A Post-disciplinary Perspective on e-Tourism

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Abstract

Disciplines have traditionally been the building blocks of knowledge production, especially in higher education. In recent times though, more flexible approaches to production of knowledge beyond disciplines, in the context of application, and with the subject or topic as the starting point have become more popular and no less impactful. Such post-disciplinary approaches to tourism studies have been advocated and in evidence for over a decade. Set against this backdrop, this chapter argues that e-Tourism is a field of study that has emerged from, and is best understood in its own right as, post-disciplinary enquiry. The differences between inter-, multi- and post-disciplinary approaches are explained in the chapter which also examines three ways in which post-disciplinary approaches may be recognised in, and contribute to, the e-Tourism body of knowledge. Far from just another esoteric concept, viewing e-Tourism in this manner suggests that its emergence is a story of synthesis and eschewing disciplines, it cannot and will not advance as far and as quickly if more restrictive approaches are taken, and that e-Tourism is one of the few fields in tourism studies to turn towards the physical sciences for new knowledge production.

Introduction

For many years, academics have been thinking about the ways in which new innovations and inventions occur, from whom, why and through which settings and conditions. Recurring themes have been the nature and roles of higher education institutions, including universities; those of non-academic partners, not only in the private sector but also in public and voluntary sector organisations; and their inter-relationships (Godin and Gingras 2000). An early subtext was the extent to which universities -as recipients of public money- were able to drive innovation and economic development for a perceived public good, either alone or in partnerships with business and enterprise (Etzkowitz 2008). Over three decades interest in the 'entrepreneurial university' and the triple helix of university-industry-government has endured (Etzkowitz 2015), exacerbated by pressure on state budgets in a number of advanced economies and questions of return on investment (Vanino et al. 2019). Of course, some disciplines, such as those related to science, technology, engineering and mathematics (STEM) have historically attracted higher levels of research funding compared to the arts, humanities and social sciences, and so too have those institutions specialising more heavily in STEM subjects (Huang and Huang 2019). In a widely-cited and relatively early contribution, Gibbons et al. (1994) distinguished between the production of knowledge through the traditional structure of disciplines within universities and higher education (Mode I) with that produced in the context of application (Mode II); that is to say, new knowledge produced within or through thematic foci rather than from disciplinary starting points. They recognised that, in order to address them appropriately and adequately, many subjects were beyond individual disciplines, or they were inherently post-disciplinary in nature. Instead, they required more flexible approaches to knowledge production, exchange and application (Smith 1998; Hellström et al. 2003; Painter 2003; Goodwin 2004). Examples of the Mode II include advances in high level computing that have been driven by the gaming industry rather than in academic departments dealing with computer science. In a similar vein, some of the major advances in project management (Garel 2013) and supply chain management (Lummus and Vokurka 1999), which are now deeply-embedded fields of study in business and management, have been traced to the military and the imperative for expediency and innovation in conflicts.

Despite the significance of Mode II type influences on innovation and paradigm development, disciplines may have been, and in many cases continue to be, considered the traditional building blocks of knowledge (Coles et al. 2006; Munar et al. 2016). Although the veracity of Mode II has been questioned (Hessels and van Lente 2008), from these and other examples it is clear that useful new high-level knowledge production has frequently taken place outside higher education and beyond the boundaries of traditional disciplines with their particular policing practices, paradigms

and canons of thought (Tribe 2004; Coles et al. 2006). Furthermore, the grander challenges facing humankind across the globe will not be addressed by work from single disciplines alone. In the so-called 'Fourth Age of Research' international collaborations among (elite) groups of researchers will be required to address the most pressing issues facing society, economy, environment and culture in the 21st Century (Adams 2013).

In many respects tourism may be considered as a post-disciplinary subject area in its own right (Coles, Hall and Duval 2005, 2006, 2009, 2016; Munar et al. 2016). As a locus for, or as a distinctive form of, human activity tourism is highly complex and comprises a wide range of behaviours by both human and non-human actors and agents that is only more fully understood when knowledge(s) produced across the social sciences, arts, humanities and, increasingly, the physical sciences are brought together (Holden 2005; Coles et al. 2006, 2016; Belhassen and Caton 2011; Fullagar and Wilson 2012; Munar et al. 2016). There are limits to tourism enquiry associated with single disciplines which other apparently more flexible (multi- and inter-disciplinary) approaches are also unable to overcome fully, either from a philosophical or practical perspective (Coles et al. 2016; Darbellay and Stock 2012; Darbellay 2016; Munar et al. 2016). This chapter argues that e-Tourism is one field of study that has emerged from, and is best understood in its own right, as a form of post-disciplinary enquiry. Within the study of e-Tourism, it is the themes, the topics and the content that are the primary concern. They continue to drive the development of the research agenda rather than disciplinary imperatives. More flexible forms of enquiry in this field of study are better able to deliver greater, more resonant contributions to knowledge that push back the frontiers of understanding and application. Next, the chapter explains how post-disciplinary approaches differ from single, multi- and inter-disciplinary approaches. This is followed by a brief examination of the multiple facets of e-Tourism, the way in which this field of study may be thought of as post-disciplinary, and how particular topics in e-Tourism have emerged and may continue to develop in the future.

Disciplines, Knowledge Production and Enquiry

The proliferation of tourism research over the past five decades has been accompanied by numerous attempts to make sense of how academic enquiry of the subject has developed. Several scholars have charted the course of tourism research among particular academic disciplines, especially in the social sciences (Holden 2005; Gibson 2008; Hall and Page 2010; Cohen and Cohen 2012; Tang 2014; Müller 2019), but also increasing in the arts and humanities (Belhassen and Caton 2011; Fullagar and Wilson 2012; Munar et al. 2016, Coles et al. 2016). In a period characterised by the increased use of

metrics to judge scholarship there has been a fetish among some to try to identify the most influential scholars as well as the institutions and spaces these 'thought leaders' inhabit (Hall 2005a, 2011; Wickham et al. 2012; Benckendorff and Zehrer 2013). For some, such studies represent entirely arid exercises in taxonomy and attribution unconnected to the more urgent issues of tourism epistemology and ontology. However, they continue to remind us that for a great many scholars interested in, and engaged with, tourism and tourism-related research, the way in which they make sense of the academic world and the scholarly environments they inhabit, is most commonly through the use of broad disciplinary ascriptions to define their intellectual affiliations and professional homes. Many would describe themselves, for instance, as 'tourism geographers' or as interested in the 'sociology of tourism', and there are several disciplinary associations and even peer-reviewed journals that continue to promote, support, and advocate the study of tourism rooted in, or inspired by, distinctive disciplinary positions on scholarship, enquiry and knowledge production.

Orientation, in this instance, matters. First and foremost, scholars tend to identify themselves by 'traditional' disciplines (e.g. economics, geography, psychology, sociology), then by their subject or thematic interest (i.e. tourism). Administrative conventions and reward systems encourage this form of attribution. Promotions within higher education are routinely made on the basis of an academic's contribution to, and standing in, a discipline (Butkowski 2016). The problem is that, as a subject area, tourism presents research problems that defy adequate (i.e. meaningful) responses from scholars exclusively inhabiting single disciplines (Weiler et al. 2012; Wardle and Buckley 2014). For example, the relationship between tourism and climate change is undoubtedly complex (Scott et al. 2012). Without perspectives on personal travel rooted in geography, sociology and psychology, our understanding of the contribution of personal travel preferences and mobility patterns in achieving emissions reductions targets would be much the poorer, arguably even deficient (Barr et al. 2011; Higham et al. 2013). Conversely, without understanding of engineering (energy systems, emissions) and management studies (organisational behaviour, entrepreneurship), supply-side responses and mitigation as crucial components would not be properly understood (Gössling 2011, 2013; Coles et al. 2014). But it is not only in the area of tourism and climate change or tourism and the (natural) environment where this is the case. Numerous other examples abound. As scholarship in tourism marketing (Troung and Hall 2013; Dolnicar and Ring 2014) and tourism policy (Ambrosie 2010) reveals, tourism produces many complex and 'wicked' problems where the solutions are to be found only at the interface of disciplines (Brennan 2004). This is precisely the same for e-Tourism. For instance, more agile, evidence-based, smart forms of tourism management are made able by specialists in data science, artificial intelligence and data analytics and advances in

systems engineering (Boes et al. 2016; Buhalis and Leung 2018). Yet the implementation of smart tourism principles, practices and technologies for destination management require multiple stakeholders and benefit from an understanding of the pragmatics of commerce, policy and politics, especially at the local level (Ivars-Baidal et al. 2019; Cavalheiro et al. 2020; Graziano and Privitera 2020). Recent reviews of 'new realities' and 'mixed reality' apps have indicated that tourism research on these forms of technology is still at an early stage (Yung and Khoo-Lattimore 2019; Liang and Eliot 2021). Arguably attention so far has mostly fallen on the intrinsic features, attributes and characteristics of augmented reality (AR) and virtual reality (VR) apps, including issues such as their use, acceptance, adoption and, ultimately, visitor satisfaction (Liang and Eliot 2021). Even the most apparent future challenges have the same focus in terms of awareness of the technologies; the willingness to substitute virtual for corporeal experiences; usability; and the demands to produce such alternatives (Yung and Khoo-Lattimore 2021). Yet some of the critical issues raised by AR and VR apps and their utilisation relate to issues such as authenticity (Dueholm and Smed 2014), representation (Bec et al. 2021) and inclusion which are non-technical, highly nuanced issues requiring entirely different academic gazes (Nevola et al. 2021), including perspectives from sociology, cultural studies or even public history. Moreover, without a consideration of law and the politics of privacy and pragmatics of data protection (Coles 2022), it is also remarkable that in such data-rich times that so few tourism studies make use of the plethora of the analytics and empirical data generated by the use of such apps by visitors (Liang and Eliot 2021).

While others may have recognised the complexity and wickedness of the subject area and its research problems some time ago (Buhalis and Law 2008), this point is arguably more pressing even now in light of the pace and nature of technological change. Without wishing to reopen the Tribe-Leiper debate (Tribe 1997, 2000; Leiper 2000), it is also further evidence for those who still doubt it, that there is not a distinctive, unified discipline focused on tourism (Munar et al. 2016: 343-344). As several contributions have argued (cf. Coles et al. 2016; Darbellay 2016), there is a need for precision in the choice of nomenclature and vocabulary regarding disciplines and their arrangements in the production of knowledge (about tourism). Routinely, the terms 'inter-disciplinary' and 'multi-disciplinary' are used in discussions of research design, knowledge production, and team composition. Quite commonly though, they continue to be (incorrectly) conflated and confused in academic discourse, although there are important essential differences between the two. This is reminiscent of a similar problem regarding multiple methods and mixed methods research (Johnson et al. 2007). In simple and abbreviated terms, the former uses particular methods in a siloed manner and relies on the analyst/s to blend findings from ring-fenced exercises to deliver sensible, complimentary conclusions; the latter seeks to use methods, the data and findings they generate in

a more mutually-reinforcing manner, such that the application of, and analysis from, one method may influence the design and execution of subsequent method/s and rounds of data collection and analysis. 'Multi-disciplinary projects' or 'multi-disciplinary teams' are precisely that; they are endeavours comprising scholars from multiple disciplines employing their knowledge, expertise and skills to generate diverse perspectives that add to the body of knowledge dealing with a particular research problem. In a wide-ranging examination of what he calls 'shifting concepts', Darbellay (2016: 365) unpacks the nature of multi-disciplinarity further, arguing that it is 'a sequential process, in which researchers from different disciplines work from their perspective[s] on a more or less shared research topic, and in a linear and independent way that does not involve any real interaction between them'. In other words, 'a multi-disciplinary approach recognizes and incorporates information derived in other disciplinary areas without scholars stepping beyond their own boundaries' (Coles et al., 2009: 83).

In contrast, in 'inter-disciplinary' approaches, the sum of collaboration is more than the individual parts and knowledge production benefits both from greater flexibility and the blending of insights and perspectives. Drawing on Sayer's (1999) definitive contribution, Coles et al. (2016: 376) note that 'inter-disciplinary enquiry is not about permanently abandoning one's disciplinary home so much as temporary or tactical transgression into a different terrain for the purpose of discovery and insight'. Darbellay (2016: 365) articulates a similar sentiment such that inter-disciplinarity requires researchers to 'work together based on –and between- their disciplinary perspectives on a shared research topic and in a co-ordinated and interactive fashion'. For example, the topic of travel behaviours and their environmental impacts has continued to generate attention in studies of tourism for over a decade now (Barr et al. 2011; Higham et al. 2013). A closer inspection reveals that this burgeoning body of knowledge is informed by, benefits greatly from, and has contributed to, debate about environmental behaviours among citizen consumers and sites of practice more generally (Barr et al. 2011). This particular intellectual terrain is also a largely inter-disciplinary space that has profited from distinctive, highly positioned and contested contributions from psychology (Whitmarsh et al. 2011) and sociology (Shove 2011). Quite different perspectives on the same issue have helped to define the composite body of knowledge and drive trajectories towards further collective understanding.

Post-disciplinary enquiry and tourism

While inter-disciplinary work may be more pragmatic and flexible, transgressions should be temporary. Further reflection on the nature of inter-disciplinary enquiry raises the existential

question of whether it is possible for a researcher or a team of researchers to be in a permanent inter-disciplinary state or even a long-term, semi-permanent situation. Put another way, if the purpose of creating the inter-disciplinary coalition and its perpetuation are because the subject or focus continue to resonate, then is it not actually the topic or theme that are the more meaningful focus for organising academic endeavour, rather than the disciplines from which the team originated? Are the members of the team not, in fact, already working beyond disciplines? Perhaps, in a post-disciplinary state or times, after disciplines cease to be relevant for them? As Munar et al. (2016: 344) put it, 'post-disciplinarity brings into question both the belief that all scientific knowledge creation originates in disciplinary compartments and the belief that tourism epistemology has to progress only as an inter- or multidisciplinary endeavour'.

In early discussion of post-disciplinarity in studies of tourism, it was argued that ideas, not (disciplinary) conventions and institutions should drive future enquiry about tourism (Coles et al. 2006, 2006, 2009). An approach of this nature would enable greater creativity, agility and responsiveness to contemporary challenges that are frequently messy, complex and wicked (Brennan 2004; Law 2004). Without more responsiveness, there was a greater probability that attempts to address contemporary subjects in tourism may be blighted by outdated institutional arrangements and restrictions within higher education that were no longer fit for purpose. In a vicious spiral, forward progress was further jeopardized by the slow pace of change in higher education (Coles et al. 2016). Post-disciplinary approaches would enable more edgy, responsive and transformative approaches to be taken and extend new knowledge production to endpoints that could not have been previously anticipated by more conservative approaches. Greater ambition, scope and imagination would be necessary to solve contemporary problems and future challenges. Research problems should be selected for their relevance not by their conformity to disciplinary or paradigmatic dogma (Coles et al. 2016: 378). In overcoming the unreasonableness associated with disciplines (Toulmin 2001), hybrid forms of knowledge would be produced (Hellström et al. 2001). As studies of innovation demonstrate, there is great value in disruption and the time was right to develop 'alternative circuits of knowledge that are free, or at least relatively free, from rationalising assumptions of dominant methods and paradigms' but that 'may usefully augment the rich heritage of knowledge derived from single, multi- or inter-disciplinary sources' (Coles et al. 2006: 295).

The intention then, of post-disciplinary approaches was not (and is not) to replace other modes of enquiry but to augment the knowledges (legitimately) produced by them. Indeed, Jessop and Sum (2001) long ago argued that the need for, and relevance of, post-disciplinary approaches is only revealed through knowledge of, and critical reflection on, the adequacies of pre-disciplinary and disciplinary-based approaches. Putting it more explicitly because of the unfortunate connotations of

the prefix 'post-' (Darbellay 2016), the goal of post-disciplinary thinking is not the (catastrophic) destruction of disciplines resulting in a form of scholastic anarchy (Coles et al. 2006, 2016; Darbellay 2016). This is an unwise, unrealistic and -of itself- anti-intellectual goal. Rather post-disciplinary approaches do set out to challenge the established power relations and politics of knowledge production. In a more recent contribution, Hollinshead (2016: 350) points out that post-disciplinary enquiry is not trivial, it should not be trivialised (for instance, as acting 'fast and loose' with academic conventions) and, while it places certain demands on them, it empowers researchers wishing to adopt this approach. As he puts it, post-disciplinarity 'requires thinkers/researchers/activities to identify –and work conceptually and operationally within- the extensive range of ways of knowing that hold sway with and across the settings they investigate where these settings are known to be, or suspected of being, pluri-dimensional'.

In demarcating the nature of post-disciplinary enquiry more generally, four components were originally identified as desiderata: '[shared] interests; competencies, worldviews; and outlook, or the assumptions of what should be involved in the field, not least conceptually and methodologically' (Coles et al. 2006: 305, based on Hellström et al 2003; Tornebohm 1983, 1985). Calls for greater post-disciplinary enquiry existed alongside, and were informed by, discussion of other broad trends associated with the nature of knowledge production in, through and with higher education. In response to the proposition of a Fourth Age of Research (Adams 2013), these included a shift from the traditional practices of 'research, publish, read and use' associated with Mode I knowledge production (Gibbons et al. 2004) towards a greater prevalence of 'engage, develop and share' associated with Mode II (Smith and Adams 2014: 10). In a digital age, 'Science 2.0' was characterized by placing ideas on the web, co-production and -development, open source, user participation, pooling resources, modification and eventual publication in a formal sense. This was a strong departure from its predecessor, 'Science 1.0', which was characterized by a more conventional approach of research leaders seeking grants, running teams, publishing and disseminating their outputs' (Smith and Adams 2014: 10).

Early advocates in international political economy (IPE) argued that there is not a single form of post-disciplinary enquiry but rather three especially promising orientations were identified (Hay and Marsh 1999): it could breathe life into old (research) problems requiring new approaches; new problems requiring old approaches; and new times requiring new approaches. In the case of the third trajectory, contemporary challenges required fresh, innovative approaches to solving (research) problems that could not have been imagined previously under usual disciplinary arrangements and conditions (Coles et al. 2006, 2016). The other two trajectories pointed to the

possibilities for revisiting knowledge produced under previous conditions and re-inspecting these through new lenses of flexibility.

In other words, one contribution of post-disciplinarity can be to drive forward knowledge by also taking a peek in the rear-view mirror, as it were. The first (old problems, new approaches) suggests that former or enduring problems which may have been abandoned as disciplines or inter-disciplinary enquiry progressed, may be resumed or reconsidered. The prospects of fruitful new knowledge production are enhanced because of the possibilities of revisiting subjects with the latest data, techniques, concepts, theorisations and so on. In tourism studies, the quintessential example of this may be reopening in the digital age of time-space geographies from the 1970s and 1980s. These were largely abandoned in the analogue era because of its considerable demands on data collection, processing and analysis that old-tech could not be satisfactorily overcome (Hall 2005b). The second (new problems, old approaches) suggests that older modes of enquiry, ways of thinking and/or established data sets remain analytically and methodologically valid and valuable, and they may be applied to contemporary topics or subjects that in some cases substantially post-date them. Solutions to new problems may be in theory, concepts, methods or techniques that have been long used but which perhaps were abandoned as disciplines, scholarship and imperatives shifted (Coles et al. 2016).

To this point, the central threads of logic have been greater flexibility, openness, agility and plurality in knowledge production culminating in post-disciplinary enquiry. Inter-disciplinary approaches are more flexible than multi-disciplinary approaches which, in turn, overcome the rigidities, exclusivities and exclusions associated with mono-disciplinary approaches. Darbellay (2016) has sought to add further clarification to what he terms the 'crisis' facing disciplines (see also Darbellay and Stock 2012). Drawing on Schlanger (1992: 292), who argued that for every discipline the limits were known and accepted, he observes a progressive de-disciplining of tourism studies where there is a gradual 'decompartmentalisation' based on a continuum of openness, interaction and integration from disciplinarity at one end of the spectrum to 'transdisciplinarity' at the other (Darbellay 2016: 366). Of course, a device of this nature is conceptually useful if analytically impossible to apply in any precise or meaningful sense. Transdisciplinarity is, for him, the condition in which 'researchers work to develop a conceptual and methodological framework that transcends disciplinary boundaries with the aim of resolving a concrete problem between science and society' (Darbellay 2016: 365). The essence of transdisciplinarity is furthermore characterized by key words of 'problem-solving, implementation, relationship between science and society' which distinguishes it from inter-disciplinary which is concerned with 'interaction, interface, exchange, shared research topic[s], interdependence' (Darbellay 2016: 365). Importantly, this definition of trans-disciplinary

does not advocate 'a return to some kind of unit of knowledge…' rather it '…refers to the "highest level of integrated study, that which proposes the unity of intellectual frameworks beyond the disciplinary perspectives and points toward our potential to think in terms of frameworks, concepts, techniques and vocabulary that we have not yet imagined" (Buckler 2004: 2)' (Darbellay 2016: 365).

Post-disciplinarity may be considered as an epistemological and ontological position –a statement on how and why knowledge is produced- as well as a relativity, as a sort of temporality, a moment in time or period after the hegemony of disciplines started to dissipate. In the case of the latter, taking a transdisciplinary approach is also to be acting in a post-disciplinary way. Arguably in a strict sense, so too is engaging in multi- or inter-disciplinary research. Be this as it may, there are obvious similarities with Darbellay's characterization of trans-disciplinarity with representations of 'post-disciplinarity' in other contributions on tourism, and as articulated above. While Darbellay (2016) correctly cautions against artificial or contrived definitions of 'post-disciplinarity' to distinguish the term artificially from 'transdisciplinarity' (and other labels) either ontologically or epistemologically, for some 'post-disciplinarity' may refer to an even greater sense of flexibility, permissiveness and creativity than his somewhat instrumental, goal-oriented depiction of trans-disciplinarity may suggest (cf. Pernicky et al. 2016; Barry 2016; Barry 2016; Bødker 2016). Articulated in this particular way, notions of problem-solving, implementation, useful knowledge all inherently infer a sense of expectation, conformity and even quasi-disciplining as do aspirations to unity and the highest level of integration (i.e., who or what defines these?).

This discussion demonstrates that considerable time can be taken discussing the relative merits and subtitles of a number of other connected terms. Concepts like 'pluri-disciplinarity', 'anti-disciplinarity' (Ito 2017), and so on, all require careful unpacking and close comparison. Nevertheless, they add to the sense that the role and status of disciplines is under ever more scrutiny (Darbellay 2016). The obvious question therefore arises of to what extent does research characterized by the hallmarks of post-disciplinarity drive the production of knowledge in studies of tourism? This is not an especially easy question to answer precisely or definitively, largely for two reasons. First, many scholars working in tourism research do not reflect on their philosophical positions in their publications nor do they discuss the extent to which their decisions (for instance about ontology, epistemology and methodology) impact on the nature of the research they conduct and the outputs they produce. They very rarely consider how their disciplinary origins, or their professional homings with the attendant baggage they bring, impact on the knowledge they produce about their subjects. These may seem somewhat nebulous, almost irrelevant points for many scholars. However, if tourism as a form of human behaviour is an interest to scholars in both geography and sociology (as it is also for psychologists and economists), how many scholars are able

to articulate clearly the differences in approach that a 'geographer' or a 'sociologist' might take to the study of tourism (Gibson 2008; Hall and Page 2010; Cohen and Cohen 2012)? In other words, in what ways might geographers or sociologists or social scientists from any other disciplinary home contribute distinctively to inter-disciplinary studies of, or projects on, tourism? Second and connected, approaches to knowledge production and research philosophy very rarely feature in the standard indexing material for most publications: that is, the title, keywords and abstracts. Thematic and subject-specific words more often than not describe publications as scholars' attempt to attract others to their work and establish *de facto* communities of common interest and practice. Using key words is a crude device that likely under-measures the extent to which post-disciplinary approaches are being or have to be taken in tourism studies (Coles et al. 2016). Instead, to establish any degree of precision or accuracy, a more labour-intensive, qualitative inspection would be required on a project-by-project or publication-by-publication basis.

In fact, alternative evidence points to post-disciplinary ways of thinking as gathering some traction. Three international conferences arranged in Switzerland (2013), Denmark (2015) and New Zealand (2018) have explored the potentials and practices of post-disciplinarity in tourism studies (Munnar et al. 2016; http://www.postdisciplinary.net/). *Prima facie*, the programmes for these meetings demonstrate the considerable opportunities of post-disciplinary enquiry, in particular in the spaces occupied by scholars identifying with the arts and humanities and the social sciences (Pernecky et al. 2016). Using the threefold categorisation proposed for IPE, Coles et al. (2006, 2016) roughly mapped out the terrains within tourism studies which would benefit (and to some extent have benefitted) from post-disciplinary enquiry in the years ahead. Of necessity, these are broad-ranging and among the 'new times, new approaches' they identified the increasing generation and use of 'big data' (Coles et al. 2016). A term like this deserves unpacking further, not only because it is multi-faceted in nature (Miah et al. 2017; Li et al. 2018; Mariani et al. 2018) but also because it implies greater connection with mathematics, computer science, data science (i.e. analytics), and engineering. This is significant: physical sciences such as these have not previously been naturally or immediately associated with the study of tourism. Notwithstanding, the digital revolution has generated all sorts of new data, both dealing with the demand and supply side of tourism, that could not be imagined when studies of tourism first started. Large data sets allow greater generalization with higher levels of certainty than in the analogue era, while the emergence of new data sets and types of data sources demand the development of new skills and approaches for data management, processing and analysis not previously widely prevalent in the tourism academy (Coles et al. 2016: 383). Clearly, there is far more to the study of e-Tourism than employing big data, the potential and

practice of post-disciplinary approaches in e-Tourism is greater than might at first seem to be the case, and it is to this we turn in the next section.

e-Tourism as a Post-Disciplinary Field of Study

As the preceding discussion makes clear, the precise and clear application of language and terminology matters. The same is also true for e-Tourism. There are probably as many separate definitions of the term as there are researchers working in the field. Within a chapter of this nature, there is neither the space nor the scope to enter into a much fuller discussion of the definitions and scope of e-Tourism. For the sake of simplicity –and albeit arbitrarily- in this chapter Buhalis' (2003: xxiv) early view will coarsely delimit the boundaries of the term and the field. For him, e-Tourism is concerned with the 'digitization of all the processes and value chains in the tourism, travel, hospitality and catering industries that enable organizations to maximize their efficiency and effectiveness'. A definition of this nature covers a full spectrum of interests from the now arguably established, everyday and banal -such as the study of electronic point of sales (EPOS) data or online booking systems - to some of the more exciting, most current advances in personal wearable technologies, psycho-physiological measures of visitors, artificial intelligence and automation.

Annual calls for papers from the International Federation for Information Technology and Tourism (IFITT) add to the sense that e-Tourism covers a wide array of interests (Neidhardt 2019), and the current research agenda is not set by particular conceptual, theoretical or methodological canons. Consulting conference programmes, tables of contents of dedicated peer-reviewed journals, and even simple keyword searches of standard bibliographical databases (i.e. Scopus and Web of Science) reveal the wide range of authors engaged with e-Tourism. These are too numerous to cite here, but the contributors' professional homes include, *inter alia*, computer science, analytics, (applied) linguistics, management studies, geography, as well as scholars in units, departments or institutes dedicated to the study of tourism, either in a broad or more specific guise. Publication teams regularly comprise scholars spanning institutional and organisational divides, and encouragingly in the Fourth Age of Research (Adams 2013), reach over international boundaries beyond national education systems. The essential aspect of their research and what unites them in a common endeavour, appears to be the subject –for instance, the solution, the method, the application, the invention, the innovation, the incremental improvement- and the more flexible approaches that are taken to knowledge production in the context of particular (research) problems, not particular disciplinary-based origin(s) or approach(es) to producing new knowledge.

Of course, not all knowledge production in e-Tourism has to be -nor automatically should be- considered as post-disciplinary in nature, and some may be produced in other modes. Conversely, just one contribution in e-Tourism overtly identifies itself as post-disciplinary in nature. Bødker (2016) attempts to provoke further discussion of the types of fieldwork and representations that would emphasize embodiment in the design of tourism technologies. His work stresses the importance of technology as a lived experience and its affective nature, and the importance of the full range of senses in future consideration of technology in digital tourism. Be this as it may, Table 1 indicates that many of the topics engaging the international e-Tourism research community currently are inherently post-disciplinary in the sense that their emergence post-dates the start of the progressive erosion of disciplines (Darbellay 2016). We would contend that this is also largely the case ontologically and epistemologically. Although by no means intended to be exhaustive, Table 1 maps many of the most urgent topics identified by IFITT recently against the three orientations for post-disciplinary enquiry exposed in IPE (n.b. a similar but more extensive exercise might have been conducted from chapter titles in this handbook). Very many of these have emerged from the context of application, from 'doing', 'managing', 'practising'.

[Insert Table 1 near here]

Typological exercises like this are typically criticized because items may not neatly sit in just one category, classifications are subjective, and allocations are sometimes the result of fine, even debatable judgement calls. They also depend on the precision of language (i.e. in how the labels or items are defined and/or interpreted). This is also the case here. For some, the topic of psycho-physiological measures of visitors might just as easily have been placed in the category 'old problems, new approaches' as in that of 'new times, new approaches'. In short, this type of research attempts to use the ever widening array of different physiological measures associated with psychological processes (e.g. eye-tracking, electro-dermal activity) in an attempt to produce enhanced understandings of contemporary visitors and their experiences. In other words, it may be considered as one of the next stages in the longstanding fascination tourism scholars have had with marketing, extending into the digital age (Dolnicar and Ring 2014). Furthermore, at its most basic, psycho-physiological research concerned with the application of method(s) to particular current research questions and much of the current research on experience and emotion is framed by established concept and theory (Kim and Fesenmaier 2015) which, in some cases, substantially predates the emergence of these forms of technology in the social sciences (from the analogue and

web 1.0 eras). On this basis, psycho-physiological research may be providing a new approach to an old, enduring challenge in tourism studies, namely understanding visitors, their experiences and especially their emotions (Hosany et al. 2015; Li et al. 2015).

Nevertheless, as Table 1 intimates, in our view this form of enquiry is actually far better regarded as a new approach for new times. It post-dates the halcyon days of disciplines; it also requires considerable background knowledge of ideas from, *inter alia*, psychology, physiology, physics and sometimes medicine, a combination that is quite new and unfamiliar to tourism studies and many tourism scholars. A greater degree of complexity is involved, therefore demanding greater methodological dexterity to combine techniques that have rarely been used together before. Several authors have called for even these newer, more advanced methods to be used in multiple methods research designs –combining both old and new, analogue and digital, psycho-physiological and self-report- as a more reliable and comprehensive means of understanding visitors (Li et al. 2018; Stadler et al. 2018). For example, Marchiori et al. (2018) employ analysis of heart rate data and self-reported perceptions to understand the effectiveness of virtual reality experiences for visitors, while Babakhani et al. (2017) connect eye-tracking and electro-dermal data to measure the appeal of carbon-offsetting in online purchasing. Others have pointed to the continued prevalence of such studies within highly-controlled laboratory environments rather than the 'natural settings' where routine activities, including those of visitors, take place (Kiefer et al. 2016; Baldwin et al. 2020). Within eye-tracking for instance, there are subtle but important differences in response to stimuli –text, images, iconography- when viewed in natural settings. It may be relatively straightforward to take the technology into homes, offices and workspaces, or even to simulate them (Baldwin et al. 2020); taking it outside into the natural environment such as the countryside or coast, where light varies and/or infrared light levels may be high, can create significant challenges (Kiefer et al. 2016; Scott et al. 2017). Added to the complexity and radically-different nature of such enquiry, such methods have the potential to shift thinking. Such work is very labour- and resource-intensive with the consequence that sample sizes have been limited to date (Scott et al. 2017); however, few if any authors have yet to pose questions of to what extent is variance in visitor experience revealed by or accounted for among psycho-physiological measures, how this relates to traditional self-reported psychographic measures, how much they account for together, and which accounts for more? Furthermore, do traditional segmentations and groups of visitors based on psychographic variables continue to be valid, and do psycho-physiological variables alone or in combination of psychographic measures form a stronger basis for future analysis and managerial interventions?

Many of the topics in the 'new times, new approaches' categories require knowledge, skills and expertise to pursue them to their logical termini that have not previously been in the scope of tourism studies and may be pushing back the frontiers of (social sciences) disciplines that contribute to the body of knowledge. For instance, Moyle et al. (2017) suggest that studying the brain and its responses represent the next frontier in tourism emotion research, just as it may also push back the frontiers of destination marketing (Baastiaansen et al. 2016). Building on neuro-economics, neuro-politics and neuro-marketing, the potential exists to measure emotions as 'the result of appraisals of perceptions… in the cortex of the brain' through 'use of EEG [electroencephalography] which records the electrical activity of the brain' (Moyle et al. 2017: 2). With more complexity, the costs of conducting cutting-edge research increase and sample sizes remain low currently. While we would agree with Moyle et al. (2017: 1) that further research of this nature 'should focus on the efficacy of utilising self-report measures with cutting-edge psychophysiological techniques', approaches like EEG that intimately measure the human-being raise all sorts of relatively new questions for research ethics, privacy and data protection which tend to get lost in the excitement about new analytical and methodological possibilities.

Beyond the more usual social science moorings, other topics in the 'new times, new approaches' category suggest studies of e-Tourism have to, and will, increasingly take a turn towards the physical sciences. While it is possible for those with a training in the social sciences or arts and humanities –as traditional foundation stones of tourism studies- to understand the principles of, and ideas behind, many of the topics like blockchains, wearable tech or the operation of travel chatbots, they require the detailed skills and knowledge of those trained in programming, analytics, engineering and so on to advance in a practical or analytical sense. And the reverse is also going to be the case in so far as new intellectual symbioses are going to be necessary. While physical science may drive invention and innovation in this space, the implementation and appraisal of such technologies takes place in particular contexts that demand other specialist knowledges and insight from those better versed in the humanities and social sciences. Audiences and visitors of the future are going to expect increasing levels of technological enhancement and augmentation in the delivery of their experiences; witness, for instance, the rush for airlines and airports to produce mobile apps designed to augment and enhance the customer service experience, not to mention to close the distribution gap when providing such services. Far from science fiction, the design of anthropomorphic automation is already part of the discourse over robotic service design (Murphy et al. 2019) but cannot and should not be disconnected from discussion about the future of the labour force, especially where tourism comprises a significant proportion of employment and/or contributes significantly to citizens' livelihoods (Bowen and Morosan 2018).

Work on robotics, automation and artificial intelligence casts e-Tourism as a largely 'path free' form of intellectual endeavour; that is, the progress and development of topics in this category is largely independent of precedent because there was little, if anything that went before it. It may be attractive to consider e-Tourism as being at the vanguard of tourism studies because it is dealing with the most current technologies, innovations, ideas and thinking. Items in the 'new problems, old approaches' category temper this view somewhat. Advances in digitisation and digital engagement have produced several research problems and challenges distinctive to contemporary times, like the growth of platform economies and their alternative business models, the emergence of digital nomads and their increasingly peripatetic lifestyles, and the proliferation of social media and social networks. Thematically though, these topics represent extensions of, and they are usefully informed by, earlier contributions. Items in this category benefit by drawing on the 'institutional memory' of tourism studies or by referring to antecedents or analogues in other disciplines and their attendant subject areas. In the case of the former, current tourism scholarship may benefit from former advances that have otherwise been forgotten. For instance, the emergence of digital nomads effectively represents the next stage in the gradual blurring of home and away, the enmeshing of work and leisure, observations that in part drove the 'mobilities turn' in the social sciences and tourism studies (Hall 2005, Coles et al. 2006; Cook 2020). The platform economy is perhaps the topic *de nous jours* in so far as some argue that web-based transactions through online booking sites and agencies comprise new business models in the tourism sector. As McKee (2017) notes, operators like Airbnb and Uber exploit the ambiguities between –on the one hand- acting as a private economic actor and –on the other- as provide of technological infrastructure for markets. For some critics, this has resulted in unsustainable outcomes for local destinations and businesses (Gössling and Lane 2015), not least by considerable off-shoring of proceeds and profits into locations that some consider tax-efficient, others unfair, immoral and exploitative. A more powerful critique is that, in retrospect, the body of knowledge on business models in management studies which is increasingly being deployed in tourism studies (Reinhold et al. 2018) may cast doubt over whether the platform economy is quite as new or radical an idea as its advocates suggest. Central to the operation of the platform economy is the connection of consumers and opportunities by online technologies; for platforms, we may read 'market places' and the operators of platforms as 'agents' or 'agencies'. Language of this nature recalls an altogether different era of travel agencies and holiday (apartment/homes/cottage/second homes) letting agencies which is the basic tenet of AirBnB. Calls for policy-makers and politicians to regulate the effects of off-shoring are nothing new: as far back as the 1980s Stephen Britton observed this was one of the unfortunate consequences of the globalisation of tourism, the choices that consumers make, and the effects these have on local

communities (Britton 1991). As Mosedale's (2006) work from over a decade ago demonstrates, the challenge is to be able to map financial flows and value (or commodity) chains precisely.

Conversely, most of the items in the 'old problems, new approaches' category are related to methods and techniques, and the nature of this form of post-disciplinary e-Tourism is actually to progress some of the more enduring issues in tourism studies by applying the latest advances. Augmented reality (AR) and virtual reality (VR) may increasingly be the domain of many, especially younger audiences (Han et al. 2019; Yung and Khoo-Lattimore, 2019; Liang and Eliot 2021); however, augmentation *per se* is nothing new. There is a long history of enhancing (or at least attempting) visitor experiences, not least through tour guides guidebooks, in-situ interpretation or even more recently the audio-guide, all of which endure today (Hanna et al. 2019). AR and VR simply represent the next level of technological sophistication (Han et al. 2019), as do other technologies such as QR codes to drive interpretation (Solima and Izzo 2018). Moreover, as contemporary experiences demonstrate, there are still challenges of curation, authenticity, data ownership, presentation and performance that require scholars and practitioners with backgrounds in the arts and humanities to work in combination with developers and marketers to deliver content to 'customers' (Dueholm and Smed 2014; Bec et al. 2021). Digital platforms do however offer greater opportunities to deliver multiple views of history and reinforce recent social trends towards the erosion of grand narratives (Bohlin and Brandt 2014). GPS and new forms of smart phone-enabled tracking are producing new insights into visitor behaviours (Hallo et al 2012; Raun et al. 2016; Hardy et al. 2017), especially when combined with other forms of psycho-physiological measures (Shoval et al .2018a, 2018b) or even analogue data and approaches (East et al 2017). However, the notion of tracking visitor behaviours through time and space has been around since the 1970s, it has been attempted by diaries and self-report (Hall 2005b), and the principal development is the technological advances that have enabled this to become more efficient and effective.

Similar comments may be made about text analytics (i.e. text mining) or sentiment analysis (Ma et al. 2018). In case of the former, the search for high quality data about tourists (and tourism) is well-established, especially in tourism studies of marketing; the principal difference appears to be the ability of high powered computing and the wider availability of accessible software to increase the scale, scope and speed of the research. Processing is also a hallmark of the latter: sentiment analysis uses computation to find and categorize the users' opinions through their texts to determine the authors' views on a particular subject. Reduced to its most basic elements, it is arguably little more than (textual) content analysis or discourse analysis (Hannam and Knox 2005). Arguably discourse analysis and semiotic analysis as anthropocentric methods may reveal some of the finer nuances that sentiment analysis may not (Qian et al. 2018). Perhaps the contemporary

contradistinction is that the direction of recent innovations and initiatives also sets the stage for potentially complex legal issues with respect to data acquisition, data protection, tracking, mining, privacy and ownership. The online activities of pre-visitors generates corporate interest in terms of shaping the experience. The data produced by visitors in situ, on-site equally present significant opportunities for everyone throughout the supply chain in terms of enhancing understandings of movements, purchase habits, dwell times, and so on. With its timeline tracking feature, which is already old technology by today's standards, Google can arguably put together meaningful pictures of individual and collective mobilities. This raises issues of what rights might tourists have to travel anonymously in the future? Is a digital footprint of one's mobility purely their own?

Concluding remarks: on the future of Post-disciplinary e-Tourism

What of the prospects for post-disciplinary enquiry in e-Tourism into the future? Part of the purpose of producing a table of this nature is to challenge current assumptions, and to provoke a wider discussion about the nature of tourism enquiry. As we noted above, there may be disagreements as to which category a particular theme may be allocated but it is clear that subjects and topics are driving the e-Tourism research agenda rather than established theoretical or conceptual traditions and orthodoxies more reminiscent of disciplines. In fact, whatever one's critical reflections on the composition of Table 1, it demonstrates the wide range of topics in e-Tourism that have emerged, that they have done so as the 'crisis of disciplines' has deepened (Darbellay 2016), and they all benefit from more flexible, responsive approaches where the subject is the starting point for enquiry, not the discipline or, in the case of tourism, the field of studies (Tribe 1997, 2000). A closer inspection of some of the earlier texts on the topic suggests that the emergence of the body of knowledge on e-Tourism is itself a story of synthesis and eschewing disciplines in favour of pragmatism and progress (Buhalis 2003). Put another way, no discipline could lay claim to the topics that interest e-Tourism scholars.

Post-disciplinary studies of e-Tourism are here to say. It is hard to imagine knowledge advancing in the areas set out in Table 1 if more restrictive and restricting modes of knowledge creation are employed. Indeed, it is difficult to conceive of the sort of transformative pathways for future e-Tourism research that Gretzel et al. (2020) identify as a necessary response to the COVID-19 pandemic. In many respects, of and by themselves the topics contained in Table 1 already represent an exciting basis for an intellectually-valuable, future-facing research agenda. Yet, the space and opportunity afforded by the pandemic for scholars to reappraise their roles and the purpose of their work, points to the further significance that these topics (and many others) can have as a force for

change. Science has long faced crisis, not least because, as Saltelli and Funtowicz (2017: 5) observe, its role has shifted 'from emancipation and betterment of mankind [sic] to instrument of profit and growth'. Rather than revert to modes of e-Tourism enquiry with these hallmarks, a new space has opened for, as Gretzel et al. (2020: 198) put it, ' transformative e-Tourism research as being critical of these assumptions but also constructive by building the necessary foundations for change'. Specifically, COVID-19 has forced 'the need to better understand but also challenge, responsibly manage, and proactively create IT as both a short-term response and a long-term means for the renewal of e-Tourism' (Gretzel et al. 2020: 198). More flexible forms of enquiry in this field of study are better able to deliver greater, more resonant knowledge of this nature to push back the frontiers of understanding and application, both during the pandemic and afterwards. Moreover, the evidence assembled here points to a different orientation to post-disciplinary studies of tourism where e-Tourism is concerned. While most previous discussion has focused on knowledge and insight on tourism developing among communities, groups and teams spanning the arts, humanities and social sciences (Coles et al. 2006, 2016), e-Tourism by necessity requires greater engagement with physical science. Among the new problems requiring new approaches, the unit of analysis may drive the nature and type of involvements in integrated knowledge production, with scholars from the physical sciences focused more on issues of technology, hardware and software and those from other disciplines in the humanities and social sciences providing subject-specific insight into the tourists and tourism, experiences and meanings involved in the act of consuming what they afford.

Some may push back on the view that e-Tourism enquiry is, or will continue to be, post-disciplinary in nature but there are more robust arguments in the opposite direction. e-Tourism is certainly not a discipline in its own right, rather a field of studies with self-supporting institutions. Potential critics may argue that, instead, e-Tourism is actually better described as inter-disciplinary in nature. Some may even argue that discussions of this nature are incidental and lack relevance. There are three reasons why such views are short-sighted and misdirected. First, within institutional settings, national higher education systems and among international bodies, the need for, and value of, more flexible, plural, integrative forms of knowledge production are more widely recognised and rewarded these days (Adams 2013, Smith and Adams 2014). Second, consideration of many of the topics in e-Tourism demands a much deeper immersion and sustained engagement by those involved, such that tactical, periodical retreating back into disciplinary homes is unrealistic or counter-productive if it happens. Finally, as Munar et al. (2016: 344) note, the nature and composition of the tourism academy, widely writ, is constantly evolving. Moving towards post-disciplinarity would appear to be the next logical step in a process that started with establishing the legitimacy of tourism as a field of study. For Filep et al. (2013: 7), this is manifest in the emergence

of 'Generation Tourism', a new cohort of tourism scholars who are 'equipped to deal with the complex issue of developing tourism knowledge across a diverse field of study' (Filep et al. 2013: 10). While Generation Tourism may be perceived in some quarters as lacking 'the advantages of a discipline-focused education with its strong theoretical and methodological foundations' (Filep et al. 2013: 1), it comprises precisely the type of scholars who may deploy advanced methodological tools, adopt disaggregated research approaches, employ high resolution analytics, and avoid stereotypical depictions of destinations and tourists. In other words, the types of scholars who are necessary to delivering renewed intellectual impetus to the study of e-Tourism (Shoval and Birenboim 2018).

Cross-References

The Field of e-Tourism | e-Tourism: a Historic Perspective | e-Tourism: An Industry Perspective | e-Tourism and Mobilities | Psychophysiological measurement |

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Table 1: Selected indicative topics for post-disciplinary enquiry in e-Tourism

Orientation	Potential Topic
Old problems, new approaches	• Augmented experiences, AR, VR. • Data mining, analytics and measurement • Data standards and data integration • Digital marketing and social media strategies • Digital Distribution and Social Selling • Gaming and gamification • GPS and geospatial tracking • Human computer interactions • Recommender systems and personalization • Text and Concept Mining, Sentiment Analysis • Travel information, search and retrieval • User Modeling and Decision Making • Website design and evaluation
New problems, old approaches	• Advanced distribution systems, strategies, and dynamic packaging • Data protection, privacy, security, ethics and legality • Digital divide and socio-economic development • Digital nomads • e-Government and public policy in tourism • Emotions and personality-based systems • ICT and the tourism experience • ICT adoption and value creation • ICT for innovation and service design • ICT for regional development and sustainability • ICT enabled partnerships and collaborations • Platform economy • Responsible ICT in Tourism • Smart destinations / visitor management • Social Networking, Social Media and Social Inspiration • Social Network Analysis

New times, new approaches	• Artifical intelligence, machine learning, deep learning
	• Big data and large-scale systems
	• Blockchains
	• e-Learning and MOOCs
	• Fairness, Transparency and Responsibility in Algorithms
	• Internet of Thngs
	• Location-based Services and Context-Aware Systems
	• Mobile services and wearables
	• Neuro-tourism
	• Psycho-physiolological measures
	• Robotics and automation
	• Semantic Web, Tourism Ontologies and Linked Open Data
	• Travel chatbots

Sources: authors, adapted from Coles et al. (2006, 2016) and Neidhardt (2019)