.1.5 The role of school leadership in the project

Students in the following quotation explain how the role of school leadership in this project was through the NGT method *"The administration team was cooperative. It has a great role. It psychologically supports the students and provides the right environment for them".* The administration team also was in the list of effective roles during the implementation of the programme. It indicates that the schools through their administration team can play their role positively for the sake of developing the students learning. Their encouragement is highly appreciated from the students.

6.3.1.6 Presenting proper instructional materials

Students through the NGT method expressed their idea about the facilities which were used in the programme as following:

"The materials used were appropriate and good. In addition, the themes
of the programme were excellent and interesting. The utilized programmes
such as TASC and Auto-desk design were easy and fruitful. Most impor-
tantly, they were easy to use".

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The previous quotation strengthens the view of using appropriate instructional materials as this improves the students learning and skills. In fact, teachers always are advised to select the most affective materials for their students to make the SD curriculum easier and understandable.

6.3.2   Teachers' perspectives

Teachers' perspectives are presented through the findings from the interviews, photographs, teacher field notes and the research diary. In this section, the analysis of the data in sections 6.3.2.1–6.3.2.2 is presented to answer research question 2: How does building a community of practice and use of Problem-Centred Design promote the incorporation of sustainable development in the SSCE curriculum in the Saudi 10th grade? The analysis of the data in section 6.3.2.3 is presented to answer research question 3: What are the factors that foster or hinder the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi 10th grade?

6.3.2.1– Was a (CoP) built?

6.3.2.1.1– How was it built and who did it involve?

6.3.2.1.2– How did it work?

6.3.2.1.3– Why did it work?

6.3.2.2– What were the outcomes in terms of incorporating SD in the Saudi 10th grade curriculum?

6.3.2.2.1– Did SD get integrated through CoP in the SSCE curriculum?

6.3.2.2.2– Did interpersonal competences develop among teachers and students?

6.3.2.2.3– Did systems thinking develop among teachers and students?

6.3.2.3– How did it do this? What were the factors that helped or hindered the in-

corporation of SD in the curriculum?

6.3.2.3.1– The role of school leadership in the project

6.3.2.3.2– Presenting proper instructional materials

6.3.2.3.3– Applying TASC for presenting functional knowledge

6.3.2.1 Was a CoP built?

In Case M, teachers' practice in terms of presenting new notions of SD changed. Distributed knowledge was another feature that teachers have experienced within the CoP. Building this community was due to the need of applying the community of practice model, which was requested by teachers in Phase 1. Since the project is new and complex, before we actually start the project, some steps need to be applied such as preparing for building the community and selecting its members. The enabling factors that support the community in order to make it work are presented in this section. It also raises the question whether this community would achieve its aims or not, which can be a critical issue from which other similar contexts might benefit.

6.3.2.1.1 How was it built and who did it involve?

Firstly, the community of practice in Case M included two communities, which were the teachers' community and the external experts' community. The external experts' community represented experts in the field of the specific sustainable development projects that were part of the Problem-Centred Design approach used in each unit. In school M, the CoP was successfully built because members of the community had a shared understanding of their roles. For example, according to the research diary,

the teachers engagement in the SD project reflected their responsibility as well as acknowledging it; they found the CoP to be relevant to them. In addition, it was built through applying practical ways such as professional communications between the members of the community.

Finally, it was built through systems that reflect the three dimensions of CoP, namely joint enterprise, mutual engagement and shared repertoire, as well as some processes in which reflected the operational everyday teaching practices in general (interpersonal competences) and TASC in particular (systems thinking). The following examples show how the community's members (teachers) and the researcher have used interpersonal competences with each other in order to apply this project while building the community through shared understanding. Example 1 from Case M shows how the researcher at the first meeting communicated with the teachers:

> *"The researcher communicated with us at the end of the second semester of the year 1437-2016 and asked us to have a meeting regarding the sustainable development curriculum".*

After that *"The researcher held an interview with all of us to obtain our general opinion of sustainable development"*. Example 2 from Case M illustrates the second meeting that focused on agreement and coordination:

> *"The researcher has a meeting with us to clarify the idea of the research and the introduction of the sustainable development curriculum into Social Studies in general. Also, the researcher had a meeting with the school administration team to get an approval of implementing the project in our school".*

Example 3 from Case M is taken from the third meeting that focused on the adoption and implementation process of the project:

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"The business meeting and workshop with the researcher was at begin-
ning of the first semester for the new year 1438 -2017 to clarify the cur-
riculum and methods of implementing it during the semester".

In Case M, the initial shaping of the three dimensions of CoP were created. These dimensions are presented in more detail in the next sub-subsection.

6.3.2.1.2 How did it work?

Data shows how the community worked and how to apply the three dimensions of CoP. However, according to the research diary, building a community of practice was a significant challenge, especially in a context where this kind of continual profes-sional development was unfamiliar. In this early stage, there were many challenges in terms of convincing teachers about the values and aims of the research. Thus, there were repeated questions concerning who exactly would be the beneficiaries of the project: teaching staff or students. If the researcher said that the students were the prime focus, teachers were seen to express excitement. However, if the re-searcher said that teachers themselves were the target, those who identified them-selves as experienced professional teachers are more likely to feel that this kind of continual professional development is unnecessary.

6.3.2.1.2.1 General procedures of the implementation stage

The following procedures were used to facilitate the implementation stage. Remind-ing the members of the community about the aims of the research during the con-duction of this project was critical. Additionally, introducing the concept of SD to the

members of the community slowly, gradually and systematically was vital (Figures 6.4 and 6.5).
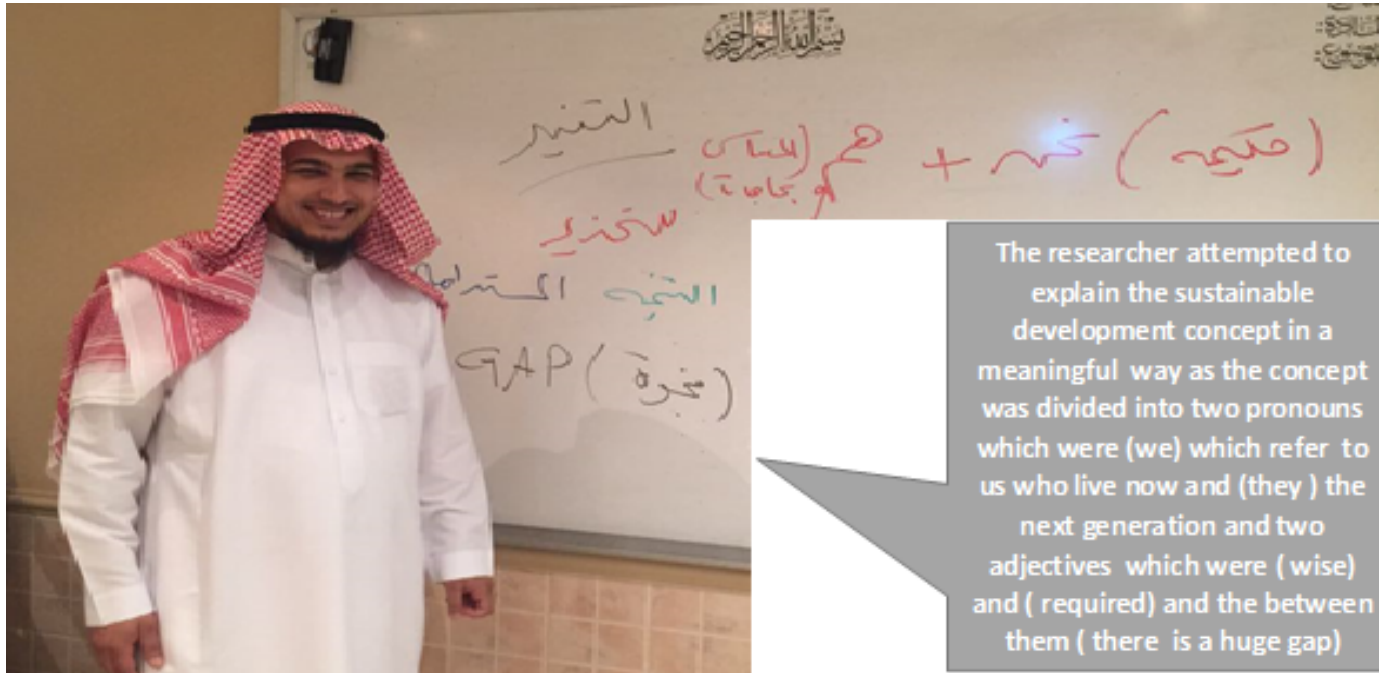
Fig. 6.4: The introduction of the concept of SD to the members of the community (Teachers)

The researcher attempted to explain the SD concept in a meaningful way through using Articulate Storyline that included interesting materials and figures in order to attract students.

Fig. 6.5: The introduction of the concept of SD to the members of the community (Students)

After introducing the concept of SD, the community members (teachers) moved from general ideas to practical agendas such as the timetable (school's schedule) for arranging sessions for a sustainable development curriculum (Appendix W). However, this task was not an easy one as the school timetable was full with its current challenges before adding a new project such as this project, which needs some sessions that could change the school timetable. This issue was handled smoothly because the community of practice' members activated their interpersonal competences and showed a positive commitment towards the project as well as the leadership.

As can be seen above, the process of implementing the topics of the two units was challenging, but applying sustainability competencies such as systems thinking and interpersonal competences under the system of community of practice model was helpful as it provided a flexible and good framework to conduct such a unique pro-gramme. Even though the project of integrating sustainable development issues was well designed for students in the 10th grade, these issues have been re-worked and re-designed based on the actual practice and needs through immediate feedback from members of the community, both teachers and students. This can be one of the advantages of the community of practice model as the designed curriculum can be modified according to the learners' needs and their context.

6.3.2.1.2.2 The impression of becoming a member of the joint enterprise
(integrating SD into the SSCE curriculum)

The data shows how teachers' perceptions with regard to becoming a member of the joint enterprise (integrating sustainable development into SSCE curriculum) was critical. Realizing the social complexity in problem solving that is associated with the project was a critical factor that made the teachers afraid of participating in the pro-gramme as Ph2.T23 noticed. Moreover, Ph2.T23 had some concerns which could prevent him from being a member of this project such as his view of the curriculum in disciplinary silos. This led him to view the curriculum as 'full' because he has an additive model based on the content. He said, *"I thought it was enough that we teach our current curriculum that has many challenges. I was wondering how we could teach this project with new additional materials"*. However, SD requires an interdisciplinary approach, Ph2.T23 indicated this by saying:

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"It is important to remember that there are historical topics included in the curriculum and I am a specialist on geography, and on the contrary, teacher [S] is a specialist in history. Thus, teacher [S] is not able to tackle geographical themes, and I am not able to do so with historical themes".

Furthermore, Ph2.T24 talked about his situation regarding the process of joining the sustainable development enterprise, and according to the research diary, Ph2.T24 asked the researcher a considerable number of questions in order to provide enough information that could support his decision to join the project, *"Personally, the project at the beginning was vague and the picture was not clear. Perhaps I had challenges that I was facing before joining the project"*. The previous statement is supported by Ph2.T23 as he said that, *"My colleagues were not enthusiastic towards participating in the project, but after a while they positively interacted with it"*. What is more, Ph2.T23 stated that his colleagues then had a clear image about the project, namely joining the sustainable development enterprise, and added that *"I would like to ask you about my colleagues as they were highly enthusiastic about the project. Whereas, on the other hand, I was not a supporter of the project"*. However, he was still in a negotiation process for becoming a member of the sustainable development enterprise.

The tension towards participation in this project is revealed through the research diary. Therefore, this was a challenge to all the teachers who were afraid to participate in the project due to having a lack of knowledge of sustainable development. Moreover, this appears through their concerns of legitimacy, as they did not want their students to know that they did not know about the themes that are presented inside the class. Generally, participants expressed their opinions with respect to becoming a member of the project of integrating sustainable development into the SSCE curriculum, which was done through negotiating and providing a space for

members of the community to be convinced about the value of the project by the project itself through its real actions.

6.3.2.1.2.3 Shared repertoire among members of the community

According to the research diary, teachers developed a shared repertoire of re-sources such as experience in instructional designing of lessons series and weekly planning. Also, they shared stories about their students with respect to implement-ing the TASC model and activities. For instance, the same teaching materials were used in all classes as Ph2.T23 highlighted:

> *"If you ask teacher [S] in the beginning of the week what his plan is for*
> *this week, and then you ask me about my plan at the end of the week, you*
> *will find out that we both have the same plan".*

Another example, members had shared tools and skills in order to facilitate the use of the provided content in a way that is meaningful for students through using technological programmes such as Articulate Storyline (Figure 6.6).

Fig. 6.6: Teacher's progress in using Articulate Storyline

More importantly, the teachers' community engaged with three of CoP's dimensions dynamically and actively. In practice, these dimensions were not seen as separate entities but rather as one unit that has different functions.

6.3.2.1.2.4 Members of CoP and the researcher working as equal members to integrate SD in the SSCE curriculum

Teachers appreciate the concept of the researcher working within the community of practice as an equal member, not as an expert who instead works for them. A com-

munity of practice model supports this point, especially the processes of integrated sustainable development. The members of the community enacted the project in healthy, democratic and sustainable ways that provided sense of distribution, producing and ownership of knowledge among every member who was belonging to this community as is shown in the following quotes. For example, Ph2.T24 showed that:

> *"The role of the researcher in this community of practice helped collaborative colleagues in our department and the participation of students in this programme. Frankly, big effects and results are visible. The programme has given good results".*

Ph2.T24 stressed the role of the researcher in this project by saying:

> *"Thank you Mr. Aiydh for your great efforts whether the intellectual effort, physical effort and practical effort. The students love you as well as teachers; you have left an honourable imprint in this school".*

Ph2.T4 highlighted the role of the researcher in this project by saying, *"Thank God, and then we thank you for this project and for your patience with our students, our administration team and on the many other circumstances"*. Here is an example that shows the researcher works with the teachers as a collaborative community of practice in which the support among the members is critical to integrate the sustainable development concept (Figure 6.7).
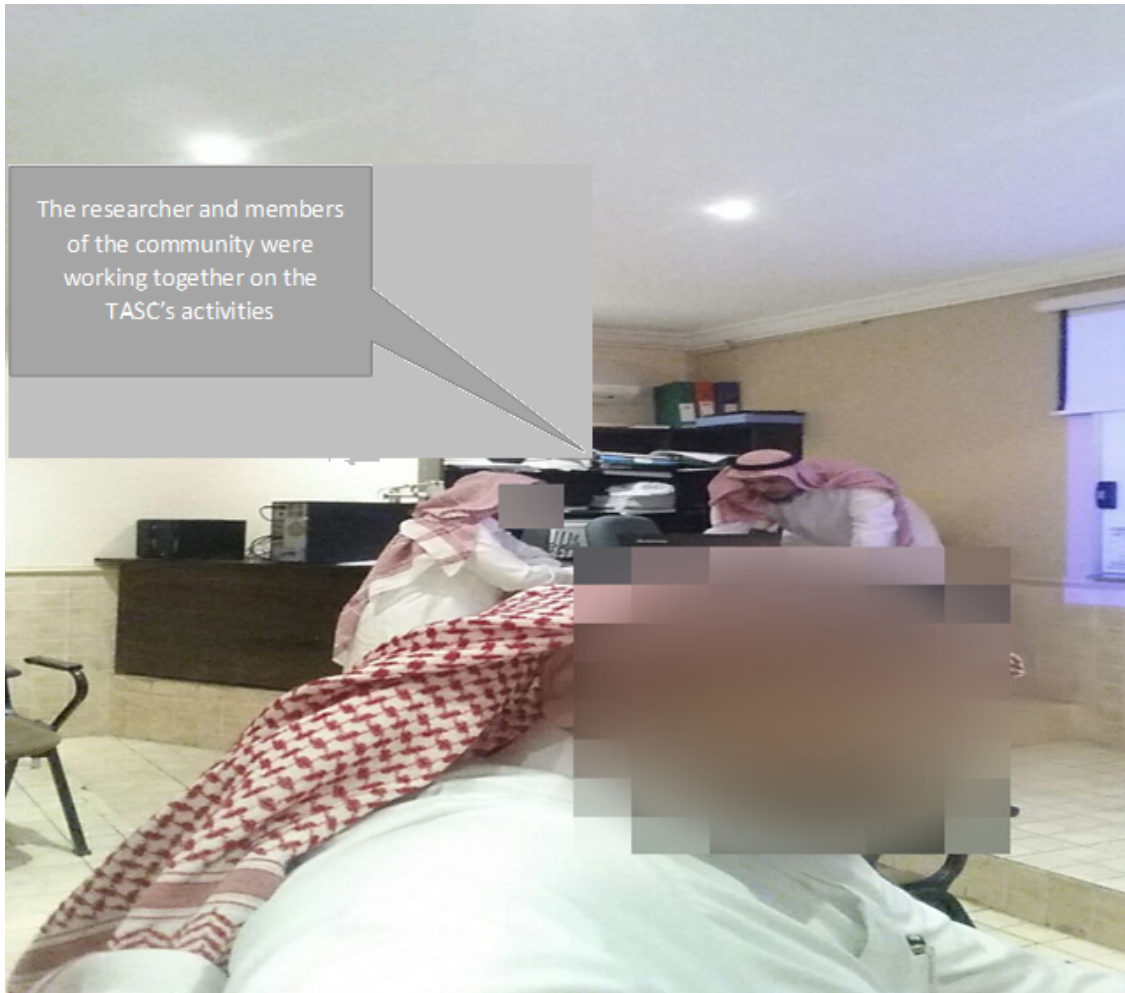
Fig. 6.7: Working as equal members who share with each other their teaching repertoire

In conclusion, teachers have highlighted that members of CoP and the researcher working as equal members to integrate SD in the SSCE is a central point for activating the community of practice and achieving its aims.

6.3.2.1.3 Why did it work?

This question partly answers RQ2 and at the same time RQ3, which is concerned with the factors that hinder or foster the incorporation of SD in the SSCE curriculum

in the Saudi 10th grade. According to the research diary, this question can highlight the disposition of the members of the community in terms of their engagement in this project. The first reason is that their beliefs can reflect the emotional intelligence as it is stated in the literature review under the section of key competencies. The second reason is that their beliefs of the importance of interpersonal competences and its roles with SD issues ethically encourage them to act according to sustainable development principles such as considering the next generation's needs.

With respect to professionalism, the members were willing to get involved in this project actively, so they translated this desire into actions through their everyday tasks and practices within their arena. In reality, it was not an easy task to join different communities in order to achieve valuable aims, which needs them to accept change and being updated with regard to their professions. Finally, the school ethos in Case M was helpful to support the community to work professionally through facilitating tools and sources that were critical. The role of school leadership will have its own section that presents what the school leadership did to contribute to support the community in carrying out their tasks.

6.3.2.2 What were the outcomes in terms of incorporating SD in the Saudi 10th grade curriculum?

Data shows that the CoP achieved its aims through two points, one of them is related to the teacher benefiting as an outcome and one is related to the student benefiting as an outcome.

Teachers consider that they obtained personal benefits within a community of practice model. For example, Ph2.T4 highlighted the fact that he profited from the project as he learned so many unfamiliar words in English through this programme, or ones he had met but not paid attention to. Now this vocabulary is impactful. Moreover, using a community of practice to integrate sustainable development in the curriculum was:

> *"Very excellent, very excellent. When I see teacher [S]'s students doing excellent jobs, this motivates me to do my best in encouraging my students to do their best. The students' creativity did not come from nothing; definitely, it came from support and encouragement from my teacher colleagues" as Ph2.T23 expressed.*

Additionally, Ph2.T23 provided some individuals' benefits of using a community of practice to integrate SD in the curriculum as he found out new information as well as discovering talented students. Thus, teachers have pointed out that through a community of practice model, teachers gained personal learning advantages. Teachers also showed how the CoP model led them to continue participating effectively towards SD in the near future as it is shown in the following examples. The project of SD should not be implemented for the sake of this study, but also even in the coming terms as Ph2.T4 stated. In addition, Ph2.T4 expressed that:

> *"I have to introduce the concept of sustainable development to my students and give them this subject from time to time, such as electricity, water, housing, and sustainable development".*

Ph2.T4 highlighted some reflections with respect to the project as he said that he

liked teaching these sustainable development themes with all of his students, he would like to teach SD again in the future since he believes that SD is very important area and the specialists in his field have ignored it.

Ph2.T23 indicated that his responsibility increased towards students' needs after this project was completed, especially with talented students who need to be paid more attention. Thus, self-development was critical to do this task properly. Furthermore, Ph2.T24 showed that the integration of SD into the SSCE curriculum needs CPD through continuous work, improvements and support. Finally, Ph2.T4 immersed himself into the concept of SD in his career as well as daily life *"In fact, this has become an obsession. There is a big difference before and after the programme truthfully"*.

However, through the research diary it is noticed that teachers were working to increase their research skills as well as having a sense of action research characteristics. This happened due to the tasks that teachers were assigned to do as most of these tasks were new and unfamiliar to them, so they reflected and thought that they needed to fill this gap in a short amount of time. Moreover, their students kept asking them a lot of questions, which encouraged them to look for their answers. Noticeably, preparing suitable activities within the lessons supported students to come up with novel ideas, which were helpful for achieving the aims of integrating SD in SSCE. Overall, the teachers believed that the community of practice model led them to carry on participating positively towards sustainable development in the near future.

Student benefiting as an outcome

The Case M was able to achieve the aims of the project due to the rational reasons that were mentioned in the previous subsection. Here is some evidence of the results of Case M, which can inspire other similar contexts to act and to integrate SD in their curriculum. Firstly, the students carried out projects and sculptures of sustainable homes which were made according to the SD principles through sculptures made out of wood, cork and general tools (see Appendix N). Secondly, the students used software programmes, which support them for 3D designing, and they printed these projects through dedicated printers (see Appendix N.2).

Thirdly, it set up an Aquaponics system in the corners of the school with the participation of students and support from the administration and follow-up of supervision by the researcher. Here is supplementary evidence (see Appendix N.3). Fourthly, a mini-exhibition is presented, showcasing the most important paperwork, pin-boards, drawings, sculptures and projects by students during the semester and follow-up supervision by the researcher (see Appendix N.4).

6.3.2.2.1 Did SD become integrated through CoP into the SSCE curriculum?

The teachers' community in Case M was able to integrate SD into the SSCE curriculum through developing a clear understanding of SD, developing identities and encouraging the use of an international language.

6.3.2.2.1.1 Understanding the meaning of the concept of SD before and after implementing the project

Providing a clear understanding of SD was critical and achievable as the data reveals how the teachers understood the meaning of the concept of SD before and after implementing it, which was through learning as an experience. Noticeably, Ph2.T4 confirmed his situation with understanding of the meaning of the concept of sustainable before and after the implementation of the programme:

"As I mentioned before there was ambiguity about the concept of sustainable development, but after we got engaged in the project, we understood the concept, honestly. I said at the beginning the concept was vague for the students and for us as teachers".

In addition, Ph2.T4 described his colleagues' situations with understanding of the concept of SD at the beginning of the project, how they activated the learning as an experience. Thus, their interpersonal competences were mutually activated. As was mentioned before, Ph2.T4 provided an example of his experience in terms of using interpersonal competences by explaining the meaning of SD to his colleague [AZ] since he had a lack of understanding it. While Ph2.T23 stressed that clearly, *"I was afraid of participating in the programme, what is meant by sustainable development? In fact, I was afraid of the programme but after a while, it became easy for me to understand it, thank God"*. Moreover, Ph2.T4 provided a real example of how his understanding of the SD concept had changed as he emphasized that:

"There has become a very clear perception of the concept of sustainable development, when I walk on the road, when I am at home, I always think about this question; does it serve me in the future ?, can this be one of

sustainable development's topics in the first place?".

In addition, he expressed his appreciation through WhatsApp, also mentioning that he had benefited from the programme more than the students and that his understanding of SD had become much better (see Appendix Q.1). Ph2.T24 stated that the concept of SD was probably limited to many individuals but thankfully, now it had become more comprehensive. Interestingly, Ph2.T4 described his students' situations of applying learning as experience in order to understand the meaning of the concept of sustainable development by saying that *"Students were also surprised by this word, so they met with each other to discuss about what the concept of sustainable development is"*. Overall, teachers have shared their experiences with respect to understanding the concept of sustainable development before and after implementing the project.

6.3.2.2.1.2 Developing students' identities towards SD through various strategies

As teachers revealed in Phase 1 with regard to the importance of developing students' identities as a way of promoting SD, in this phase, teachers have reflected their beliefs through SD activities and put them into practice. Moreover, one of the fundamental features of a community of practice model is focused on identity, so developing students' identities towards SD is supported by the CoP's features. Developing students' identities towards sustainable development principles was done through various strategies that can be seen as moveable, changeable and gradual, not static. For example, students were able to use their background and prior experiences in new SD challenges, within the TASC model.

Teachers pointed out that there is a potential to applying diverse strategies through the principle of a community of practice model. For example, Ph2.T4 expressed

this clearly by saying that now, if a student is not at the centre of the educational process, the student will not grasp a large portion of information. Thus, the student must be encouraged to participate. Hence, the subject of sustainable development was very rich in terms of using multiple strategies that were helpful in promoting student learning.

Notably, Ph2.T23 stated that through these diverse strategies some positive results appeared. *"They were very excellent, because there are groups of students who have intelligence and creativity, these students were very keen in this programme"*. Not only that, but also students were interactive to the point that they were calling Ph2.T23 after school regarding their queries about the theme of the week and they kept asking him for further clarification around the instructions. Ph2.T24 explained how the community of practice recognises students' needs:

> *"The new learning approach provides an opportunity for students to put forward their ideas, opinions, creativity and distinctiveness. The 3D project or the idea of 3D design in fact has fascinated us. The students presented their work in an unexpected way and this in itself is a qualitative leap".*

Here is an example of students who attempted to produce and create projects through using 3D programme (Figure 6.8, Appendix N, N.2, N.3 and N.4).

Fig. 6.8: Students working to create sustainable development projects through using 3D pro-
gramme

Ph2.T24 summarised the experience, saying that teaching practices had stimulated
exciting work, ideas and participations, and that they, the teachers, had moved from
theory to practice by using some very attractive approaches. Overall, teachers have
considered the criticality of using diverse strategies through a community of practice
model.

*6.3.2.2.1.3 Combination of Arabic and English Language as a way of responding to
the need of labour market*

Teachers emphasize that there is criticality of integrating SD's seven concepts, SD
dimensions and SD competencies such as introducing an international language
while maintaining the local language through the principle of a community of prac-

tice model.

For example, Ph2.T4 expressed his view that all members of the community bene-
fited from the opportunity of the combination of Arabic and English language:

*"During the programme, there were English words provided from time to
time. If I try to count the English terminologies that students have learned
from the programme, it would be a huge number of words, so students
benefited in increasing their learning of English language, honestly".*

Ph2.T23 stated that there were some results of the combination of the Arabic and
English language in the project such as providing terminologies which can develop
the talent and the ability of the students to learn the English language, which is now
a global lingua franca.

Additionally, Ph2.T24 highlighted that *"The combination of Arabic and English lan-
guage in this project was one of the most attractive ideas since we need to promote
many skills needed in today's labour market"*. Ph2.T24 offered his experience with
the combination of Arabic and English in the project:

*"Students have benefited a lot especially from some videos in English but
with Arabic subtitles. I would say if this idea was provided within 20, 25
lesson, we assume that the students may come out to 20, 25 opportunities
of learning. This by itself is good learning".*

Ph2.T4 supported Ph2.T24 by saying students had also learned vocabulary that
they had then retained.

6.3.2.2.2 Did interpersonal competences develop among teachers?

Data shows that interpersonal competences develop among teachers coherently. Even though this section is specified to interpersonal competences, they can be seen in various sub-sections because these competences are needed to integrate SD within the CoP. For example, these sub sections are:

– How was it built and who did it involve?

– General procedures of the implementation stage.

Interpersonal competences can present the dimension of CoP, mutual engagement, in more practical ways, which can be provided in more detail with regards to the development of teachers and the reactions of the students.

The data indicates that the members of the community focused on the SD project, which involved activating interpersonal competences that lead them to exchange pedagogical aspects and experiences of linking sustainable development issues with students' daily lives through exchanging emails (see Appendix P.2) as well as through WhatsApp (see Appendix Q.2). Furthermore, instructional design was activated through mutual engagement that included interpersonal collaboration, interactions and an open healthy environment. For example, Ph2.T4 described the communication environment, before and after applying the CoP model, by saying:

> *"The path between my colleagues and me was disconnected, but with this programme, there has become a communication channel between us, not only in the field of sustainable development, but also in our subject (SSCE)".*

Furthermore, Ph2.T4 highlighted the change of the interpersonal collaboration between the members of the Social Studies department after applying the community

of practice model:

"The fact is that our relationship with colleagues in the Social Studies department has become a very significant cooperation, which has influenced our success in our subject before our success in the sustainable development programme. Now, there is a direct co-operation between colleagues".

Ph2.T23 provided further details of how they had activated the instructional design through the interpersonal collaboration by stating that *"The communication between us was constant to the extent that we had to work together collaboratively for our original curriculum (SSCE)"*. Additionally, Ph2.T4 showed some results of the interpersonal collaboration within the community of practice as there was more coordination, organisation and group plans to stimulate their co-operation. For example, they started discussing with each other and Ph2.T4 began with teacher [S]. *"Teacher [AZ] asked me about the meaning of sustainable development, and what its relation to society is and how we benefit from it"*. Furthermore, Ph2.T24 described the situation before and after applying a community of practice model:

"In fact, the teamwork was almost lost in any process, but after the experience of sustainable development and the idea of this project, we have our workshops, our evolution and shared some ideas, which had resulted in the marvellous group projects, group meetings and working with multiple mind-sets".

Significantly, Ph2.T4 provided external evidence that this community of practice has been appreciated by other educational stakeholders, noting that:

"The director of our school praised this work in his meetings as a role

model. In addition, he said they had become more co-operative and a unified team, which plans and works accordingly. This is based on what we gathered and discussed about in sustainable development themes".

6.3.2.2.3 Did systems thinking develop among teachers?

Data reveals that systems thinking developed among teachers through applying CoP as well as through using TASC as SPCK. Systems thinking has been applied within the community itself through considering enabling factors that could enhance the integration of SD into the SSCE curriculum, such as the school leadership and the private sector. Consequently, teachers stress that using TASC through the principle of a community of practice model is critical for developing systems thinking among students. The following quotes are examples of the teachers' views. For instance, Ph2.T4 explained how students interact with TASC as he noticed that sometimes he introduces the concept as follows:

"Oh youth, today, we have a theory to apply about sustainable development, what is it? They say directly TASC. TASC is not a strange word any more to students, honestly; this is a good effort, thank God".

Moreover, Ph2.T4 indicated how a community practice model is helpful to activate TASC by saying:

"Of course, at the beginning there was ambiguity as I mentioned, but after we explained the TASC theory, the students were highly acquainted to TASC and its stages or steps. They have understood its steps and started to apply it in sustainable development's themes".

Ph2.T4 emphasized that students examined SD themes by using systems thinking; they were able to apply TASC directly and easily in a very flexible way. Students were able to identify the problem and determine solutions. Thus, the process of using TASC had become comprehensively entrenched in their minds as Ph2.T4 commented. While Ph2.T23 pointed out some results of the students' efforts by saying:

"I saw excellent projects presented by the students. It is excellent. When I propose a problem to the students, the students immediately present several ideas to solve this problem, and then they embrace one idea, which they think is most appropriate".

It is an excellent pedagogy and this is the best way for addressing the sustainable development issues as Ph2.T23 stated. Interestingly, Ph2.T24 highlighted this too:

"Honestly, it is my first time knowing and learning about the TASC theory, it is an excellent theory. It helps to solve problems, enlightens the minds of the learners and it allows a larger scope for creativity and thinking for learners".

In conclusion, teachers believe that using TASC within a community of practice is helpful for developing systems thinking.

6.3.2.3 How did it do this? What were the factors that fostered or hindered the integration of SD into the curriculum?

Data shows how the members of society as a whole can be engaged effectively in the interests of sustainable development when there is a clear shared understanding of the philosophy behind SD. Social processes through school ethos and leadership

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vision, teachers and external experts, together with support from the private sector can be a concrete example of a sustainable development community.

6.3.2.3.1 The role of school leadership in the project

Teachers believe in the criticality of the school leadership role in the project. For example, Ph2.T23 expressed this clearly by saying, *"You have been lucky to apply your project under the leadership of the current director of the school. He has a futuristic vision and he is very cooperative"*. This can indicate that it is not usual to get support from leadership to make the project viable. Ph2.T4 provided an explanation of why the school leadership's role is key in integrating sustainable development into the SSCE curriculum:

> *"The fact is that the director of the school when we started talking about sustainable development, was welcoming any project in sustainable development and any action. The director of school was trying to support it even though the material capabilities of school were not great".*

However, Ph2.T4 indicated that the school leadership's support is not enough for the project to be viable, which is very critical, but also visits to and praise for this programme from the educational leadership should be frequent. Moreover, Ph2.T4 provided some feedback from the local educational administrative:

> *"They were surprised and always said that this is first time or the first school to apply this topic. This initiative has been attributed to this school. In fact, it is a new and modern idea which is necessary and which is supposed to be implemented in other schools".*

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Generally, teachers consider that the role of school leadership in the project is critical.

6.3.2.3.2 Presenting proper instructional materials

Teachers highlighted the critical importance of conducting proper instructional materials that are presented in the project through the principle of a community of practice model. Ph2.T24 expressed that:

"We have moved from theories and familiarities to something more tangible that we need nowadays in our country in order to move from one stage of SD plans to another. The curriculum we have seen in this programme of sustainable development was well organised and coordinated. The programme was comprehensive. The topics that we covered, for example, the first topic, II, III, IV, V are all complementary to each other, but with new ideas, honestly".

Additionally, Ph2.T23 reported that instructional materials were suitable for educational processes as they were suitable for the ages of the students; they were positive for developing students intellectually, for the teachers to present and for the environment in which they live. While Ph2.T24 supported Ph2.T23 by saying that:

"Regarding the sustainable development curriculum, based on the work in front of us and the themes addressed, they were honestly great, which actually made the environment of SSCE classes a noticeably different world".

Here is an example of when the teachers used a traditional method at the beginning of the project before they changed to applying active and collaborative strategies (Figure 6.9).
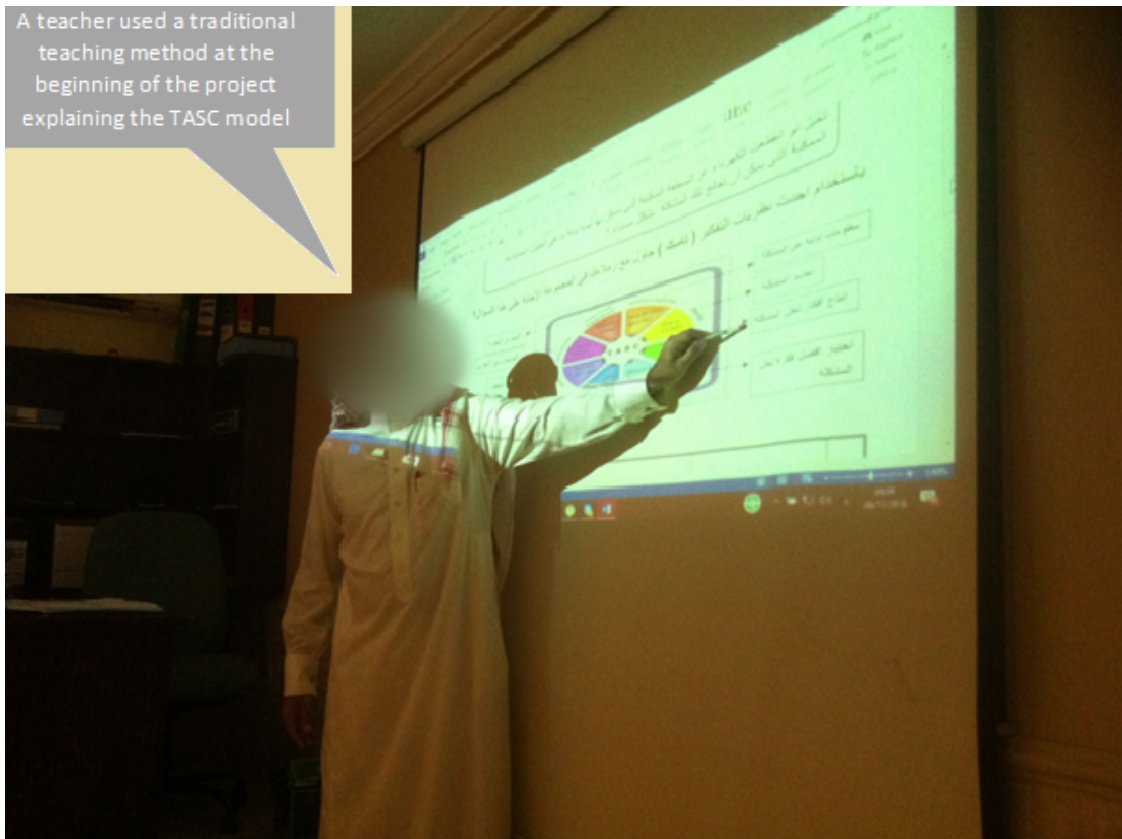
Fig. 6.9: Teachers using their old teaching repertoire at the beginning of the project

On the other hand, in real teaching practices as is especially noticeable through the research diary, presenting proper instructional materials did not happen in the beginning, but rather they happened after facilitating sustainable improvement as well as using the feedback that was received from the teachers and students. According to the research diary, the engagement of external experts was helpful for the teachers to present topics that needed functional information such as Aquaponics system. Here is an example in which the researcher discusses with teachers, with regard to the received feedback, how the work could be improved and how the teachers could present new concepts in their classes (Figure 6.10).

Fig. 6.10: The researcher discusses with teachers

However, there were initially some difficulties in implementing TASC due to TASC and its materials being only available in English (see Appendix A.1), so Ph2.T4 said this:

> *"After we spent time in thinking to make TASC understandable for students, we came up with an idea. That we have to put this theory and its explanations in a model or a diagram in the Arabic language in all sustainable development activities that were presented to the students, this has led to keep TASC in students' minds".*

At the beginning of the project, students faced some difficulties in applying the various steps in English. Hence, the teachers, through their emergent community of practice, suggested creating worksheets for this purpose in both English and Arabic in order to facilitate usage. After providing the worksheets and with support from the teachers, the students enjoyed applying TASC; they became familiar with the steps

and later they became proficient in using them. For example, students started their tasks by gathering and organising primary background information in order to assist them in the next step which was identifying the problem. Thus, students logically moved from the basic thinking steps to the advanced level thinking steps, such as generating ideas and deciding which of them could be best implemented. This happened within a stimulating classroom environment.

Figures 6.11 shows the outcome of working with the teachers to use the TASC planning framework to develop the Sustainable Cities scheme of work, starting with the key question: *"Imagine if the population of Saudi Arabia become 60 million people, what are the possible sustainable solutions that could continuously provide sustainable accommodation?"*.

بسم الله الرحمن الرحيم

Ministry of Education	وزارة التعليم
kingdom of Saudi Arabia	المملكة العربية السعودية
Jeddah educational administration	إدارة تعليم جدة
secondary school (M)	مدرسة ثانوية (م)

التنمية المستدامة فكر وثقافة وانتاج لبناء حضارة اسلامية فريدة

Sustainable development: Thought, culture and production to build a unique Islamic civilization

---

تخيل لو أصبح عدد سكان المملكة العربية السعودية 60 مليون نسمة ما هي الحلول المستدامة الممكنة التي يمكن أن توفر سكنا مناسبا بشكل مستدام؟

Imagine if the population of Saudi Arabia became 60 million people, what are the possible sustainable solutions that could continuously provide suitable accommodation?

The first activity in Project No. 1 Sustainable City

Through using the latest theories of thinking (TASC) try with your group to answer the above question

	معلومات أولية Primary-back ground information	(1
	تحديد المشكلة Identifying the problem	(2
	إنتاج أفكار لحل المشكلة Producing ideas to solve problems	(3
	اختيار أفضل فكرة Choosing the best idea	(4
	التنفيذ Execution	(5
	تقويم التنفيذ Evaluation	(6
	التواصل مع الآخرين Communication with others	(7
	التعلم من الخبرة Learning from experience	(8

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Fig. 6.11: TASC's activities after teachers' considerations

6.3.2.3.3 Applying TASC for presenting functional knowledge

TASC is seen as a powerful tool for developing systems thinking as well as presenting functional knowledge. In the figures below, it is shown that the TASC model created a community of inquiry among the students based on its steps and activities. For example, the students split up into several smaller groups in order for every student to participate equally. The students started by gathering initial information of the given problem and then they moved, with their own mini community of inquiry, to other steps. Moreover, they continued to apply the other steps until they reached the step of deciding which of the ideas was best and they presented it to other mini communities.

Noticeably, some aspects of TASC are relevant to curriculum design, such as being structured thematically and multidisciplinary. Learners enthusiastically direct their own learning and they are motivated by an exciting learning environment. Moreover, through Problem-Centred Design, learners needed to familiarise themselves with a new learning environment and an unfamiliar new pedagogy (McLean et al., 2006). The curriculum team uses TASC throughout the Implementation Phase. For example, Figure 6.12, shows the class environment and status of students who attempted to make a decision, which is one of TASC's steps.

Fig. 6.12: Students are focused on making a decision

In Figure 6.13, students change gradually from focused stages to active and inter-active stages, which in TASC is labelled the evaluation step.

Fig. 6.13: Students are conducting an initial evaluation inside the class

Figure 6.14 shows how students present their work to other groups, which in TASC is called the communication step.

Fig. 6.14: Students communicating with others

6.4   Case O

The data for case O will be presented under two main headings: students' perspectives and teachers' perspectives. In this section, the analysis of the data is presented in a similar way to the data for case M. However, because the project was not successful in developing a community of practice, the aims of incorporating SD and the development of interpersonal competences and systems thinking were not achieved. Accordingly, these sections are shortened and the data focuses on the factors that helped or hindered the success of the project.

6.4.1 Students' perspectives

Students' NGT results from Case O with regard to the challenges that hindered Case O from incorporating SD are now presented.

6.4.1.1 The style of school leadership

Through the NGT method, students mentioned how the style of leadership in the school was an obstacle to applying this project:

> *"-The school leadership did not want to support the project as they are not convinced to do so.*
> *-The school leadership believed that the project did not actually serve the school, the teacher, nor the student".*

It was assumed that the role of school leadership in terms of applying the programme is very important for its success. However, in case O, the school leader and the administration team looked at the project from a narrow angle. They claimed that the project wasted time. Therefore, they provided no help in implementing the project.

6.4.1.2 Time challenge

Students through the NGT method pointed out time consumption if undertaking this project: *"We have a lot of lessons every day, so it is hard to engage with this project actively"*. Students here highlighted their significant number of commitments during the school day. They lacked the time to meet their academic responsibilities. Students in this case were unhelpful in the application of the programme.

6.4.1.3 School facilities

Students through NGT method stated some reasons related to school facilities that might prevent them from involvement in this project:

"1. Studying in a rented old building is not suitable for this purpose.

2. Classrooms are small and the numbers of the students are large.

3. There is no available and appropriate place to apply the project.

4. The aeration in the school is often improper.

5. There is a lack of equipments and instruments".

The school environment for case O was not helpful in terms of the improper condition of the buildings, small classrooms, and lack of supportive tools. In fact, having a suitable environment with all the necessary assistance and resources would definitely encourage both teachers and students toward implementing the programme successfully.

6.4.1.4. Quality of the students

Students through NGT method commented on the general background of their fellow students which might hinder them in the application of SD:

"1-The students in this school are from lower social classes.

2-The educational level of the students is weak and need to be improved.

3-Students do not pay close attention to the significance of SD themes as

they claim that these themes are not officially included in the curriculum".

Application of the programme is affected by the students' attitudes. In case O, students come from poor families, which is significantly different from the students in

case M. The former showed little interest in learning or improving their competencies. This indicates that the school leadership and teachers should together strive to encourage students to improve their educational level.

6.4.1.5 Lack of interpersonal competences

Students through NGT method commented on their teachers claims and beliefs which might prevent them from carrying out this project:

"1. The teacher is not active in the class.

2. Teachers claimed that they do not have enough time to apply the project.

3. Teachers believed that they work at maximum formal scheduled teaching hours and they cannot take more over timework.

4. Teachers claimed that the project does not actually serve their curriculum.

5. Teachers believed that applying the project is just an extra work in which they are not responsible about it".

Not only do student's thoughts negatively affect the process of applying the programme, teachers as well play a significant part. Unfortunately, it was difficult to convince the teachers of the importance of the project. They are unwilling to undertake extra commitments, particularly if they are not convinced of the significance of the programme.

6.4.2 Teachers' perspectives

Teachers' perspectives about their experiences of taking part in the project.

6.4.2.1 - Was a Community of Practice built?

6.4.2.1.1 How was it built and who was involved?

6.4.2.1.2 - How did it work or not?

6.4.2.1.3 - Why did it work or not?

6.4.2.2 Did it achieve its aims? Was SD integrated into the Saudi 10th grade curriculum?

6.4.2.3 ? What were the factors that fostered or hindered the incorporation of SD into the curriculum?

6.4.2.1 Was a CoP built?

In Case O, the community was only partially built because of factors that prevented the community from integrating the SSCE curriculum. Since the project is new and complex, before it is even begun some steps need to be applied such as preparing for building the community and selecting its members. The factors that prevented the community success are presented under this section. It also discusses the reasons why the community did not achieve its aims, which can be critical for other similar contexts if they are to benefit from its experience.

6.4.2.1.1 How was it built and who was involved?

In the beginning, the atmosphere of this community was similar to the atmosphere of the Case M community, so it started to engage with the project. The CoP in Case O was built initially through having shared understanding of the educators' roles

and the value of their engagement in such a project. The participants included two teachers and 150 students. However, according to the research diary, teachers in this community considered the project irrelevant, hence their resistance and inability actively to engage. For the same reason, external experts were not involved in the project since the joint enterprise and mutual engagement elements of a CoP were not present.

6.4.2.1.2 How did it work?

After running the project for a while, the community could not continue due to several challenges that are discussed in the following section.

6.4.2.1.3 Why did it work or not?

This question is part of the response to RQ2 and at the same time RQ3, which is concerned about factors that may hinder the incorporation of SD into the SSCE curriculum in the Saudi 10th grade. As previously mentioned this community was partially built since the members of the teachers' community had only activated one of CoP's three dimensions, namely the shared repertoire. Moreover, there are factors that prevented this community from integrating SD coherently into the SSCE curriculum. These factors can be divided into two factors, the internal factor and the external factor. The internal factor includes teachers' beliefs about the appropriate CPDs for them and the challenge of shifting from curriculum content to Problem-Centred Design. However, the external factor is concerned with the challenges that are surrounding teachers' environment. The next paragraphs discuss these factors in more detail.

6.4.2.2 Did it achieve its aims? Was SD integrated into the Saudi 10th grade

curriculum?

The answer to this question has already been provided through the discussion of the previous questions, which showed that the community in Case O was not able to integrate SD into the SSCE curriculum. Therefore, neither interpersonal competencies nor systems thinking were developed through the units of work.

6.4.2.3 What were the factors that fostered or hindered the incorporation of SD into

the curriculum?

In this section, the data are presented to show how factors particular to Case O hindered the project as a whole. As a result, the incorporation of sustainable development knowledge, competencies and skills into the SSCE curriculum for 10th grade students did not occur. These factors are presented below as challenges for teachers in shifting from curriculum content to Problem-Centred Design, including teachers' beliefs, and factors external to the school.

6.4.2.3.1 The challenge of shifting from curriculum content to Problem-Centred

Design

The data shows how shifting from curriculum content to Problem-Centred Design was a challenge for the teachers. For example, Ph2.T6 believed that the integration of sustainable development into the SSCE curriculum is unsuitable *"Because it is not an active subject such as chemistry, physics, mathematics and other subjects, which keep pace with the industry in general"*, while at the same time he considered that there are potential ways to integrate SD into the SSCE curriculum. How-

ever, Ph2.T6 expressed his view regarding how the project was relevant locally and globally, and how its goal to maintain environmental resources offered something for future generations. Additionally, Ph2.T25 talked about the students' perception clearly, by saying:

"In fact, they had no problem to apply this project in their school, or renew their information. However, they did not know what the result is. Thus, they had the readiness to interact with the subject".

In contrast, Ph2.T25 perceived the integration of sustainable development into the SSCE curriculum from the first or second lesson as hard. In addition, Ph2.T25 believed that the integration of sustainable development is applicable but not in the SSCE curriculum. On the other hand, Ph2.T25 indicated that he was facing a challenge in shifting from curriculum content to Problem-Centred Design:

"Personally, I did not have a good understanding of the curriculum provided. At the beginning of the project, of course, like students, I was also thinking of the result of this project, what are the results, but after we were engaged with first stage and then next stage I saw it was far".

Ph2.T25 continued by providing further evidence regarding his situation at beginning and during the project:

"The welcoming was at the beginning of the project so that it can be applied as I did not understand the concept of sustainable development, then I have understood it from you. When I understood it from you, I saw that it is not applicable with the current curriculum".

Generally, teachers in this point have expressed their opinions with respect to the likelihood of integrating sustainable development into the SSCE curriculum as they

provided different and confused responses. This confusion can be clarified through the research diary as the teachers were influenced from being long time curriculum content deliverers, so Problem-Centred Design was less likely to be implemented from their point of view. Therefore, they prefer to teach curriculum based content.

6.4.2.3.2 Teachers' beliefs about the appropriate CPDs for them

The data indicates teachers' beliefs about the appropriate CPDs for them, which is seen as an internal critical factor in this case. For example, Ph2.T25 believed that the top-down model is the only solution for teacher professional development:

> "The teacher can only be developed if it is mandatory, not optional. This is the only solution for the development of the teacher and if we find that the teacher does not want to develop, he will be fired. This is the only solution".

As he explained, teachers are not willing to develop themselves, unless there are rules in the educational policy that enforce teachers to develop their skills. However, Ph2.T25 had been asked if he were given another chance to participate again in this project, what his response would be, and he said that:

> "If I am free and not committed to the ministry obligations, I will have to be separate from the ministry by having my own curriculum. By being free, I have to provide the concept of sustainable development for students with the minimal amount of knowledge".

Interestingly, there are only two choices based on Ph2.T25's point of view, which are being extremely passive, without internally willing to develop himself, or being free from all the organisational commitments even though the community of practice

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takes into account personal creativity and freedom as well as belonging to the organisation. The community of practice can support and guide teachers in case they are struggling with their own curriculum.

6.4.2.3.3 Other challenges that hindered Case O from incorporating SD

Moreover, there are factors that prevented the teachers' community from being effective in this case. These factors are the style of the school leadership, time, school facilities, quality of the students and lack of interpersonal competences.

1. **The style of the school leadership**: Teachers identified the criticality of the school leadership role in the project. For instance, Ph2.T6 indicated that the style of an irresponsible leader is acceptable even if it is far from what he should do according to the Saudi educational policy:

   "I am with the opinion that says less pressure on teachers gives higher productivity inside the school. In general, teachers, students, school leadership and the building are all responsible".

   In addition, Ph2.T25 supported Ph2.T6 idea, which is that the style of an irresponsible leader can be acceptable:

   "In our situation and in our education, yes. It is ok in our situation. Positive, I have some business to do. If the business is done, why do I have to sit in the school? I have done my work, why do I have to sit, doing nothing! It gives you more motivation and flexibility in work".

   However, Ph2.T25 pointed out that school leadership was one of the dilemmas that hindered conducting the project properly *"There is a dilemma of conducting*

this research in the current school's situation, whether administrative or student aspects. It is hard to conduct this research into this school". Ph2.T6 was asked what he would do if he had another chance to participate again in this project, "*I hope that the timetable of lessons is formatted for the teacher and the school should be ready in order for the school director to interact with the programme positively*".

2. **Time challenge** : Teachers here stress that having limited time was one of the major challenges as is shown in the following examples. Ph2.T6 revealed that time is seen as one of major challenges to the integration of sustainable development into the SSCE curriculum *"The difficulties! The time was not appropriate and our curriculum in 10th grade is large, so it has not got enough time to apply this project*". Ph2.T25 supported Ph2.T6 with respect to the time challenge:

    "*The curriculum I had is large and I am obliged to finish the curriculum, I am also obliged to do working papers, these were all a burden. It took huge amount of time from the lesson, so I would not be able to teach the whole curriculum*".

3. **School facilities**: Teachers here state that having limited school facilities was one of the major challenges. Ph2.T6 disclosed other challenges, one of which was the building, as he said, *"The dilemma was in the building*". Whereas Ph2.T25 supported Ph2.T6 with respect to the challenge of the building by saying that *"As you know, we have a rented building and we do not have the potential for doing such work, honestly*". Furthermore, Ph2.T25 pointed out that access to the learning resources room was challenge:

    "*The person who was in charge of the learning resources room said*

he is sorry, the learning resources room had been overused and this caused complaints from other teachers, so the school administration had to act accordingly".

Additionally, Ph2.T6 said that the circumstances were not supportive to undertake the project. Ph2.T6 asked if he would have another chance to participate again in this project, and expressed the wish that *"I hope there will be ready classes in the first place".*

4. **Quality of the students**: Teachers here claim that having unqualified students was one of the major challenges. For example, Ph2.T25 revealed another challenge, which was the students' background knowledge about the project as they had no basis in SD. While Ph2.T6 disclosed other challenges, one of which was the quality of the students *"The quality of our students, which are different from the quality of other students".*

In addition, Ph2.T25 said that the quality of the students was one of the challenges as he stated that student's thinking was limited and if a student is not willing to attend school, it is made compulsory. His only goal, when and if he attends, is nothing more than to obtain a certificate. Convincing him of a different attitude is challenging. On the other hand, Ph2.T6 had been asked what he would do if he had another chance to participate again in this project:

> *"I hope that we have qualified students who have knowledge of sustainable development and who are knowledgeable of what is happening in the world in general and fully aware of what is going on the world in order to benefit from this programme".*

5. **Lack of interpersonal competences**: Teachers here believe that miscommunication was one of the major challenges. Ph2.T25 had been asked this ques-

tion by the researcher: Might I understand from you that there was not positive communication between the teacher and the students about the importance of research and that research supposed to serve the country, and that research is part of the development of skills and knowledge? *"Exactly, exactly. The student does not have the vision of this at all"*. On the other hand, Ph2.T6 had been asked if he had another chance to participate again in this project, what he would do:

> *"I hope that the timetable of lessons is formatted for the teacher, and school should be ready in order for the school director to interact with the programme positively".*

It seems that the benefit of practicing interpersonal competences within Case O was missing. Even though the opportunity to do so was provided, teachers and students were not communicating together successfully.

6.5   Lessons Learned from Case M and O

As is shown previously in Case M and Case O, there were different perspectives towards integrating SD into the curriculum of SSCE. In this section, there is an attempt to learn lessons from the two cases. In order to bring more evidence to show the lessons learned, the teachers' field notes, which appear in Appendix R, as well as previous perceptions are used. The following categories and how each case dealt with them are discussed below.

6.5.1   Impression of the possibility of integrating SD into SSCE curriculum

Case O expresses that:

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"In the subject of geography, it is possible to teach agriculture, oil and livestock as well as how to keep the livestock for the next generations, aquatics resources and how to preserve it for future generations, so it is possible to incorporate the idea of sustainable development in Social Studies".

However, when the work started, teachers faced certain challenges that could not help them integrate the project into the new curriculum. Although these challenges could be overcome, according to the teachers the circumstances were not favourable. It can be learned from Case O that teachers should be resilient and should not give up easily.

On the other hand, Case M believes that integrating sustainable development into the SSCE curriculum is possible if there is a desire to deal with uncertain educational situations. It can be learned from Case M that teachers should be provided spaces, freedom and support from educational policy makers in order to let them achieve their aims of ESD. Below, some examples of the work and efforts of Case M are shown.

6.5.1.1 Applying interpersonal competences within the community's members

Case O shows that there was a lack in communication between teachers and students in the integration of SD. Students believed that the teachers did not support them to interact with SD activities actively, while teachers claimed that the students did not have a background of SD even though they showed their desire to participate in SD activities. It can be learned from this case that teachers should be able to communicate with students from different kinds of backgrounds through having

suitable interpersonal competences.

However, Case M shows how the researcher provided opportunities for the teachers to use their interpersonal competences through different occasions and purposes as is shown in the three examples that are mentioned in the section how was a CoP built. Furthermore, Case M explains the process of acting and reacting through on-going meetings with the researcher to discuss what has been implemented through sustainable development curriculum sessions. These points were addressed as follows:

> *"1. Identifying specific hours on every Thursday to meet and discuss what has been done during the entire week.*
>
> *2. Communicating with the researcher continuously by email.*
>
> *3. Communicating with the researcher continuously through the WhatsApp programme".*

It can be learned that even though teachers in Case M had typical abilities to communicate with different kinds of students' backgrounds, discussing with them about cutting-edge knowledge with regard to interpersonal competences is critical.

6.5.1.2 Teachers' beliefs about the appropriate CPDs for them

It seems that teachers in Case O prefer to continue to be treated as passive recipients, who can only be developed through the top-down approach, and thus they do not have to use their creativity and innovation as an active educator. It can be learned from this case that many efforts are needed to change teachers' mind-sets to accept their real role as agents who are able to participate in their professional development and have ownership of their learning.

While Case M explains that acting and reacting positively to the proposed CoP (community of practice) not only from the beginning of the project until the end, but even after the project was critical as they have the intention to use it as a way of continuing professional development. Overall, teachers in Case M believed that the community of practice has an impact in a way that has successfully gathered them together after being far away from each other.

6.5.1.3 Time challenge

Case O shows that the teachers in the CoP did not have enough time to apply all the aspects of SD. It also shows that students did not have enough time to engage with the many lessons actively. The time challenge can be a chance to let the administration team participate within the community agenda if there is shared understanding of ESD aims.

However, Case M shows that teachers were acting and reacting to overcome the time challenge so they *"Avoid defects in the regulation and the performance of all curriculum and specifically the official curriculum of Social Studies"*. They also *"Conducted workshops in the presence of the researcher and overcame this challenge"*. Furthermore, they were acting and reacting by:

> *"Determining two sessions out of three sessions of Social Studies lessons with materials that were linking lessons to sustainable development through discussion and worksheets. Also, determining the full session for sustainable development curriculum".*

It can be learned from this case that teachers might face challenges, so adapting themselves to these challenges is useful.

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6.5.1.4 The problem of school facilities in Case M and O

Teachers in Case O show that working on such a project in a rented building is hard for several reasons. One of them is that classrooms are small and there are too many students to fit in them. The rest of the examples can be found in the section school facilities. It can be learned from this case that teachers should use their systems thinking to find solutions for the challenges of school facilities. On the other hand, teachers in Case M were acting and reacting to provide proper facilities inside the school in order to implement the project:

> *"Specifically, the session of the sustainable development curriculum needs a special room which should be equipped with visual aids and enough space for collective actions. Since there are limited locations inside the school, it selects one of the rooms via coordination with the administration, managing and controlling this room through the school schedule".*

6.5.2 The factors that foster or hinder incorporating SD in the SSCE curriculum

This subsection answers RQ3 briefly as it has been already answered under the question of why did CoP work or not in both cases. As can be seen from the previous analysis, certain factors foster or hinder incorporating sustainable development in the SSCE curriculum in the Saudi 10th grade through the community of practice. These factors are the teachers' beliefs, quality of the students, school facilities, time challenge and lack of interpersonal competences. However, there are other factors that unexpectedly emerged from these case studies such as the support from members of society, be they internal factors such as a school leadership or external

factors such as the private sector.

According to the research diary, with regard to the implementation of the project's activities such as the Aquaponics system, which requires financial support, businessmen as members of society have different views with respect to understanding their responsibility towards promoting sustainable development educational tools. Some of them have broad understanding about their duty towards enhancing sustainable development such as being close to schools and supporting them financially, educationally and emotionally, while others have a narrow understanding of their responsibility towards education for sustainable development.

6.6   Summary of the Chapter

The results of Phase 2 have been presented in two sections, Case M and Case O, and each section has several sub-sections which have been presented in meaningful ways. The key points of the results of this phase can be summarised in the following points:

– Although implementing cutting-edge knowledge in terms of integrating SD through developing systems thinning and interpersonal competences is globally recommended, the ways in which to put these competencies into practice within a unique context such as Saudi Arabia can be challenging;

– Although the role of the researcher is positive, which can be seen before and after building the community of practice, the limitations within his own capacity appeared through time limitation and resources and even in collecting data from students, which can lead to Phase 2 being thin on the student side;

– If the researcher had an ideal situation with regard to these limitations, he could

use other tools to collect in depth data from students such as semi-structured interviews;

– Although the roles of teachers in Case M were adequate to implement the project according to its aims, they could do much better if the project was officially implemented and included incentives that link to their development career;

– Although the roles of teachers in Case O did not seem appropriate to implement the project according to its aims, there is a possibility to enable them to implement the project if both internal and external factors are taken into consideration;

– The students in both cases were expected to have a background with respect to SD, however, they did not. Thus, this can be seen as a learning opportunity to reconsider the aims of SD, which emphasizes the social development as one of its core aspects;

– Although the processes of PCD, TASC and CoP arguably seemed complex and required a shifting in mind-sets, flexibility in combinations of them might lead to integrate SD educationally.

7. DISCUSSION

This chapter discusses the main findings of the study in relation to the existing litera-ture and the context. The results discussion will be addressed in two main sections, Phase 1 and Phase 2.

7.1   Phase One

Discussion of Phase 1 integrates the researcher's voice and the participants' voices (both teachers and students) with those from the literature which are reinterpreted to provide latent interpretive and meaningful conceptual categories to understand the first question of the study: What is the current practice regarding the incorporation of sustainable development in the Saudi Social Studies and Citizenship Education curriculum?

The four themes in Phase 1, which are the conception of sustainable development, the current SSCE curriculum and sustainable development, the need to change for sustainable development to be incorporated in the SSCE curriculum and the current implementation of continuing professional development CPDs, are reinterpreted and discussed in relation to why SD is not incorporated in the Saudi educational context.

7.1.1 Teachers' and students' perceptions of SD concept

Few studies currently examine teacher knowledge with respect to the concepts of sustainable development (Zachariou and Kadji-Beltran, 2009; Burmeister and Eilks, 2013a; Ceulemans and Eilks, 2014), a gap that is partially addressed by this study. If understanding the meaning of sustainable development concept is not clear, which is the basic step for starting the sustainable development processes, making sustainable development come alive becomes very challenging. As shown in the findings from the students and teachers in Chapter 5 (see 5.2.1 and 5.3), there is a lack of any clear concept of sustainable development. If teachers do not have a clear concept of SD, it is not surprising that neither do their students. One of the reasons behind the lack of students' perceptions of the sustainable development concept is that the current curriculum did not present SD in a holistic manner, which will be discussed in Subsection 7.1.2. Another reason is that the teachers have a lack of subject knowledge with regard to SD concept, so they are not able to provide pedagogical assistance for students, which will be discussed in Subsection 7.1.6. Globally, however, evidence suggests that not only teachers but also education leaders have misconceptions about SD, which is a key reason why few educational institutions succeed in integrating concepts of sustainable development in their programmes (Leal Filho, 2011). Research conducted in North America shows that only a few universities in the USA, Canada and Mexico were able to implement SD into their programmes (Leal Filho, 2011), while research conducted in Europe shows that teachers in both Belgium (Ceulemans and Eilks, 2014) and Germany (Burmeister and Eilks, 2013a) and school leaders in Cyprus (Zachariou and Kadji-Beltran, 2009) lack understanding of the concept of sustainable development, with most leaders providing definitions which emphasise environmental issues and neglect the social

and economic aspects. It is clear that lack of understanding of SD in education is therefore not limited to Saudi Arabia, but is a global phenomenon.

Consequently, it can be argued that if there is a lack of clear understanding of the actual concept of sustainable development, educators will also be unclear about how to approach both its integration into school curricula and about how to teach it. The inability to grasp a basic working knowledge of sustainable development impedes its real world understanding and, therefore, CPD for teachers in SD is critically required (Waas et al., 2011). However, lack of clarity over the concept was not the only factor affecting the integration of SD into the SSCE curriculum in Saudi Arabia. Further factors are discussed in the following section.

7.1.2 Unsuitability of the current SSCE integrated curriculum

Overall, the findings show that the current official SSCE curriculum is not appropriate for promoting or integrating SD content (see 5.4). The findings identified five factors that offer possible reasons for this finding:

- The current SSCE curriculum is not based on an integrative approach, but is subject-based covering the subjects of history, geography and citizenship; whereas SD is cross-curricular;

- The current SSCE curriculum shows a lack of progression in knowledge, skills and understanding which makes it difficult to identify where it is best to place SD topics;

- SD is not fully mentioned in the current SSCE curriculum and where it is mentioned it focuses only on economic aspects;

- Current textbooks do not support teachers in helping to raise students' knowledge and attitudes towards SD; the teachers stated that TV and the Internet

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were their main sources of information and that they found these sources stimulating and relevant to students' lives;

– Teachers' lack of SD knowledge means they are dependent on official curriculum guidelines but, as shown in the points above, it is not suitable for this task.

One might wonder why the teachers have pointed out the reasons above, what their roles are in the curriculum development and its processes and how the Saudi Ministry of Education (MOE) views the teachers' roles. According to the literature that has addressed these issues in the Saudi context, it seems that many challenges lead teachers to express their reasons above. For example, in practice, the teacher's roles is restricted to traditional managerial roles such as evaluating students' progress, coping with the learners' behaviour and being ready to apply what the MOE requested from them (Alsalahi, 2014).

In addition, the teachers are burdened with a considerable amount of work, which only gives them a limited amount of time to think about their expertise as teachers, thus submitting them to significant pressure (ibid). Therefore, the MOE views teachers as only implementers of the curriculum although teachers consider themselves as capable of participating in the curriculum development process (Alnefaie, 2016). The teachers' situation has negatively influenced their motivation, professional creativity and teachers considered themselves as if they are in marginalised status (ibid). Although these challenges that impeded teachers' participation in the curriculum development, teachers also have the responsibility to find ways that can allow them to participate in this task. Teachers need to develop their subject knowledge in terms of curriculum development independently and find CPDs approaches that assist them in this challenge.

Problematising the institutional and policy constraints in terms of teachers' roles in

the curriculum development have been addressed briefly and it is necessary to consider how to make ESD applicable within the SSCE curriculum and how to support teachers to be curriculum developers. Altaher (2013) confirms the findings of this study, which reveal that TV and the Internet influenced pupils' knowledge and attitude towards sustainable development in the Saudi context, as key sources of information for them. It is recommended that educational textbooks must focus students' attention more directly to help raise their knowledge and attitude towards sustainable development (ibid).

It is evident that the situation in Saudi Arabia is extremely challenging for teachers who wish to integrate SD issues into the SSCE curriculum, but the students and teachers in this study had a number of ideas about what was needed to change the current situation. Thus, the findings encourage urgent action to address the issues of sustainable development and to highlight them in the curriculum in a comprehensive manner, due to the current content in the 10th grade not mentioning sustainable development. Therefore, globally and locally it is seen that an inclusive approach for developing the curriculum is needed which will be discussed in the next section.

7.1.3 Developing the SSCE curriculum

The findings show that students and teachers agree on the need for curriculum development if it is to support the integration of SD issues. The teachers in particular offered a number of ideas:

– Curriculum development should be holistic and influence all subject areas, not only SSCE;

– Guidance should be provided for how to achieve this and how to teach SD across subjects in a systematic way;

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– Guidance should focus on both knowing that (content knowledge) and knowing how (procedural knowledge) as well as focus on key SD competencies such as systems thinking and interpersonal skills;

– The curriculum should shift from being concerned with quality (depth of understanding) rather than quantity (content coverage) and should attempt to link with students' daily lives;

– An interdisciplinary approach would be necessary to achieve this.

With respect to the importance of teachers' roles and their involvement in the curriculum development, one might ask whether teachers' involvement can make a change in the curriculum development itself or on the students' attainments (Subsection 7.1.2).

Although teacher involvement, empowerment in curriculum development and taking curricular leadership roles become fundamental in the educational processes (Fullan, 2001; Carl, 2009; Handler, 2010; Alsubaie, 2016), there is not enough evidence of their effectiveness on the curriculum development (Weiss, 1993) or on the students' outcomes (Leithwood and Jantzi, 2000). The question is why teacher involvement does not support either the curriculum development or the students' achievement. Handler (2010) argues that the uselessness of teacher involvement on the curriculum development is due to lack of teacher subject knowledge in curriculum development. In addition, the current study reveals that one of the reasons of unsuccessful teacher involvement is that they did not have an opportunity to participate in curriculum development, which was confirmed by the study of Oloruntegbe (2011) in the Nigerian context. One might suggest developing teacher subject knowledge through CPDs. However, according to the literature the reason why teacher involvement is unsuccessful in the curriculum development is that the kind

of CPDs that are used or recommended are not helpful in this task.

For example, Handler (2010) and Alsubaie (2016) recommended using training courses to prepare teachers to be able to participate effectively in the curriculum development. The findings of the current study show that the training model of CPDs is not appropriate to support teachers to participate effectively in educational processes in general which was confirmed in the study by Nunan (2003).

Noticeably, based on the findings of this study, it would be difficult to help them to involve professionally in curriculum development, which will be discussed in more detail in Subsection 7.1.5. Moreover, Dambudzo (2015) suggests that further research is required to examine curricula and approaches that are concerned with the integration of education for sustainable development with the challenges that schools face when they are trying to implement ESD. In addition, the author states that further research is needed to evaluate the effectiveness of implementing ESD on competencies in learners and how curriculum change or innovation can promote ESD (ibid).

The above suggestions have been taken into consideration by implementing Phase 2. Moreover, this research focused on a project of curriculum development that aimed to combine knowing that (content knowledge) and knowing how (procedural knowledge) through a community of practice approach in the belief that a CoP approach is more likely to support the development of both these aspects. Thus, teachers in this study are not only considering the current practice of integrating sustainable development in the SSCE curriculum, but also considering how the current practice could be improved. The extent to which this was successful is discussed in Section 7.2.

Providing environments for applying knowing how aspects can provide initial futuristic competency recommended by Wiek et al. (2011) as one of the key sustainability

competencies as well as activating one of the seven SD concepts that is concerned with future generations. Wiek et al. (2011) defined futuristic competency as is the capability to cooperatively "analyse, evaluate, and craft rich "pictures" of the future related to sustainability issues and sustainability problem-solving frameworks" (p. 207-209). The application of know how might help to ensure the development of this competency through exposing students with sustainable development issues that are related to students context and local environment as well as using TASC's steps in Phase 2. Findings suggest that a curriculum should shift from concerns of providing a considerable amount of information concerned with qualitative aspects, especially with the availability of the Internet, in an attempt to link it with students' daily lives. As Pigozzi (2010) argues, ESD requires a more complex approach such as an interdisciplinary one that focuses on quality instead of quantity. The school environment must be ready to make the necessary changes to apply the recommended curriculum. For the changes suggested by the teachers to have a realistic chance of taking place, the teachers discussed the political context in which they were working.

7.1.4 Political context needs to change for SD

The key finding in relation to the political context was not that Saudi Arabia needs to change its policy on sustainable development as it is already an active member of the G20 countries and is showing its responsibility towards promoting the concept of sustainable development. Rather, the key finding is that there is a lack of connection between broad policy statements and what is happening more specifically in the education sector. Teachers argued that Saudi Arabia should increase the responsibility of education policies to be aligned with the SD principles if future generations

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were going to be able to live and work in sustainable ways.

At a national political level:

– There is a need for greater political-educational collaboration;

– All members of society (including teachers and school leaders) must facilitate full participation of each individual in order to fulfil their roles and responsibilities with regard to SD;

– Educational institutions have a duty to change lifestyles and customs to meet the needs of SD;

– SD processes are complex and require cooperation between the institutions of society, education and the media, and between formal and informal education;

– The ministry of Education should have a department which is responsible for studying the current and contemporary issues that are critical to SD and to students' lives;

– Unqualified people have developed the current curriculum–the need for specialisation is paramount in curriculum development.

At a local, school level:

– Creating opportunities for teachers to collaborate with external people who are expert in SD would help with the previous point, and give teachers a sense of agency in the work;

– Consider involving students and young people in playing an active role in their development as sustainable citizens;

– Invest in the contribution that religious and ethical values can make to SD issues–currently there is little or no connection between Islamic teaching and SD;

– Develop students' identities that they are orientated towards SD by: linking SD to their personal environments; engaging them in problem-based inquiries to increase their motivation and pro-environmental behaviours; make use of real-world learning so increase students' sense of relevance and thus enhance their SD identities.

Noticeably, teachers throughout their interviews repeatedly used the pronoun 'we', an observation that arguably could carry significant meaning. One such meaning could be that the challenges and issues of teaching and raising awareness of sustainable development issues are in fact aspects that few can manage. All members of society must facilitate full participation of each individual through their abilities as well as their responsibilities.

Murga-Menoyo (2009) supports the findings of the current study by emphasizing the statement that the duty of education is to change lifestyles and customs to meet the needs of sustainable development through educating and socializing new generations for the evolving paradigm of comprehensive sustainable development. Based on previous statements, sustainable development issues can be seen as complex, uncertain, value laden, and include a plurality of legitimate perspectives (Funtowicz and Ravetz, 2003). Cars and West (2015) state that eventually sustainable development needs a change in personal/public awareness at several levels, in an effort to reach a shared vision. Teachers in the current study indicate that education can be an active tool for SD which supported by the study of Richmond (2010). Richmond (2010) highlights the fact that education for sustainable development is a tool to mobilize support through which domestic communities, global organisations, the public, and the international private sector can demonstrate a collective commitment in order to learn and live sustainably.

Essentially, in order to accomplish a sustainable societal transformation, alteration

has to be activated in a participatory way, reflecting the different interests of various players (Cars and West, 2015), such as through CoP which will be discussed in Subsection 7.1.5. Huckle (1996) concludes that adequate attention must be paid to education as the focus of alteration itself if it is to achieve its expected changes of attitude towards these challenges. Regarding the need to specialise in curriculum development is obvious as education systems are required to be constructed upon robust, updated curricula and to design classroom activities based on cutting edge information about what motivates individual learning (Van den Branden, 2015).

The reason for building a strong curriculum is due to the world having experienced massive ecological, economic, social, political changes and faced major intimidations, meaning that the curriculum of the twenty-first century will be required to be different from the curriculum of the preceding century (ibid). Furthermore, it can be argued that designing a sustainable curriculum is not just adding some content knowledge into a course or unit, but instead it is incorporating these values of sustainable development throughout the entire course or unit and presenting the course in sustainable means (Scott, 2009).

Noticeably, teachers do not have necessary expertise and therefore external experts who do have the expertise in SD issues were brought into the project in Phase 2 to fill this gap. Also, data reveals some challenges can transform into solutions in the Saudi context. For example, one solution to the issues of Saudi sustainable development is a reconsideration of student and youth roles. It is stated that many educators believe that more of the same approach and content of the current education system will only make matters worse (Orr, 2004). This statement is not against education, but instead encourages the kind of education that prepares individuals for survival and living in an appropriate manner based on the environment and earth, which better understands the rules of natural balance (ibid). Youth and student roles to-

wards sustainable development is crucially important and their voices must be heard (Alnahdi, 2014). According to Pleasance (2016), democratic approaches allow students' involvement and engagement in their education process, and can enhance the transformational learning necessary for sustainable development.

This study put this into practice by involving students in this research from the beginning by applying the NGT method with them and by asking them to participate in the development of the two units of SD that were implemented in Phase 2. In addition, Muslim academics or academics writing about Muslim contexts have made the connection between the values of Islam and those of SD (cf. Sule and Adam, 2018). In fact, to the best of the researcher's knowledge, few studies have focused on the relationship between the Islamic teaching in the Saudi context and sustainable development even though Islam supports the principles of sustainable development (bin Hamad, 2017). Alturki (2015) states that although Saudi Arabia has endorsed a flourishing body of ecological regulations to promote the third dimension of SD, these regulations have not yet been successfully applied. Moreover, findings reveal why Islamic teaching has no influence on developing a religious sense towards SD because either it is not presented well in the curriculum or it is not reflected through educational processes as a whole.

On the other hand, it was argued that ethical values as the fourth pillar of sustainable development are viewed as linking discussions of good governance (political/institutional perspective), personal growth (religious/spiritual perspective) and cultural integrity and vitality (cultural/aesthetic perspective) (Burford et al., 2013). In addition, it is argued that the religious and emotional aspects can play a vital role for sustainable development and increase the ownership of the place, which can at the end work positively towards sustainable development (Narayanan, 2014). Moreover, it can be seen that sustainable development strategies provide room for individuals'

religious beliefs. This is because sustainable development can involve the citizen as an ethical representative who derives their wisdom of purpose and obligation from their religious principles (Kamali, 2016).

As mentioned in Chapter 4, this research is value bound, the researcher being a part of the study context and understanding its cultural experiences, so it can be argued that religion can positively support the culture of sustainable development principles. The role of religion can be activated through religious practitioners acting as role models, who can reflect their beliefs into actions instead of only theoretically lecturing. Furthermore, it is believed that spirituality plays a very vital role because distinctive values and the value orientations found in every culture, have influenced the worldview and awareness among members of that culture (Čiegis et al., 2008). Although values and their aspects are commonly presumed to be intangible and immeasurable, there is an argument of potentiality of operationalizing them in terms of measurable indicators (Burford et al., 2013).

There is a belief that religious-spiritual belief is the missing pillar/dimension of sustainable development although it is rooted in the concept of a worldwide awakening of ethical and spiritual consciousness that reinforces sustainable development transitions (ibid). Therefore, positive values can support the principles of sustainable development as the soul of its processes. Finally, the data demonstrated that there is the possibility of integrating ethical values in such practical ways through lesson objectives. Moreover, data shows that the role of developing citizens' identities through linking them to their personal environment is necessary. This can be done through cultivating a sense of social responsibility among the population with the idea that everyone is as responsible for their country as they are for their own houses.

Forsyth et al. (2015) draw on place identity theories, predicting that people whose

identities are based, at least in part, on the location where they were raised, would have a higher possibility of engendering environmentally responsible behaviours. Thus, they were associated with increases in a willingness to protect water resources and to have pro-environmental behaviour (ibid). Data emphasizes that the concern of accessing the necessary knowledge should be used to help develop students' identities. This is because the learning facilities that are provided in the digital age as well as the abilities of students enable them to find information easily through searching the Internet. Thus, teachers need support and guidance on how to help students access real world learning in order to show them how to be more innovative and creative in a healthy environment, which does not restrict and limit their freedom. According to Lawson (2010) there is a substantial literature dedicated to good professional education and teaching practices, but little observed research of constructivist knowledge creation that promotes different understandings to be developed by students in classroom based and real world learning. On the other hand, it is argued that there is a possibility for adaptability in identity forming and decision-making capability in an open-ended curriculum (ibid). The importance of teachers' requests for training and guidance towards developing students' identities can be seen as urgent, especially in a world that it is rapidly changing and uncertain. The connection between student identity and SD can be seen through dealing with SD issues and unique solutions which in fact require appropriate sustainability competencies. Thus, in doing so, students in the future will have diverse aspects of identities, or multiple identities as well as many communities, which will help them contribute positively towards sustainable development. The broader political changes are outside the scope of school teachers and this study. However, most of the key findings in 7.1.1–7.1.4 imply the need for in-service teacher professional development and Phase 1 findings showed that current models used for CPD are consid-

ered unsuitable by the teachers, who instead favoured a collaborative, participatory approach to their development. This is discussed in the following section.

7.1.5   Continuing Professional Development- different models and their suitability

In general, teachers in this study consider that current models of CPD are not suitable for integrating SD in the Saudi SSCE curriculum. Specifically, they found both the training and cascade models (which are most commonly used) to be problematic for the following reasons:

– Trainers are more concerned with meeting the training objectives and satisfying those in charge than they are meeting the needs of the teachers on their courses;

– Trainers are often not qualified supervisors and so they are ineffective;

– Training programmes offered do not meet the teachers' needs; the content, processes and materials presented did not reflect the teachers' requirements;

– Teachers are often motivated to attend courses because the training hours can be counted towards their career advancement, rather than because they hope to learn things that will be helpful to their teaching;

– Teachers believe they are not able to actively participate in training programmes; they play a passive role;

– If a single teacher is trained and then returns to their school to train the rest of the staff using the cascade model, messages and information provided become diluted;

– Teachers believe that it is important to develop innovative pedagogies for SD, but no CPD programmes are available for pedagogical development;

– Therefore, teachers need to find ways of developing innovative pedagogies amongst themselves (e.g. Active Learning, Problem-Based Learning, use of Thinking Actively in a Social Context (TASC) approaches);

– The practice of social networking and formation of communities of practice may be supportive in overcoming such challenges because it would focus on practical applications more than theoretical aspects.

Teachers in the current study provide valuable information with respect to CPDs from their current practice and experience. It can be argued that teachers encounter current challenges and responsibilities that require innovative abilities, information and new roles, which can be gained through continuing professional development (Macheng, 2016).

However, teachers demonstrate the limitations of training and cascade models, which will be discussed in the following paragraphs. Findings are concerned with one of the hindering factors, a trainer's goals in the training programmes. Some authors were concerned about this issue under trainer performance, in terms of to what extent the trainer accomplished the training objectives and the trainees' requirements (Diamantidis and Chatzoglou, 2012). These training programmes do not meet the teachers' needs, thus, they are not effective for teachers to benefit from and use to integrate SD in their classrooms. In fact, this issue contradicts sustainable development principles by wasting time, effort and resources, which need to be used wisely in order to contribute to the future lives of students. However, if these resources are not used wisely, the students will not be able to fully integrate SD in their daily lives.

The current practice reveals that the nature of training programmes only present content through simply lecturing theoretical based sessions that lack elements of

application, which are the most effective elements that teachers can benefit from. This issue can have an undesirable impact on trainees' motivation, as it is stated that individuals who believe and know beforehand that there will not be any chance to implement new expertise do not transfer training into their work practices (Nikandrou et al., 2009).

Teachers highlighted their goals with respect to attending these training programmes are to collect the amount of training hours to be counted later in the competition for career advancement to become a deputy director, a director of a school or to teach outside the Kingdom of Saudi Arabia. This issue led back to the literature in order to get a clear picture of this issue. It was found that one of the most important findings was trainees' goals as it is stated that nearly half of the individuals interviewed, who participated in training programmes, intend to improve their personal capabilities and information to be ready for a future career rather than thinking of their present position (Nikandrou et al., 2009). This issue leads to consider the role of trainees during the training programmes, which is the next sub-element.

Teachers believe that they do not have a chance to actively participate in these training programmes, so they play a passive role in these programmes. Furthermore, a complex issue shows that even when a teacher does implement these educational processes inside the classroom, his voice was not heard or enhanced in such training programmes. Teachers commonly consider the training model which is one of CPDs, is not appropriate for them. On other hand, it is argued that policy-makers have strived to close this deficit by developing the quality of teacher education in countryside regions through teacher professional development (PD) programmes (Lu et al., 2017). Despite investing billions, there is little evidence on the efficiency of such courses (ibid). Therefore, the findings of this study indicate that the centralised top-down nature of the current CPD system negatively affects the achievements of

CPDs.

On the other hand, it was stated that one of the immediate benefits of the cascade model is the capability to reach a great number of teachers within a short period of time (Bett, 2016). Data reveals that although teachers respond positively to employ the cascade model in school, this has a negative impact on schoolteachers with respect to the absence of those who attended these courses. In addition, the data shows that regardless of moving training programmes from training centre to school through a cascade model, it still has the advantages and disadvantages of all training programmes, with the teacher who presents the training content possible being better than the supervisors in the training centre. Dichaba and Mokhele (2012) investigated in their study whether the cascade model does work for teacher training and concluded that even though this model has come to be recognised as an effective approach for distributing information widely in-service training programmes, it seems to be unsuccessful in its attempts to meaningfully develop the performance of teachers.

However, it has been criticized for being similar to the training model, as it is commonly established on the idea of a skilful person bringing major notions to often inexpert or uninformed teachers (Bett, 2016). However, reality tells something different as teachers have special requirements and practices, and when these go unnoticed or rejected, the procedure of training can be viewed as unsuccessful from the beginning (ibid). Furthermore, Bantwini (2009) argues even though there is no justification to discourage the usage of these models, it should be taken into consideration that circumstantial factors and teachers' requirements play an important role in the achievement of new improvements. Thus, it seems that the cascade model needs to improve in order to be suitable not only for the Saudi context, but also for other contexts because at the present moment it ignores teachers' needs

and appreciation towards their experiences, which are important keys for developing teachers' professionality. To sum up, the limitations of conventional forms of teacher professional development programmes such as the training model and the cascade model have drawbacks towards supporting teachers to activate sustainable development.

One might ask which kind of CPD models can assist teachers to participate in the integration of SD in the SSCE curriculum. Educational researchers and teacher educators argue instead for collaborative ongoing teacher learning through participation in professional teacher learning communities (Pausigere and Graven, 2014). Based on data provided in Section 5.6, it seems that there is a relationship between self-directed and a community of practice model from different angles. Furthermore, this can be supported as communities of practice blend collaborative and self-directed learning to encounter the challenges of today's active institutional setting (Monaghan, 2011). Grover et al. (2013) present results in their discussion of the concepts of self-directed learning and how the inadequacy of awareness about paediatric stroke, along with a lack of resources, affects the parents' ability to gather information. Their findings indicate that the practice of social networking and the formation of communities of practice are supportive in overcoming such challenges. In this point, teachers came up with the notion with respect to teacher professional development, which is a community of practice model. The data shows the demand of these kinds of continuing professional development programmes.

Current practice reveals that there are social relationships between the teachers, but these relationships do not lead to the production of any action in terms of teaching practice. In addition, teachers value the benefits of such kind of continuing professional development programme especially in a working environment. It is emphasized that a teacher can work in a collaborative manner and accept criticism

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from colleagues because the aim is pursuing development not only for criticism. Anderson-Carpenter et al. (2014) have found in their study that communities of practice facilitate practice changes across communities which support views in the existing literature of a community of practice. In addition, experts have constantly recognised communities of practice as a vital feature for increasing workable collaborative capability for reliable knowledgeable practices (Tolson et al., 2011).

It is highlighted that community events transform the methodological structure such as processes, procedures, the development and employment of innovative methods or practices, the social structure such as relationships between members, collaboration and sense of identity and uniting the community (Sánchez-Cardona et al., 2012). Data illustrates that there is belief in a collaborative community of practice model that can be much better than the training programme model since it is focused on practical applications more than the theoretical aspects. In a study by McCreesh et al. (2016) participants pointed to the many advantages of a community of practice model. These advantages include activating the role of teamwork for decreasing isolation and accomplishing goals and gaining positive clinical practice changes in terms of improved patient education, increasing confidence and availability of new resources. Furthermore, some elements of personal growth and development, especially evidence-based practice skills have increased and the benefits of implementing communities of practices as ways of continuing professional development were evident (ibid). It is believed that a community of practice model can provide benefits for individuals, communities and organisations.

Based on the previous paragraphs, findings only highlighted the positive sides of CoP, which are confirmed by the literature. On the other hand, many authors as discussed in Chapter 3 have critiqued CoP. For example, there are several limitations that need to be considered when applying CoP such as professional hierarchies

and local culture are emphasised as the major limitations of CoP (Kerno Jr, 2008). Another drawback of CoP is the challenge of readiness as the members of the community might resist and might prefer to become entrenched with regard to their own knowledge (Roberts, 2006). The need for professional development in Sustainable Pedagogical Content Knowledge (SPCK) is a conclusion that can be drawn from the earlier findings and more detail of this point will be discussed in the next section.

7.1.6   Sustainable Pedagogical Content Knowledge (SPCK)

Although they did not identify it as such, teachers in this study showed awareness of the need for professional development in Sustainable Pedagogical Content Knowledge (SPCK) if they were going to successfully integrate SD into the SSCE curriculum. However, they expressed concerns about being able to deal with an interdisciplinary approach such as connecting history, geography and citizenship through the same topic. For example, some teachers would be specialists in history but may not be creative in geography and vice versa. A further challenge teachers identified was that current practice relies on cramming information into the minds of students, so their pedagogical knowledge is based on a delivery model which they would need to develop if SPCK were to be successful.

The central point here is that teachers' pedagogical content knowledge should match with the core of Shulman's definition of PCK, which is that teachers must be capable of interpreting their personal understanding of this notion into their teaching through using techniques which would make it easy to present to their students (Birdsall, 2015). In addition, it can be noticed that from the definition that there were three categories, which were knowledge of topics regularly taught in ones subject area, knowledge of forms of representation of those ideas and knowledge of stu-

dents' understanding of the topics.

Thus, Shulman (1986) begins this by constructing the basic framework of pedagogical content knowledge that is based on three categories. Following on from Shulman's (1986) conceptual framework, there are many conceptions of pedagogical content knowledge (PCK) and models that define its components such as Grossman (1990), Marks (1990), Tamir (1988), Magnusson et al. (1999), Rodrigues et al. (2003), Andrews (2001), Park and Oliver (2008) and Barrett and Green (2009). However, it can be seen that most of the models identify context knowledge as well as the areas of content knowledge and pedagogical knowledge (Perry, 2013).

Some of these models can be generic, which means they can be applied to most subjects, while others have produced specific models that are suitable for their subjects because the nature of disciplines such as mathematics or science are different from foreign languages (Jing-Jing, 2014). On the other hand, no matter what features are recognised for pedagogical content knowledge components, the key principle is that all the elements are combinations of pedagogy and subject matter knowledge or other knowledge elements for teaching (Jing-Jing, 2014). Noticeably, teachers in the current study lack content knowledge in SD and this why this study introduced TASC in Phase 2. Teachers believe that the curriculum should provide simplistic and identifiable topics in order to support teachers in performing their roles, such as assisting students to have first-hand experience of these issues and implementing what they have learnt in the classroom in real life. On the other hand, some researchers discuss a sustainable pedagogical content knowledge (SPCK) such as Perry (2013), Birdsall (2015) and Buchanan and Crawford (2015). It can be argued that sustainability literacy and competency can provide the first component of PCK, which is the knowledge of sustainability subject matter (Nolet, 2009; Perry, 2013).

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According to the sustainability literacy's and competencies' perspectives, knowledge is not perceived as merely certain and limited, as is the case of the current curriculum, but rather as emerging and changeable. Teachers believe that it is vital to develop innovative pedagogies for SD which is supported by Akyüz and Samsa (2009) who claim that numerous educationalists believe that particular knowledge will not be as vital to future employees and people as the significance of the competence of learning and realizing of new information. This can be especially true in the digital age, which is characterized to not only make information easy for accessing, but also providing deep learning through improving the learners' performance with access to further data (Weigel, 2002). It is stated that there is a need to embrace 'liquid learning' and the sense of it is that learning and knowledge are continuously on the move, so that educational institutions design curricula in ways that introduce questions about practices and understandings of knowledge within and beyond disciplinary areas (Savin-Baden, 2014).

Noticeably, it is argued that in social studies education, debatable problems are often genuinely integrated into the curriculum, offering a genuine chance to investigate challenges as a component of social studies lessons (Buchanan and Crawford, 2015). This leads to talk about the second component of PCK, which is the knowledge of representing the sustainability themes, notions, issues, and ideas through teachers' personal understanding of these themes and issues and through choosing strategies that better enable students to produce knowledge and participate actively. Therefore, it can be strongly emphasized that Problem-Centred Design can attempt to provide the basic elements of liquid learning curricula, as stated in the previous paragraph, that are characterised as liberated, reflexive and flexible (Savin-Baden, 2014). Thus, knowledge and knowledge boundaries are perceived as contestable and constantly on the move (ibid). Teachers highlight the importance of sustain-

able awareness by using various ways and this belief is consistent with results of the study of Kruidenier and Morrison (2013). They express the significance of the sustainable engagement with sustainable development issues in order to advise students and to enhance their ideas of how to take action related to sustainable issues. They found that through continuous engagement, there was a significant positive impact on students' content knowledge.

Birdsall (2015) analysed teachers' translation of their comprehending of sustainability through employing a PCK framework and found these results. It is found that the translation of sustainability was a multifaceted interaction of three of the pedagogical content knowledge components. In addition, certain children have developed clearer ideas of sustainable development but only two were capable of linking their understanding with the scientific concepts taught, resulting in diffused learning (ibid). It can be argued that learning now happens in a diversity of means through communities of practice, personal networks, and through the accomplishment of work-related tasks (Siemens, 2014). The last component of sustainability PCK is perceiving feedback with respect to students' understanding of what makes the learning of specific topics simple or difficult for them. On the other hand, there is a belief that these sustainability PCK components are working and interacting with each other as one team not as isolated elements (Park and Oliver, 2008; Perry, 2013; Suh and Park, 2017).

Therefore, since this research attempts to explore and understand how to integrate SD into (SSCE), it deals with PCK sustainability components in Phase 2. Now, teachers move their concern to the vital element of educational processes, which is the student. Thus, a teaching style based on building positive relationships with learners is regarded as vitally important in order to facilitate the delivery of a new challenging curriculum, and this is the area which this study will now consider, the

approach adopted for Phase 2. In Phase 1, the only findings from students about competencies is that they understand the need for them to development interpersonal competencies, but they say current practices do not support interaction or participatory approaches. While the finding from teachers showed that only 7 of the 25 teachers displayed awareness of, and interest in, SD competencies, nevertheless these 7 teachers wanted a more integrated approach to education for sustainable development, in other words an approach that involved interaction between teacher-student and community.

Several interpretations might explain why students and teachers were not aware of SD competencies. Both teachers and students lack of awareness of SD competencies as they lack understanding of SD in general. According to the literature, students need to extend beyond content knowledge and methodological expertise to possess interpersonal skills (Brundiers and Wiek, 2017). Therefore, students need the opportunities and spaces provided for them in order to develop their interpersonal competences. There is a belief that within interpersonal competences, students can have the capability "to create opportunities for dialogue, debate and discussion (with a view to collaborative problem solving)" (Sheble and Wildemuth, 2009, p. 136). William (1981), believes that educational participation in learning, which relates directly to students' daily interpersonal experience, is not only developing intellectual and analytical competences of students but is also developing their interpersonal competences. Moreover, a lack of interpersonal competences can increase the possibility "for disengagement with the formal education system, followed by less ambitious educational aspirations or career choices" (Mahoney et al., 2003, p. 409).

According to the findings, students' systems thinking skills need to be developed within their school environment but these skills are not seen as key competencies

that need more attention from the teachers and school leadership. Curwen et al. (2018) believe that the role of the teacher in systems thinking competencies is to widen the consciousness of the students by providing means for them to be involved in various learning opportunities. Nguyen et al. (2012) found that the applications of systems thinking have been limited whether by managers or practitioners because "the emphasis in formal education is evidently placed on events, parts and isolated processes rather than systemic relationships; the bulk of systems education to date has been focused on training specialists" (ibid, p.15). Moreover, the effective ways to integrated systems thinking in the curriculum are still mostly unexplored even though systems thinking and sustainability are including in many programmes (Gregory and Miller, 2014). Similarly, Clark et al. (2017) contended that although there is considerable research that argues that systems thinking competencies can be learned, few studies have been conducted in terms of the methods for teaching these competencies to children or evaluating them in terms of their effectiveness.

Although teachers should be able to support their students in terms of developing systems thinking skills, teachers themselves need support from experts in systems thinking skills in order obtain a profounder broad understanding (Hallström and Klasander, 2013). Moreover, the institutional culture factor should be taken into consideration as it can influence the change processes and strategies positively or negatively (Kezar and Eckel, 2002). Educational actors should not think of the school as" an isolated entity but as an interconnected set of processes and practices, linked by its nature both to the community around it and to the classrooms and individual learning experiences within it" (Cambron-McCabe et al., 2012, p. 15).

7.1.7 Summary of Phase One

This section has discussed the findings of Phase 1 that included these points which are the perception of the sustainable development concept, the current SSCE curriculum, the current implementation of CPDs and the need to change for sustainable development to be incorporated in the SSCE curriculum. There are key insights gained as a result of relating the findings of this section to the literature. For example, the lower level of understanding the concept of SD is a global educational phenomenon among the Saudi educators and other educators around the world, which needs innovative approaches to develop SD concept among them.

Innovative approaches to develop SD concept among educators needs to be considered gradually and systematically so as to offer them knowledge, competencies, dispositions and values. Developing systems thinking and interpersonal skills are most key competencies that need to be developed among teachers and students, but the potential theoretical approaches that can assist to develop these competencies among them need to be identified. CoP, PCD and TASC have the potential to assist, but how the Saudi education context can deal with this complex task will be discussed in Phase 2.

7.2 Phase Two

The purpose of Phase 2 of the research was to answer research questions 2 and 3:

2. How does building a community of practice and use of Problem-Centred Design promote the incorporation of sustainable development in the SSCE curriculum in the Saudi 10th grade?

3. What are the factors that foster or hinder the incorporation of sustainable devel-

opment in the Social Studies and Citizenship Education curriculum in the Saudi 10th grade?

Question 2 is discussed under Subsection 7.2.1 and question 3 under Subsection 7.2.2. In each subsection, a summary of the findings is presented followed by a discussion of these.

7.2.1 Using a Community of Practice model in the Saudi context to incorporate SD in the SSCE curriculum

Phase 1 findings showed that teachers in Saudi Arabia face several challenges when considering incorporating SD into the current SSCE curriculum: lack of SD knowledge and skills; unsuitability of the current SSCE curriculum; and unsuitability of current CPD models. In order to address these challenges, Phase 2 of the research used a CoP approach to develop teachers' SD knowledge and skills at the same time as collaboratively designing two schemes of work based on the SSCE curriculum but ones that incorporated SD issues. The key findings of this phase from Cases M and O can be summarised as follows:

– Both Cases M and O had an opportunity to build their own community in order to integrate SD in the SSCE curriculum;

– Case M was successful in meeting the criteria for a CoP, in integrating SD into the two SSCE schemes of work, and in enhancing students' learning about SD issues. Case M put its goals into practice, by using interpersonal competences and strong channels of communication that enabled cooperation between its members and allowed the researcher, teachers and external experts to engage with each other in order to achieve the goals of the project;

– Case M engaged in key processes of a CoP such as identifying the topics, developing units that present *Shared Practice*, having regular planning meetings, sharing of resources and using subject knowledge development (concept of SD) to begin the processes that present *Domain-Distributed Knowledge*. It also had group projects and group meetings, which enables the members to work with multiple mind-sets that present *Mutual Engagement-Shared Repertoire*;

– Case O was unsuccessful in meeting the criteria for a CoP, making it difficult to meet the other aims of the project. A number of factors were identified that contributed to the lack of success in this context. Case O lacked the interpersonal competences to engage professionally with other actors; this was partly due to the lack of belief in collaboration on the part of the teachers, but also due to the nature of the school's senior management team who did not appear to support innovative practices;

– Both Cases M and O were able to implement the recommendations of Phase 1 by designing a curriculum that integrated SD. However, once the schemes were being taught, Case O teachers were resistant to making the changes to their practice that were needed;

– Case M continued benefiting from this educational experience by using a pedagogy that was decided through the CoP, which was an interactive pedagogy using real world learning supported by frames and tools such as Articulate Storyline and TASC. Case M teachers understood the need to change their practice in order to ensure that the students benefited.

The next sections discuss these key points in more detail.

7.2.1.1 The professional model of Community of Practice

The review of literature on CoPs in Chapter 3 showed that traditional professional communities of practice are based on a master/apprentice relationship. As new members of the community join an established CoP (e.g. teachers qualifying and beginning to work in a school) the core members (teachers in the school) would act as experts who would work with the novice teachers to gradually induct them into the ways of working (processes and practices) of the established CoP. However, in the context of this study in Saudi Arabia, the professional model of established CoP was not appropriate for the following reasons:

1. Schools in Saudi Arabia are not accustomed to collaborative working or the CoP model;

2. For Schools M and O there was no established CoP in SD or curriculum design to join.

It was therefore necessary to create a new CoP and to do so in a way that responded to the aims of the project as a whole, to create a CoP that not only would be able to incorporate SD into the SSCE curriculum for the two schemes of work that were investigated during the lifetime of this study, but to create a CoP that would be sustainable for these purposes in the longer term. For this reason, it was not considered appropriate to create a CoP based on the traditional master-novice form of relationship between the researcher and the teachers. To position the teachers as being on the periphery of the CoP and the researcher as the expert at the centre (Sawchuk, 2003), would be to create a hierarchy in which the teachers were dependent on the researcher; once the researcher left the chances that the CoP would continue in his absence would be limited. In such a CoP there would be no equality since the

core members would have so much power over the novices/learners (Fuller and Unwin, 2004), with the result that the core members might underestimate the learners (Figure 7.1).
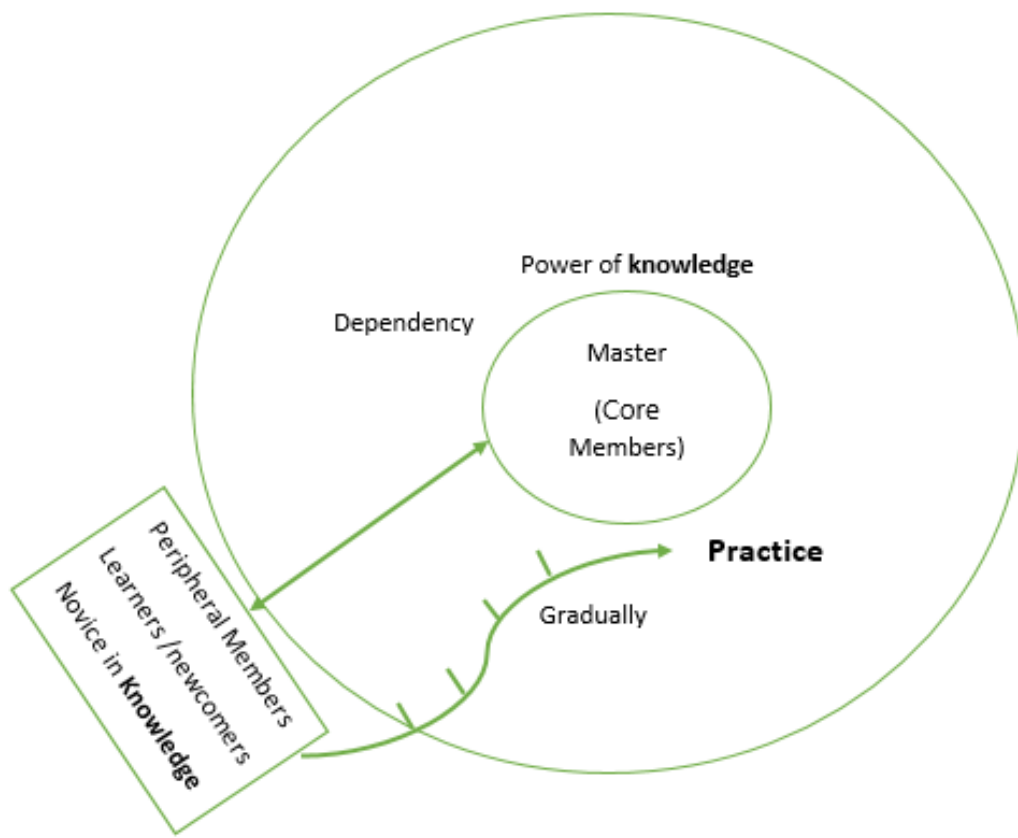
Fig. 7.1: The master/novice model of a professional community of practice

The risks in adopting a master-novice model of a professional CoP would therefore be that: knowledge of SD would be vulnerable because it would be held by the master (researcher); the teachers would be positioned as novices and might not feel confident and so be over-reliant on the researcher to develop the schemes of work; communication of knowledge would be transmission from researcher to teacher and

so create dependency rather than interdependency; and even though the teachers were experts in their areas of curriculum specialism (geography and history), they would feel like novices due to not being active in learning processes. It is evident that the social learning in this kind of community of practice is unidirectional, occurring from the master to teachers, with the teachers only acquiring knowledge and practice from the master with little interaction or sense of agency.

Although, the teachers would have some elements of community of practice dimensions, such as having awareness of teaching repertoire, expertise in their subject and social relationships, they would not be well activated to integrate sustainable development professionally.

The literature states that the community should ensure that teachers receive support to negotiate successfully for a change in identity (Mercieca, 2017). In this case that change in identity was from curriculum deliverer to curriculum maker. This study shows that a master-novice approach to developing the CoP would not enable the teachers to achieve legitimate participation and if the researcher used this model there was a possibility that he would underestimate their expertise. Hence, an existing professional community of practice model would not lead to *sustainable* learning communities that can integrate SD in the SSCE curriculum. For the purposes of the project that was the focus of this study it was felt that a new model that incorporates the concepts of *distributed* knowledge and *equal* participation was needed. The emergent CoP model was therefore considered more suitable for a number of reasons, and it emerged during the research as part of an organic process as the researcher himself was not aware of the emergent model at the beginning of the project. How this came about and the nature of emergent CoPs is discussed in the next section.

7.2.1.2 The emergent Community of Practice

In their early work Lave and Wenger (1991) stressed that Communities of Practice should not (and indeed cannot) be managed by a top down approach, but rather that they develop naturally through emergent, bottom up processes, coordinated by the community members. However, in later work by Wenger (1998) and others who applied CoPs in organizational contexts (Kimble, 2006), it was suggested that while an emergent approach should be encouraged, a CoP can also be actively guided or nurtured in some way by a member or members of the community. In this study, taking account of the findings from Phase 1 and the need to create a model of collaborative working that would be sustainable after the researcher left, it was considered important to use a horizontal rather than vertical approach to management of the curriculum design project.

The teachers in schools M and O had, in their Phase 1 interviews, expressed a great desire to be more involved, to have a sense of agency and ownership in their professional development. However, on their own at the beginning of the project they did not have sufficient knowledge of models of CPD that were not training or cascade, nor did they have sufficient knowledge of SD to be able to design schemes of work. Somehow a way of working had to be found that acknowledged their areas of expertise, but that also injected relevant knowledge in the areas they needed to development. It was this way of working that emerged as the project progressed. Groups, inter-organisational teams and networks may form emergent communities of practice and generally do so for two reasons: to deal with a current, pressing issue (Pyrko et al., 2017; Evans and Fisher, 2012); and because the nature of the task is unfamiliar and uncertain (McAlister, 2016). When an emergent CoP forms to respond to a particular issue, individuals effectively select themselves because of

their shared issue and their desire to mutually engage in a collective learning process (Pyrko et al., 2017).

In this study, although the teachers did not select themselves for the Phase 1 part of the study, they did select themselves at the end of Phase 1 in their positive response to take part in the curriculum design project in Phase 2. The group in this study also showed elements of the second type of emergent CoP because they did not have prior experience or knowledge of how to adapt the current SSCE curriculum to design a scheme of work that incorporated SD. Emergent CoPs are dynamic, are fluid over time, involve great degree of uncertainty, and rely more clearly on natural relations and hence, are frequently harder to govern or manage than more established or traditional CoPs (Crawford and L'Hoiry, 2017). Arguably, therefore, emergent CoPs need to stay away from working in and through hierarchies (ibid).

Figure (7.2) below shows the emergent community of practice model at the beginning of the Implementation Phase (Phase 2). This model shows how the emergent CoP took into consideration the theoretical perspectives that emerged from Phase 1, which acted as a catalyst for the formation of this emergent community and how it gradually began moving forward to reach its aims. Although this is an emergent model, it was necessary to begin working with the notions of CPD that the members of the community (teachers) had used for a long time, namely the training and cascade models for CPD. The teachers wanted to have more agency but did not know how to go about this. Therefore, at the early stage the researcher acted as a facilitator bringing the two groups of teachers and external experts together for the purposes of PCD (7.2).

Key findings of Phase 1

Lack of understanding of SD

Unsuitability of SSCE curriculum for
integrating SD

Unsuitability of current CPD models

Implications for Phase 2

CoP model for CPD

Inclusion of student voice/identity

SPCK

Researcher
Role of facilitator, brings
CoPs together

Teachers

Role of expert in
pedagogical knowledge

External experts
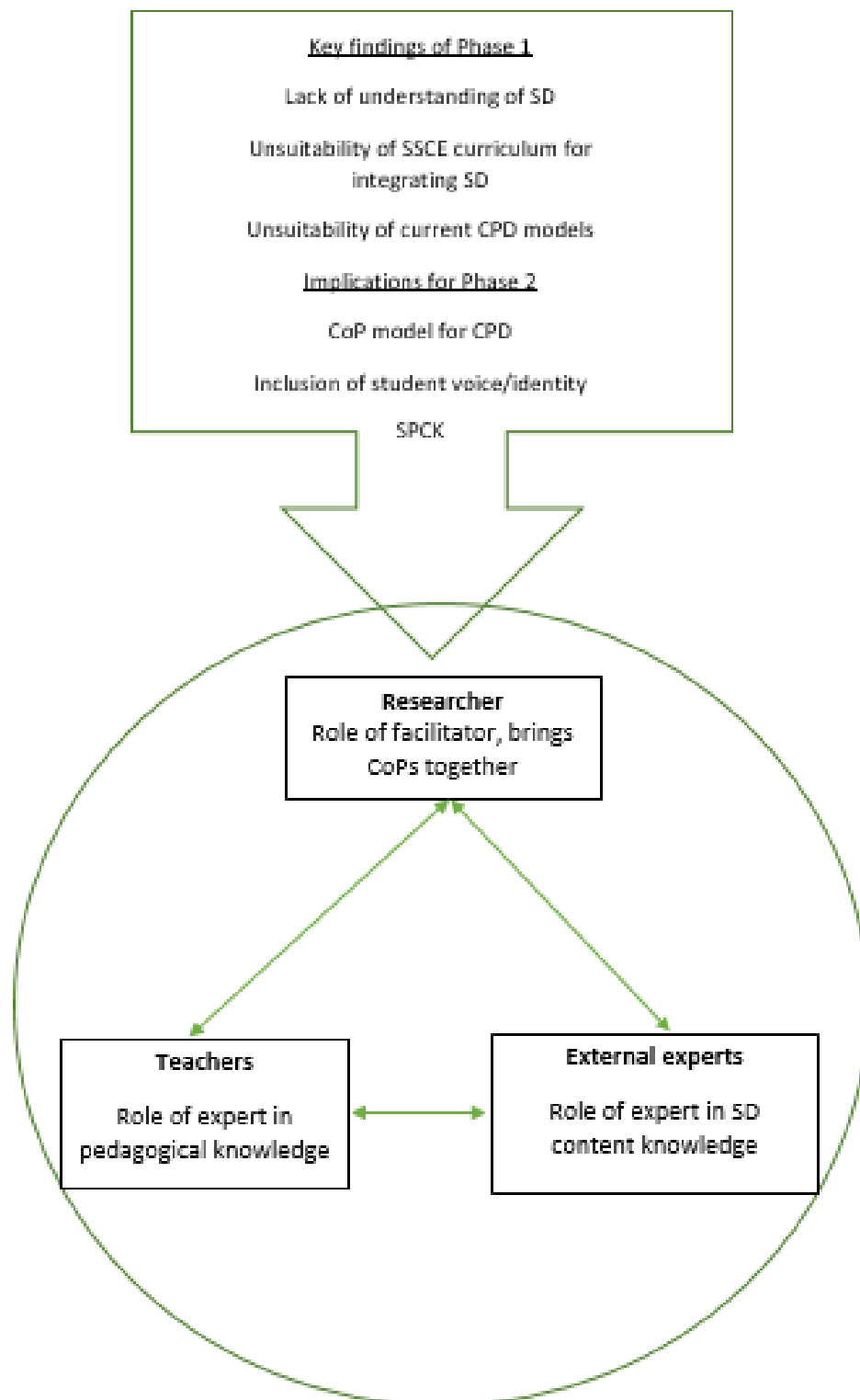
Role of expert in SD
content knowledge

Fig. 7.2: The new emergent community of practice model at the beginning (SSCE)

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In this model, mastery/expertise in the current curriculum and the school ethos is represented in the teacher group, while mastery/expertise in SD (sustainable fish farming) is represented in the external experts group. As the emergent model was being established, a hierarchical vertical relationship approach was used to get the project going in the first place. In general, Wenger (2010) states that the vertical approach is associated with conventional hierarchies, bureaucracies, accounting and inspections, policies and regulations and decisional authority. However, according to Wenger (2010), having a significant dependency on the coordinator, weakens the group and it reduces the variety of perspectives among the community. Consequently, this model on its own is not sustainable regarding the development of a sustainable learning community.

Therefore, another attempt was needed to make the group masteries sustainable by activating the horizontal relationships that connect the members of the two groups, teachers and external experts, sharing with them knowledge and practice of emergent CoPs (Cinalli, 2004). This led to the researcher discussing the implications of emergent community of practice used in a professional context that uses a horizontal rather than a hierarchical approach to the task/issue for which it emerged to address in the first place.

Case O and the implications for Case M

At this point, it is worth remembering that creating a CoP was not equally successful in both Case M and Case O. The original intention of the researcher was that schools M and O would collaborate with each other over the project because they worked together in developing the initial schemes of work at the end of Phase 1, they were both implementing the same schemes of work with year 10 students, and the schools were located in the same district. However, collaboration across the two cases became difficult partly because of lack of time, but mostly because school O

was constrained by a number of factors and so did not take up the opportunity to develop a CoP.

The impact of this on school M was that a small number of teachers were involved in the CoP and, although with the external experts and the researcher this was a large enough community to undertake the project, at the end it could be perceived more as a community of inquiry rather than a full CoP. The processes school M undertook were still emergent and collaborative, and although one might argue that it is hard to make claims based on such a small number, Kerno Jr (2008) states that the population size of the community "can vary from a few specialists to hundreds of members" (P. 71). Therefore, in the remainder of Phase 2 discussion, the successes of the emergent CoP with regards to the overall aims of the project–incorporating SD in the SSCE curriculum–is based on the case of school M, unless otherwise stated.

7.2.1.3 Key processes of the emergent Community of Practice

Findings show that the teachers' community became professional in applying systems thinking and interpersonal competences in order to make SD issues understandable for their students. In addition, the teachers' community gained experience in using systems thinking which provided insight for them on how the members gradually changed to being professional in using this competence. It is evident that the process of learning in how to become a systems thinker is an incremental process (Mathews et al., 2008). Hence, the teachers developed systems thinking and interpersonal competencies through their involvement in the CoP, and in using these skills to develop systems thinking and interpersonal competencies in their students. The findings also indicate that flexibility was one of the most powerful tools that was

necessary for the success of an emergent community of practice in supporting the development of systems thinking and interpersonal competences among teachers. According to the research diary, teachers at the beginning of the project wanted everything be clear, and even expected that the outcomes of the project should be known in advance and that students' actions should be controlled. This was due to teachers being concerned about retaining their legitimacy and preserving the respect of their students. They were fearful that if they changed their pedagogical approaches from transmission to participation, the relationship with their students would be compromised. This was one of the challenges that took up much of the researcher's time as he had to address teachers' questions, such as possible courses of action in various potential scenarios.

However, once the project was under way, teachers were able to explore for themselves the results with many of their concerns being answered through the project itself. In a way, this helped them to integrate a unique SD curriculum that was full of uncertainty as well as to use strategies and skills that in their nature were moveable and changeable. Human sustainability and worldwide environmental change are categorised as the task of managing change in active systems that are full of uncertainty (Dovers and Handmer, 1992). It is claimed that the nature of our knowledge is imperfect and uncertain, so the implementation of modest, or naive, resolutions to these issues is undesirable. Thus, difficult issues require unique solutions. SD needs a mind-set that welcomes a sense of wonder, innovation, risk, uncertainty, change, an aspiration and capability to learn (Blewitt, 2014). Arguably, framing sustainability and learning as a challenge of risk, necessity, uncertainty and complexity are essential requirements (Gough and Scott, 2003). Therefore, developing systems thinking might help to deal with different SD scenarios that require unique solutions. On the other hand, it is seen that, meaning-making in the Saudi context is challeng-

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ing; there is no doubt that there will be mistakes, some of which could lead to a great cost in mockery, and legitimacy. Thus, in a context where mistakes are not allowed, this would prevent preliminary acceptance of the idea of taking risks (Davis, 2005). This study faced some challenges of this nature, such as some of the community members being afraid to participate in the project due to a lack of knowledge of the sustainable development concept. More practically, they were concerned about the effect this lack of knowledge might have on their legitimacy. Applying systems thinking was helpful to overcome the issue of legitimacy. One of the solutions to this issue was to provide spaces and chances for having conversations with members of the community so that no individual teacher felt isolated. Another solution was to attend and observe classes with some expert teachers who had been teaching for more than 20 years. A third solution was to allow some teachers who felt that they were not ready to participate to delay until they received feedback from the members of the community about the project, its activities and its materials. To sum up, it appears that the teachers showed their use of systems thinking and interpersonal competences to cope with difficulties as they collaborated to distribute knowledge and share experience across the community. This emergent model will be further explored in the Concluding Chapter 8.

7.2.1.4 Developing expertise in Problem-Centred Design and SPCK

This section discusses the findings with regard to the first action in the processes of the emergent community of practice model, which was to develop expertise in Problem-Centred Design (PCD) and Sustainable Pedagogical Content Knowledge (SPCK). The first focus was concerned with how the teachers perceived and reacted to the change from curriculum deliverer to the use of PCD. This was necessary due

to Phase one's recommendations that put emphasis on the use of PCD as one of the enabling factors of integrating sustainable development.

It seemed that both cases M and O were challenged by this kind of change as they used to be content curriculum delivers. Therefore, they were asking to change from being curriculum delivers to being curriculum makers. Recently the phrase 'curriculum making' was used to describe medium-term planning and teachers' enactment of such planning in the classroom (Catling, 2013). Lambert and Morgan (2010) state that curriculum-making is not the same as curriculum planning or curriculum development, although it is guided by these approaches. Curriculum-making is a process that takes place between nationally prescribed curricula and lesson planning. Often this middle process is undertaken by educational publishing companies who produce schemes of work and supporting materials for schools. In this study, teachers were asked to undertake this process for themselves. They were provided with spaces to be curriculum makers and decision makers in the classroom based on the view that the curriculum was not entirely as a document defined by 'experts' external to the classroom (Catling, 2013) but rather is a set of "educational experiences jointly created by students and teachers" (Snyder et al., 1992, p. 418).

Therefore, curriculum making is seen as professional development in itself (Catling, 2013) which in fact offers a chance for teachers to explore their potentiality for having a role in curriculum implementation and being able to learn how to enact it properly. Bloomer (2002) claims that this evidence gives considerable weight to the statement that curriculum making does not start and finish with policy makers. Instead, curriculum making should be influenced by how teachers can perform critically, in various ways through creating chances for their students; and how students act upon those chances as they each shape out their own learning life. Both teachers and students "'make' rather than 'take' their roles and the making of the curriculum is their essen-

tial business" (ibid, p.2).

However, as the findings showed, case M was more likely to adapt to this fundamental change for various reasons, the teachers themselves being one of the main reasons for the success of the project. The teachers' positive attitudes were essential for integrating SD through PCD. However, even with positive attitudes they could not have engaged in the processes of curriculum making or used PCD if they did not have support from the coordinator (the researcher) and the head-teacher (Sub-section 7.2.2.1 provides more detail in this regard). It is argued that curriculum change is a collaborative activity not an individual one (Hammer et al., 2014; Hubball and Burt, 2004). Similarly, the research diary provides evidence that some members of the teachers' community felt that they were experts in their field and were professionally well prepared. They continuously asked the researcher who would benefit from this project, teachers or students and who the target of the project was. After a while, they realized that the value of the project was not only in enhancing their subject matter knowledge or their teaching practices but also in terms of enhancing their personal interest and their future career.

Moreover, the sustainable development issues which dealt with uncertain situations were experienced on daily basis through their teaching practices as the members of community were requested to apply new notions, theories and strategies. This new task was rejected at the beginning due to some teachers preferring to work with certain and familiar notions, theories and strategies that they had used for a long time and could apply repeatedly. This issue was understandable as the teachers were long time curriculum content delivers. Problem-Centred Design cannot be implemented without challenges. Other studies have shown that changing from content specialists to PCD is difficult (Cowdroy, 1993), and that many challenges are faced (Kiguli-Malwadde et al., 2006). For instance, there is a concern that

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the new curriculum requires more human resource than the traditional curriculum (ibid). Hunkins and Ornstein (2016) state that despite claims that students do not learn much subject matter when they use the Problem-Centred Design, the findings of this study indicate that the students gain adequate subject matter knowledge within Problem-Centred Design. Moreover, the response to this claim is that the life-situations design is drawn profoundly from local content which makes the design exceptional in using techniques that enable students to develop a deep understanding of the sustainability issues in their area (Hunkins and Ornstein, 2016).

Findings in this study show that, after accepting the new philosophy in terms of curriculum development and design, teachers showed interest in playing a more significant role in the processes of integrating SD. However, they could not achieve this on their own and the findings show that the teachers appreciated the opportunities provided to participate in the design of their own schemes of work. Huizinga et al. (2014) identify a number of competencies that are needed for successful curriculum design which they divide into two main groups: generic design and process expertise, and specific design expertise. The generic level focuses on the intra- and inter-personal skills that have been discussed in the previous section (7.2.1.3). Specific design expertise requires competencies in subject matter knowledge, pedagogical content knowledge, curriculum design and curriculum consistency (Huizinga et al., 2014, p. 36).

However, to the researcher it does not make sense to make subject knowledge matter and pedagogical content knowledge separate from each other in specific design expertise as Huizinga et al. (2014) did in their study. In this study, subject matter knowledge and pedagogical content knowledge were combined under the idea of Sustainable Pedagogical Content Knowledge (SPCK). Huizinga et al. (2014) state that generic design and process expertise refers to information and abilities for en-

acting design procedures in common, while specific design expertise refers to the information and abilities needed for developing curricula schemes of work, which include lesson sequences as well as designing and choosing the PCD materials. This model was helpful for the teachers to interpret the curriculum through choosing the appropriate instructional materials and presenting them professionally through meaningful approaches such as TASC. Huizinga et al. (2014) identify two key strategies or approaches to supporting teachers during the process of curriculum design. Firstly, support is offered just-in-time and in a specific context. Second, support in the form of specific workshops or training sessions are needed to boost both the generic and the specific design competencies. It is recommended that these two strategies should go hand-in-hand and continue throughout the process (Lumpe, 2007). Although this research used a community of practice approach to support the teacher design teams, the use of this information on different types of competence in curriculum design was also helpful as in itself it provided a focus for the second strategy, that of specific training for the teachers. Table 7.1 shows how these sets of competencies were realised in this project.

Tab. 7.1: The competencies of specific design expertise with their explanations informed by (Huizinga et al., 2014) as well as the results of Phase 2

Teachers Design competencies		Explanation
Specific design expertise (the macro curriculum level)	Sustainable Pedagogical Content Knowledge	Teachers as designers are expected to comprise their pedagogical repertoire in the designed curriculum. Teachers' knowledge and skills to possess subject matter knowledge accurate and up-to-date. Furthermore, materials (including ICT-applications such as Articulate Storyline) and TASC model require to be selected, which suit the pedagogy and then content.
	Curriculum design expertise	Teachers' knowledge and skills to conduct curriculum design that embraces teachers' ability to conduct curriculum design activities as well as overcome design challenges while designing.
	Curriculum consistency expertise	Teachers' ability to design materials that are internally through reflecting the logic contingencies of the components of the curriculum and externally consistent through sharing understanding of the content and nature of the curriculum that needs to be designed.

Therefore, this study attempted to support teachers' knowledge and skills in the specific design expertise of PCD as well as in subject knowledge of SD. In addition, it supported teachers in their SPCK–specifically in how to use a collaborative and thinking skills tool, Thinking Actively in a Social Context (TASC) to help with both the

curriculum design and its implementation with the students, as is discussed in the next subsection.

7.2.1.5 Teachers use of Thinking Actively in a Social Context (TASC) for developing systems thinking and interpersonal competences among students

Findings show that teachers were able to put their own learning into their teaching practice and instructional design through sharing systems thinking and interpersonal competences among students. Furthermore, teachers increased their capacities to expand their teaching practices by sharing appropriate strategies with each other for presenting sustainable development issues inside the class using tools such as TASC. However, the teachers did not find it easy to support their students in developing systems thinking and interpersonal competences that could be applied to real world SD issues, such as during the Aquaponics project. Cloud (2005) states that "although one can teach systems thinking and system dynamics without teaching about sustainability, one cannot do the reverse" (p. 225). The use of TASC and the inquiry processes it takes students through was also new to the teachers and, as Kelley and Williams (2013) state, teachers require similar practices as the students themselves: time, space and assistance. Teachers and students were learning side by side in this project.

As discussed above, the teachers participated in the curriculum design process from the beginning. They selected real world issues and integrated them into the SSCE curriculum. These issues were based on pre-set criteria that combined learning objectives from geography and citizenship education disciplines, the history of Saudi Arabia, and systems thinking and interpersonal competences. The outcome for the curriculum planning group was the creation of the two units or schemes of work, one

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about sustainable cities and one about citizenship. As a community, they gave each other feedback on whether in the planned activities based on the TASC framework, it would develop systems thinking and interpersonal competences among students, such as in the weekly plan, and in the materials used to support the lessons (see Section 6.3.2.3.2).

Thus, two functions of SPCK were activated by teachers applying TASC to develop systems thinking and interpersonal competences among students, while also learning sustainable development content knowledge from professional experts in sustainable projects. It is argued that Lave and Wenger (1991) attached little importance to the role that 'teaching' could play in the workplace learning process (Fuller et al., 2005). This study shows that the teachers' active engagement in collaboratively planning for teaching was key in developing appropriate pedagogical content knowledge that contained sustainable elements within it (SPCK). Students use of TASC automatically involved interpersonal competences and systems thinking, and thus assisted them in gaining practical experience of the many advantages of using TASC for their learning. Sadlo (2016) has found that Problem-Centred Design can form a community of inquiry based on workplace learning and this would involve many activities including: fieldwork development, scientific reasoning, the embedding of theoretical aspects into practice, collaborative skills, values and promotion of students' teamwork. In addition, it was found that the application of Problem-Centred Design supported and inspired students to think critically, by identifying their own questions and problems and finding solutions, as well as having a constructive effect on students' academic achievements (Jeronen et al., 2016).

Real world inquiry learning is unusual in Saudi Arabia and it is hoped that the outcomes of this study will encourage others to use this approach in the future. As the project progressed, teachers and students not only dealt with the given issues of

sustainable development, but they also became creative in terms of producing their own sustainable development projects; this was due to the teachers and students becoming familiar with TASC's steps and the supportive environment that was provided for them. This creativity can be seen clearly through the new ideas generated by students such as the Aquaponics project. Therefore, the need to engage the experts and practitioners' community in sustainable fish farming was critical at this stage because the teachers and students did not have adequate knowledge and experience of breeding fish inside the school. Data also shows that at the beginning of the project, teachers applied the TASC model and its activities using their traditional method of presenting the activities. However, after having weekly meetings they began to be more innovative in their teaching methods and enjoyed using the TASC model.

It is argued that nowadays educators are required to work smarter rather than harder for two central reasons. The first reason is that the daily demands on teachers take most of their energy and there is none left for other work (Wallace and Maker, 2009). The second reason is that educators are dealing with working circumstances and contemporary styles of living which need problem-solving capacities, and thinking skills in order to cope with these changing complexities that challenge them (ibid). The interpersonal competences can be developed through language that used inside the class as data demonstrates the emphasis of Vygotsky (1978) with respect to innovative teachers who continually develop language through guided classroom dialogue, students' interaction and the sharing of thoughts. This is not only educationally sound but is also vital for effective learning. Furthermore, developing material in dual languages was not only beneficial to the project, but also to the goal of Saudi Arabia becoming a multilingual nation. English as a second language provides the means for mass communication for sustainable national development

(Owolabi and Nnaji, 2013).

7.2.1.6 Orienting the Community of Practice, Problem-Centred Design and TASC towards an Educational Sustainable Development Project (ESDP)

Data has suggested that the implementation of the project provided opportunities for the members of the emergent community of practice to work with external experts on a project in sustainable fish farming; in other words, the teachers and students engaged positively with the concepts of sustainable development and its activities. This positive engagement happened for several reasons, one of which was the criticality of building teachers' capacity to integrate sustainable development (Stenhouse, 1975). International evidence recommends that the progress of educational reform depends on teachers' individual and collective capability and its relationship with the school-wide capacity for promoting of student learning (Stoll et al., 2006).

Building of teachers' capacity was one of the tasks that the emergent community of practice supported in this study in case M, but it also required the school environment and the senior management team to create the space for this capacity to be built. Developing professional learning communities seems to have significant promise for capacity building for education for sustainable improvement when it takes place in a positive overall environment (see Section 7.2.2.1). Overall, this study has found that the TASC model is a potentially useful tool for promoting the integration of sustainable development in the SSCE curriculum. This refers back to the 'know-how' knowledge that was identified as being important to curriculum design and implementation in Chapter 3. Following this study, the researcher argues that the education sector is neglectful of both producing tangible products and of meeting society's needs. Based on the empirical evidence that comes from the current

study, it is argued that educational research can produce a conceptual framework that can promote not only socio-economic aspects, but also environmental aspects, as a comprehensive model that can be incorporated into the school SSCE curriculum (see Section 8.5.1, Higher Education). There were some novel ideas that were created by students and one of them was breeding fish inside the school (for more details see Appendix A.2). Data also reveals that school leadership and activating a Corporate Social Responsibility (CSR) concept from companies supported the ESDP (more details about CSR will be provided in the Section 7.2.2.4).

The philosophy behind this project was about providing sustainable food through the concept of small-medium sized enterprises (SMEs) for breeding fish inside the school which could be later used for consumption and selling. This philosophy facilitated the presentation of the concept of sustainable development into practice socially, economically and environmentally. This project was called Aquaponics, and included fish, plants and it was appreciated by the members of the community. It is argued that SMEs play a significant role in political and socio-economic development due to their functions (Gaol et al., 2016). Moreover, it is found that the SMEs are central to the sustainable development concept since they have a noticeably lower negative impact on the environment than larger businesses (Jansson et al., 2017). This can be seen as a much better situation for both public and the private sector if they have clear ideas of the benefits that they will gain from the Sustainable Small and Medium-sized Enterprises (SSMEs).

7.2.2   Factors that foster or hinder the incorporation of SD into the Saudi SSCE curriculum

This section is concerned with the need for a supportive environment. It is emphasized that curriculum redesign needs active supportive factors (such as financial, organisational and political) from heads/administration (Hubball and Burt, 2004). The aforementioned factors can expose failings of the project, or lead to the weakening of ESD messages. For example, participants state that among the challenges within the school context is frustration with the surrounding environment for both students and teachers which also occurs elsewhere, such as in the UK (Weitkamp et al., 2013). This study has taken into account these factors in order to make the project achieve its aims. Equally, both Cases M and O had a similar situation at the beginning of the project and teachers in both cases were keen to participate in the project. However, there were factors that influenced the two cases with regard to integrating SD in the SSCE curriculum. From the findings, it is seemed that the factors in Case M were more likely to enable integrating sustainable development into the curriculum, which are internal factors (Sections 7.2.2.1, 7.2.2.2 and 7.2.2.3) and external factors (Section 7.2.2.4). There were hindering factors in Case O that impeded integrating sustainable development into the curriculum (Section 7.2.2.5). Case M had some of these internal factors, but, they were able to overcome these because of the school environment, school leadership and ethos were supportive overall. Nevertheless, the teachers in school M also faced some challenges as will be shown in the following sections. The purpose of identifying these supporting factors is to determine which factor can support the integration of sustainable development but not beyond this purpose. However, from these factors has emerged a new area for potential future research, which is Sustainable Small and Medium-sized Enterprises

(SSMEs) (see Section 8.5.1, Higher Education).

7.2.2.1 School leadership as a critical internal factor for implementing SD

Findings indicated that the school leadership was an enabling factor in Case M. In Case M, the members of the community of practice were in a healthy and open relationship with the school leadership which was enabling them to integrate SD processes professionally and to help the project's aims be met. For example, the school leadership contacted the private sector to gain resources and support from them. They also provided space for them to contribute to the critical project which stresses the importance of each agent in this kind of project. Therefore, the school leadership had translated the principles of SD into practice through engaging other social institutions such as the private sector.

The literature on the implementation of CPD programmes in schools shows that there are critical factors to ensure enabling the practice of CPD's activities, a vital one being school leadership (Macheng, 2016). It is emphasized that leadership and change management are significant factors in facilitating institutional changes. This is due to the targeted change that is seen as a complex learning process, which is required to conduct new elements, ranging from who is doing this task to knowing the gap in their expertise (ibid). A study by Lozano et al. (2015) states that academic leadership's commitment was a primary reason to implement sustainable development, signing a declaration, initiative and charter. This leads to consider both internal and external factors, which is suggested in a study by Sandholtz and Ringstaff (2016) as they found that the lack of resources and the influence of leaders' support are the internal factors in the education context. Data indicates that the educational leaders of both cases M and O had applied their leadership con-

tent knowledge but there is some variation between them. The leader in Case M shows his abilities with regard to the knowledge of how to stimulate teacher learning, knowledge of diverse pupils and how variety encourages learning outcomes which confirmed what Robinson et al. (2007) found in this matter. The findings of the current study confirmed what Curwen et al. (2018) reveal, which is that school leadership is vital in creating spaces that allow teachers and their pupils to address what systems thinking requires of them when working with SD issues.

Moreover, the leader in Case M indicates his ability to apply features of pedagogical leadership such as involving and engaging in teaching and learning processes, sharing in improving student outcomes, providing an appreciated tool for professional reflection, progress and action (Robinson et al., 2007). In addition, the leader in Case M was able to develop relational trust between the members of the school community by activating interpersonal skills, adapting with contextual conditions, which led the CoP to achieve its aims, and these findings confirmed the study of Robinson et al. (2007).

7.2.2.2 Teachers' beliefs as a critical internal factor for implementing SD

In Phase 1 discussion, teachers' perceptions in terms factors that affect their participations in training and cascade models of CPD have been discussed, and Section 7.2.1.3 discussed how teachers in Case M changed their pedagogical approaches from transmission to participation. This section discusses the effects of teachers' beliefs in Phase 2, Case O, after experience in applying a community of practice model of CPD for integrating SD in the SSCE curriculum. Teachers' beliefs are not the focus of this thesis; however, it is seemed teachers' beliefs are very complicated especially when they are linked to applying new pedagogical content knowledge,

new materials and shifting from transmission to participation. Findings from the current study confirm the results of the study of Mansour (2008) which reveals that several sources of experience such as the work-place, initial teacher programmes and CPD can influence teachers' beliefs.

Moreover, Brody (1998) supports the findings above by stating that teacher's beliefs might have the largest influence on what the teachers enact inside the classroom, the methods that they theorise for their instruction and learn from their experience. De Hei et al. (2015) argue that "different beliefs are likely to lead to different teaching practices" (p. 253). The question here is whether the surrounding environment and context could play negative or positive roles that make teachers' beliefs willing or not to deal with the new tasks above. There is a belief that the environment and context that teachers are working within can influence teachers' beliefs both positively and negatively (Nespor, 1987; Maxson, 1996). With respect to ESD and EE, it is found that teachers' beliefs, their experience and motivation drive their practice (Hart, 2003). In teaching languages, for example, "teachers' deep-rooted beliefs about how languages are learned will pervade their classroom actions more than a particular methodology they are told to adopt or course book they follow" (p. 209). Furthermore, a study by Al-Lamki (2009) indicates that the possible penalties of the lack of congruence between the CPD model and teachers' beliefs might lead to lack of confidence and frustration amongst teachers. This was clear in the current study as the teachers themselves, especially in Case O, although they began positively, soon began to lose confidence in the project because they stopped perceiving it as being relevant to them or their students. A study by Stevens (2004) reveals that "teachers tend to implement in their classrooms what they know and understand, in spite of whatever innovation may be adopted by the school" (p. 389). This can be clear in the findings of the current study as teachers in both Cases M and O applied

what they know about pedagogical content knowledge and what they believe was suitable for them. However, teachers in Case M realized that the new tasks and materials that present SD issues need innovative pedagogies that could assist them to present SD issues educationally. Findings show that teachers need sustainable internal and external support in order to comply with their beliefs positively and professionally. Individually, teachers need to examine their beliefs in order to provide constructive feedback on themselves and provide valuable features such as taking advantage of their beliefs that they hold to encourage students' academic progress, self-sufficiency and the mutuality of knowledge (Xu, 2012). Additionally they make spaces for their own development as they identify and review beliefs that do not assist their schools, themselves or their students (ibid).

Collectively, Main and Bryer (2007) state that teachers need to find out if the environment in which they are working ensures providing tangible benefits for them as well determines the limiting circumstances. This statement can be acceptable to some extent due to the identification of the limiting conditions, which can be very challenging especially when it is linked with SD issues.

7.2.2.3 Students' dispositions as a critical internal factor for implementing SD

Data shows how students' dispositions change or not change towards the learning of ESD and more particularly through PCD that presented SD issues within the SSCE curriculum. However, this change in students' dispositions was to some extent different between Case M and O. Thus, attempting to understand how students develop their dispositions toward engaging in SD with relation to classroom activities can provide insight into the reasons behind differences in terms of the process of integrating SD and the outcomes of its activities between the two cases. For example,

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Katz and Raths (1985) highlight that:

> *Dispositions, which are defined as summaries of act frequencies or trends in behaviour, are contrasted with habits, skills, attitudes, and traits. Professional dispositions are treated as "habits of mind" that give rise to the employment of skills and are ideally manifested by skillful behaviour. (P, 301)*

More specifically, Besong and Holland (2015) argue a significant element of dispositions towards ESD can consider learners' willingness to engage in SD actions or behaviours. Furthermore, their study reveals that only 13% of the student respondents show reluctance in their dispositions to engage with sustainability. These students were poorly disposed towards sustainability. However, the majority of students' respondents were willing to engage, being well disposed towards sustainability.

The current study had taken into consideration the idea that the SSCE curriculum should be developed within students' local contexts in order to have them engage with it actively. However, students in Case O had conditions that did not support them to change or form positive attitudes towards SD. These conditions are the school environment, school ethos and the administration management team which made fewer contributions to support students to engage with PCD and TASC activities confidently. There is a belief that contexts can contribute actively towards the development of positive dispositions: "contexts are also presented as general motivators, offering students exciting and real life examples that engage their interest" (Boaler, 1993, p. 14).

In Case M, students faced similar challenges, but they were in the context of team work. The community realised the benefits of the SD project, so they did their best to reach their goals. Similarly, Gresalfi (2009) found providing opportunities for stu-

dents that let them work within a small group, which encourages their engagement, involves teachers and incorporates sufficient time could foster creative attitudes. Therefore, the teacher's role is one of the key elements in creating positive dispositions for students. The external factor, which is the support of the private sector, can fill the lack of resources through Corporate Social Responsibility (CSR), which will be discussed in the next sub-section.

7.2.2.4 The private sector as a critical external factor for implementing SD

Findings indicate that the private sector can play a role in supporting ESD in Case M. It is argued that in order to make SD viable, companies have to identify mutual benefits between their interest and the community's interest in which they are sensitive to the community's culture, context and its requirements (Epstein, 2018). Moreover, it is found that at the corporate level social responsibility initiatives essentially concentrate on fields such as environment, education and community support (Popa, 2015). There are several ways of making the private sector contribute positively towards education for sustainable development whether educationally, strategically or technologically. The members of CoP had discussed the issue of getting support from the private sector financially and educationally. For example, external experts in SD projects have supported the community's members, if teachers, through providing another form of just-in-time CPD for teachers or real world learning for both teachers and students as it appeared in the Aquaponics project.

Moreover, the external experts' team were an educational channel for both teachers and students as they provide them with updated knowledge and skills with regard to SD projects. However, the responses of the companies were different and this is because how the concept of SD is understood by companies. Moreover, data

shows that some chief executive officers' understanding of their Corporate Social Responsibility (CSR) towards the contribution to sustainable development agenda was shallow and limited which could impede the successful integration of SD. This can be supported by the study of Grayson and Nelson (2013), as in their assessment of CSR initiatives they notice that there is increasing evidence to suggest that voluntary management by the business sector has been too shallow, too narrow, too limited and too isolated to have the required influence for leading a more sustainable, responsible and comprehensive development. Therefore, there is still an absence of an inclusive framework for directing these attempts and most corporations stay trapped in a social responsibility mentality, in which social concerns are at the margin, not the centre (Porter and Kramer, 2011). One of the most valuable lessons learned from this project is how we can provide a tangible example of positively engaging in solutions for SD challenges, based on the sustainable development principles that highlight equality and balance of the social, economic and environmental aspects. Secondly, it highlights the real role of educational theories and practical activities that can present the education sector as a central social institution in promoting SD principles.

7.2.2.5 Hindering factors that impeded integrating SD into the SSCE curriculum in Case O

Noticeably, Case O had limitations in implementing the project and integrating SD, which are presented in this section. These limitations were the style of the school leadership, time challenges, school facilities, the quality of the students and the lack of interpersonal competences. The school leadership in Case O somehow might reflect the current practice of the Saudi educational leaders who show management

rather than leadership and maintenance rather than development which confirmed the results of the study of Algarni and Male (2014). It seemed that the tendency of the Saudi Ministry of Education to integrate SD in the curriculum is contradictory to its way of leading Saudi education and this was revealed in the previous study when they implemented collaborative learning.

This lead to the reasoning behind why this contrast is happening especially with the new Saudi Vision 2030. One reason that appeared in the literature of the Saudi educational leadership is that the educational system in the Saudi education is based on the model of a centralized top-down approach (Alzaidi, 2008; Algarni and Male, 2014). This kind of leadership model can limit producing and implementing novel pedagogical approaches that can improve educational outcomes due to the paucity of spaces and freedom that were provided for them and the educational leader being a role model of leadership, who is creative and proactive. Akbari (2008) states that "people who have the power to make decisions in society at large are the ones who also have the power to design and implement the educational system" (p. 276). Consequently, the educational leader as in the Case O can be seen as less efficient in terms of using their leadership content knowledge, establishing the conditions for an effective community, let alone to activate their pedagogical leadership which is consistent with the study of Algarni and Male (2014).

Moreover, the school leadership was not able to act and let other social institutions participate and present their values towards SD. In Case O, the need for readiness and willingness to share their responsibilities was very clear. Wenger and Trayner (2012) identify failure factors such as the leaders being unable or unwilling to devote sufficient efforts to develop the community, which led most communities to die very soon. There are some solutions, as is mentioned in the case of the managers who work in the private sector, when they are not well prepared. Having a special training

course of SD was one of the solutions that has been recommended (Slavova and Bankova, 2015).

It is found that there are critical factors which enable educational institutions to conduct the crucial transformational changes to integrate SD. These include environmental sustainability advocates, strong policy environment, encouragement of leaders and the resourcing of strategies (Ralph and Stubbs, 2014). It is believed that the responsibility of the school leadership is to ensure that the teachers are capable of meeting the requirements of the curriculum and policies through offering them quality leadership (Macheng, 2016). This quality leadership creates a school environment that is supportive, encouraging and motivating for teachers in order to contribute to quality teaching and learning (ibid). On the other hand, there is emphasis on the whole educational community to take part in various aspects such as orienting institutional culture toward the necessities of sustainable development (Murga-Menoyo, 2009). Becker et al. (2016) consider the sustainable development concept as systematic, which means that the system is under consideration, and the concept certainly cannot be treated in isolation from its environment.

In the light of the institutional, policy constraints, and the Saudi context, within which the researcher has needed to conduct his research, the context itself is unique and it has its own policy, vision and educational system. Therefore, conducting such research that arguably is critical and which can lead to changing society to cope with SD issues within the current institutional culture and policy can be very challenging. The research's purpose is to spread out the culture of SD through ESD by developing systems thinking and interpersonal competencies within the SSCE curriculum. With regard to what the researcher in the current study has faced in terms of political dilemmas, Winter and Firth (2007) reveal some of the ethical and political problems faced by student teachers who struggle to solve the tensions between the

constraints of education policy, school culture, school teaching resources and their own values and passions. In fact, this research faced major challenges in order to make the principles of SD work together environmentally, socially and economically. It is understood that Saudi Arabia is one the leaders of providing energy over the world and has responsibility for this great task. However, designing its vision, which is mostly concerned with the economical aspect, can generate tensions with other aspects of SD. Thus, having a pragmatic view that pays attention to one aspect of SD at the expense of other aspects may lead to unsatisfactory outcomes for its vision. The Saudi Ministry of Education attempts to reflect the Saudi 2030 vision within its policy, agenda and activities. This also can be seen clearly through its official curricula such as the SSCE curriculum. The results of this study showed that economic aspects occupy a special place in the issues that are presented in the SSCE curriculum. The question that might rise here is the possibility to integrate SD into the SSCE curriculum bearing in mind major difficulties such as institutional culture and leadership.

One might consider there is still an opportunity to be used to integrate SD in the SSCE curriculum by activating other elements of educational processes such as teachers and students. This can be done by developing their skills such as systems thinking and interpersonal competences as well as encouraging their agencies and empowerments. The question here is whether teachers and students recognise their environment in terms of SD, in which they live and work, and to what extent this environment and surrounding conditions might prevent them from achieving their goals. As it was written in the Context Chapter 2, Saudi Arabia is very worried about peak oil and is over-reliant on oil. When the peak oil situation is reached, the country is unsure what it will do in such a very challenging situation. Saudi Arabia does not just have a responsibility only to itself, but also to finding other supporting energy

sources and inventions globally due to the fact that the energy being used at the present moment is oil based. These are the tensions and pragmatics that affected the way in which the researcher was not able to implement his vision in his study. Another question is whether the teachers and students are ready to play their roles and take risks to engage in transformational social changes and activities. In addition, a key question that might emerge here is whether teachers and students will play their roles actively enough to participate in transformational social changes or whether there is need for commitment in order for them to fulfil their duty. On the other hand, findings show that time constraints are one of the hindering factors that prevented the members of the CoP to integrate SD into the SSCE curriculum. Time constraints as hindering factors were also found in several studies (Kerno Jr, 2008; Wenger and Trayner, 2012). It is believed that although the time constraints are one of the difficulties in applying the CoP approach, an institution has to assure that the time allocated for the community's tasks is appreciated and accepted as work (Wenger and Trayner, 2012). In contrast, Case M was able to overcome this limitation by devoting sufficient time which was valued and recognised as work. Kerno Jr (2008) states the availability of time in which to participate in the activities of CoP in order to be active is the first challenge confronting the members of a CoP.

Findings in Case O reveal that school facilities can be seen as a hindering factor that impeded the teachers to integrate SD into the SSCE curriculum actively. Similarly, Barwick et al. (2015) have found that the simplicity of access, proper facilitation, encouragement from leadership and the development of collaborations among the members of the community are all critical factors. It is recommended that in order for leaders to overcome the challenges that they might face during the integration of SD, they need a clear understanding of these aspects, such as offering the means for conducting the processes of integrating SD and highlighting interdisciplinary col-

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laboration (Ralph and Stubbs, 2014).

Weitkamp et al. (2013) state that challenging factors and barriers that schools might face in attempting to implement ESD programmes include a lack in various areas such as financial support, facilities and tools to promote an integration of education for sustainable development across school life and dependence on under-supported community helpers. Findings show that the quality of students and their background with regard to SD in Case O is low, which appeared as a hindering factor to integrate SD in the SSCE curriculum. This factor is understandable in the Saudi context which still needs a considerable amount of educational effort to fill the gap of awareness in SD (Altaher, 2013).

However, in Case M it is apparent that the factor of having a low level of awareness and knowledge of SD among students can be solved if the members of CoP are willing to make efforts to achieve this. On the other hand, findings highlight that teachers in Case O were not able to share knowledge between them properly due to the lack of interpersonal competences. Although teachers were encouraged by the researcher and were provided chances to share knowledge between them, the culture of the work environment was not supportive. This finding was consistent with the study of Ipe (2003) who identifies factors that influence the members of the CoP in terms of sharing knowledge between them, such as chances to share, inspiration to share and the culture of the work environment. Probst and Borzillo (2008) in their article *Why Communities of Practice Succeed and Why They Fail* found that a low level of interaction between members is one of failure factors of the community of practice. Baker and Beames (2016) stated that when there are fewer chances among members of CoP for discussing or debating about some issues at meetings, or when they recognise that these meetings are not supportable, this leads the members to consider that they are wasting their time. Therefore, this makes the

community of practice unsuccessful in meeting its goals.

Finally, one might ask what insights do the community of practice in Case O offer with regard to the internal and external nature of essential core conditions in order for a CoP to work. The following points can provide insights from the conditions of Case O in order for a CoP to work:

– Schools members whether administration management team, teaching staff and students need sustainable encouragements in order to enable them to integrate SD in the SSCE curriculum;

– It is helpful and practical for educational actors when they are facing challenges during integrating SD in the SSCE curriculum, moving from complaining and providing list of excuses to adapt with these challenges and providing solutions for them;

– Changing the students' attitude from only having a certificate at the end of the academic year to recognising the value of SD knowledge and competencies which might eventually prepare students for best future careers;

– Collaborating with successful educational environments through having partnership with them, includes distributing knowledge, sharing practice in all the educational aspects whether in school leadership, SPCK and students' agency and empowerment will provide them with a practical example for integrating SD;

– Students should be exposed to real world learning experiences through letting them visit higher educational institutions, SD projects and SD research centres in order to increaser their awareness of SD.

7.2.3 Summary of Phase Two

There are key insights gained as a result of relating the findings of this section to the literature. Developing systems thinking and interpersonal skills through CoP, PCD and TASC among the Saudi teachers and students were accompanied by challenges and risks contextually, educationally, culturally and individually that were not expected to occur at the beginning of implement the project. These challenges and risks occurred in other contexts, so this context might offer an insight of how to deal with such challenges and risks.

At the beginning, teachers and students in both cases M and O were struggling to cope with integrating SD in the SSCE curriculum, especially with unfamiliar approaches like CoP, PCD and TASC, which increased the difficulty among teachers and students to engage properly with this task. The educational system, school leadership, teachers' beliefs and students' dispositions and the private sector are key factors that need to be considered if similar contexts intend to integrate SD in the curriculum. Overall, the current study has shifted the researcher's belief and vision in several educational aspects in the Saudi context whether teachers professional development, students' learning, curriculum development, pedagogical content knowledge and his understanding of these aspects with regard to incorporating SD in the school curriculum in Saudi Arabia became deeper. It is believed that the current study has developed a praxis as well as proposed a novel theoretical framework to make the integration of SD in the SSCE curriculum possible, which will be presented in more detail in the Concluding Chapter 8.

8. CONCLUSION

8.1   Introduction

The purpose of this chapter is to summarise the key findings and the limitations of the study, as well as to identify recommended areas for further research. The key findings are presented through matching them with the research questions and are followed by a discussion of its contributions to the current body of knowledge in various dimensions. It concludes by a reflection on the research process.

8.2   The Main Contributions of This Study

This section is presented through answering the research questions and presenting the new understanding of the community of practice which emerges from this study.

8.2.1   RQ 1.

What is the current practice regarding the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi tenth grade? This question was answered through Phase 1 which employed certain methods as

mentioned in the Methodology and Methods Chapter 4. The outcomes of this question showed the keenness of the Saudi government in promoting and raising awareness education for sustainable development among its younger generation via a sustainable development-promoting curriculum. However, applying this vision in a real school setting, particularly via the SSCE curriculum in grades nine and ten, has been challenging for different reasons as revealed by this study.

Firstly, incorporating sustainable development in the SSCE curriculum, was based on the vision of the Saudi government, but the Ministry of Education's rules and regulations did not support it. Moreover, the circulars issued by the ministry were also not supportive of teachers' and students' efforts to implement a sustainable development education curriculum. Secondly, teachers, as members of this community who could play a significant role in achieving the objectives of incorporating sustainable development, were often seen as technicians and not as professional human beings. They were confined to the curriculum, the classroom and deprived of their will power by the school management and the educational administration. Thus, the teacher needs to be heard and provided with the scope and freedom in order to participate effectively in educational processes such as having a role in designing the curriculum to interpret and implement it correctly.

Hence, it is believed that the implementation of sustainable education needs significant governmental support in two matters. These matters are: taking the essential steps to integrate and organize the reframing of curricula and main objectives of educational systems, and then promoting school teams and individual teachers to advance and develop their professional expertise (Van den Branden, 2015). It is also argued that, globally, education systems are altering, and thus offering chances for serious and promising educational reforms. One of the vital elements in most of these reforms is the continuing professional development of teachers (Dichaba and

Mokhele, 2012).

In addition, it is argued that there is an increasing belief that professional development programmes have to be associated and directly connected to teachers' practice (Tairab, 2012). Thus, this belief concentrates on the perception which is that professional development should be site-based and incorporated into the consistent practices of teachers so that it assists both teachers and their students in obtaining high levels of content comprehension and improved performance (ibid). Similarly, Gaikhorst et al. (2017) have found that in schools where the transfer of a professional development programme was successfully completed, the teachers felt that their expertise was recognised and unitized by their leaders in the development of the school organisation. On the other hand, the subjects, who were students, were also neither prepared nor guided to achieve the objectives. In addition, the tools used to mediate between subjects and objects were not convenient. Moreover, it became evident that there was a need to address the issues of having a lack of clear conceptualization and understanding of sustainable development among teachers and students, which relates to sustainability literacy.

Furthermore, there was a requirement for presenting sustainable development issues by considering appropriate curriculum design, the teachers' voice and the students' needs, which all relate to sustainability competency. Lozano et al. (2015) indicate that although there are many instances of sustainable development implementation throughout the system, the efforts largely tend to be compartmentalised. Furthermore, while notable advances were made in the area of education for sustainable development, the integration of ESD holistically within the curriculum remains to be done (Blake et al., 2013; Owens and Legere, 2015; Tilbury, 2011). Even though some principles of sustainable development have been implemented in other contexts, such as India, the successful implementation of this requirement is

hindered by a lack of interdisciplinary competence among educators and students (Banga Chhokar, 2010). It is apparent that many teacher educators do not know how to best integrate sustainable development into their curriculum area or their teaching practice (Dyment and Hill, 2015). As a result of Phase 1, the following are findings which were helpful for Phase 2 which is the Development and Implementation Phase (Figure 6.1).

8.2.2 RQ 2.

How does building a community of practice and use of Problem-Centred Design promote the incorporation of sustainable development in the SSCE curriculum in the Saudi 10th grade?

The second question was answered through applying the project in two case study schools in Phase 2. The study reveals that in Case M the integration of a curriculum for sustainable development, in addition to the use of innovative teaching approaches, was highly valued by students and teachers in Social Studies sessions. This was due to the fact that it created a positive atmosphere for interaction and aroused both teachers' and students' interest. The content of the new curriculum also contributed to increasing students' sense of shared responsibility through involving them in thinking about solutions for various global issues. This was carried out by addressing these issues through the concept of sustainable development and the theory of Thinking Actively in a Social Context (TASC).

Students had interacted with sustainable development sessions intellectually and they also practically applied it through designing projects and sculptures. Ongoing meetings and workshops to develop work between both the researcher and the teachers, and by the teachers themselves, played a vital role in implementing the two

new units. The participation of teachers in the development of the project through working papers, exchanging experiences and introducing amendments to the students' environment was also critical in the process of implementing the two new units. It became evident that theories in Problem Centred Design (PCD), TASC and the emergent community of practice, which have been used in this study, were appropriate for supporting the integration of sustainable development into the SSCE curriculum. These theories could be integrative and supportive of each other in order to provide the ultimate conceptual framework model that is a product of a grounded theory study (Figure 8.1).

The researcher participated in the workshop for the Theory and Practice of Social Learning Leadership with Etienne Wenger, the author of Community of Practice theory and Beverly Wenger-Trayner, 19-22 September 2016, Ljubljana, Slovenia and the certificate of this participation can be found in Appendix U. The research project was introduced to both Wenger and Beverly Wenger at the beginning of the implementation of the sustainable development project in Schools M and O. This discussion was informative to understand the community of practice profoundly and authentically and how apply it in the Saudi schools. Moreover, during this real world learning, the researcher learnt from different participants who apply the community of practice in their contexts. The knowledge and experience that the researcher gained from this rich learning opportunity made him to be confident to apply the community of practice professionally. The theoretical framework of this study and its features show that these features are working together dynamically with the potential to adapt with competency in uncertain future situations.

It appeared that both Cases M and O faced a challenge with this kind of change as they were used to delivering a content curriculum. However, the condition of Case M was more likely to adapt to dramatic change, while the members of Case

O faced some hindrances that prevented them from positively embracing this new opportunity. The teachers were one of the main reasons for the successful running of the project. Their readiness supported the integration of sustainable development through PCD. However, this readiness could not be effective without sustainable support from the surrounding environment such as the researcher and head-teacher. It is argued that curriculum change as a collaborative activity differs from an individual activity (Hammer et al., 2014; Hubball and Burt, 2004).

It is shown that members in Case M had provided spaces and support and this had led them to interpret their own learning into their teaching practice and instructional design and to act like learners. In order for teachers to reach the aforementioned state, as well as to feel self-assured and empowered to leave the classroom barriers, they need to get similar practices as learners themselves: time, space and enhancement (Kelley and Williams, 2013).

It is believed that providing support to boost teachers' design expertise is a necessary concept for integrating sustainable development into the curriculum (Huizinga et al., 2014). Thus, teachers in this study appreciated the opportunities to participate in the macro curriculum level, as well as activating the new instructional design level. Therefore, it is evident that within the teachers' community, the members have chances to use all the possessed competencies through distributing knowledge and sharing practices. These possessed competencies were distributed and shared among the members equally (Table 7.1). Therefore, the building of teachers' capacity to integrate sustainable development was one of the tasks that the emergent community of practice supported in this study, especially in Case M. Stenhouse (1975) argued that curriculum change is a social experiment in which teachers' capacity has a major role.

8.2.3   RQ 3.

What are the factors that foster or hinder the incorporation of sustainable development in the Social Studies and Citizenship Education curriculum in the Saudi tenth grade?

The critical time in which we live requires the rethinking of many potential ways in which to make the concept of sustainable development and its principles an integral part of daily life. One of these potential approaches is how to attract community institutions, such as the private sector, to participate effectively in the sustainable development industry by supporting public schools in fulfilling their duties. Certain contextual factors, as shown by the data, should be taken into consideration when policy makers and school administrations in Saudi Arabia wish to integrate sustainable development into school activities. For example, school leadership, teachers' beliefs, students' dispositions and the private sector were significant factors in Case M and hindrance factors in Case O. On the other hand, it is highlighted that curriculum redesign needs active financial, organisational and political support from heads and the school administration (Hubball and Burt, 2004).

Moreover, the acknowledgement of the valuable contribution of the members' personality, efforts, abilities and experiences, plays a vital role in the integration of sustainable development. Second, institutional culture, which was not expected to emerge as an important factor in this study, has a significant role in the integration of sustainable development. Trust among the members of the community towards the integration of the sustainable development concept and its principles through school activities is another important condition. On the other hand, some chief executive officers' understanding of the contribution of Corporate Social Responsibility (CSR) towards a sustainable development agenda was shallow and limited and this

could impede the successful integration of sustainable development. A shared understanding between the members of the community regarding the integration of sustainable development was a vital condition in the integration process. The study also reveals that the integration of sustainable development could not be an ongoing process if implemented in isolation of the other community institutions such as the private sector.

It can be argued that this study on incorporating sustainable development into the Social Studies and Citizenship Education curriculum has provided new insights into the research methodology in education for sustainable development research. This study was conducted to explore the current practice regarding the incorporation of sustainable development into the SSCE curriculum, to understand the process of building community of practice for promoting sustainable development in SSCE as well as to identify the factors that foster or hinder the incorporation of sustainable development into SSCE. Based on the achievement of the study objectives above, it can be argued that the study has provided substantial contributions to theory and practice, as well as enabling new insights into the state of education for sustainable development in the Saudi Arabian schools context.

It is believed that the current study can contribute to knowledge and practice in several fields such as CPDs, PCD and SPCK. Noticeably, this study has attempted to work according to United Nations (2005) ESD characteristics, which demonstrate four features. Firstly, the characteristics of education for sustainable development is contextually relevant. Thus, this study has addressed domestic and international challenges and displayed them through the languages that students are predominantly using, namely Arabic and English. The second characteristic of education for sustainable development is that it is value-driven. Hence, this study has presented questions and issues in order to activate and raise awareness of principles under-

pinning sustainable development through several educational pedagogical content knowledge. The third characteristic is concerned with addressing and attempting to solve sustainable development issues in meaningful ways. Therefore, enhancing particular sustainability competencies is vital, such as systems thinking and inter-personal competency (participatory competency) through a systematic tool, such as TASC. This was an umbrella to activate other educational pedagogical content knowledge such as collaboration learning.

The last characteristic of education for sustainable development is that it is inter-disciplinary and comprehensive, which means that sustainable development should be integrated into the entire curriculum, not only in one subject or in one discipline. Although this study was not able to embed education for sustainable development in the whole curriculum, it provided an example of a practical interdisciplinary curricu-lum by integrating sustainable development into the SSCE curriculum. The reasons for only incorporating sustainable development in one curriculum were due to the limitations and scope of the study. Overall, this study has responded to the demand of filling the gap in the literature in several theoretical issues such as the teach-ers' level of understanding of the concept of sustainable development as shown in Phase 1. This study also contributes to understanding of the process of addressing the lack of clear understanding of sustainable development concept through apply-ing the emergent community of practice model, as shown in the Phase 2. This study has responded to the demand of filling the gap in the literature in terms of conduct-ing research in a general education setting through the development of curricula in high schools, especially Social Studies (including geography, history and citizenship education) for sustainability literacy and competencies (Unlu, 2011; Kolnik, 2014) which has been done in Phase 2. Also, the findings of this study contribute to the current literature in terms of theoretical and practical contributions as has been dis-

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cussed in the above subsections.

8.3   Limitations of the Study

The claims above were limited by some factors, which will be discussed in this section. These limitations are related to the researcher, participants and the research methods that were used in this study and could be identified in this section. The researcher's and team members' beliefs and own biases, relative to the phenomenon under the study, are explicit and several steps were taken to eliminate their impact on the quality of data (as mentioned in Section 4.7.1). The research methods such as nominal group technique used with the students, semi structured interviews used with the teachers, a research diary, teacher field notes and photography have advantages and disadvantages as mentioned in Chapter 4 and here we will highlight the drawbacks that emerged from our study. For example, there is a criticism about the results of NGT, which may not be able to be generalized to a larger population (Jacobson et al., 2005). Moreover, the time for collecting NGT data was limited to a single occasion as appears in the findings of Phase 2, which are not in depth as are the findings of Phase 1 for NGT.

Arguably, Alshenqeeti (2014) criticized semi-structured interviews as it might consume considerable time and possibility of bias. Similarly, Sheble and Wildemuth (2009) considered the research diary method has some limitations such as consuming considerable time and having the potentiality for bias. Although the researcher was convinced of the importance of the students' voice, engagement and ownership, in effect the students group in Phase 1 was much bigger than in Phase 2. However, the limitations of being the researcher and project coordinator gathering

data from the students' perspective during Phase 2, which was almost impossible have already been discussed (Chapter 4). Since it was very limited, the researcher could have done more there, such as interviewing the students about their samples of work, but the time and the researcher's own resources and the time within which he had to come back to University of Exeter to shape his analysis and write it up were limited. All these were severe limitations on what was possible. Therefore, if the researcher was ever going to conduct this research again, he would do his research differently especially with the data collection from students. Moreover, when the researcher has an ideal situation, he will do this research differently in terms of the resources, the tools he will use to collect data from students such as a semi-structured interview and he will have enough time to spend with them.
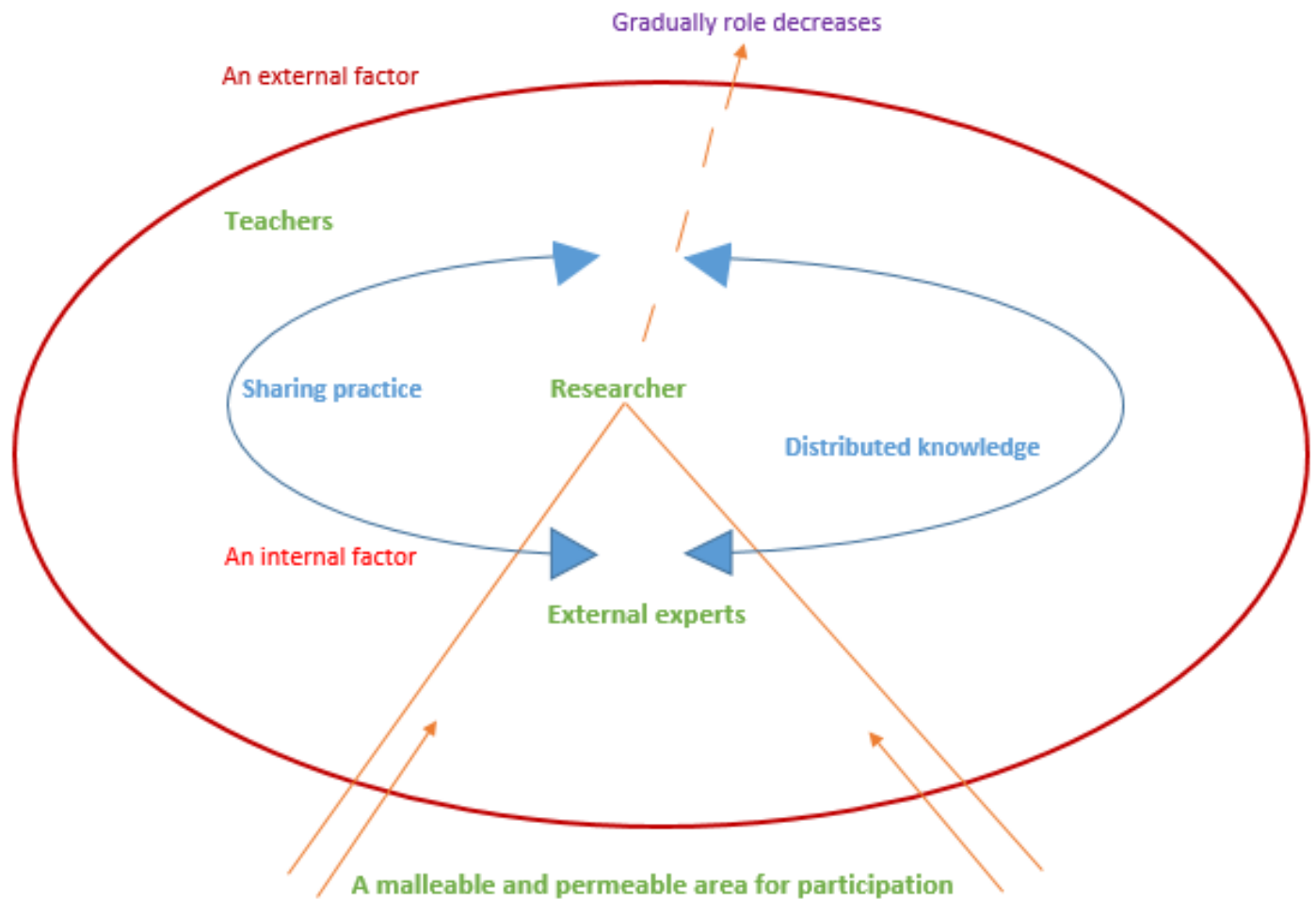
8.4   Proposing an Emergent Community of Practice Model for Integrating SD into the Curriculum

Although there were limitations that affected the researcher's vision, this study proposes a novel model that can be useful for ESD. The proposed model in this study overcomes the limitation of having hierarchical participants as all participants were considered equal in sharing their own legitimated knowledge regardless of the experience that external experts might have. It is stated in the Methodology and Methods Chapter 4 that the study is interpretive in nature and employs a qualitative case study approach to deeply understand this complex educational phenomenon.

It can be argued that the origin of CoP provides the basics of thinking of building the community within its broad system and its three dimensions. However, it has key limitations which provide chances for contribution to the body of knowledge and provide theoretical framework (e.g. power and equality). This study reflects on the

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principles of SD, its key concepts and its key competencies. Overall, the situation of SD in practice itself required a lot of emergent thoughts and actions to provide a sense of participation towards SD. This needs a dynamic environment that includes different stakeholders who present the local community and have multiple mind-sets and this can show the social aspect of SD. Based on the data (see Section 6.3) and the discussion in Subsection 7.2.1 and Subsection 7.2.2, the diagram below has emerged from this study which consists of the several aspects that will be presented in the following paragraphs. This emergent community of practice model has evolved gradually and reached its current model (Figure 8.1).

Fig. 8.1: Model of the emergent community of practice in the later stages

Complete independence is not good for new learners, as they need a little help to guide them. For a period of time, the researcher as a catalyst and facilitator was a helpful starter for the learners at the beginning of their learning journey. He then left

them to gradually learn independently. Furthermore, considering the economic and the ecological aspects, the community has to have space of permeable social structures to allow external experts to distribute their legitimate knowledge and share their practice. In this model, both teachers and external experts as mastery/expertise in their specialties participate equally. They have different types of knowledge and all these types are legitimate and valid. If they know that they are both equal, they will learn to learn together and be cooperative. They will have the ownership of personalising their own learning and managing their own practice based on their needs.

In this model, the function of external experts is that they only participate temporarily if there is a need for relevant expertise in the tasks of permanent members. They leave when they have shared their practice and distributed their knowledge, whilst the permanent members remain in place. The members of the community continue their regular learning process using their legitimate knowledge and practice. However, as is said in the discussion of Phase 1 sustainable development issues can be seen as complex, which means that the permanent members cannot know everything about sustainable development aspects, so they might need to invite and lead other members of society to participate in some relevant issues that permanent members need help in. By doing so, the members not only could activate an interdisciplinary approach through engaging other experts of sustainable development but also they provide spaces within their area of learning and practice, so it can be a permeable arena for others to join them with their relevant expertise that they could share with permanent members. It is viewed that the learners are capable and have their own legitimate knowledge and potential to have better levels of knowledge and practice than they had previously.

In this model, the system contributes to the body of knowledge through providing a proposal of a sustainable approach, which allowed more malleable and perme-

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able social structures in which to enable and encourage participation. Furthermore, the emergent community activates the horizontal approach, which is described by Wenger (2010) as the approach that is associated with involvement in joint activities, peer recognition, identity and reputation, negotiation of mutual relevance, commitment to collective learning and standards of practice. A horizontal community can be defined as a group of professionals, who think they are involved in the same kind of work, share a number of principles, rules, and viewpoints, which adapt to work associated tasks and extend beyond them (Van Maanen and Barley, 1984). Their social relationships blend the world of work and free time and they consider that they are relatively suitable with their work (ibid). Arguably, there is a common mistake in organisations which assume that horizontal relationships lack accountability and thus that the approach to creating accountability is to overlay vertical structures (Wenger, 2010).

However, it is emphasized that participants in a community of practice through a mutual commitment to a learning partnership can give rise to very robust horizontal accountability (ibid). In terms of the boundaries, according to Wenger (2000), between different communities this can include members who act as brokers between the communities, artefacts such as the tools used and interactions among the members. The 'brokers' in this study includes the researcher, his role being not only to align different perspectives and disseminate practices among communities' members, but also distribute his mastery knowledge and expertise thus enabling everybody to have a role of mastery. Each community distributes knowledge and shares practice within its members as well as within other communities. Sometimes one of these communities can lead others to their zone of expertise and share with them their practices. For example, teachers have shown the experts and practitioners in sustainable fish farming their presentation of the issues that relate to extinction of

fish and what they expect from the students. In contrast, the experts and practitioners in sustainable fish farming have shown teachers and students how they could breed fish inside the school. Therefore, it can be noticed that numerous conventionally hierarchical organisations in many contexts demonstrate authentic interest in promoting horizontal communities and networks, which might not be a revolution, but can have a transformative possible for the future of learning (Wenger, 2010).

As discussed previously (7.2.1), the limitations of the existing professional community of practice using a master/apprenticeship relationship model would not be able to integrate sustainable development in the curriculum as well as sustain the community itself. The focus in this paragraph is on two other types of communities, presenting their limitations and how improvements can be made through the new emergent community, which is appropriate for integrating sustainable development and to sustain the community itself. The professional communities of practice emphasize the importance of demonstration and face to face meetings, as they are only ways of communication. In addition, this kind of community needs time for training and educating its members. Moreover, the change often occurs slowly as the processes of learning are controlled by institutional rules, which means that innovation and creativity for applying new knowledge might face considerable challenges such as the issue of institutional culture as seen in Phase 1. Therefore, this kind of community of practice cannot be used for integrating something is as complex as sustainable development, especially in workplaces that have limited time. The expert or creative communities were not helpful in terms of integrating sustainable development nor in sustaining the community itself due to its complex processes that contained standards and codes. Moreover, this kind of community uses group management style of organisational dynamics in which teachers professional development purposes might not be achieved because of having general tasks to be

conducted.

Consequently, they might not have their own community that is well established in which they can sustain and maintain their focus of developing professionalism and being updated of recent changes and requirements in their fields. Arguably, based on the results of this study, this new emergent community of practice model can contribute to the literature that is concerned with how to sustain the community's function regardless of the presence of broker mastery. It can be claimed that Table 8.1 below shows another contribution that this study added to the body of knowledge especially to the table presented in Chapter 3, Section (3.5.1).

Tab. 8.1: The new emergent community of practice model

Activity	Type of knowledge	Social interaction			Innovation	Organisational dynamic
		Proximity/ nature of communication	Temporal aspects	Nature of social ties		
Sustainable CPD model for integrating SD into a national curriculum	Specialised and expert knowledge, this was distributed among all members and existed to extend knowledge base, teachers on the other hand, practice PCD/TASC. The permanent members were consistent and the creation of coalitions was provisional as the case in (Aquaponics) project. Knowledge and practice were changing rapidly.	Spatial and/or relational proximity. Communication facilitated through a combination of distanciated contact and face-to face.	Short-lived drawing on institutional resources from a variety of expert/ creative fields and hope to be continued after the broker left.	Trust based on reputation and expertise, weak social ties (external experts) and increase stronger tied with the permanent members (teachers).	High energy, radical Innovation, the time of the application was short, so the hope is that they continue with permanent of the community (teachers) in a way that is Incremental.	Small peer managed organisations no restrictions on the entry of other communities for distributing knowledge and sharing practice.

Thus, the result is an emergent community of practice model for sustainable CPD model for integrating SD into a national curriculum that has emerged from this study as a contribution to the body of knowledge. Li et al. (2009) and Amin and Roberts (2006) state that community of practice was initially developed to offer a template for investigating the learning that occurs among practitioners in a social environment.

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However, after a while the focus of the concept changed.

For example, in 1991 the focus was on interactions between novices and experts, and the process by which newcomers created a professional identity, while in 1998 the focus moved to the trajectory of individuals' participation within a group ' (i.e., peripheral versus core participation)' and personal growth (Li et al., 2009, p. 1). A managerial tool for developing an organization's competitiveness was the focus in 2002 (ibid). Noticeably, the need for reinforcing the community of practice model for integrating sustainable development in education is important as well as developing a model that is sustainable in itself. Thus, it can be seen that Phase 2 has provided a proposed model of a community of practice which is called the emergent community of practice. Furthermore, in order to understand the emergent community of practice model and appreciate its contribution, it is worth presenting the existing professional community of practice using a master/apprenticeship relationship (Figure 7.1).

The existing professional community of practice model was not useful for integrating sustainable development due to the lack of knowing, belonging, positive interactions, social learning process, sharing teaching repertoire and design expertise. This occurred because the philosophy behind this model was associated with a hierarchical manner of communication, a unidirectional community that considered the learners as novices. The new emergent community of practice model can be appropriate for the two goals, which are integrating sustainable development and sustaining the community itself (Figure 8.1).

The emergent community of practice model was useful for integrating sustainable development due to facilitating the knowing process, engaging in belonging, positive interactions, social learning process, sharing teaching repertoire and design expertise. This occurred because the philosophy behind this model was associ-

ated with inclusive methods of communication and a multi-directional community that considered the learners as participants and experts. The internal and external factors seems to play a vital role in supporting the members of CoP to enact their tasks of integration of SD in the SSCE curriculum that allow the members to engaged with them properly (see Subsection 7.2.2). To sum up, it appears that in these paragraphs the teachers have shown their ability to cope with difficulties in the level of distributing knowledge and sharing experience with other communities. In addition, it is evident that teachers have interacted with the dimensions of the emergent community of practice model within their community and these dimensions were demonstrated professionally.

8.5 Implications for Education and Recommendations for Future Research

8.5.1 Implications for education

The results of this study contribute specifically in a number of ways, which can be generally divided into macro and micro levels. The macro level comprises how this study can contribute to educational policy, curriculum development and design and higher education. While the practical contributions on the micro level relate particularly to the instructional level and presenting the content materials which can mainly be approached through teachers' continuing professional development programmes, a positive school environment and engaging local stakeholders such as parents, Non-Governmental Organizations (NGOs), and the private sector.

Educational policy for enabling SDGs to be promoted

The educational policy maker should produce a clear vision that enables them to achieve SDGs that comply with Saudi 2030 vision. The Saudi Ministry of Education should have contact with all other ministries, public organisations and NGOs to work together to apply SDGs. The Saudi Ministry of Education needs to explore the demands of enabling factors to let it to work collectively with other social institutions. Training the policy makers how to integrate SDGs in their educational strategic planning and operational planning are essential for ESD.

As it appeared in the research results with regard to SD in the Saudi context, several stages be very helpful to integrate SD. Spreading the culture of sustainability among employees of the Ministry of Education and all citizens through available means should be the first stage. The second stage is mainstreaming sustainability competencies through curricula. The third stage is building comprehensive evaluations models which are based on qualitative and quantitative criteria as well as taken into consideration the social, economic and environmental dimensions of SD. The fourth stage is having compatibility between public education products and university education products to ensure sustainability and achieve unique quality products that contribute to creating a diversified and valuable economy (Knowledge Based Sustainability). The further stages can be done through focusing on meaningful scientific research that puts theory into practice, increases the degree of risk in conducting research, continues improvement, and engages in multiple kinds of partnerships with other social institutions.

The educational policy department should be aware of the meaning of the sustainable development concept. It should also be updated with regard to sustainable development movements around the world. Furthermore, the educational policy de-

partment should be a role model for other educational departments by applying the principles of sustainable development in all its activities, making short and long-term educational plans which are compatible with the principles of sustainable development. The educational policy department should produce procedures, which will ensure all other educational departments are following and applying the principles of sustainable development within their activities. More importantly, the department of educational policy should highlight the concept of sustainable entrepreneurship within schools' activities and allow the private sector to participate actively in these activities.

Curriculum development and design

Having a special research centre, which is concerned with the educators' points of view and uses them for developing the curriculum is needed for enabling sustainability curriculum. The members of this centre should include various educational stakeholders such as supervisors, teachers and students. The Saudi Ministry of Education emphasises the need to establish a department in the Ministry, which is responsible to investigate the up-to-date and current challenges that are crucial to pupils' lives.

Accordingly, educators can display topics in the curriculum, which are truly what people require at the present moment. Moreover, there is a need to increase the possibility of teachers to participate in the designing and developing of the curriculum through encouraging them to use their expertise and providing them a stimulated environment. By doing so, teachers will be able to interpret the prescriptive curriculum into the descriptive curriculum due to their participation in designing the

curriculum level. Finally, teachers through these processes will naturally be able to feel ownership of their participation to the higher level of teaching professionalism.

Higher Education

With respect to higher education, data has affirmed that universities can benefit from this study for preparing initial teachers through creating a special module that provides comprehensive sustainability literacy and competency. Furthermore, the process of integrating sustainable development in this study can adapt to the universities' contexts, which comply with their conditions. Noticeably, the case studies that have been investigated in this study have provided examples of how sustainable development issues can be incorporated into the Social Studies and Citizenship Education curriculum in the Saudi context. It was found that during the processes of implementing the project, there was an unexpected conceptual framework model. This emerged model was created due to the evolved and progressed work (see Section 6.3.2.3.3), and this model was called an educational know-how sustainable development project (Figure 8.2).
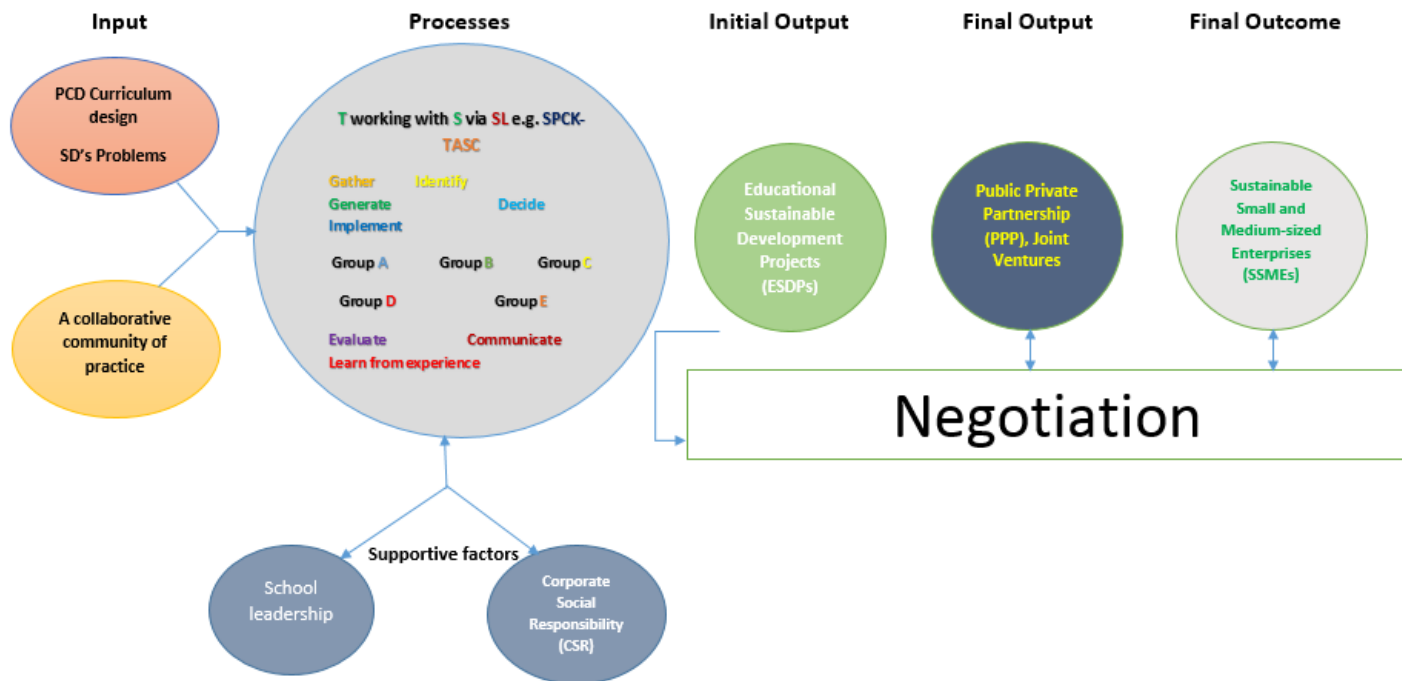
Fig. 8.2: The created conceptual framework for an educational know-how project

It can be seen that the framework above includes various procedures such as input, processes, supportive factors, initial output, final output and final outcome. The created conceptual framework for an educational know-how project starts with the school setting through input that includes PCD and CoP as well as processes and ends with Educational Sustainable Development Projects (ESDPs).

Data also reveals that the real ESDP, as in Case M, were supported by the CSR. These projects can be moved to be the final output through the negotiation between school leadership and the companies that have already engaged with ESDP. Moreover, there are potential social, economic and environmental products which can be gained through further negotiations with the private sector to achieve final output and outcome.

However, these procedures depend on the capabilities of the educational institutions, educational actors and school leadership as they can move from Corporate Social Responsibility (CSR) to Public Private Partnerships (PPPs) - (joint ventures) and SSMEs. The joint venture can be seen as a relationship that offers a public facility, which is partly owned by a governmental authority and partly by a commercial firm or business stockholders (Hall, 2008). It is argued that within joint ventures in which business and government cooperate, both of them are applying their strengths to develop an enterprise more efficiently and professionally than the government might achieve on its own (Akintoye et al., 2015). In a joint venture, the government engages mutually with investors in different processes such as constructing, financing, operating and maintaining a project for a definite period, which might or might not be transferred to government authority at the end of the period (Rashed et al., 2017).

This model is not a blueprint, so users should develop it based on their contexts and provide new insights from their applications. It can be seen that the model of educational know-how sustainable development project is a practical contribution of this study, which can provide an example of the value of educational efforts towards its society, environment and economy. To sum up, the educational know-how sustainable development project model could be a possible area for future research. Finally, the micro level is concerned with the instructional level that can be presented through the community of practice model, school environment and engaging local stakeholders: parents, Non-Governmental Organizations (NGOs), and the private sector as is elaborated below.

Teachers' Continuing Professional Development programmes

Data has revealed that the continuing teacher professional development department should use the community of practice model wisely. This can be done through several procedures. One of them is introducing the emergent community of practice model in a small scale in order to manage its activity and gain its advantages. The second procedure is having a clear enterprise in order for the teacher to engage mutually with it and shared teaching repertoire. Additionally, in order to encourage teachers to participate in this kind of continuing teacher professional development programme, there should be rewards as well as future promotions.

Within the emergent community of practice model, teachers can address complex issues such as integrating sustainable development that require the teachers to be willing to use approaches such as PCD and novel educational strategies such as TASC even though they are not familiar with them. School leadership should participate positively in integrating sustainable development processes through activating their duty of leadership roles in the community of practice, and be willing to learn new information as well as facilitating the tools that schools are required to have.

School environment

It is necessary then to create a school environment that provides the needed means and facilities to enable the process of integrating sustainability into the curriculum to be feasible. Thus, the school leadership and teachers should concentrate their efforts on educational processes instead of focusing on other elements that can be solved by other stakeholders such as the status of school buildings. Concentration on the quality of learning processes can translate the school philosophy into practice and eventually achieve its aims. Positive human relations between the school mem-

bers should be activated in all educational processes such as fairness in distributing tasks among teachers and students and the prevalence of encouraging atmosphere and appreciating of efforts through various techniques such as providing weekly, monthly and yearly awards.

Engaging local stakeholders: Parents, Non-Governmental Organizations (NGOs), and the private sector

Sustainable development concept is a complex concept and at the same time is associated with all members of society and its institutions. Therefore, engaging local stakeholders such as parents, NGOs, and the private sector in the educational activities is a vital way to make sustainable development promote its principles. The school members should have freedom and creativity to engage these local stakeholders through various ways that fit both. For example, these local stakeholders can participate in providing their thoughts to improve the school plan and its vision, the curriculum, students' experiences and learning, and school's facilities and resources.

8.5.2   Recommendations for future research

There were several limitations of the present study that could be areas for further research investigations. Firstly, the current study has only integrated systems thinking and interpersonal skills, so it would be useful if there were an investigation into integrating other sustainability competencies. Moreover, the current study has only focused on formal education, so it would be beneficial if some of the researchers would focus on conducting research into informal education with regard to supporting SD. It would be commendable if a group of researchers examined why the edu-

cational policy agendas do not focus on the practicalities of integrating SD into the educational processes as a whole. It is recommended that future researchers could examine educational technological aids in terms of facilitating deep learning for sustainability competencies.

Additionally, the present study focused on exploring the current practice of sustainable development in Phase 1 and it additionally intended to understand the process of integrating sustainable development in Phase 2 rather than to evaluate its outcomes. For example, one can do this through making criteria which are based on sustainability literacy and competency as indications of the evaluation process. It can also be an area for further research in evaluating the outcomes based on educational sustainable development projects. Furthermore, it can be conducted through formative evaluation. This can be applied with Phase 2 for the purpose of evaluation instead of understanding. Due to time limitation, it was hard to use research methods to capture data and analyse it in the Development Phase, which can be a future research area for further investigation. The study complied with an interpretive paradigm, which aimed to gain chances of understanding the authentic phenomenon.

Qualitatively, the study has chosen certain research methods and data analysis methods for its purpose. On the other hand, being qualitative researchers can raise some methodological issues with respect to validity, reliability and generalisability. However, the researcher has tried to minimise these problems by carrying out the study in a way that trustworthiness and credibility were ensured (see Section 4.7.1 in the Methodology and Methods Chapter 4). Thus, there would be an opportunity to re-conduct this research by other methodologies such as experiment design, pure action research and lastly, design based research (DBR). These methodologies can be used to produce reliable data, but they were not the right methodologies for the

current research because they presented some drawbacks.

These consumed too much time and, guided by a pragmatic paradigm as the case with DBR, aimed to produce cause-effect outcomes as with the case of experiment design, measuring the change and improving local educational issues that are studied by the teachers themselves as is the case with action research. Moreover, there would be an opportunity to explore the current practice quantitatively through other research methods and using statistical data analysis methods such as the Statistical Package of Social Science (SPSS). It might be useful to use both qualitative and quantitative approaches in order to provide a comprehensive picture according to Creswell (2012). It would be beneficial to use semi-structured interviews with students to gain in depth information.

In addition, it would be helpful to apply this study locally in more schools in the Saudi context in order to compare between the similarities and differences and obtain insight from them. It would be good to apply this study globally in more countries such Gulf Cooperation Council (GCC) countries and advanced countries by applying ESD in order to compare these similarities and differences and obtain insight from them. It would be useful to apply this study in different educational stages as well as in different educational curricula in order to provide theoretical frameworks and novel applications for ESD. To apply this study in initial teachers programmes to gain insights of their challenges and opportunities and how to prepare initial teachers professionally to teach ESD are also interesting ideas. It might be useful to investigate how the CoP can be used for integrating SD into girls' schools at different educational stages. It would also be helpful to investigate of how the school leadership can be enacted to support ESD.

Although the study aimed to use a geographic information system (GIS) with activities that were running in the project, the facilities to do this task were not available,

nor were teachers qualified or schools' equipment provided. The GIS is a computer system that includes a group of instruments for gathering, keeping, regaining at will, transmitting and exhibiting spatial data from the real world for a specific number of aims (Burrough et al., 2015). It is stated that the real world entities in such a system are signified by their location in a coordinate system, which includes a set of features such as name, area and colour (Avouris and Page, 2013).

Another potential area of future research would be to investigate what is the situation of the members of the community with respect to the continuing of participation in their mutual engagement and shared teaching repertoire after finishing the current study. Additionally, this study agrees with the issue that is concerned with professional development models which are under pressure to provide approaches that accommodate a considerable number of teachers while not compromising the effectiveness and quality of teacher learning communities (Pausigere and Graven, 2014).

Therefore, conducting further research is needed to examine how smaller teacher communities of practice can be shaped into larger professional learning communities while maintaining the advantages of the teacher learning (ibid). There is an opportunity for future research to conduct further investigation to discover the reasons why the Saudi Ministry of Education was not developing teachers in a way that is acceptable to all stakeholders.

8.6   Concluding Remarks

As a citizen I am supposed to have a positive role and this role is influenced by several requirements, locally and globally which associate with each other and have an impact on each other. One of the positive roles is providing valuable work, which

contributes to sustainable human development. The process of sustainable human development is complex and sensitive, which means that it requires creative ways of thinking and continuous giving. If we link human development with the requirements of sustainable development, the situation becomes more critical. This criticality requires advanced experience and informative knowledge, which can be gained through conducting scientific research.

It is believed that this research has highlighted in-depth knowledge in education for sustainable development and there is a desire that this research be an introduction, guide and reference for future postgraduate students as well as practitioners who are passionate about integrating sustainable development. Furthermore, the whole research journey was a way of learning through contacting the head office of Eco-school, which is one of the educational sustainable development programmes that runs globally. The reason behind this contact was to gain deeper knowledge of the programme.

Moreover, in order to have practical school examples, I visited many Eco-school offices in different countries such as France, Belgium, Sweden and the UAE. I also contacted other national offices such as Netherlands, Finland, Tunisia, Morocco, Germany, Wales and Brazil through various ways such as email, Skype, WhatsApp and telephone. These efforts had somehow shaped my focus on the current investigation of my study. After that, I started exploring the relevant literature and began to understand the breadth of education for sustainable development research area and to appreciate the value of the work that has been done.

In addition, through extensive reviewing of the literature, there were some research areas which provided opportunities for the researcher to conduct a thorough investigation. This study was one of these areas which needed to be conducted. Even though this study has been conducted in the Saudi context, the investigation was

recommended to be conducted globally in order to fill the gap in this research area. Therefore, it is believed that the outcomes of this study can be helpful for other educational contexts. On the other hand, it was a considerable challenge for the researcher to produce a meaningful thesis. Thus, one of the challenges that the researcher faced was to choose an appropriate paradigm that could guide the research procedures and its methodology in order to achieve the study's aims.

The interpretive paradigm was suitable for the research purpose, which assisted the researcher to understand the present phenomenon authentically. However, the difficulty of choosing the proper methodology still existed. This could not stop the researcher looking for alternative methodologies and this led the researcher to use the case study approach that has a variety of functions. Analysing the data was another challenge as there were several ways of analysing qualitative data depending on the purpose of analysis. For example, some of them are concerned with descriptive, surface (semantic) interpretations of data such as the thematic analysis method. Moreover, it is stated that the process of using its steps is very easy.

This study has aimed to produce a conceptual framework model from the data that has been provided in order to allow future researchers to expand and develop the conceptual framework and hopefully enable it to become a theoretical framework that can be widely used. Therefore, this study has used Constructive Grounded Theory (CGT) which is concerned with (latent) interpretation and theorization of the concepts that emerge from the data. The steps of CGT were complex and needed sufficient time to be applied properly. More importantly, being a researcher who belongs to the Graduate School of Education community at University of Exeter, is another challenge and at the same time a unique opportunity.

The challenge came from the perspectives of working independently as well as working with uncertainty. The unique chance came from the stimulated environment

that encourages researchers through providing seminars, workshops and hosting scholars from different educational contexts to share their insights and practical examples. In addition, the researcher has used his time wisely during the journey of PhD through participating in different educational events such as presenting research papers in international conferences, teaching in a higher educational context and competing to participate in critical workshops such as developing skills for research collaboration in sustainable futures. The clarification of my thesis' findings, or what is called the 'take-home message', was done through presenting them in several international conferences.

For instance, the researcher has received an award for the best presentation on December 28, 2017 at ICESD 2017: 19th International Conference on Education, Sustainability and Development held in Paris. These valuable chances were supportive, but there was also a significant opportunity for the researcher through meeting his supervisory team. The meeting with supervisors was itself a new learning channel that included challenges, conversations, applying problem solving skills and being tolerant of other opinions. This kind of learning channel can be called 'relational learning' as the learning processes aim to offer an informal approach of learning and letting the ideas flow smoothly.

The PhD journey changed my personal attitudes, so I felt that I became more logical, able to justify everything I did, and I followed the scientific methodologies for investigating any matter that came up in my PhD. For example, when I started my PhD, I valued the top-bottom approach as the most appropriate style especially for designing, developing and implementing the new curriculum, so the perception of my role was only to design the content and instructional materials and teachers' role was only to apply them. However, this style could not be used for dealing with a complex issue such as integrating sustainable development and within unsustain-

able learning communities. Therefore, I have shifted from this style to a workable approach which was appropriate for learning communities, the bottom-up approach. This approach was helpful to hear the voices of all the members of the communities and being close to them.

Moreover, there were high expectations in terms of data assessing and collecting, implementing the sustainable development curriculum and supporting school leadership and teachers. However, the situations were not as expected because they were dealing with humans who have different socio-economic contextual conditions. The researcher was realistic and adapted with these situations in order to achieve the research's aims. Truthfully, the experiences that have been gained from the process of learning in the all stages of the PhD journey did not occur without self/community-encouragement, self/community-motivation, self/community-hope, self/community-responsibility and self/community-engagement. Finally, being scholars in an educational field means that we have to be patient, positive and optimistic if we want to make the educational field relevant and supportive towards sustainable development.

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Appendix A

A SUMMARY OF TASC MODEL ADAPTED FROM (MOSELEY 2005, P. 265-266)

Summary: Wallace and Adams

Purpose and structure	Some key features	Relevance for teachers and learning
Main purpose(s): • to support the development of problem-solving and thereby improve achievement and attitudes • to prepare students for active roles in society	**Terminology:** • very clear terminology in everyday language, to be used by learners in discussion and reflection	**Intended audience:** • curriculum developers • educational psychologists • teachers and parents • learners, including those for whom English is a second language
Domains addressed: • cognitive • affective • conative • social	**Presentation:** • as a series of practical guides for teachers with the theoretical rationale developed in articles	**Contexts:** • education • work • citizenship • recreation
Broad categories covered: • self engagement and self-regulation • reflective thinking • productive thinking • building understanding • information-gathering	**Theory base:** • Vygotsky's development of higher psychological processes • Sternberg's 'Triarchic Theory of Intelligence' • Bandura's social learning theory	**Pedagogical stance:** • start with real-life problems • collaborative problem-solving as a practical context in which to develop transferable skills • move from modelling to guided activity to autonomy • provide ample practice in strategy use • emphasise motivation and self-regulation
Classification by: • broad stages in the problem-solving process with identified sub-skills or 'tools'	**Values:** • to develop self-confident and motivated learners.	**Practical illustrations for teachers:** • plenty of practical examples are included in a series of books for pupils, teachers and parents

بسم الله الرحمن الرحيم

وزارة التعليم

المملكة العربية السعودية

ادارة تعليم جدة

مدرسة ثانوية (م)

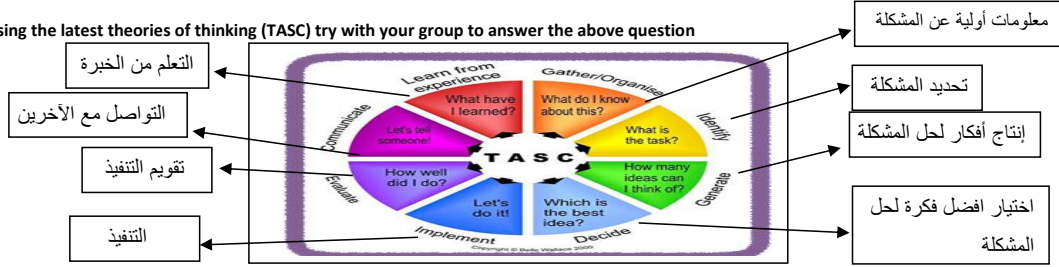التنمية المستدامة فكر وثقافة وانتاج لبناء حضارة اسلامية فريدة

النشاط الاول في مشروع رقم 1 المدينة المستدامة

تخيل لو اصبح عدد سكان المملكة العربية السعودية 60 مليون نسمة ما هي الحلول المستدامة الممكنة التي يمكن ان تعالج تلك المشكلة بشكل مستدام ؟

باستخدام احدث نظريات التفكير (تاسك) حاول مع زملاءك في المجموعة الاجابة على هذا السؤال؟

_____

اعداد فريق مجتمع العمل المتعاون :

معلمي المادة/

بسم الله الرحمن الرحيم

Ministry of Education	وزارة التعليم
kingdom of Saudi Arabia	المملكة العربية السعودية
Jeddah educational administration	إدارة تعليم جدة
secondary school (M)	مدرسة ثانوية (م)

التنمية المستدامة فكر وثقافة وانتاج لبناء حضارة اسلامية فريدة

Sustainable development: Thought, culture and production to build a unique Islamic civilization

> تخيل لو أن السمك أو الدجاج أوشك على الانقراض ما هي الحلول الممكنة لهذه المشكلة بشكل مستدام ؟
>
> Imagine if fish or chicken were about to become extinct, what are the potential sustainable solution?

The seventh activity in Project No. 1 Sustainable City

Through using the latest theories of thinking (TASC) try with your group to answer the above question

التعلم من الخبرة — Learn from experience — What have I learned?
التواصل مع الآخرين — Let's tell someone!
تقويم التنفيذ — How well did I do?
التنفيذ — Let's do it! — Implement
معلومات أولية عن المشكلة — Gather/Organise — What do I know about this?
تحديد المشكلة — Identify — What is the task?
إنتاج أفكار لحل المشكلة — How many ideas can I think of? — Generate
اختيار افضل فكرة لحل المشكلة — Which is the best idea? — Decide

	معلومات أولية Primary-back ground information	(1
	تحديد المشكلة Identifying the problem	(2
	إنتاج أفكار لحل المشكلة Producing ideas to solve problems	(3
	اختيار أفضل فكرة Choosing the best idea	(4
	التنفيذ Execution	(5
	تقويم التنفيذ Evaluation	(6
	التواصل مع الآخرين Communication with others	(7
	التعلم من الخبرة Learning from experience	(8

Appendix B

KEY ELEMENTS OF COMMUNITY OF PRACTICE

	Lave & Wenger 1991	Brown and Duguid 1991	Wenger 1998	Wenger and McDermott and Snyder 2002
Definition	"A set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping Communities of Practice" (p98).	" That is to say their shape and Membership emerges in the process of activity, as opposed to being created to carry out a task"(p.49).	"Inventive ways of engaging students in meaningful practices, of providing access to resources that enhance their participation, of opening their horizons so they can put themselves on learning trajectories they can identify with, and of involving them in actions, discussions, and reactions that make a difference to the communities that they value"(p.10).	"Groups of people informally bound together by shared expertise and passion for a joint enterprise [which can] drive strategy, generate new lines of business, solve problems, promote the spread of best practices, develop professional skills, and help companies to recruit and retain talent"(P.139-140).
View of learning (Cox, 2005).	Central, and seen as occurring through becoming a member mostly the socialisation of new members by peripheral participation.	Collective learning / collaborative problem solving of the group through storytelling.	An individual learning history is identification with different communities of practice and trajectories through communities.	Learning/ problem solving by deliberately bringing together multiple experts in learning focussed communities.
Change (Cox, 2005).	Gradual change through generations, but rather static	Static, improvisation of solutions to immediate problems is probably within known bounds.	Individual change through trajectories and multi-membership.	Follows a simple group formation pattern familiar from small group performing, forming, dissolving, storming and norming.
Formality/ informality (Cox, 2005).	Could be in the setting of a formal system of apprenticeship, but sees most learning as informal, i.e. unstructured, unplanned, not taught.	Informal in the sense of existing outside the formal organisation (though premised on its structures), counter cultural. Paradoxically this counter culture actually works to get the job done.	Authentic engagement around an enterprise, therefore beyond formality. May have a shape and purposes unexpected by the designer of the formal system.	Pre-exists management interest may pursue its own path of evolution, has no formally constituted objective Its membership cuts across formal organisational boundaries relations are based on expertise not formal position has no formal organisational leader.
What does it do?	"Generative social practice in the lived in world" (p35).	"Through a reliance on canonical descriptions (to the extent of overlooking even their own non-canonical improvisations), managers develop a conceptual outlook that cannot comprehend the importance of non-canonical practices" (p.42).	"A significant amount of the processors' communal energy goes into making their time at work a liveable realization of their marginality within the corporation and the insurance industry" (p. 171).	"We share a vision that communities of practice will help shape society [and] provide new points of stability and connection in an increasingly mobile, global and changing world" (p. xii).
How does it work?	"Legitimate Peripheral Participation provides a way to speak about relations between newcomers and old timers and about activities, identities, artefacts, and communities of knowledge and practice" (p.29).	"Simultaneously and interdependently, the reps are contributing to the construction and evolution of the community that they are joining what we might call a 'community of interpretation', for it is through the continual development of these communities that the shared means for interpreting complex activity get formed, trans- formed, and transmitted" (p. 47)	"A single conceptual unit that is formed by two inseparable and mutually constitutive elements, whose inherent tensions and complementarity give the concept richness and dynamism"(p. 66).	"A tension between two opposing tendencies that the community must address before it can move on to the next stage" (p. 69).

Appendix C

Appendix A: a real example of NGT protocol in Arabic language that has been used for students in elementary schools:

الخطوة الاولى

كل صفحة تخصص لسؤال

الخطوة الثانية

تبادل الأفكار

الخطوة الثالثة والرابعة

منظمة الأفكار السابقة بشكل مضغوط من خلال مجموعة

الخطوة الأخيرة

التصويت والترتيب

الارقام	الافكار المنتجة	التصويت والترتيب
1	الفكرة 10	3
2	الفكرة 7	2
3	الفكرة 13	4
4	الفكرة 14	1
5	الفكرة 3	5

Appendix D

AN EXAMPLE OF MAXQDA IN PHASE ONE

Appendix E

Appendix F

AN EXAMPLE OF THE CODED INTERVIEW TRANSCRIPT

Document System

Documents	220
Sample of Semi- structured interviews participant (N19)	220
Sets	0

Document Browser: Sample of Semi- structured interviews participant

We are neither plannin

!We are neither planning to reality nor for the fut

39 ?Q: Do the current training programmes meet th

Training programmes a

40 A: the Training programmes at the present time

these training programi

development and simulation of sustainable devel

.any way

do not seek for provi

And I will be frank with you, these training progr

is to prove for those

renewed teacher. The goal of these training pro

do not meet the nee

.training programmes, but these training program

41 Q / if a social studies department has been given

?do you think

If a teacher got to

42 A: If a teacher got to provide an opportunity, a t

a teacher will creat

freedom and leave him some space and scope. I

just give him freed

Code System

Code System	220
even without having external members from the ministry of educa	1
Two or three teachers from the same subject can make it	1
I wish we have teamwork, at least in the same school	1
but now there are not any	1
They said there are site visits between teachers to help each o	1
but your colleague's method is more appropriate	1
method of delivering information to students that do not work	1
Exchanging experiences from each other	1
If people meet to work together, this is the best	1
a teacher, in my view, remains a tool with no free will.	1
It does not touch what we are suffering in the present	1
but teachers are restricted by the curriculum which is rigid an	1
Provide a scope to a teacher, and wait for creativity	1

Appendix G

الرقــم : ٣٧٩٢٦١٦٤

التاريخ : ١٤٣٧/٥/٢٠هـ

المرفقات : ١

المملكة العربية السعودية

وزارة التعليم

(٢٨٠)

الإدارة العامة للتعليم بمحافظة جدة

وزارة التعليم
Ministry of Education

التخطيط والتطوير – قسم الدراسات والبحوث

إلى : سعادة الملحق الثقافي السعودي بلندن   المحترم

من : مدير عام التربية والتعليم بمحافظة جدة .

بشأن : الموافقة على قيام باحث بتطبيق أدوات بحثه على عينة من
المعلمين بتعليم محافظة جدة .

السلام عليكم ورحمة الله وبركاته

إشارة إلى خطابكم (المرفق) المتضمن الموافقة على مهمة الباحث / عائض
يحيى عائض الجدعاني ، المبتعث لدراسة مرحلة الدكتوراه ، بجامعة (EXETER)
في تخصص التربية ، وتطبيق أدوات دراسته في الميدان التعليمي بتعليم محافظة جدة
في دراسته التي بعنوان " دمج الاستدامة في منهج الدراسات الاجتماعية والتربية
الوطنية من خلال مجتمع عمل متعاون في سياق المدرسة السعودية الثانوية بجدة –
دراسة حالة " واستجابة لرغبته في تزويدكم بالموافقة على المهمة ووفق أفادتكم .

نفيدكم أنه لا مانع من ذلك تشجيعًا للبحث العلمي والتربوي وبما يعود على الوطن
من جدوى علمي بمثل هذه البحوث الميدانية والتطبيقية، ونتمنى للباحث التوفيق
والسداد .

مدير عام التعليم بمحافظة جدة

عبد الله بن أحمد الثقفي

Appendix H

الرقم : ٢٨٦٢٢٢١٩٢
التاريخ : ١٤٢٨/١٤/١٨
المرفقات : ....

المملكة العربية السعودية
وزارة التعليم
(٢٨٠)
الإدارة العامة للتعليم بمحافظة جدة
إدارة التخطيط والتطوير - الدراسات والبحوث

إلــى : سعادة الملحق الثقافي السعودي بـلـنـدن .

مــن : مدير عام التعليم بمحافظة جدة .

بـشـأن : إنهاء تطبيق بحث الطالب / عائض بن يحيى بن عائض الجدعاني.

السلام عليكم ورحمة الله وبركاته ، وبعد :

إشارة إلى خطاب الباحث / عائض بن يحيى بن عائض الجدعاني ، (مرفق) حول رغبته في إبلاغكم عن انتهائه من مرحلة جمع البيانات من خلال عينة الدراسة في بحثه الذي بعنوان " دمج الاستدامة في منهج الدراسات الاجتماعية والتربية الوطنية من خلال مجتمع عمل متعاون في سياق المدرسة السعودية الثانوية بجدة "

نفيدكم بالتالي :

◼ أن الباحث حصل على موافقة بتطبيق البحث في ١٤٣٧/٥/٢٠هـ ، وبدأ جمع المعلومات في ١٤٣٨/١/١٢ هـ الموافق ٢٠١٦/١٠/١٣م ، وأنتهى من جمع المعلومات في ١٤٣٨/٤/١١هـ الموافق ٢٠١٧/١/٩م .

◼ أفادت جهات عينات البحث أن الباحث طبق بحثه على منهج مادة الدراسات الاجتماعية و التربية الوطنية حسب الخطاب المرفق .

والسلام عليكم ورحمة الله وبركاته .

مدير عام التعليم بمحافظة جدة

عبدالله بن أحمد الثقفي

المملكة العربية السعودية
وزارة التعليم
الإدارة العامة للتعليم بمحافظة جدة

وزارة التعليم
Ministry of Education

لمن يهمه الأمر

تفيد إدارة مدرسة /   المتوسطة

بأن الباحث / عائض بن يحيى الجدعاني ، قد قام بإجراء أداته البحثية المسماه بتقنية المجموعة

الاسمية (N G T) يوم الأربعاء الموافق ١٤٣٧/٧/٢٧هـ وذلك على عينة من

طلاب الصف الثالث متوسط بمدرسة   المتوسطة – مكتب التعليم بوسط جدة بناء على

الخطاب ذي الرقم ٥٢٢ / ١ / ٣د بتاريخ ١٤٣٧/٧/١٢هـ الصادر من إدارة التخطيط

والتطوير التربوي بجدة .

وقد اعطى هذا المشهد للإفادة عن حضوره في الفترة المشار إليها أعلاه .

وبالله التوفيق ؛؛

القائد المدرسي

بسم الله الرحمن الرحيم

وزارة التعليم
Ministry of Education

(إلى من يهمه الأمر)

تفيد إدارة مدرسة /

بأن الباحث / عائض بن يحيى الجد عاني قد قام بإجراء أداته البحثية المسماة بتقنية المجموعة الاسمية (NGT) في الفترة من الاثنين 7/11 _ الأربعاء 7/13/١٤٣٧هـ وذلك على عينة من طلاب الصف الثالث المتوسط بمدرسة المتوسطة _ مكتب التعليم جنوب جدة بناء على خطاب رقم ٥٢٢/١/٣د بتاريخ ١٤٣٧/٧/١٢هـ الصادر من إدارة التخطيط والتطوير التربوي بتعليم جدة .

وقد أعطي هذا المشهد للإفادة عن حضوره في الفترة المشار إليها أعلاه
وبالله التوفيــــق ،،،،،

مع خالص الشكر والتقدير

قائد المدرسة

بسم الله الرحمن الرحيم

المملكة العربية السعودية

وزارة التعليم

الإدارة العامة للتعليم بمحافظة جدة

مدرسة

[لـمـن يـهـمـه الامـر]

تفيد إدارة مـدرسـة /

بان الباحث / عائض بن يحيى الجدعاني قد قام بإجراء أداته البحثيه المسماه بتقنية المجموعة الاسمية (N G T) في الفترة من الخميس ١٤/٧ ــ الثلاثاء ١٤٣٧/٧/١٩هـ وذلك على عينة من طلاب الصف الثالث متوسط بمدرسة ـ مكتب التعليم جنوب جدة بناء على الخطاب ذي الرقم ٥٢٢ / ١ / ٣د بتاريخ : ١٤٣٧/٧/١٢ هـ الصادر من إدارة التخطيط والتطوير التربوي بتعليم جدة .

وقـد اعطـى هذا المشهـد للإفـادة عن حضوره في الفتره المشار اليها أعــلاه .

وبالله الـتـوفيــــق ،،،،،،،،،

القـائـد المـدرسـي

443

بسم الله الرحمن الرحيم

المملكة العربية السعودية
وزارة التربية والتعليم
الإدارة العامة للتعليم بمحافظة جدة (بنين)

(الى من يهمه الأمر)

تفيد إدارة متوسطة

بأن الباحث عائض بن يحيى الجدعاني قد قام بإجراء أداته البحثية المسماة بتقنية المجموعة الأسمية (NGT) في يوم الثلاثاء الموافق ٢٦ / ٧ / ١٤٣٧ هـ وطبقت على عينة من طلاب الصف الثالث المتوسط بمتوسطة   مكتب التعليم بوسط جدة بناء على خطاب رقم ٥٢٢ / ١ / ٣د بتاريخ ١٢ / ٧ / ١٤٣٧ هـ الصادر من إدارة التخطيط و التطوير التربوي بتعليم جدة .

وقد اعطي المشهد للإفادة عن حضوره في الفترة المشار اليها أعلاه

والله الموفق ،،،

القائد التربوي

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المملكة العربية السعودية

وزارة التعليم

الإدارة العامة للتعليم بمحافظة جده

مكتب التعليم بالصفا

وزارة التعليم
Ministry of Education

(الى من يهمه الامر)

تفيد إدارة

بأن الباحث عائض بن يحيى الجدعاني قد قام بإجراء أداته البحثية المسماة بتقنية المجموعة الاسمية (NGT) في الفترة من الاحد ١٤٣٧/٧/٢٤ هـ الى الاثنين ١٤٣٧/٧/٢٥ هـ وذلك على عينة من طلاب الصف الثالث المتوسط ال ـ مكتب تعليم الصفا بناء على خطاب رقم ٣/١/٥٢٢د بتاريخ ١٤٣٧/٧/١٢هـ الصادر من إدارة التخطيط والتطوير التربوي بتعليم جدة

وقد اعطي هذا المشهد للإفادة عن حضوره في الفترة المشار إليها أعلاه

والله الموفق ،،،

القائد التربوي

٤٤٥

==

(إلى من يهمه الأمر)

تفيد إدارة مدرسة

بأن الباحث / عائض بن يحيى الجدعاني قد قام بإجراء أداته البحثية المسماة بتقنية المجموعة الاسمية (NGT) في الفترة من الأحد ٢٤ / ٧ إلى الاثنين ٢٥ / ٧ / ١٤٣٧هـ وذلك على عينة من طلاب الصف الثالث متوسط بمدرسة ال   مكتب التعليم بالصفا بناءً على خطاب رقم ٣ /٥٢٢ د بتاريخ ١٢ / ٧ / ١٤٣٧ هـ الصادر من إدارة التخطيط والتطوير التربوي بتعليم جدة .

وقد أعطي هذا المشهد للإفادة عن حضوره في الفترة المشار إليها أعلاه .

والله الموفق ..

مدير المدارسة

Appendix I

INFORMATION SHEET AND CONSENT FORM (FOR STUDENTS)

Dear students

I am Aiydh Aljeddani, currently a PhD student at the Graduate School of Education at the University of Exeter. My research seeks to study and understand the possibility of incorporating sustainability in the curriculum of social studies and citizenship education through the cooperative work of the community inside the school. I would like to obtain your consent by completing and returning this form to me.

My work with you:

I will use with you an approach which is called Nominal technique group (NGT) for gathering data. The NGT has five steps as they are shown below.

1. Introduction and explanation: I will explain to you the aim and procedure of the meeting.

2. Silent generation of ideas: each of you will be provided with a pencil/pen and booklet with a question at the top of each page. You will be asked to write down your individuals' ideas when considering each question, and you will be asked not consult or discuss your ideas with other at this point. A couple of minutes will be allocated to each question roughly ten minutes.

3. Sharing ideas: I will let the you to begin of sharing the ideas which you have generated through involving in a round-robin feedback in order to record every individual's idea and present them a flip chart that allow everyone in the group can say them. All of you have right to take enough time to present your idea. Therefore, this stage is just for recording the ideas not for discussing them or having debate and it will take between 20-25 minutes.

4. Group discussion: I will invite you to start engaging in friendly environment to seek verbal explanation or further details about any of the ideas that has been listed in a flip chart. All of you have right to take enough time to present your inquiry or thought. This stage will take roughly 40 minutes.

5. Voting and ranking: This is the final step in the protocol which will ask each all of you to engage to prioritize privately your recorded ideas about each question discussed by ranking them from top high priorities to less priorities. Therefore, this process will reach to having a specific outcome of each question that have been present in the booklet.

As a current student in Social Studies and Citizenship education curriculum, you are kindly invited to take part in this study. Your participation is appreciated as it is expected to enrich this research and provide invaluable information that is expected to help the researcher achieve his intended goals. Your participation is totally voluntary and you have the right to withdraw at any stage. In order to ensure anonymity, I will make sure your identity is protected by using codes instead of names and that the data will be stored in a secure place.

For further information about the research /interview data/NGT data, please contact:

Name: Aiydh Aljeddani

Postal address: Graduate School of Education- Exeter University, St. Luke's Campus, Heavitree Road, Exeter, EX1 2LU, Critical Studies Unit.

Telephone: 00 44 (0)7808516246 / Email: aa622@exeter.ac.uk If you have concerns/questions about the research you would like to discuss with someone else at the University, please contact:

Dr. Fran Martin. Fran.Martin@exeter.ac.uk

Consent

I understand that:

•there is no compulsion for me to participate in this research project and, if I do choose to participate, I may withdraw at any stage;

•I have the right to refuse permission for the publication of any information about me;

•any information which I give will be used solely for the purposes of this research project, which may include publications or academic conference or seminar presentations;

•If applicable, the information, which I give, may be shared between any of the other researcher(s) participating in this project in an anonymized form;

•all information I give will be treated as confidential;

•the researcher(s) will make every effort to preserve my anonymity.

…..……………………………………….……. ……..……………………………………………….

(Signature of participant) (Date)

…………………………………………………… ……………………………………………..……

(Printed name of participant) (Email address of participant if they have requested to view a copy of the interview transcript.)

One copy of this form will be kept by the participant; a second copy will be kept by the researcher(s).

Your contact details are kept separately from your interview data.

Appendix J

INFORMATION SHEET AND CONSENT FORM (FOR PARENTS)

Dear parents

I am Aiydh Aljeddani, currently a PhD student at the Graduate School of Education at the University of Exeter. My research seeks to study and understand the possibility of incorporating sustainability in the curriculum of social studies and citizenship education through the cooperative work of the community inside the school. I would like to obtain your consent by completing and returning this form to me through your son.

My work with your son:

I will use with your sons an approach which is called Nominal technique group (NGT) for gathering data. The NGT has five steps as they are shown below.

1. Introduction and explanation: The researcher will explain to your son the aim and procedure of the meeting.

2. Silent generation of ideas: your son will be provided with a pencil/pen and booklet with a question at the top of each page. Your son will be asked to write down his individual ideas when considering each question, and your son will be asked not consult or discuss his ideas with others at this point. A couple of minutes will be allocated to each question roughly ten minutes.

3. Sharing ideas: I will let your son to begin of sharing the ideas which he has generated through involving in a round-robin feedback in order to record every individual's idea and present them a flip chart that allow everyone in the group can say them. Your son will have right to take enough time to present his idea. Therefore, this stage is just for recording the ideas not for discussing them or having debate and it will take between 20-25 minutes.

4. Group discussion: I will invite your son to start engaging in friendly environment to seek verbal explanation or further details about any of the ideas that has been listed in a flip chart. Your son will have right to take enough time to present his inquiry or thought. This stage will take roughly 40 minutes.

5. Voting and ranking: This is the final step in the protocol which will ask your son to engage to prioritize privately his recorded ideas about each question discussed by ranking them from top high priorities to less priorities. Therefore, this process will reach to having a specific outcome of each question that have been present in the booklet.

As your son is a current student in Social Studies and Citizenship education curriculum, he is kindly invited to take part in this study. His participation is appreciated as it is expected to enrich this research and provide invaluable information that is expected to help the researcher achieve his intended goals. His participation is totally voluntary and he has the right to withdraw at any stage. In order to ensure anonymity, I will make sure your son's identity is protected by using codes instead of names and that the data will be stored in a secure place.

Contact Details

For further information about the research /interview data/NGT data, please contact:

Name: Aiydh Aljeddani

Postal address: Graduate School of Education- Exeter University, St. Luke's Campus, Heavitree Road, Exeter, EX1 2LU, Critical Studies Unit.

Telephone: 00 44 (0)7808516246 / Email: aa622@exeter.ac.uk If you have concerns/questions about the research you would like to discuss with someone else at the University, please contact:

Dr. Fran Martin. Fran.Martin@exeter.ac.uk

Consent

I have been fully informed about the aims and purposes of the project.

I understand that:

•there is no compulsion for me to participate in this research project and, if I do choose to

participate, I may withdraw at any stage;

•I have the right to refuse permission for the publication of any information about me;

•any information which I give will be used solely for the purposes of this research project, which

may include publications or academic conference or seminar presentations;

•If applicable, the information, which I give, may be shared between any of the other researcher(s)

participating in this project in an anonymized form;

•all information I give will be treated as confidential;

•the researcher(s) will make every effort to preserve my anonymity.

.............................…………….……….. ....……………………..

(Signature of parent) (Date)

……………………………………………… ……………………………………………..……

(Printed name of parents) (Email address of parents if they have requested to view a copy

of the interview transcript.)

.............................………………….. ....………………..

(Signature of researcher) (Printed name of researcher)

One copy of this form will be kept by the participant; a second copy will be kept by the

researcher(s).

Your contact details are kept separately from your interview data.

Appendix K

INFORMATION SHEET AND CONSENT FORM (FOR TEACHERS)

Dear teachers

I am Aiydh Aljeddani, currently a PhD student at the Graduate School of Education at the University of Exeter. My research seeks to study and understand the possibility of incorporating sustainability in the curriculum of social studies and citizenship education through the cooperative work of the community inside the school. I would like to obtain your consent by completing and returning this form to me.

My work with you:

I will conduct interviews with you and you will be asked to participate through implementing new aspects of community of practice in order to incorporate sustainability in the curriculum of social studies and citizenship education. Also, you will be asked to write a diary regarding the implementation of the new aspects of community of practice. We will meet regularly every week. As a serving teacher of Social Studies and Citizenship education curriculum, you are kindly invited to take part in this study. Your participation is appreciated as it is expected to enrich this research and provide invaluable information that is expected to help the researcher achieve his intended goals. Your participation is totally voluntary and you have the right to withdraw at any stage. In order to ensure anonymity, I will make sure your identity is protected by using codes instead of names and that the data will be stored in a secure place.

Contact Details

For further information about the research /interview data/NGT data, please contact:

Name: Aiydh Aljeddani

Postal address: Graduate School of Education- Exeter University, St. Luke's Campus, Heavitree

Road, Exeter, EX1 2LU, Critical Studies Unit.

Telephone: 00 44 (0)7808516246

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Email: aa622@exeter.ac.uk

If you have concerns/questions about the research you would like to discuss with someone else at

the University, please contact: Dr. Fran Martin. Fran.Martin@exeter.ac.uk

Consent

I understand that:

•there is no compulsion for me to participate in this research project and, if I do choose to participate, I may withdraw at any stage;

•I have the right to refuse permission for the publication of any information about me;

•any information which I give will be used solely for the purposes of this research project, which may include publications or academic conference or seminar presentations;

•If applicable, the information, which I give, may be shared between any of the other researcher(s) participating in this project in an anonymized form;

•all information I give will be treated as confidential;

•the researcher(s) will make every effort to preserve my anonymity.

……………………..………….……….. ……………………….………….……….

(Signature of participant) (Date)

…………………………………………… …………………………………….…..…

(Printed name of participant) (Email address of participant if they have requested to view a copy of the interview transcript.)

……………………..…………….. ……………………..…………….

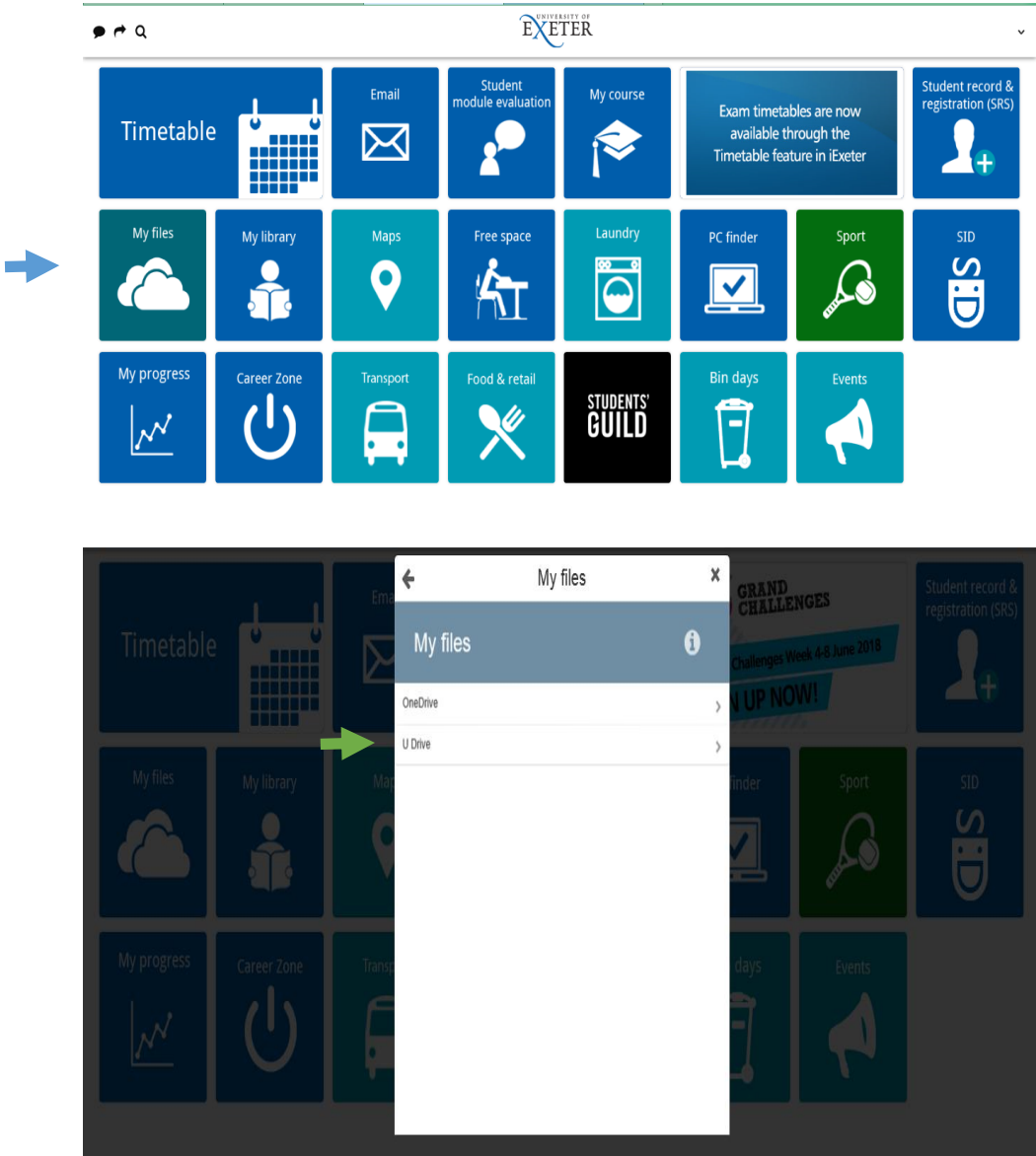(Signature of researcher) (Printed name of researcher)

One copy of this form will be kept by the participant; a second copy will be kept by the researcher(s).

Your contact details are kept separately from your interview data.

Appendix L

Appendix M

CERTIFICATE OF ETHICAL RESEARCH APPROVAL

UNIVERSITY OF EXETER

**COLLEGE OF SOCIAL SCIENCES
AND INTERNATIONAL STUDIES**

Amory Building
Rennes Drive
Exeter UK EX4 4RJ

www.exeter.ac.uk/socialsciences

CERTIFICATE OF ETHICAL APPROVAL

Academic Unit: Graduate School of Education

Title of Project: Incorporating sustainability in social studies and citizenship
                           education curriculum: a collaborative community of practice
                           case study in a Saudi high school context.

Research Team Member(s):   Aiydh Yahia Aljeddani

Project Contact Point: aa622@exeter.ac.uk

Supervisors: Dr Fran Martin, Dr Nasser Mansour

This project has been approved for the period

            From: 11th April 2016
            To: 4th January 2017

Ethics Committee approval reference: 201516-71

Signature: Date: 6th April 2016

(Matt Lobley, Chair, SSIS College Ethics Committee)

Appendix N

SOME EVIDENCE OF THE RESULTS OF CASE M

N.1   *Sculptures*

466
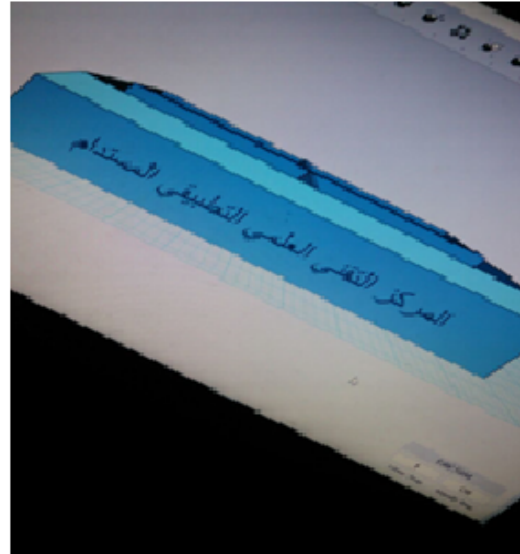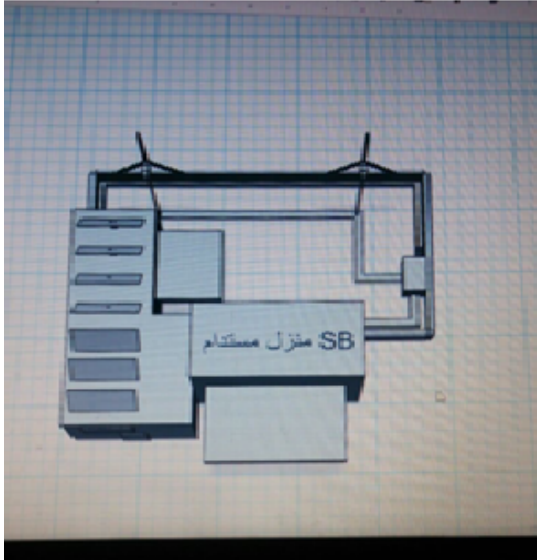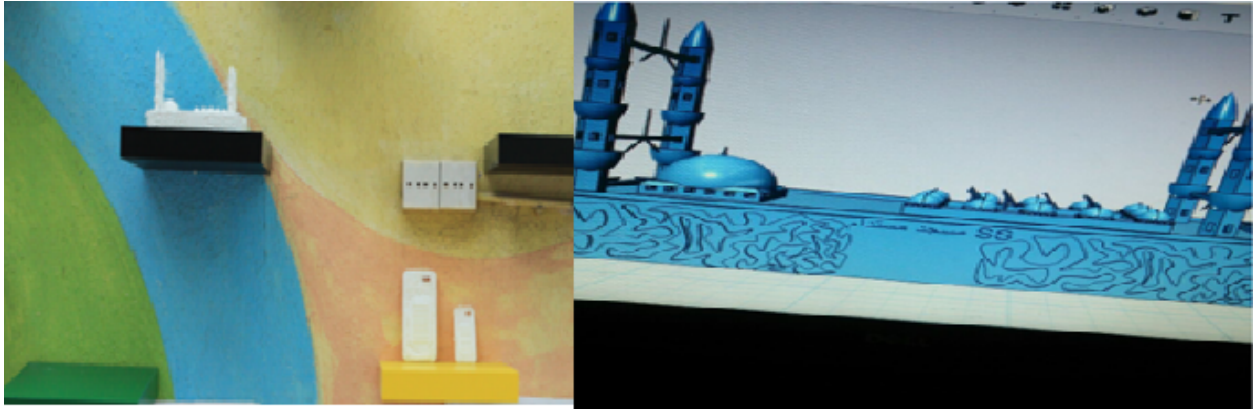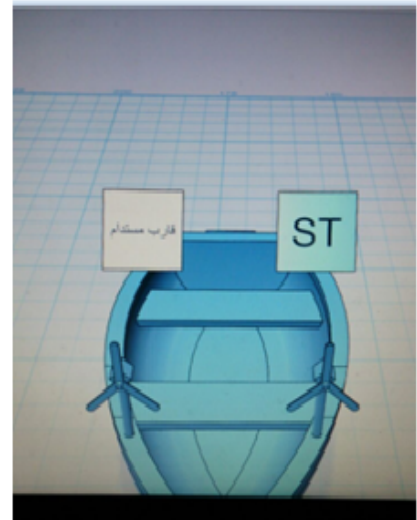
Appendix O

TEACHERS' LESSONS PLAN

O.1   Teachers' Lessons Plan Phase One

الصف : الثالث المتوسط		المادة : الدراسات الاجتماعية والوطنية	الفصل الدراسي الثاني لعام ١٤٣٧ هـ	
الأسبوع الأول	الأسبوع الثاني	الأسبوع الثالث	الأسبوع الرابع	الأسبوع الخامس
من ٨ إلى ١٢	من ١٥ إلى ١٩	من ٢٢ إلى٢٦	من ٢٩ إلى ٣	من ٦ إلى ١٠
عدد السكان	توزيع السكان	تركيب السكان	المياه	النفط والغاز والثروة المعدنية
الأسبوع السادس	الأسبوع السابع	الأسبوع الثامن	الأسبوع التاسع	الأسبوع العاشر
من ١٣ إلى ١٧	من ٢٠ إلى ٢٤	من ٢٧ إلى ٢	من ١٢ إلى ١٦	من ١٩ إلى ٢٣
الزراعة والرعي وصيد الأسماك	الصناعة والتجارة والسياحة	جهود المملكة وأهمية المحافظة على الموارد	أهمية العمل والإنتاج	أخلاقيات العمل
الأسبوع الحادي عشر	الأسبوع الثاني عشر	الأسبوع الثالث عشر	الأسبوع الرابع عشر	الأسبوع الخامس عشر
من ٢٦ إلى ١	من ٤ إلى ٨	من ١١ إلى ١٥	من ١٨ إلى ٢٢	من ٢٥ إلى ٢٩
مجالات العمل ومشكلات العمالة الوافدة	مفهوم الأمن ومجالاته	مفهوم السلامة ومجالاتها	السلامة المرورية	السلامة المرورية
الأسبوع السادس عشر من ٢ إلى ٦ مراجعة عامة للدروس السابقة	الأسبوع السابع عشر اختبار الفصل	الأسبوع الثامن عشر الدراسي الثاني	قائد المدرسة :	معـــلـــم الـــمـــــادة:

المملكة العربية السعودية
وزارة التربية والتعليم

إدارة التربية والتعليم بجدة

توزيع مقرر الدراسات الاجتماعية والوطنية 1 للصف الاول ثانوي نظام فصلي للفصل الدراسي الأول للعام الدراسي 1436 هـ

الأسبوع السادس	الأسبوع الخامس	الأسبوع الرابع	الأسبوع الثالث	الأسبوع الثاني	الأسبوع الأول
12 /29 — 12/ 25	12 / 22 — 12 /18	12 / 1 — 11 / 26	11 /23 — 11 / 19	11 / 16 — 11 / 12	11 / 9 — 11 / 5
1- سيرة النبي الشخصية 2- سيرة النبي الاجتماعية 3- حل نشاط الوحدة	1- سيرة النبي في الجهاد 2- شمائل النبي 3- تابع شمائل النبي	1- سيرة النبي في العبادة 2- سيرة النبي في الدعوة 3- تابع سيرة النبي في الدعوة	1- عيسى عليه السلام 2- حل نشاط الوحدة الاولى 3- اهمية دراسة السيرة النبوية	1- ابراهيم عليه السلام 2- لوط عليه السلام 3- موسى عليه السلام	1- الرسل والانبياء 2- ادم عليه السلام 3- نوح عليه السلام
الأسبوع الثاني عشر	الأسبوع الحادي عشر	الأسبوع العاشر	الأسبوع التاسع	الأسبوع الثامن	الأسبوع السابع
2 / 12 — 2 /8	2 /5 — 2 /1	1/27 — 1/ 23	1 / 20 — 1/ 16	1 /13 — 1 /9	1/6 — 1436/1 /2
1- منظمة التجارة العالمية 2- حل الانشطة 3- تابع حل الانشطة	1- منظمة التعاون الاسلامي 2- منظمة اوبك 3- هيئة الامم المتحدة	1- حل نشاط الوحدة 2- جامعة الدول العربية 3- رابطة العالم الاسلامي	1- تابع الحرب العالمية الاولى 2- الحرب العالمية الثانية 3- تابع الحرب العالمية الثانية	1- تابع الاستعمار 2- التنصير 3- الحرب العالمية الاولى	1- الكشوف الجغرافية 2- تابع الكشوف الجغرافية 3- الاستعمار
الأسبوع الثامن عشر	الأسبوع السابع عشر	الأسبوع السادس عشر	الأسبوع الخامس عشر	الأسبوع الرابع عشر	الأسبوع الثالث عشر
3/24 - 3/20	3/17 - 3/13	3 /10 — 3/ 6	3 / 3 — 2/ 29	2 / 26 — 2 / 22	2/19 — 2/15
اختبارات	اختبارات	مـــــراجعـه	1- تابع تنفيذ الانشطة 2- مراجعة 3- مراجعه	1- التنمية في المملكة 2- الدور الريادي في المملكة 3- تنفيذ الانشطة	1- اليوم الوطني والرموز الوطنية 2- عملة المملكة العربية السعودية 3- خصائص المملكة وسماتها
	مشرف المادة :		مدير المدرسة :		معلم المادة :

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الأسبوع	1437/5/2هـ	1437/4/28	الأسبوع	1437/4/25هـ	1437/4/21	الأسبوع	1437/4/18هـ	1437/4/14	الأسبوع	1437/4/11هـ	1437/4/7	الأسبوع
4	7) الاقتصاد في الوطن(2) 8) التكامل الاقتصادي بين دول الوطن العربي 1) فلسطين الموقع والحدود		3	5) السكان في الوطن العربي (2) 6) الاقتصاد في الوطن العربي (1)		2	3) المناخ في الوطن العربي – 4) السكان في الوطن العربي (1)		1	1) الموقع والحدود – 2) أشكال سطح الأرض في الوطن العربي		1

الأسبوع	1437/6/1هـ	1436/5/26	الأسبوع	1437/5/23هـ	1436/5/19	الأسبوع	1437/5/16هـ	1436/5/12	الأسبوع	1437/5/9هـ	1437/5/5	الأسبوع
8	3) الأقليات الإسلامية في أفريقيا 4) الأقليات الإسلامية في أوربا		7	اختبار 1) مدخل لدراسة الأقليات الإسلامية 2) الأقليات الإسلامية في أسيا		6	5) الحروب ضد اليهود 6) موقف المملكة العربية السعودية من قضية فلسطين		5	2) السكان والمناخ 3) الحركة الصهيونية ... فلسطين 4) الانتداب البريطاني على فلسطين.		5

الأسبوع	1437/7/6هـ	1437/7/2	الأسبوع	1437/6/29هـ	1437/6/25	الأسبوع	1437/6/22هـ	1437/6/18	الأسبوع	1437/6/15هـ	1437/6/11هـ	الأسبوع
12	5) الاتحاد الأوربي اختبار		11	3) روسيا الاتحادية 4) الصين الشعبية		10	1) خصائص القوى المؤثرة في العالم 2) الولايات المتحدة الأمريكية		9	5) الأقليات الإسلامية في الأمريكتين 6) الأقليات الإسلامية في أوقيانوسيا		9

الأسبوع	1437/8/5هـ	1437/8/1	الأسبوع	1437/7/27هـ	1437/7/23	الأسبوع	1437/7/20هـ	1437/7/16	الأسبوع	1437/7/13هـ	1437/7/9هـ	الأسبوع
16	5) الهيئات والجمعيات الحقوقية في المملكة العربية السعودية		15	تابع 4) الإعلان الإسلامي والإعلان العالمي لحقوق الإنسان- اختبار		14	3) حقوق الإنسان (2) 4) الإعلان الإسلامي والإعلان العالمي لحقوق الإنسان-		13	1) مفهوم حقوق الإنسان وخصائصها 2) حقوق الإنسان (1)		13

					الأسبوع	1437/8/19هـ	1437/8/15	الأسبوع	1437/8/12	1437/8/8هـ	الأسبوع
• إجازة منتصف الفصل الثاني:الخميس 6/ 1 • اختبارات الفصل الثاني 8/8 • إجازة الهيئة التعليمية 9/4 • بداية العام الدراسي الجديد : الأحد 1437/12/17هـ					18	اختبارات الفصل الدراسي الثاني الأسبوع الثاني		17	اختبارات الفصل الدراسي الثاني الأسبوع الأول		17

المعلم :   المشرف :

مدير المدرسة :
التوقيع :   التوقيع :

التوقيع :

Appendix P

PARTICIPANT'S EMAILS

P.1   *The Teachers' Needs Analysis of the Current SSCE Curriculum*

مقترح بناء على رغبتكم

This email indicates the response, in which the members of the community desire to have workshops to implement sustainability's activities.

مستند ستوري لاين في شكل ورد

This email indicates the response, in which the members of the community request the content of Story Line to be provided in a Word document, in case the Internet was slow.
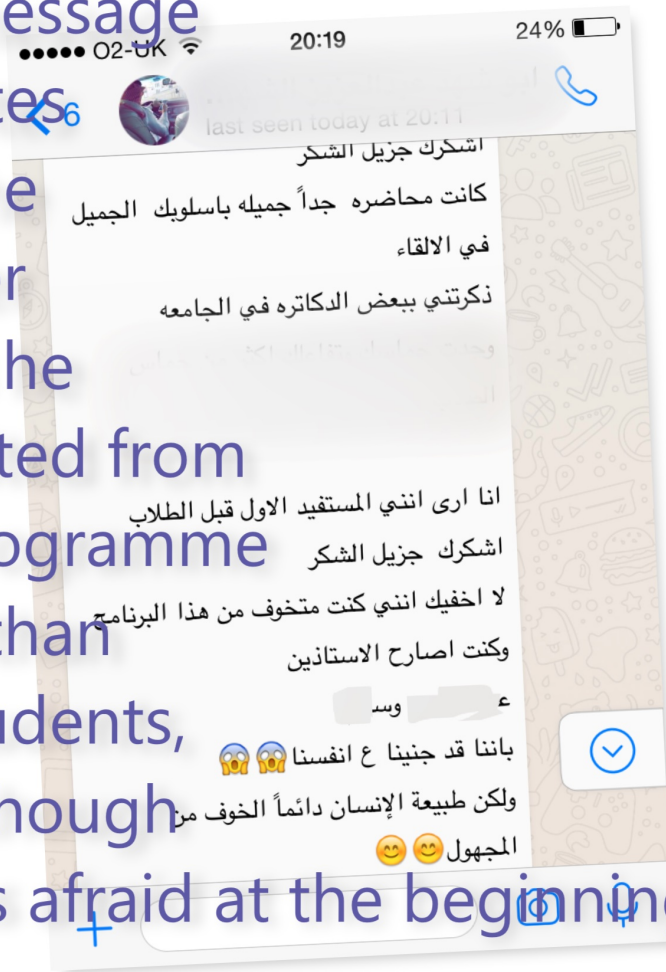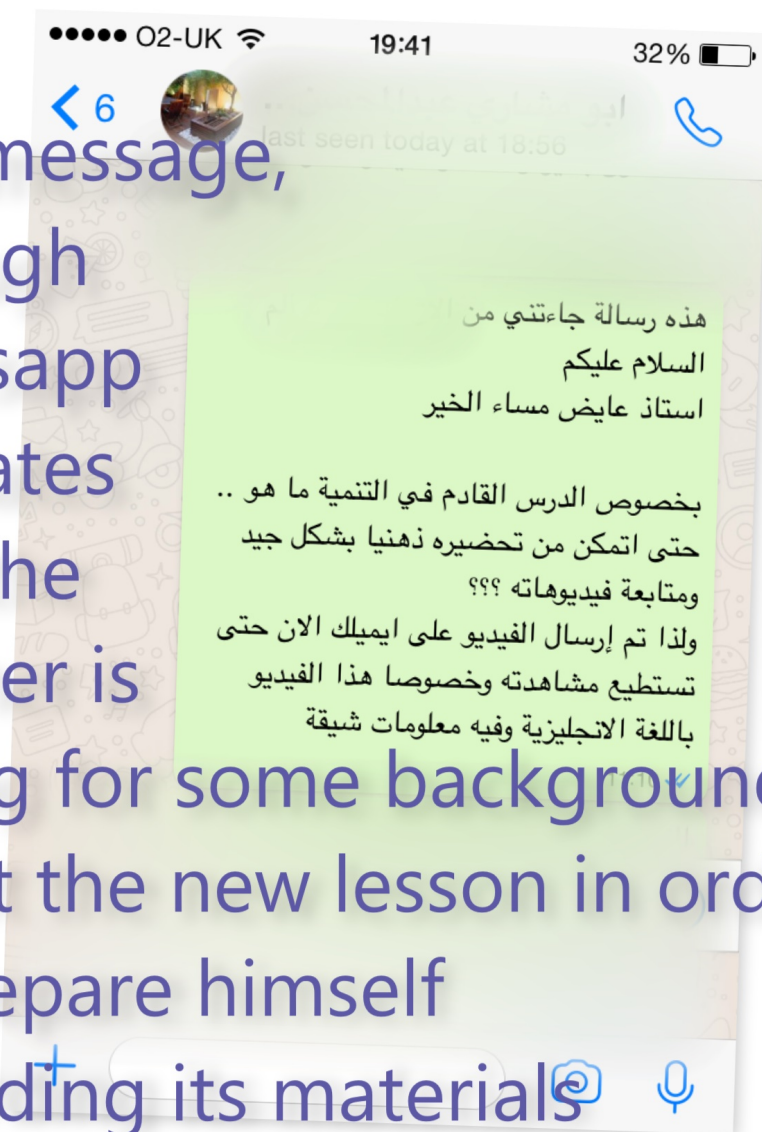
Appendix Q

Q.1   *The Concept of Sustainable Development Before and After Implementing the Project*

This message indicates that the teacher thinks he benefited from the programme more than the students, even though he was afraid at the beginning

•••• O2-UK   20:19   24%

last seen today at 20:11

اشكرك جزيل الشكر

كانت محاضره جداً جميله باسلوبك الجميل في الالقاء

ذكرتني ببعض الدكاتره في الجامعه

انا ارى انني المستفيد الاول قبل الطلاب

اشكرك جزيل الشكر

لا اخفيك انني كنت متخوف من هذا البرنامج

وكنت اصارح الاستاذين

ع وس

باننا قد جنينا ع انفسنا 😱😱

ولكن طبيعة الإنسان دائماً الخوف من المجهول😊😊

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This message, through whatsapp indicates that the teacher is asking for some background about the new lesson in order to prepare himself regarding its materials

هذه رسالة جاءتني من

السلام عليكم
استاذ عايض مساء الخير

بخصوص الدرس القادم في التنمية ما هو ..
حتى اتمكن من تحضيره ذهنيا بشكل جيد
ومتابعة فيديوهاته ؟؟؟
ولذا تم إرسال الفيديو على ايميلك الان حتى
تستطيع مشاهدته وخصوصا هذا الفيديو
باللغة الانجليزية وفيه معلومات شيقة

This message, which was sent through whatsapp indicates that the researcher requests the teacher to download this software programme
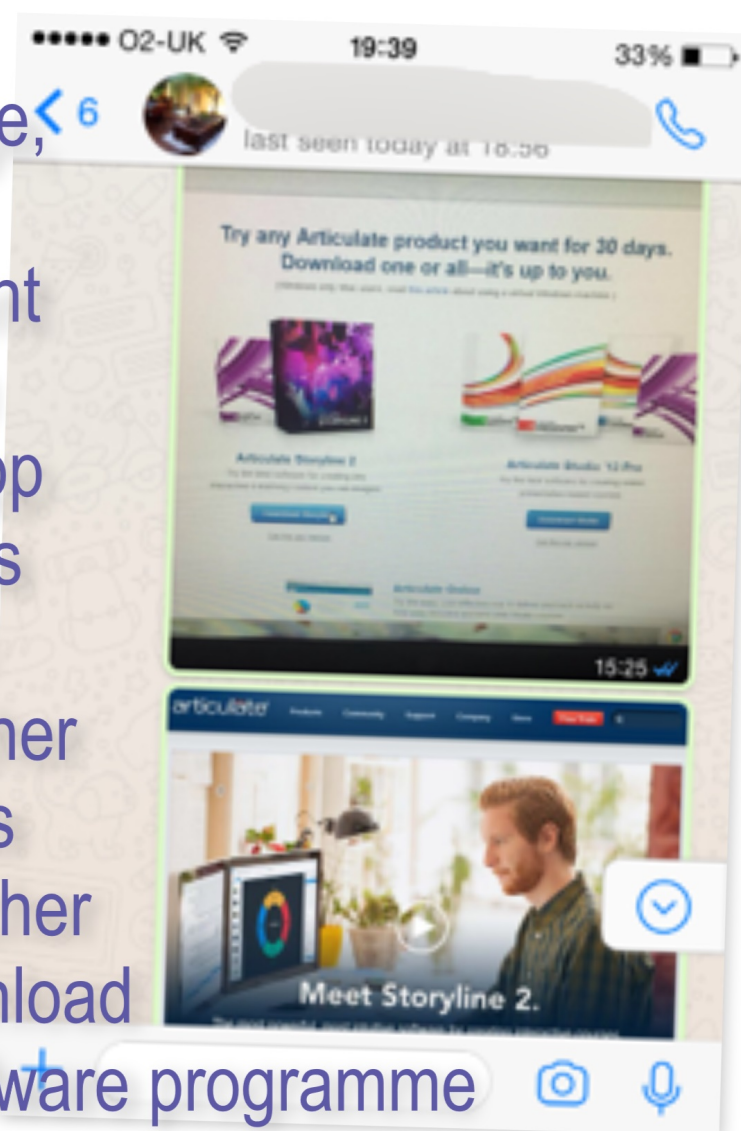
Appendix R

مقدمـــه

ملاحظات عن مشروع التنميه المستدامه في
منهج الدراسات الاجتماعيه للصفوات ثانويه

(*) اللقاء والاتصال الأول مع الباحث :

قام الباحث بالتواصل معنا نهاية الفصل الدراسي الثاني لعام ١٤٣٦/١٤٣٧هـ
وطلب منا عمل لقاء لخصوص منهج التنميه المستدامه وتمت مقابلة
الزميلـ حيث أجرى مقابله معنا جميعًا لأخذ فكره عامه عن التنميه
المستدامه .

(*) اللقاء الثاني : الاتفاق والتنسيق :

الاجتماع معنا لايضاح فكرة للباحث وادخال منهج للتنميه المستدامه
مع بدايات الاجتماعيه شكل عام والاجتماع مع ادارة المدرسه لأخذ
الموافقه على اقامة المشروع عبر رسمتنا ، رغبتنا بالموافقه للمدرسه المرجوه
بشروط تضامه منها موافقة الوزارة من احضار حفل بعلى ذلك

(*) اللقاء الثالث : الاعتماد والانطلاق

محل اجتماع موسعة عمل مع البداية الفصل الدراسي لأول
للعام الجديد ١٤٢٨/١٤٢٩هـ لايضاح للمنهج وطرق تنفيذه خلال
الفصل والانطلاقه لبداية المشروع .

(١)

أهم التجارب

- طريقة دمج منهج التنمية المستدامة مع منهج الدراسات الاجتماعية للصف الأول الثانوي ، وحتى لا يحدث خلل في التنظيم ولإعطاء كل منهج حقه وتقديراً منهج الدراسات لرسمي ، ضمنا بعل رؤية لحمل عضوا الباحث و تجاوزنا هذا الحدى بالتقسيم التالي:

أ - تخصيص حصتين من أصل ثلاث حصص لدروس مادة لاجتماعية مع ربط الدروس منها بالتنمية المستدامة من خلال بيانات وأوراق العمل.

ب - تخصيص حصة كاملة لمنهج التنمية المستدامة.

٣ - إمكانيات المدرسة : وتقديراً حصه طبع منهج التنمية المستدامة حيث نحتاج الى إذاعة مجهزة بأ جهزة العروض المرئية ومساحة كافية للأعمال الجماعية ، لمحدودية لمواقع داخل المدرسة تم اهتما ! احدى القاعات بالتنسيق مع الإدارة وضبطها من خلال الحدود المركبة.

٤ - اللقاءات المستمرة مع الباحث لمناقشة ما تم تنفيذه طوال الحصص : وتمت معالجة هذا الأمر من خلال الأمور التالية:

أ - تخصيص ساعات محددة ليوم الخميس من كل أسبوع للاجتماع ومناقشة ما تم عمله خلال الأسبوع كاملاً.

ب - التواصل عن طريق البريد الإلكتروني مع الباحث بشكل مستمر.

ج - التواصل مع الباحث بشكل مستمر عن طريق الواتس آب.

٤ -

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أهم ~~النقاط~~ الإيجابيات

١) إدخال منهج مليئ بالمعلومات الجديدة المشوقة للطلاب والمعلمين لحصص الاجتماعيات وهو منهج السمنية المستحدثة ، حيث أضفى على حصص الاجتماعيات التفاعل الإيجابي والتشويق المستمر .

٢) إدخال اللغة الإنجليزية من حصص السمنية المستحدثة من خلال العروض المرئية المسموعة باللغة الإنجليزية والمرئية كتابيا باللغة العربية من خلال ترجمة اليوتيوب . كذلك استخدام بعض المعلمين ته العامية ~~لغير وملزم~~ لا الطلاب سوى الفائدة ما اكسابه مهارة جديدة للقلم .

٣) أضاف المشرع للطلاب بمشاركة في تحمل المسؤولية من خلال إشراكه في وضع حلول لأهم القضايا العالمية وكيفية مواجهتها من خلال مفردات السمنية المستحدثة ونظرية حداثت كل تسلسل

٤) تفاعل الطلاب مع حصص السمنية المستحدثة فكريا وعمليا من خلال تقيم مشاريع ومجسمات تطبيقية لما تمت دراسته لمنهج السمنية المستحدثة .

٥) اللقاءات المستمرة وورش العمل لتطوير العمل سواء بين الباحث والمعلمين أو المعلمين أنفسهم المشاركة في تطوير المشرع من خلال بعض التقارير الملاحظة لبيئة الطلاب وأوراق العمل وتبادل الخبرات .

المنتجات و المشاريع

١ قام الطلاب بعمل مشاريع ومجسمات لمنازل مستدامة وفق ضوابط لبيئة مستدامة . من خلال مجسمات مصنوعة بالفلين الخشبي والأدوات الخاصة به
أوضح خلال استخدام برامج وتطبيقات حاسوبية بدعم 3D وطباعة هذه المشاريع عن طريق طالبات مختصة لذلك .

٢ تم إنشاء مزرعه سمكية ومزرعه مائية في أحدى زوايا المدرسة لمشاركة الطلاب ودعم الإدارة ومتابعة وإشراف الباحث .

٣ عمل معرض مصغر لأهم الأعمال الورقية واللوحات والمجسمات والمجسمات والمشاريع التي قام بها الطلاب خلال الفصل الدراسي بمتابعة وإشراف الباحث .

Appendix S

بسم الله الرحمن الرحيم

وزارة التعليم
Ministry of Education

تقرير عن برنامج

الموضوع	تقنية المجموعة الاسمية (NGT)	التاريخ Date	من ١٣ـ الى ١٤٣٧/٧/١٨ هـ From 20-25/04/2016
الزمن Time	٤ ساعات 4 hours	المكان location Learning Resources Center	مصادر التعلم	عدد المستفيدين Number of Participants	٢٢ 22

أهـداف البرنامج : Objectives of NGT

١	اخذ صوت الطالب فيما يتعلق بالمنهج الحالي عن التنمية المستدامة Taking the students' voice regarding SSCE and SD into consideration.
٢	رغبات واحتياجات الطالب في منهج الصف الاول ثانوي Student's desires and needs with regard to the tenth grade curriculum
٣	انتاج الافكار من الطلاب من خلال المناقشة والتشاور Students generate ideas through dialogue and discussion

منفذ البرنامج	أ / عائض الجدعاني Aiydh Aljeddani	Executor of the programme

التقرير المصور :

Appendix T

DEVELOPING THE TWO UNITS OF SSCE

THE CERTIFICATE OF PARTICIPATION ON THE THEORY AND PRACTICE OF SOCIAL

LEARNING LEADERSHIP

CERTIFICATE

of PARTICIPATION

This certifies that

AIYDH ALJEDDANI

Has successfully completed the workshop for

THE THEORY AND PRACTICE
OF SOCIAL LEARNING LEADERSHIP

September 19 - 22, 2016 in Ljubljana, Slovenia
With Etienne and Beverly Wenger-Trayner

September 28, 2016

DATE

AUTHORIZATION

Appendix V

Interview schedule for teachers in Phase 1

1- I will introduce myself to the interviewees and the reason why I am here with them.

2- I will ask them general questions about their names, when they start teaching, how they feel with respect to the teaching career from the beginning until now.

3- Then, I start asking about specific questions that are related to the following themes:

Sustainable development theme:

I. What do you know about the meaning of sustainable development?

II. Which of these issues such as well-being, energy, water, waste management, green lands or air pollution do you think should have priorities to develop?

III. How can education in Saudi Arabia be helpful to make the Saudi citizens contribute to sustainable development?

IV. How can the Saudi schools be helpful to make the Saudi students contribute to sustainable development?

Sustainability literacy and sustainability competency theme:

Do you care about being sustainable in your daily life? If so, how do you express this in a practical way? How can this be linked regarding your teaching in Social Studies and Citizenship Education curriculum?

Curricula theme:

V. As you are the teacher in the tenth grade, do you think that curricula in general are supporting the Saudi students to contribute to sustainable development?

VI. Do you think that Social Studies and Citizenship Education curriculum is supporting to make the Saudi students contribute to sustainable development? Why?

VII. What is your reaction when you are commanded by the Ministry of Education to apply a new curriculum and why?

VIII. Where do you think the problems related to changing the curriculum or revising it are?

IX. Do you think that teachers can do something to make the curriculum much better and how?

X. The new version of the Social Studies and Citizenship Education curriculum is based on integrated curriculum, do you think it is really integrated and why?

School environment theme:

XI. Do you think that the school environment is supporting Saudi students to contribute to sustainable development? Why?
XII. Do you think the teachers get enough support inside the school to teach in an appropriate manner and why?

Professional development theme:

XIII. Can you tell me about your professional development (i.e. the last training you have attended with respect to your subject whether in curriculum or pedagogy)?
XIV. How do you find those training programmes with respect to your practice inside the classroom? Are they enough to support you in terms of continuing professional development?
XV. Did you try to develop your profession independently or through training given by a school?

Community of practice theme:

XVI. Most of the time, do you prefer to work independently or collectively? Why?
XVII. What is your reaction to learning and applying a new idea or a new theory?
XVIII. Do you share a new theory or pedagogy with your colleagues, why and how?

Interview schedule for teachers in Phase 2 (School M):

Q1. Can you tell me your impression and perception of the concept of sustainable development before implementing the programme and after it?

Q2. How were the instructional materials that are included in the sustainable development programme for the student and the teacher?

Q3. What do you think about using both the Arabic and English language to present sustainable development themes?

Q4. In terms of applying TASC, how do you see its importance and its impact on students, now and in the future?

Q5. How did the students interact with this theory during class?

Q6. In your opinion, what is the impact of the teaching strategies used on students' learning?

Q7. What do you think of the cooperation in the project application between you and your colleagues in the Department of Social Studies?

Q8. In terms of the integration of the concept of sustainable development through cooperative work of the community, what was the impact on you?

Q9. What do you think of the role of school leadership in the programme?

Q10. Would you like to say something at the end of this meeting?

Interview schedule for teachers in Phase 2 (School O):

Q1. What is your overall impression of the idea of incorporating the concept of sustainable development in the curriculum of Social Studies and Citizenship Education?

Q2. In your opinion, if somebody tells you, you will have another opportunity, what is the mechanism that if you use, would make social studies curriculum vital and convenient, simplifying the notion of sustainable development for students in the tenth grade?

Q 3. In your opinion if the curriculum and working papers have been continually provided to the students, do you think there is an impact on their understanding and acceptance of the concept of sustainable development?

Q4. When you implemented the programme, there were several challenges and difficulties that you faced, what are these difficulties?

Q5. What do you think of the role of school leadership in the programme?

Q6. If we have another chance to apply this project within your school, what are the conditions or criteria that you wish to be provided in order to make the programme succeed?

Q7. Would you like to say something at the end of this meeting?

Appendix W

THIS PICTURE SHOWS THE PROGRESS ON (SCHOOL'S SCHEDULE) THAT POINTS
OUT THAT THE SESSIONS WERE RUNNING IN SOURCES OF LEARNING ROOM

مركز مصادر التعلم

7	6	5	4	3	2	1	
		١/١	٣/١				الأحد
							الأثنين
							الثلاثاء
		٢/١	٤/٢				الأربعاء
				٥/١			الخميس