Moodle and Social Constructivism: Is Moodle Being Used as Constructed?

A Case Study Analysis of Moodle Use in Teaching and Learning in the School of Business, GMIT

by

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DECLARATION OF ORIGINALITY

I declare that the content of this thesis is my own work. This thesis has not been submitted for any degree or other purposes. I certify that the intellectual content of this thesis is the product of my own work and that all the assistance received in preparing this thesis and sources have been acknowledged.

ABSTRACT

Moodle was originally developed by Dougiamas in 2002 to help educators create an online platform that embodies a social constructivist pedagogical framework. Galway Mayo Institute of Technology (GMIT) in Ireland began using Moodle in 2006 but very little research has been done on whether Moodle facilitates social constructivism in practice in GMIT. The main aim of this study is to explore how engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. The study begins with a literature review which considers theoretical perspectives on social constructivism and draws on social constructivist theorist such as Piaget, Dewey, Bruner and Vygotsky. It abstracts four principles from the overall theoretical framework to support a methodological basis to gauge what is occurring in Moodle in GMITs School of Business from a social constructivist perspective. These key principles include scaffolding, knowledge construction, active learning and social interaction and shows that Moodle can facilitate such principles in theory. The research strategy is a case study approach to assess if engagement with Moodle facilitates these social constructivism principles in the final year of a GMIT business degree. The research choice is mixed methods. The data collection instruments include surveys and focus groups with final year business students and lecturers. The main finding that emerged from the study is that Moodle does not facilitate social constructivism principles in this group to any significant degree. However, the study found that Moodle does facilitate limited scaffolding and in particular, conceptual scaffolding. It also found that business lecturers leverage Moodle to support social constructivism principles in a traditional classroom setting. In addition, a number of barriers were identified to using Moodle to facilitate social constructivism principles. These include a lack of training and time, availability of alternative technologies, more effective face to face social interaction and student inhibitions. The study concludes by offering some recommendations on how GMIT's School of Business might move closer to a position that harnesses Moodle's potential to facilitate the social constructivism principles which underpin it. These recommendations are categorised under cultural, technical and policy enablers.

KEYWORDS: *Social constructivism, Moodle, Virtual learning environments, Mixed methods.*

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GLOSSARY

Active learning: Students learn by actively constructing their own learning.

Conceptual scaffolding: Educators help students decide what to consider in learning and guide them to key concepts.

Constructionism: derived from constructivism focuses on the art of learning, or 'learning to learn', and on the significance of making things in learning.

Constructivism: a view in which an individual mind constructs reality within a systematic relationship to the external world

Knowledge construction: Students are presented with opportunities to build on prior knowledge and understanding in order to construct new knowledge and understanding.

Metacognitive scaffolding: Educators prompt students to think about what they are learning throughout the process and assists students reflecting on what they have learnt.

Procedural scaffolding: Educators help students use appropriate tools and resources effectively.

Social constructivism: Social constructivism emphasises the importance of culture and context in understanding what occurs in society and constructing knowledge based on this understanding.

Social interaction: Knowledge is constructed through interaction with others.

Strategic scaffolding: Educators help students find alternative strategies and methods to solve complex problems, for example, through feedback

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CHAPTER ONE: INTRODUCTION

1.1 CONTEXT

The benefits of computational technology in teaching and learning is well documented, for example, Salmon (2002), Francis and Raftery (2005), Palloff and Pratt (2007) and Phillips, McNaught and Kennedy (2012) all show how Virtual Learning Environments (VLEs) can be used to enhance learning and teaching. Moodle (Modular Object Orientated Dynamic Learning Environment) is one such VLE and it was originally developed by Martin Dougiamas to help educators create an online platform underpinned by a social constructivist pedagogical framework (Smith 2006, p. 3; Helling and Petter, 2012, p. 1040). Moodle 1.0 was first released to the public in August of 2002 and was introduced as a learning platform in GMIT in 2006.

Galway Mayo Institute of Technology (GMIT) in Ireland began using Moodle in 2006 but very little research has been done on whether Moodle facilitates social constructivism in practice in GMIT. This study explores how engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. From an educational research perspective, it is hoped that this will provide a snapshot of Moodle use in the GMIT's School of Business and seek to explain why such use is occurring. The study will then make some recommendations on how GMIT's School of Business might move closer to a position that harnesses Moodle's potential to facilitate the social constructivism principles upon which it was founded.

1.2 AIMS & OBJECTIVES

The main research question for this case study is to explore if engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. The main objectives for this study are to:

- Abstract key principles from the overall social constructivist theoretical framework
- Identify if Moodle can theoretically facilitate these principles
- Gauge whether engagement with Moodle facilitates these social constructivist principles in the final year of a GMIT business degree

1.3 RESEARCH METHODOLOGY

The research strategy is a case study approach to assess if engagement with Moodle facilitates these social constructivism principles in this group. The research choice is mixed methods. The data collection instruments include surveys and focus groups with final year business students and lecturers to capture different dimensions of the same question.

1.4 SCOPE & LIMITATIONS

This study investigates how engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. A main limitation of this study is that is does not consider other groups, programmes, disciplines or institutions and this could be the focus of some further investigation. Another limitation is that only the social constructivist approach to teaching and learning is considered. Whereas social constructivism theory evolved from constructivism, which belongs to the cognitivist school of education, this thesis will not be considering cognitivism or constructivism in detail. In addition, the sample size is reasonably small as only final year students (n = 134) and their lecturers (n =20) in GMIT's School of Business were asked to participate in this study.

1.5 THESIS STRUCTURE

Figure 1.1 outlines the structure to this thesis. This thesis consists of six chapters. Following on from this chapter, Chapter Two provides a literature review. This literature review considers theoretical perspectives on social constructivism and draws on social constructivist theorist such as Piaget, Dewey, Bruner and Vygotsky. It abstracts four principles from the overall theoretical framework to support a methodological basis to gauge what is occurring in Moodle in GMITs School of

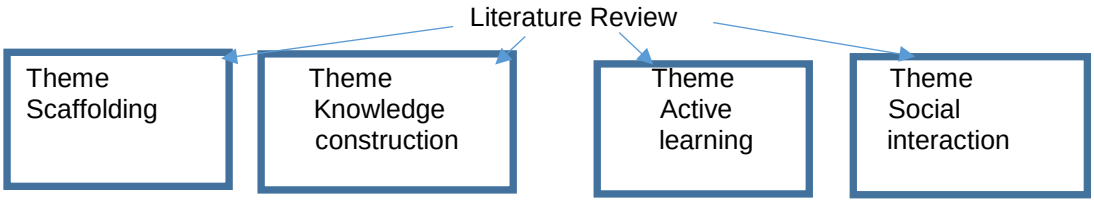
Chapter Two: Literature Review Research Question: How does engagement with Moodle facilitate social constructivism principles in the final year of a GMIT business degree?  	May –September 2017
Chapter Three: Research Methodology and Methods Research question: How does engagement with Moodle facilitate social constructivism principles in the final year of a GMIT business degree? Philosophical assumptions: Ontology Philosophical stance: Constructivism Strategy: Case study Choice: Mixed methods	October 2017
Chapter Three: Research Techniques and Procedures Stage 1: Design Stage 2: Select the site Stage 3: Select participants Stage 4: Design instruments Stage 5: Gain access and other ethical considerations Stage 6: Conduct pilot Stage 7: Collect data	November 2017 –January 2018
Chapter Four: Research Findings	Feb-March 2018
Chapter Five: Research Findings	April 2018
Chapter Six: Conclusion	April 2018

Figure 1.1: Thesis structure

Source: Adapted from research methodological frameworks outlined by Saunders, 2003, p. 83; Creswell, 2009, p. 5; Scotland, 2012, p. 9; Cohen et al, 2011, p. 6; Trafford and Lesham, 2012, p. 95, and Ginty, 2014, p. 41.

Business from a social constructivist perspective. These key principles include scaffolding, knowledge construction, active learning and social interaction. This chapter demonstrates that Moodle can theoretically facilitate such social constructivism principles.

Chapter Three describes and justifies the research methodology with reference to the literature to try to answer the research question. The chapter is divided into three sections. The first section considers the research question, namely, how engagement with Moodle facilitates social constructivism principles the final year a business degree in GMIT, the underlying philosophical assumptions, the philosophical stance, the research strategy and the research choice. The second section includes a discussion of the design, selecting the site and the participants, designing and piloting the instruments, gaining access and ethical considerations and collecting the data. It frames this discussion around the concept of validity as outlined in the literature. The final section offers some concluding remarks.

Chapter Four presents the findings from the data analysis, which gauges how engagement with Moodle facilitates social constructivism in this group. This Chapter is divided into five sections. Section one presents the quantitative results from the student and lecturer perspective on engagement with Moodle facilitating social constructivism principles. Section two summarises the quantitative results and identifies what findings need to be further explained. Section three presents the qualitative findings to provide an understanding of subjective student and lecturer experiences on engagement with Moodle facilitating social constructivism. Section four interprets how the qualitative data helps to explain the quantitative results.

Chapter Five discusses some of the main findings presented in Chapter Four with reference to the literature reviewed in Chapter Two and relates directly to the research question. It is divided into three sections. Section one considers the limited degree to which Moodle facilitates social constructivism in the final year of a GMIT business degree. Section two looks at how Moodle facilitates scaffolding in this group. Section three considers how Moodle is used to facilitate social constructivism principles in the classroom in this group. Section four outlines some barriers to Moodle facilitating social constructivism principles in this group. Each section discusses the qualitative

and quantitative findings from a mix of students and lecturers with reference to the literature. The final section relates to the conclusions and implications of the findings.

Chapter Six concludes this study by presenting the main findings of the study, acknowledges the limitations of this study and identifies possible future research work relevant to the findings. It concludes by recommending technical, cultural and policy enablers that will harness Moodle's potential to be used as it was originally constructed in GMIT's School of Business.

CHAPTER TWO: LITERATURE ANALYSIS

2.1 INTRODUCTION

Social constructivism is a learning theory, which has evolved from the work of a number of theorists including, among others, Dewey (1859-1952), Piaget (1896-1980), Vygotsky (1896–1934) and Bruner (1915–2016). The aim of this chapter is to abstract the key principles from the overall social constructivist theoretical framework and to identify if Moodle can theoretically facilitate these principles. This chapter is divided into four sections. Section 2.2 considers theoretical perspectives on social constructivism and abstracts the key principles from the overall social constructivist theoretical framework. Section 2.3 identifies if virtual learning environments (VLEs) can facilitate these social constructivism principles. Section 2.4 identifies if Moodle can facilitate these social constructivism principles. Section 2.5 offers some concluding remarks.

2.2 THEORETICAL PERSPECTIVES ON SOCIAL CONSTRUCTIVISM

Constructivism is a learning theory, which is an assimilation of both behaviorialist and cognitive ideals and believes that learning is a process of constructing meaning from our own experiences (Amineh & Asl, 2015, p.9). The main theorists associated with constructivism are Bruner (1915–2016) and Piaget (1896-1980) (Alanazi, 2016, p.1). Indeed, Piaget's theory of cognitive development is considered one of the most influential constructivist theories in education where people learn from previously-built knowledge by building on that knowledge (Alanazi, 2016, p.5).

It is useful at this point to distinguish the term constructivism from constructionism given that they are both theories of learning. Papert (1928-2016) developed the theory of constructionism which is an educational method in which learners need to create physical artefacts to practice what they have learned (Ackermann, 2001, p.1, Alanazi, 2016, p.5). Papert and Harel (1991, p.5), using a metaphor of soap-sculpturing, suggest that the simplest definition of constructionism evokes the idea of learning by making and that this active learning may vary depending on one's style of making a piece of knowledge one's own.

Social constructivism augments constructivism by emphasising the importance of culture and context in understanding what occurs in society and constructing knowledge based on this understanding (Kim, 2001, p. 2). Vygotsky (1896–1934) is the main theorists among social constructivists (Amineh & Asl, 2015, p. 13) and he considered that "all higher functions originate as actual relations between human individuals" (Vygotsky, 1978, p.57) and elevated social interaction in learning over individual cognitive learning (Trif, 2015, p.979).

While there may be a lack of consensus about the term social constructivism as well as its theoretical bases and assumptions (Bozkurt, 2017, p. 211), this section seeks to present the theory by dividing it into four key principles. While this approach may seem overly simplistic, it is useful to abstract these four themes from the overall theoretical framework to support a methodological basis to gauge what is occurring in a VLE from a social constructivist perspective. The themes are shown in Figure 2.1 and are as follows: learners construct new knowledge using their current knowledge; learning is an active process; knowledge is constructed through interaction with others; scaffolding is central to learning. This section is divided into four parts to reflect these themes from a social constructivist theoretical perspective. Section 2.1.1 considers knowledge construction, Section 2.1.2 describes active learning, Section 2.1.3 details social interaction and Section 2.1.4 outlines scaffolding.

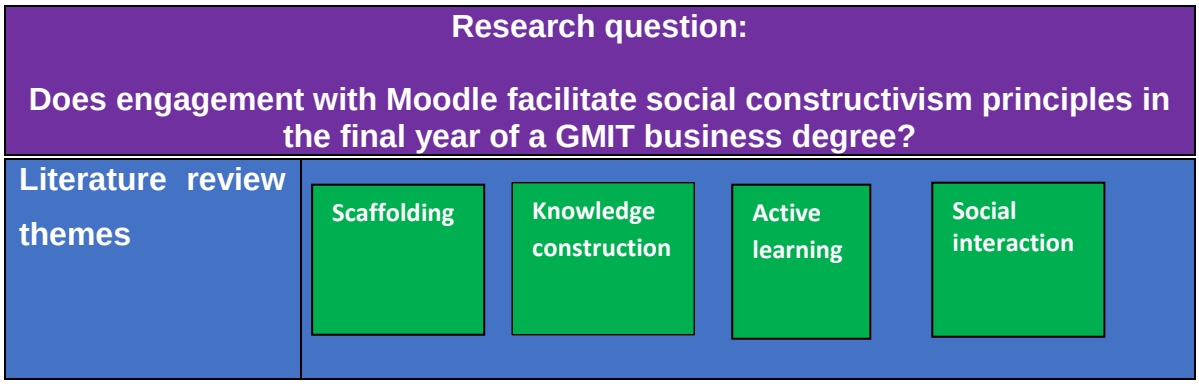


Figure 2.1: Literature review themes

2.2.1 KNOWLEDGE CONSTRUCTION

Constructivists believe that knowledge is essentially subjective in nature, constructed from our perceptions and mutually agreed upon conventions (Alley, 2008, p.30 and Bates, 2015, section 2.5.1). Social constructivism considers that learners construct new understandings using their current knowledge (Cole, 2009, p. 142). This places social constructivism theory within the cultural historical school (Engestrom, 2015, p. xiv) which elevates the influence of culture on learning and the individual. As Daniels (2001, p.56) puts it, humans are seen as 'making themselves from the outside'.

Dewey elevates the notion that knowledge and experience begets further learning and argues that "the beginning of instruction shall be made with the experience learners already have; that this experience and the capacities that have been developed during its course provide the starting point for any further learning" (Dewey, 1938, p.32). Vygotsky develops on this notion and argued that social setting and culture were fundamental to cognitive development in constructing knowledge from prior knowledge (Vygotsky, 1978, p.57). Indeed, Vygotsky believed that the individual could not be understood without his or her cultural means (Engestrom, 2015. xiv). Brunner (1978, p.243) also emphasises this notion that knowledge is constructed given our pre-exiting knowledge and experiences and argued that to learn something about "a domain requires that you already know something about the domain and that, perhaps, there is no such thing as ab initio learning pure and simple".

If we accept social constructivism as a pedagogical framework, then we must understand the role of prior knowledge, experience and culture in learning and how they inform pedagogy. Cole (2009, p. 142) suggests that "people learn best by actively constructing their own learning: students are presented with opportunities to build on prior knowledge and understanding in order to construct new knowledge and understanding". Amineh and Asl, (2015, p.9) suggest that teachers should consider what students know and allow their students to put their knowledge into practice. This theme therefore links to the next theme, that learning is an active process.

2.2.2 ACTIVE LEARNING

A key tenet of the constructivist model of learning is that people learn best by actively constructing their own learning (Cole, 2009, p. 14, Harkness, 2009, p.248). Dewey (1938, p.192) believed that learning was an active process and created a five stage framework for active learning to be meaningful. The learning should be authentic, it should require a problem to solve, the student should have the tools necessary to solve the problem, the student should propose solutions and then test these solutions for validity. In the words of Dewey (1916, p.192).

> …thinking is the method of an educative experience. The essentials of method are therefore identical with the essentials of reflection. They are first that the pupil have a genuine situation of experience -- that there be a continuous activity in which he is interested for its own sake; secondly, that a genuine problem develop within this situation as a stimulus to thought; third, that he possess the information and make the observations needed to deal with it; fourth, that suggested solutions occur to him which he shall be responsible for developing in an orderly way; fifth, that he have opportunity and occasion to test his ideas by application, to make their meaning clear and to discover for himself their validity.

Piaget's paradigm also argued that active learning was the best way to facilitate learning (Kivunja, 2014, p.84). According to Piaget, learning requires an active learner, not a passive one, because problem-solving skills cannot be taught, they must be discovered (Kafai and Resnick, 1996, p.1 and McLeod, 2015, Section 6). Bruner (1978, p.243) shunned the notion that students are passive rote learners of knowledge and display success by "by repeating what has been learned" but that learners should be active constructive learners. Cole (2009, p. 142) asserts that for social constructivism as a model of learning to be successful, it requires learner-centred instruction: "educational materials need to be provided that helps the student to discover things for themselves rather than via passive tuition".

Central to the notion of active learning is this idea that we learn when we are making or doing and this links back to the previous discussion of constructionism. Resnick & Kafai (1996, p.1) develop this notion of active learning and assert that "learners are particularly likely to make new ideas when they are actively engaged in making some type of external artefact" and they consider ways in which design activities can provide personally meaningful contexts for learning. Evard (1996, p.224) suggests that constructivism is based on the idea that people learn particularly well when making

things – especially things that can be shared with others. This links to the final theme that knowledge is constructed through interaction with others.

2.2.3 SOCIAL INTERACTION

Social constructivists argue that meaningful learning occurs when individuals are engaged in social activities such as interaction and collaboration (Ally, 2008, p.30 and McKinle, 2015, p.1). For example, Dewey believed that “education is essentially a social process” (Dewey, 1938, p.25). It supposes that human development is socially situated and that knowledge is constructed through interaction with others (McKinle, 2015, p.1). Vygotsky (1978, p.90) elevated social interaction in learning over individual cognitive learning and considered that much important learning by the student occurs through social interaction with their teacher and with their peers (Wertsch, 2009, p. 14 and Trif, 2015, p.979).

Vygotsky (1978, p.57) considered that “all higher functions originate as actual relations between human individuals” and he discussed three main themes for optimal learning which include social interaction (1978, pp. 84-91). These include social interaction (much important learning by the student occurs through social interaction with their teacher and with their peers), the more knowledgeable other (where the teacher has a higher understanding or more ability than the learner) and the zone of proximal development (students must work at a level that is just beyond that which they can do independently). He described the zone of proximal development as “the distance between the actual developmental level as determined through independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (1978, p.86).

While Piaget’s constructivist perspective focused more on individual cognitive processes than on the social cognitive processes emphasised by Vygotsky (Kivunja, 2014, p.84), this difference is often exaggerated (Daniels, 2001, p.37; Bozkurt, 2017, p. 212). Indeed, Piaget also considered that “social life constitutes an essential factor in the creation and growth of knowledge, both prescientific and scientific”. (Piaget (1995, p.30) quoted in Daniels 2001, p. 38). If we accept social constructivism as a pedagogical framework, then we must understand the role of social interaction and

how it informs pedagogy. Indeed, Engestrom (2015, p. 135) suggests that Vygotsky saw instruction as a chief means to exploit the zones of proximal development.

2.2.4 SCAFFOLDING

Scaffolding is a concept this is also closely aligned with social interaction in the theory of social constructivism. The concept is most often associated with Bruner (1978, p.244) who stressed the 'inherently social nature' of learning and considered the role of scaffolding in the context of a mother teaching a child language.

> Scaffolding…reduces the degrees of freedom with which the child has to cope, concentrates his attention into a manageable domain, and provides models of the expected dialogue from which he can extract selectively what he needs for fulfilling his role in discourse" (Bruner, 1978, p.244).

This notion of scaffolding is similar to Vygotsky's zone of proximal development, where the student's learning always occurs in a social context in co-operation with the more knowledgeable other (Raymond, 2014, p. 158; Trif, 2015, p.980). However, it is worth noting that Vygotsky's zone of proximal development is a broader concept than scaffolding where the former refers to the emergence of long lasting activities while the latter is restricted to the acquisition of the given knowledge of the instructor (Newman, Griffin and Cole, 1984, p. 47; Engestrom, 2015, p. 135). In addition, the term scaffolding might imply a one-way process wherein the 'scaffolder constructs the scaffold and presents it for use to the novice whereas the zone of proximal development is created through negotiation between the more advanced partner and the learner (Newman et al (1989) cited in Daniels (2001, p. 59); Verenikina, 2008, p. 236). In terms of pedagogy, scaffolding occurs when the lecturer provides student assistance to the extent that the scaffolded individual can do the task in hand by himself (Amerian et al, 2014, p. 757).

If the notion of social constructivist learning is accepted, then the methods of learning and teaching must agree (Cole (2009, p. 142). This section has abstracted four key principles from social constructivism theory including knowledge construction, active learning, social interaction and scaffolding. The following section identifies whether

VLEs (Virtual Learning Environments) can facilitate these social constructivism principles.

2.3 SOCIAL CONSTRUCTIVISM IN VIRTUAL LEARNING ENVIRONMENTS

If we accept social constructivism as a pedagogical framework, then we must understand the role of knowledge construction, active learning, social interaction and scaffolding in learning and how these social constructivist concepts inform pedagogy. This section considers how the social constructivist approach to assessment and learning can be practically embraced using a virtual learning environment (VLE). A VLE can be defined as 'a collection of integrated tools enabling the management of online learning, providing a delivery mechanism, student tracking, assessment and access to resources' (JISC, n.d. para 1). This section considers how VLEs can facilitate social constructivism principles of knowledge construction, active learning, social interaction and scaffolding.

2.3.1 KNOWLEDGE CONSTRUCTION

The potential for VLEs to support knowledge construction is well documented. For example, Grosseck (2009, p.479) suggests that wikis can be used for student projects to collaborate on ideas and organise documents and resources or blogs can be used by students to develop peer networks to develop their own knowledge. Van Soest et al (2000, p. 478) found that the use of online forums enhanced learning for students relating to cultural diversity and societal oppression and provided useful feedback for teachers regarding issues students struggled with. Fox and Mackeogh, (2010, p.121) found that, given the appropriate pedagogical design, students can develop effective ways of conducting online discussions which display evidence of engaging in higher-order learning (Fox and Mackeogh, 2010, p.121).

2.3.2 SOCIAL INTERACTION

The potential for VLEs to facilitate social interaction is well documented. For example, VLEs allow students to collaborate, and to share (exchange) online information

(Grosseck, 2009, p.481). In addition, there is a strong potential for VLEs to build communities of learning. For example, Clarke and Abbott (2008, p. 179) show evidence of online learning in a teaching practice programme facilitating communities of practice in terms of the essential components of such communities as defined by Wenger's domain, community and practice (Wenger 1998). Reingold, Rimor and Kala (2008, p. 147) show that instructors can provide scaffolding to learners working on a common task and that this facilitates a community of learners.

2.3.3 ACTIVE LEARNING

The potential for Moodle to support active learning is well documented. Salmon (2002) describes various E-tivities that are frameworks for enabling active and participative online learning by individuals and groups. For example, VLEs allow student to get involved actively in creating content (Grosseck 2009, p.481). Boulos et al (2006, para. 3) suggest that If effectively deployed, wikis, blogs and podcasts could offer a way to enhance students' learning experiences and deepen levels of learners' engagement within digital learning environments.

2.3.4 SCAFFOLDING

The potential for VLEs to facilitate scaffolding is evidenced in the literature. Indeed, Garrison (2011, p.60, p.96) considers that effective learning support is important for providing scaffolding in an online learning environment. For example, Reingold, Rimor and Kala (2008, p.147) provide evidence to support the relationship between instructor's scaffolding (especially feedback and support) and students' reflective and metacognitive processes in an online environment. Jumaat et al (2014, p. 75-76) extracts this concept of scaffolding to an online environment and identifies four progressive levels of scaffolding that can be used and these are outlined in Table 2.1. The next section identifies if Moodle, a VLE explicitly modelled on social constructivist theory, can facilitate the social constructivism principles of knowledge construction, active learning, social interaction and scaffolding.

Table 2.1: Levels of scaffolding

Conceptual scaffolding:	Helps students decide what to consider in learning and guide them to key concepts
Procedural scaffolding:	Helps students use appropriate tools and resources effectively
Strategic scaffolding:	Helps students find alternative strategies and methods to solve complex problems
Metacognitive scaffolding:	Prompts students to think about what they are learning throughout the process and assists students reflecting on what they have learnt (self-assessment).

Source: Jumaat et al (2014, p. 75-76)

2.4 SOCIAL CONSTRUCTIVISM AND MOODLE

This section discusses the four principles of social constructivism; knowledge construction, active learning, social interaction and scaffolding in an applied Moodle environment Dougiamas, the founder of Moodle, outlines some Moodle functions which are based around his interpretation of social constructivism (2013, Section 4) and these are outlined in Table 2.2.

First, a central theme of social constructivism is that learners construct new knowledge using their current knowledge. Dougiamas (1998, para. 54) interprets this as students coming to class with an established world-view, formed by years of prior experience and learning and that even as it evolves, a student's world-view filters all experiences and affects their interpretation of observations. In addition, Dougiamas (2013, Section 4) suggests that by understanding the contexts of others, we can teach in a more transformational way. Table 2.2 outlines some functions in Moodle that can facilitate such an approach. For example, individual blogs allow people to express things in a public but reflective way.

Table 2.2: Moodle supporting social constructivism in learning and teaching

Social constructivism principle	Moodle application of principle
Learners construct new knowledge using their current knowledge.	Provide a passive unfaciltated forum Facilitate and guide forum entries Get students to Blog on issues Use survey module to study and reflect on course activity Get students to upload assignments Provide RSS feeds
Learning is an active process.	Message students Facilitate and guide active managed forums, Provide quizzes Get students to upload assignments Provide feedback on uploaded assignments on moodle Use wikis Use glossaries Use databases Use roles implementation
Knowledge is constructed through interaction with others.	Upload notes and readings Use wikis Use glossaries Use databases Use rubrics in moodle Facilitate forums Use peer-review modules like Workshop Use chats rooms for students to meet and exchange ideas
Scaffolding, zone of proximal development.	Course structure Facilitate discussions in Forums, asking questions, guiding Use Badges Use conditionality: Combining activities into sequences, where results feed later activities.

Adapted from Dougiamas (2013)

Second, social constructivism proposes that learning is an active process. According to Dougiamas (2013, Section 4), Moodle facilitates this active learning in that many of the activities in Moodle are designed to allow students to control common content. For example, the roles implementation allows teachers to create new roles where students can be allowed to facilitate forums, create quiz questions or even control the course layout (Dougiamas, 2013, Section 4).

Third, social constructivism posits that knowledge is constructed through interaction with others. This theme is expressed by Dougiamas (2013, Section 4) when he proposes that we learn particularly well from the act of creating or expressing something for others to see and that we learn a lot by just observing the activity of our peers (Dougiamas, 2013, Section 4). Moodle facilitates such social interaction, for example, forums provide spaces for discussion and sharing of media and documents.

Fourth, pivotal to this notion that knowledge is constructed through interaction with others is the zone of proximal development (Vygotsky, 1978, p.84) and scaffolding (Brunner 1978, p.254). Moodle also provides functions to scaffold learning. For example, the lecturer can: use the course structure page to outline the module journey; post content and instructions online; use conditionality whereby students are only exposed to further information once a task has been completed; award badges whereby students can 'earn' badges and then move to the next stage and guide forums, where the more knowledgeable other guide forums in the construction of new knowledge by posing questions to push the debate forward. Therefore, it is argued that Moodle can theoretically facilitate social constructivism principles and this is shown in Figure 2.2.

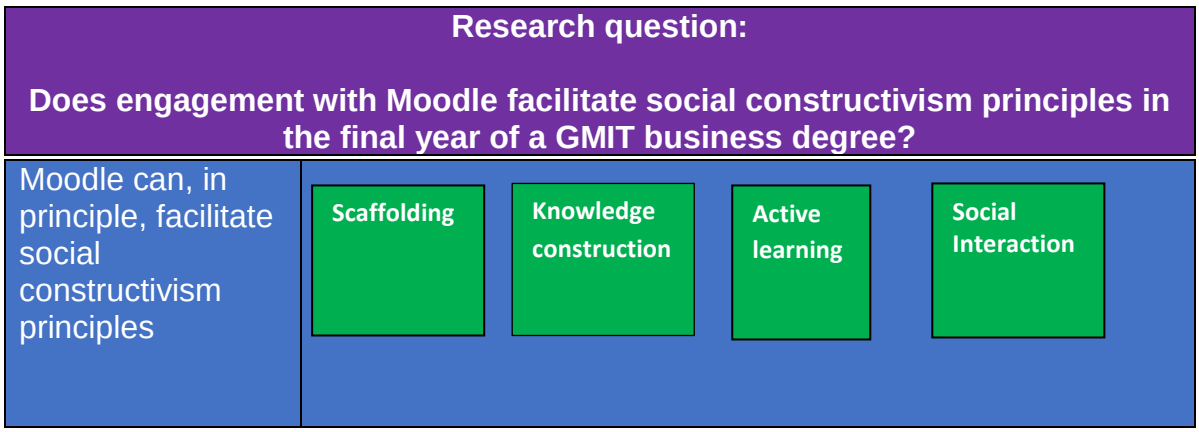


Figure 2.2: Moodle can theoretically facilitate social constructivism principles

2.5 CONCLUSION

This chapter provides some theoretical perspectives on the theory of social constructivism drawing on, inter alia, constructivist theorists such as Piaget and Bruner and social constructivist theorists such as Vygotsky. It distils social constructivist theory into four key principles which include knowledge construction, active learning, social interaction and scaffolding. The Chapter concludes, drawing on the literature, that Moodle can theoretically facilitate these four social constructivism principles. This study explores, in practice, how engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. Chapter Three describes and justifies the research methodology used to try to answer this research question.

CHAPTER THREE: RESEARCH METHODOLOGY AND METHODS

3.1 INTRODUCTION

This chapter describes and justifies the research methodology used to try to answer the research question, namely, how engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. The research methodology is based on a methodological framework, which draws on a number of research methodology frameworks including Saunders, 2003, p. 83; Creswell, 2009, p. 5; Scotland, 2012, p. 9; Cohen et al, 2011, p. 6 Trafford and Lesham, 2012, p. 95, and Ginty, 2014, p. 41. The chapter is divided into four sections. Section 3.2 considers the research methodology. Section 3.3 considers the research techniques and procedures. Section 3.4 considers the data analysis. Section 3.5 offers some concluding remarks.

3.2 RESEARCH METHODOLOGY

Figure 1.1 outlines the structure of this section which considers the research question, the underlying philosophical assumptions, the philosophical stance, the research strategy and the research choice.

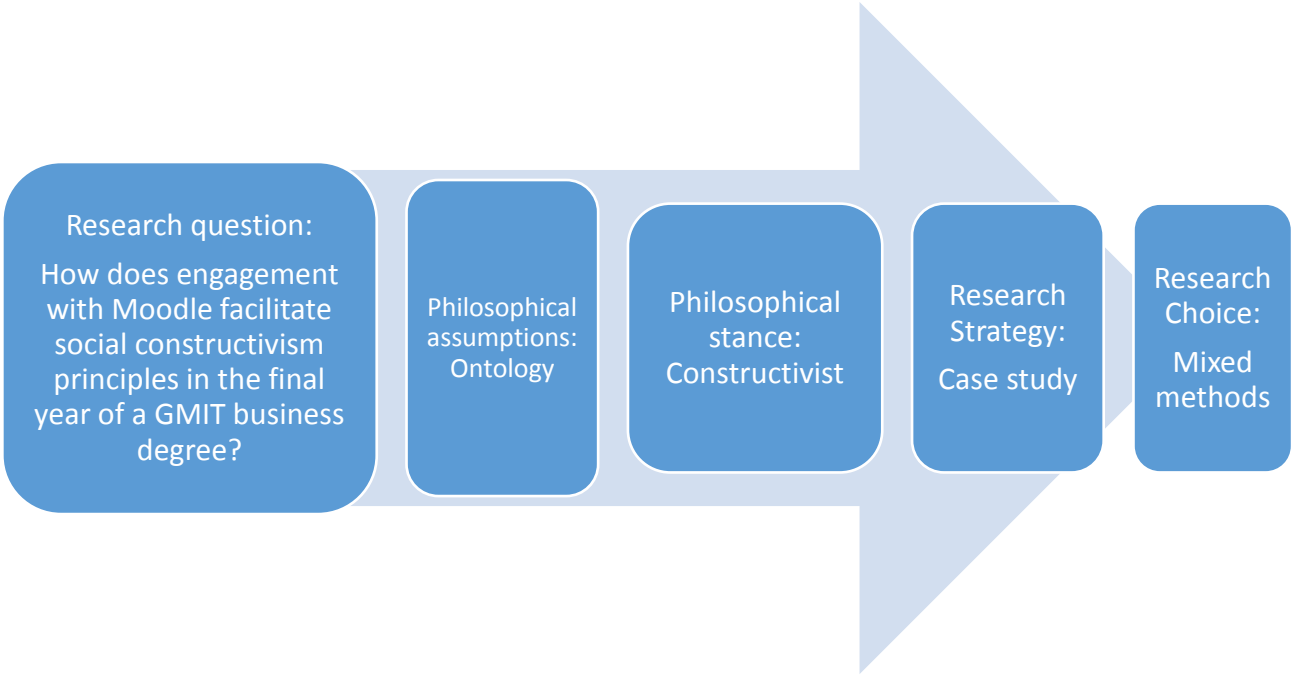


Figure 3.1 Research methodology

3.2.1 RESEARCH QUESTION

The main research question for is to explore if engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. The main objectives for this study are to:

- Abstract key principles from the overall social constructivist theoretical framework
- Identify if Moodle can theoretically facilitate these principles of scaffolding, knowledge construction, active learning and social interaction.
- Gauge whether engagement with Moodle facilitates these social constructivist principles in the final year of a GMIT business degree

3.2.2 PHILOSOPHICAL ASSUMPTIONS

The philosophical context for this research is determined by the research question and is ontological. Ontology concerns itself with what is the nature of reality and considers that reality is subjective and multiple (Yilmaz, 2013, p. 316). The research question of how engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree seeks to address what is the nature of reality with respect to Moodle use and the reality is subjective and multiple as seen by participants in the study.

3.2.3 PHILOSOPHICAL STANCE

The philosophical positions commonly agreed to work under an ontological worldview include objectivism and constructivism (University of Derby, n.d). Within this ontological tradition, I am adopting a constructivist as opposed to objectivist view. Objectivism is an ontological position that asserts that social phenomena and their meanings have an existence that is independent of social actors (Bryman, 2015, p.29). Constructivism asserts that knowledge is not an objective representation of nature but, rather, a linguistic creation that arises in the domain of social interchange (Guterman, 2006, p. xiii). The rationale for this choice is informed by the research question, which seeks to collect subjective participants' experiences and attitudes in the final year of a business degree on how engagement with Moodle facilitates social constructivism principles and then generate meanings from this social interchange.

3.2.4 RESEARCH STRATEGY: CASE STUDY

The research strategy chosen for this study is a case study. A case study approach is "an empirical inquiry that investigates a contemporary phenomenon (the 'case') in depth and within its real-world context" (Yin, 2014, p. 16). This approach has been chosen for two reasons. First, the case study research strategy is useful for testing whether a specific theory and model actually applies to phenomena in the real world (Iacono, 2011, p.58). The research question demands that I test how social constructivism theory actually applies to Moodle use within the real life context of the final year of a business degree in GMIT. Second, given that case studies recognise that context is a determinant of both causes and effects (Cohen et al, 2011, p. 289), this method aligns with the ontological constructivist philosophical stance adopted. For instance, case studies are studied in a real life setting and therefore can be aligned with an ontological philosophical assumption. In addition, Harrison et al (2017, Section 3) quoting Merriman (1998) outlines a constructivist approach to case study research, whereby the researcher assumes that reality is constructed intersubjectively through meanings and understandings developed socially and experientially.

Case studies have been criticised on the basis that they are not generalisable and that they may be prone to problems of observer bias (Flyvbjerg, 2006, p 219). First, with respect to generalisability, Cohen et al (2011, p. 294) quoting Yin (2009, p. 15) and Robson (2002, p.183) make a convincing argument that case studies opt for analytic rather that statistical generalisation. In analytical generalisation, the concern is not for a representative sample but its ability to contribute to the expansion and generalisation of theory that can help researchers to understand other similar cases (Cohen et al, 2011, p. 294).

Second, the nature of observer bias is explicitly acknowledged in this research and reflexive techniques regarding this bias is pivotal to credibility in this research process (Harrison et al, 2017, Section 4). I acknowledge how my interpretation of the data may flow from my own personal, cultural and historical experiences as an educator (Freeman, 2006, p. 492 and Creswell, 2009, p.8). In particular, I am an 'insider researcher', which is defined as those who choose to study a group to which they belong (Unler, 2012, p.1). I lecture in GMIT's School of Business and have

professional relationships with students and lecturers. There are some advantages to insider research given that the research takes place within my own work practice such as sensitivity to context (Yardley, 2017, p, 295) and 'social situatedness' (Vygotsky, 1996, p.55). In addition, there is relative ease of access to participants. However, conducting insider research has implications for how I conduct research and how I interpret the data. Both the research participants and I have preconceptions about one another given our shared history and this must be acknowledged. For example, while acknowledging my own preconceptions on Moodle as an effective platform to facilitate social constructivism principles, I opted not to publicise this view and sought to chair rather than to contribute to the focus groups in line with Mercer (2007, p.13). This explicit acknowledgement of my bias aligns with the ontological constructivist philosophical assumptions underpinning this research. Indeed, Scotland (2012, p. 9) argues that researchers need to take a position regarding their perceptions of how things really are and of how things really work in this philosophical tradition (Scotland, 2012, p. 9).

3.2.4 RESEARCH CHOICE: MIXED METHODS

The research choice adopted for this case study is mixed methods. Mixed method research involves collecting, analysing and interpreting quantitative and qualitative data in a single study that investigate the same underlying phenomenon (Leech and Onwuegbuzie, 2009, p. 265). It is an approach that denounces the elevation of quantitative over qualitative methods and instead champions a mixed method approach (Burke Johnson et al, 2007, p. 129). This method has gained increased traction and currency in research methods, especially in education (Cohen et al, 2011, p. 21-26).

This approach has been chosen for a number of reasons. First, the research question should drive the methods (Thompson, 2007, p. 170). My research question is: how does engagement with Moodle facilitate social constructivism principles in the final year of a GMIT business degree? It is believed that in attempt to try to answer such a 'what and how' question, that both quantitative and qualitative data are required. As Tashakkori (2007, p. 207) puts it 'a strong mixed methods study starts with a strong mixed methods question'. Second, linking methodology to methods, the mixed method

approach aligns itself with my ontological constructivist view. Constructivism values multiple realities that people have in their minds and to acquire valid and reliable multiple and diverse realities, multiple methods of searching or gathering data are in order (Golafshani, 2003, p. 604). Third, case studies are a prototypical instance of mixed methods research as case studies recognise and accept that there are many variables operating in a single case, and hence, to catch the implications of these variables usually requires more than one tool for data collection (Yin 1984, p. 23; Cohen et al, 2011, p. 289). Fourth, a mixed method approach facilitates cross checking of data (Flyvbjerg, 2006, p. 219) which, in this case, promotes the richness of analysis rather than seeking consensus from different data sources (Freeman, 2006, p. 492).

3.3 TECHNIQUES AND PROCEDURES

This section explains the techniques and procedures involved in collecting the data for this mixed methods case study. Figure 3.1 outlines the methodological approach used in part three and is informed by the concept of validity as outlined in the literature. Validity is the extent to which any measuring instrument measures what it is intended to measure and is an important indication of whether a test will be useful (Sage, 2005, p.1171).

In terms of increasing the validity of a case study approach, Yin (2009, p. 41, 122-4) calls for a 'chain of evidence' to be provided such that an external researcher could track through every step of the case study from its inception to its research questions, design, data sources, instrumentation and data collection. This echoes Yardley's (2017, p. 295) view that commitment to rigor, transparency and coherence are key to demonstrating the quality of qualitative research and Golafshani's (2003 p. 604) view that validity is conceptualised as trustworthiness, rigor and quality in a qualitative paradigm.

Even if a test is generally considered to be "valid," it might not be applicable to the particular group, behaviour, or situation you are trying to study (Sage, 2004, p. 1171). To increase validity from this perspective, piloting the instruments to see if they do produce useful data to answer the research question is considered to be important (Bolarinwa, 2015, p.195). The methodological approach illustrated in Figure 3.2 details

the stages employed which tries to account for validity concerns in a mixed method case study and provides the structure for this section.

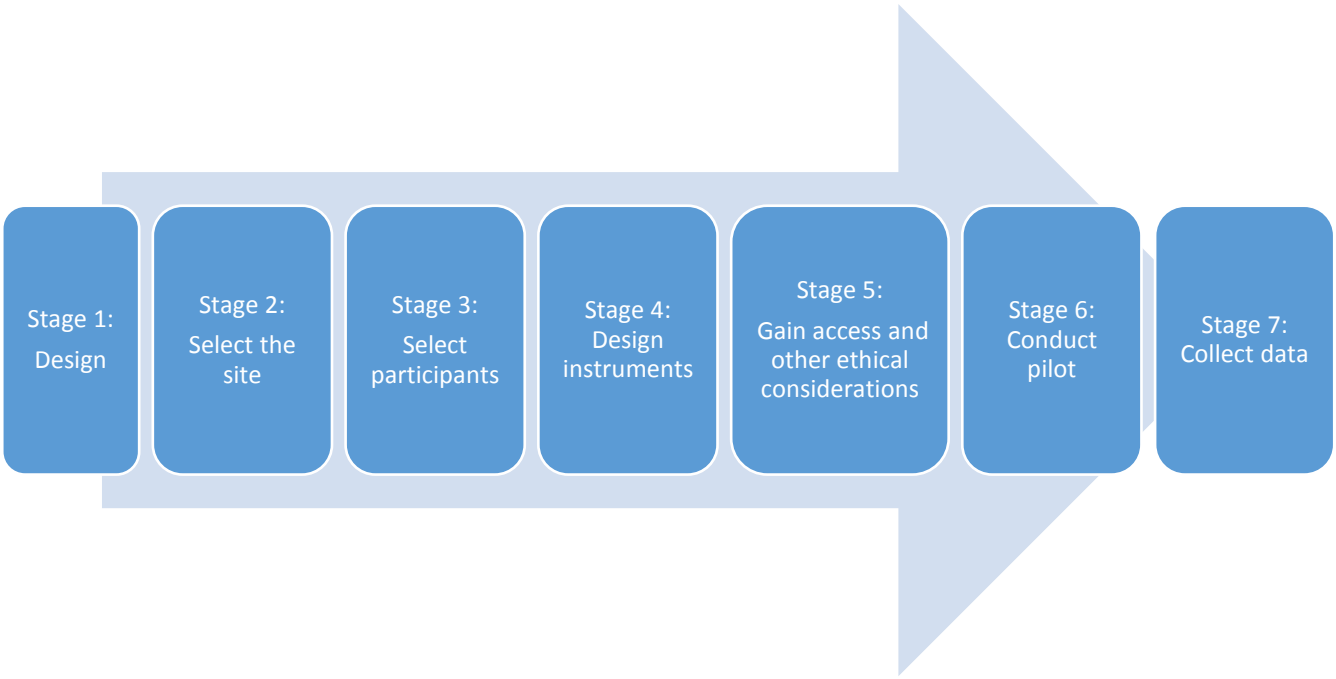


Figure 3.2: Research Techniques and Procedures

3.3.1 STAGE 1: DESIGN

This mixed methods study will address how engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. An explanatory sequential design model is used and this is shown in Figure 3.3. It is a type of design in which one type of data provides a basis for collection of another type of data (Cameron, 2009, p. 144).

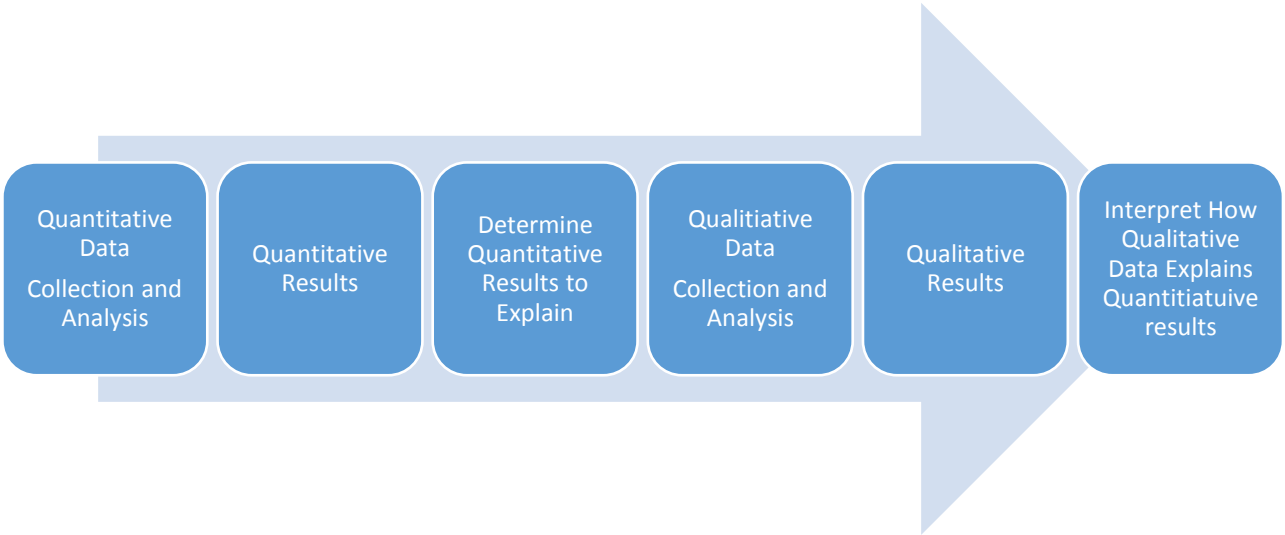


Figure 3.3: Explanatory Sequential Design, Source: Creswell, 2013, slide 40.

This design model was chosen for a number of reasons. First, it links with the constructivist philosophy underpinning the research, which suggests that I need different, and multiple perspectives. Second, the qualitative approach is used to explore and explain the quantitative results and attempt to gain an understanding of subjective experiences (Richardson & Alsup, 2015, p. 146). Equal priority was given to both the quantitative and qualitative data and both sets of data are integrated to provide an understanding of the case study.

3.3.2 STAGE 2: SELECTING THE SITE

The final year of a business degree in GMIT was chosen as the site for this mixed method case study as GMIT introduced Moodle in 2006 and all students on this programme use Moodle. In addition, I lecture in GMIT and have relative ease of access to participants.

3.3.3 STAGE 3: SELECTING THE PARTICIPANTS

In terms of quantitative and qualitative data collection, the participants include students and lecturers in the final year of a GMIT business degree in order to assess how engagement with Moodle facilitates social constructivism principles in this group. The final year of the programme was chosen for a number of reasons. First, students are familiar with this platform after four years' exposure to Moodle. Second, social constructivism generally facilitates higher order thinking such as knowledge construction (Amineh and Asl, 2015, p.14) which is more likely to be evident in the final year of a programme. Third, focusing on both lecturers and students engaged in the same programme will enable the levels of congruence or disjunction between the responses of the two subgroups to be charted (Cohen et al, 2011, p. 140).

The sampling procedure for both quantitative and qualitative data collection was purposeful stratified sampling. Purposeful sampling is a technique widely used in qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources (Patten, 2002 quoted in Palinjas et al 2015, p. 533). This involves identifying and selecting a sample with knowledge and experience in a phenomenon of interest, in this case, final year business students and their lecturers. While this sampling approach seeks to address the research question, it is

not generalisable to the wider population. This links back to Cohens (Cohen, 2011, p.115, p.294) point in Section 3.2.4 that case studies opt for analytic rather that statistical generalisation.

Stratified sampling involves dividing the population into homogenous groups, each group containing subjects with similar characteristics (Cohen, 2011, p. 111). It is stratified in that both lecturers and students were surveyed to see how engagement with Moodle facilitates social constructivism principles from a student and lecturer perspective. In terms of the time horizon, the data was collected on a cross sectional basis rather than longitudinally due to the eight month time limitation for this thesis.

3.3.4 STAGE 4: DESIGING THE INSTRUMENTS

From the perspective of developing instruments that measure the application of social constructivism theory, Section 2.2 identified four principles including scaffolding, knowledge construction, active learning and social interaction. In order to investigate these four principles of social constructivism, I have used student and lecturers' surveys and focus groups as the data collection tools for this study.

These data collection tools were chosen for a number of reasons. First, such data collection tools align with the ontological constructivist philosophical stance underpinning the research methodology (Creswell, 2009, p.8). Second, such tools allow me to survey students and lecturers as two distinct user groups to gain both quantitative and qualitative data on how engagement with Moodle facilitates social constructivism principles. Third, such instruments permit the collection of both qualitative and quantitative data, which can be collected and analysed sequentially and then merged according to the explanatory sequential mixed methods design (Cameron, 2009, p. 144). A multi-module design or overall programme analysis was constructed in order to overcome the idiosyncratic aspects of individual modules.

3.3.4.1 QUANTITATIVE DATA: SURVEY

The survey is a commonly used technique in education research (Artino et all, 2014, p 463). In particular, surveys are considered a cost effective method of collecting data from a large number of people in a relatively standardised way (Strange et al, 2003,

p.337). This tool enabled me to target a large group of students (134 final year business students) and lecturers (20 lecturers) engaged in this group. The student survey can be found in Appendix 4 and the lecturer survey in appendix 6.

Garrison (2011, p.22-23), Carvalho et al (2011, p. 824), Dougiamas (2013, Section 4) and Jumaat et al (2014, p. 75-76) have been useful to code activity in a Moodle context from a social constructivism viewpoint. Their interpretations led me to construct a quantitative survey to assess how engagement with Moodle facilitates scaffolding, knowledge construction, active learning and social interaction. I grouped questions under these themes in a matrix design starting with scaffolding and ending with social interaction.

The questions use a Likert scale where participants are asked to agree or disagree with a statement which varies from ‘strongly agree’ to ‘strongly disagree’ or to rate how often they use a particular Moodle function with choices varying from ‘often’ to ‘never’. Ordinal response was scored using the scale (0= Strongly Disagree) to (5= Strongly Agree) and (Never = 0 to Often=5).

The same broad survey was used for both students and lecturers to ensure that the two groups perceived the same four broad principles, which allows me to identify convergence or divergence. The same questions were adapted to have meaning to that particular user group. Lecturers were asked three additional questions on what Moodle functions they use. For example, appendix 6 shows Q17 includes questions regarding scaffolding tools such as badges and conditionality, Q18 concerns social interaction tool such as wikis, managed forums and databases, Q19 considers active learning tools such as quizzes or roles. The student survey took five minutes to complete and the lecturer survey took six minutes to complete.

3.3.4.2 QUALTITATIVE DATA: FOCUS GROUPS

Focus groups are a form of group interview that capitalises on communication between research participants in order to generate data (Kitzinger, 1995, p.229). Focus groups as a data collection tool are aligned with the ontological constructivist philosophy underpinning this research and the nature of the mixed methods research question of how engagement with Moodle facilitates social constructivism principles.

The focus group strategy employed here is informed by Freeman (2006, p. 494) who, drawing on Kitzinger (1995, p.300), details a number of methodological characteristics of a focus group strategy in a constructivism tradition. First, the group membership is students in one group and lecturers in another and is pre-existing rather than random in that the people know and work closely with each other. This approach emphasises the situated nature of human interaction and any such knowledge construction (Freeman, 2006, p. 494). Second, there is a central role for interaction as a central analytical resource in focus groups and it is intrinsically valuable, not simply an efficient way of gathering data. (Freeman, 2006, p.494). Third, it is accepted that the findings from this focus group are not generalisable but instead offer useful conceptual insights and in depth understanding (Patton, 2002, p. 230; Freeman, 2006, p. 495). This relates to the analytic rather that statistical generalisation referred to in section 3.2.4 on the case study method and section 3.3.3 on purposeful sampling. In general, the focus groups were based around the four themes of knowledge construction, active learning, social interaction and scaffolding that discussed in section 2.2. In particular, the focus groups sought to explain and explore the survey results around these themes as per the exploratory sequential design employed.

3.3.5 STAGE 5: ETHICAL CONSIDERATIONS

Research involving human respondents raises ethical issues. Walton (n.d, para 1) suggests that there are three objectives involved in research ethics. The first is to protect human participants. The second is to ensure that research is conducted in a way that serves interests of individuals, groups and/or society as a whole. This echoes Yardley's (2017, p. 295) view that qualitative research should have impact and be important. The third is to examine specific research activities and projects for their ethical soundness, looking at issues such as the management of risk, protection of confidentiality and the process of informed consent.

These three objectives were used to reflect on the ethical considerations in this research study. First, I needed to protect the participants**.** In particular, while lecturing in GMIT helped me identify candidates for surveys and focus groups. I had to take a number of active steps to ensure that my role would not pressure students and colleagues to participate.

Regarding students, I lecture those students targeted for surveys and they may have felt pressured to participate given that power imbalance. To mitigate against this, I emailed the information and survey link to all students. The student information leaflet can be seen in appendix 1. The leaflet stresses that participation is voluntary and that they can withdraw at any time. I also read the information leaflet in a lecture and invited students to participate if they wished. I left the room for 10 minutes to ensure they would not feel pressured to partake. To validate that students understood their participation was voluntary they had to answer three questions in the affirmative at the beginning of the survey.

Regarding lecturers, lecturers were emailed the information and a survey link. The lecturers' information leaflet can be seen in appendix 2. I was aware that colleagues may feel pressured to participate given our working relationships and so stressed the voluntary and anonymous nature of participation both the email and survey. To validate that lecturers understood that participation was voluntary, they had to answer three questions in the affirmative at the beginning of the survey.

Given that I stressed that participation in the surveys was voluntary, there is the downside self-selection bias that results when survey respondents decide if they will participate in a survey and that those who choose to participate will not represent the entire target population (Sage, n.d). However, ethical concerns superseded this concern over self-selection bias.

Second, the research does serve the interests of the School of Business as it is hoped that the process of learning and reflecting on Moodle use should lead to recommendations on how Moodle can be harnessed to facilitate the social constructivism principles upon which it was founded.

Third, I prepared an ethical supporting paper that considered the ethical soundness of my research. The document considered issues such as protection of confidentiality and the process of informed consent and was given approval by the MA in Teaching and Learning Research Ethics Committee on the 3rd November 2017.

3.3.6 STAGE 6: CONDUCT THE PILOT

A pilot refers to a small-scale survey of a complete survey or a pre-test for a particular research instrument such as a survey (Janghorban, 2014, p. 1). The pilot stage allowed me to test the feasibility of the research and the usefulness of the instruments. This stage describes the piloting of the data collection tools that informs the design as per Figure 3.1.

In November 2017, I conducted a survey pilot with nine male and female final year business students, both male and female. I asked them to complete the survey and then discuss their feedback on the design. The discussion prompted a number of adjustments to my survey design. Some changes included the rephrasing of questions to ensure that students knew they were being asked about the programme in general and not just my module (e.g.: Q11 and Q12); making questions clearer by given them titles (e.g.: Q11, Q 12, Q13, Q14, Q15 and Q16); and removing questions that were unclear (e.g.: Q16). Appendix 3 shows the original and appendix 4 shows the revised student survey.

In November 2017, I conducted a pilot with three lecturers, one female and two males. I asked them to complete the survey and following this, I asked them to discuss their feedback. My review of the lecturers' survey pilot prompted a number of adjustments to my survey design. Regarding the Likert scale, participants were asked to agree or disagree with a statement and the feedback suggested I should include a 'not applicable' choice, which is not the same as 'undecided'. All questions in this category in both the student and lecturers survey were adjusted to show this option. The feedback also suggested I include a 'sometimes' option in questions, which sought to gauge frequency of use of Moodle functions (e.g.Q17, 18, 19 and 20). In addition, I added a question on 'How many years have you been lecturing for' (Q9). Appendix 5 shows the original and appendix 6 shows the revised lecturers survey.

3.3.7 STAGE 7: DATA COLLECTION

It is important to note the time and place in which the case study data is collected, as, many actions and events are context specific and are part of a 'thick description' and it will enable any replication research to be planned (Macpherson et al, 2009, p.56). The collection of quantitative data was conducted using a survey. The survey and accompanying information leaflet regarding the study was emailed to students and lecturers at the end of the first semester of the academic year. Those emailed included those participants who had previously taken part in the pilot. This time was chosen as participants had completed one full semester and are more likely to be able assess how engagement with Moodle facilitates social constructivism principles.

134 final year business students were emailed the information leaflet and a survey link and were invited to take part in the survey during lecture time. The surveys were accessed online through survey monkey. Most students took these surveys on their mobile devices in class. To increase participation, a further email was sent to students to re-invite them to complete the survey. In summary, 63% of final year students (n=84) volunteered to participate in the survey. Overall, there was a good gender balance, with 50% of respondents being male and 50% being female.

Lecturers were emailed the information leaflet and the link to the survey in December 2017. Take up on the lecturers' survey was slow initially with only 4 lecturers out of 20 lecturers partaking. To increase participation, I sent another email two days later and participation increased to 11. I sent a further email in mid-January 2018 and participation increased to 15 (75% of in lecturers). Overall, there was a good gender balance, with approximately half of respondents being male and half being female. Table 3.1 shows the numbers of students and lecturers who were invited and who participated.

Table 3.1: Number of student and lecturer participants in the survey

GMIT Site	Invited	Participants	Percentage taking part
Final year students	134	84	63%
Lecturers	20	15	75%

The collection of qualitative data was conducted using focus groups. As per the explanatory sequential design model employed, quantitative data was analysed from surveys of students and lecturers involved in the final year business programme. The quantitative results highlighted a number of areas that needed further explanation and these questions informed the themes brought to the student and lecturers focus groups. Appendix 7 and Appendix 8 detail the questions brought to the focus groups. The focus groups for both students and lecturers took place in January 2018. About 20% of the student and lecturer group were invited to take part in focus groups (students n=27 and lecturers, n=5) and 7 students and 5 lecturers agreed to participate.

3.4. DATA ANALYSIS

Quantitative and qualitative data was analysed sequentially and then merged according to the explanatory sequential mixed methods design employed. This section considers the research methodology employed in analysing the quantitative and qualitative data.

3.4.1 QUANTITATIVE DATA ANALYSIS

Quantitative data was collected electronically through an online survey software tool, Survey Monkey. Survey Monkey was chosen as it is licensed in GMIT and it provides anonymity to participants in keeping with ethical considerations. The survey data was then exported and analysed in Excel. Once the data had been stored it was necessary to transform the raw data into variables that produced meaning and then analyse these variables using excel analytical techniques. In particular, the student and lecturer survey findings were categorised under key themes, which enabled a comprehensive data analysis. These included knowledge construction, active learning, social interaction and scaffolding. Quantitative data was presented in bar charts or tables where appropriate.

3.4.2 QUALITATIVE DATA ANALYSIS

The qualitative data was collected during separate focus groups for students and lecturers. They focus groups were allocated one hour each and took place in the teaching and learning resource room in GMIT. The focus group dialogue was recorded

on a Samsung voice recorder and transcribed verbatim, which took seven hours. Participants were asked if they wished to see the transcription and all answered in the negative. Following transcription, both transcripts were saved as separate files and all participants were assigned a pseudonym.

The data was coded to break it down into smaller units of meaning. Stuckey (2015, p. 7) suggests that coding involves reading through the data and creating a storyline and then categorising the data into codes. I read the entire transcribed focus group output for both students and lecturers twice and then coded the data with key words while keeping my research question and sub questions in mind. I used codes that were predetermined arising from the four key social constructivism principles that emerged in section 2.2 and new codes that emerged as I was reading the transcript. I kept a data dictionary, which defined the meaning of codes to keep the data transparent and consistent. This can be seen in Appendix 9.

I then used the code to group words/sentences into key themes in two separate attempts with a one-week interval. In the second attempt, I ensured the codes accurately represented what was being expressed. I colour coded the various codes and counted their frequency. This assisted in the development of themes emerging from the students and lecturers including: leveraging Moodle to facilitate social constructivism in the classroom and barriers to Moodle facilitating social constructivism principles in the fourth year of a business degree in GMIT.

Chapter Four presents the findings from the data analysis. In order to identify participants in the focus group, each participant was assigned a pseudonym, identified as student or lecturer and each line of the transcripts was numbered. For example, Lily, Student, 4:185 signifies: Lily, a student in the final year programme of a GMIT business degree, page 4, line 185. Or Andrew, Lecturer, 1:34 signifies: Andrew, a lecturer in the in the final year programme of a GMIT business degree, page 1, line 34.

3.5 CONCLUSION

The most effective research strategy to answer the research question of whether engagement with Moodle facilitates social constructivism was deemed a case study approach. The case study approach allows an in-depth analysis of this issue, within its context with a view to understand the issue from the perspective of student and lecturer participants (Palinkas et al, 2015, section 3.2). A mixed methods research choice was chosen which allows for multiple sources of evidence for a comprehensive depth and breadth of inquiry. This chapter described the rationale for and detailed the case study research strategy and the mixed methods research choice adopted. The data collection tools chosen were surveys and focus groups of final year GMIT business degree students and their lecturers. This allowed both quantitative and qualitative data to be captured. The design and piloting of these data collection tools were described, with a particular focus on validity and ethical considerations. Chapter Four will explore the findings obtained as a result of the research methods and data analysis undertaken.

CHAPTER FOUR: RESEARCH FINDINGS AND ANALYSIS

4.1 INTRODUCTION

This chapter presents the findings from the data analysis to ascertain whether engagement with Moodle facilitates social constructivist principles in the final year of a GMIT business degree. Chapter Five will discuss the main themes arising from these findings. The explanatory sequential design model referred to in Figure 3.3 was used to analyse the findings and provides the framework for this Chapter, which is divided into five sections. Section 4.2 will present the quantitative results from the student and lecturer perspective on engagement with Moodle facilitating social constructivism principles. Section 4.3 will summarise the quantitative results and identify what findings need to be further explained. Section 4.4 will present the qualitative findings from the focus groups to provide an understanding of subjective student and lecturer experiences on engagement with Moodle facilitating social constructivism. Section 4.5 will interpret how the qualitative data explains the quantitative results. Section 4.6 will offer some concluding remarks.

4.2 QUANTITATIVE RESULTS

This section presents the quantitative results on whether engagement with Moodle facilitates social constructivism principles in this group. The findings are presented under the social constructivism principles that emerged in section 2.2 and include scaffolding, knowledge construction, active learning and social interaction

4.2.1 SCAFFOLDING

Scaffolding as a central theme of social constructivism occurs when the lecturer provides student assistance to the extent that the scaffolded individual can do the task in hand by himself (Amerian et al, 2014, p. 757). As described in Chapter Two, Jumaat et al (2014, p. 75-76) identifies four types of online scaffolding. These include conceptual scaffolding which helps students to decide what to consider in learning; procedural scaffolding which assists students in using available tools and resources, strategic scaffolding which suggests alternative ways to tackle problems in learning and metacognitive scaffolding which guides students on what to think during learning.

This section considers how engagement with Moodle facilitates the various levels of scaffolding in this group.

4.2.1.1 STUDENT PERSEPCTIVE

Students agreed that engagement with Moodle facilitates conceptual scaffolding to a strong degree. Figure 4.1 shows that 95% of students agreed or strongly agreed that Moodle helped them to find the information they needed. 80% of students agreed or strongly agreed that Moodle helped them to organise their study. 91% of students agreed or strongly agreed that Moodle helped them to keep up with their course work.

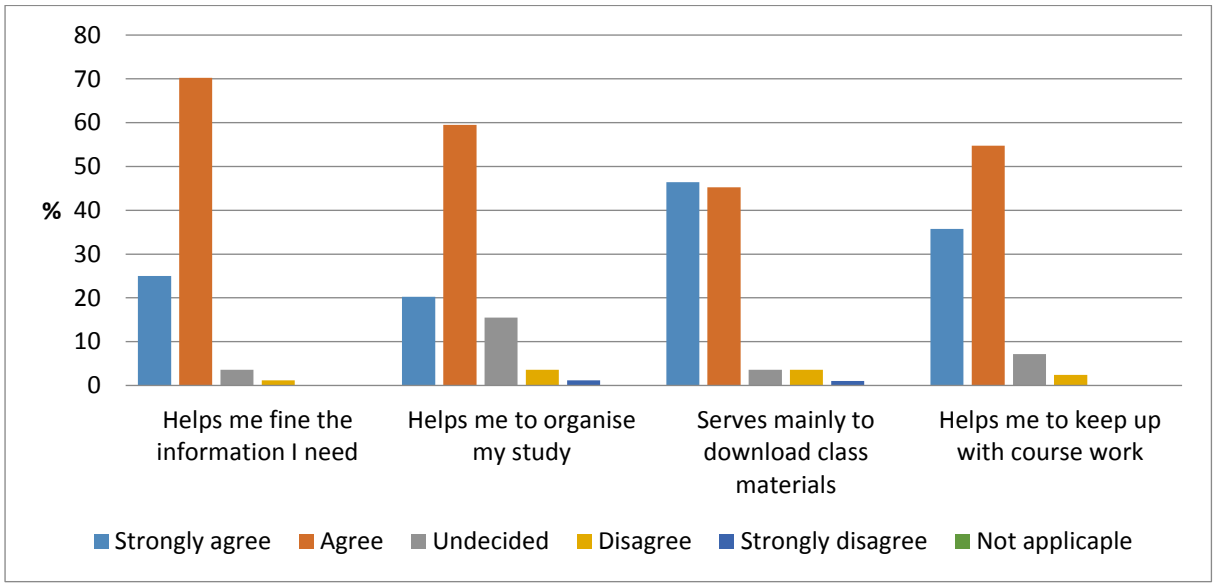


Figure 4.1: Moodle

Figure 4.2 shows that 87% of students agreed or strongly agreed that lectures used Moodle to clearly communicate module learning outcomes. 87% of students agreed or strongly agreed that lectures used Moodle to clearly communicate important module topics. 87% of students agreed or strongly agreed that lectures used Moodle to clearly communicate important dates/times for learning activities.

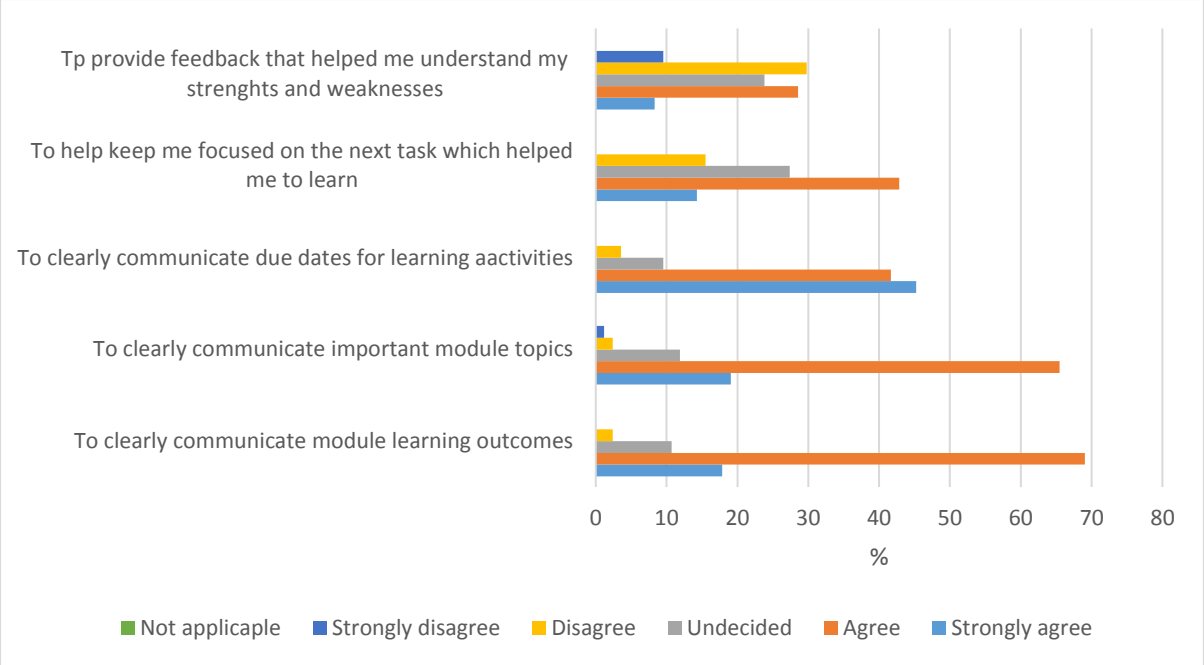


Figure 4.2: Academic support

However, Students did not agree that engagement with Moodle facilitates deeper levels of scaffolding. Figure 4.2 shows that 57% of students agreed or strongly agreed that lectures used Moodle to help them keep focused on the next task in a way that helped them to learn. Only 37% of students agreed or strongly agreed that lecturers used Moodle to provide feedback that helped them to understand their strengths and weaknesses.

4.2.1.2 LECTURER PERSPECTIVE

Lecturers agree that engagement with Moodle facilitates conceptual scaffolding. Figure 4.3 shows that 93% of lecturers agreed or strongly agreed that Moodle helped students to find the information they needed. 73% of lecturers agreed or strongly agreed that Moodle helped students to organise their study. 73% of lecturers agreed or strongly agreed that Moodle serves mainly for students to download class material. 80% of lecturers agreed or strongly agreed that Moodle helps students to keep up with the course work.

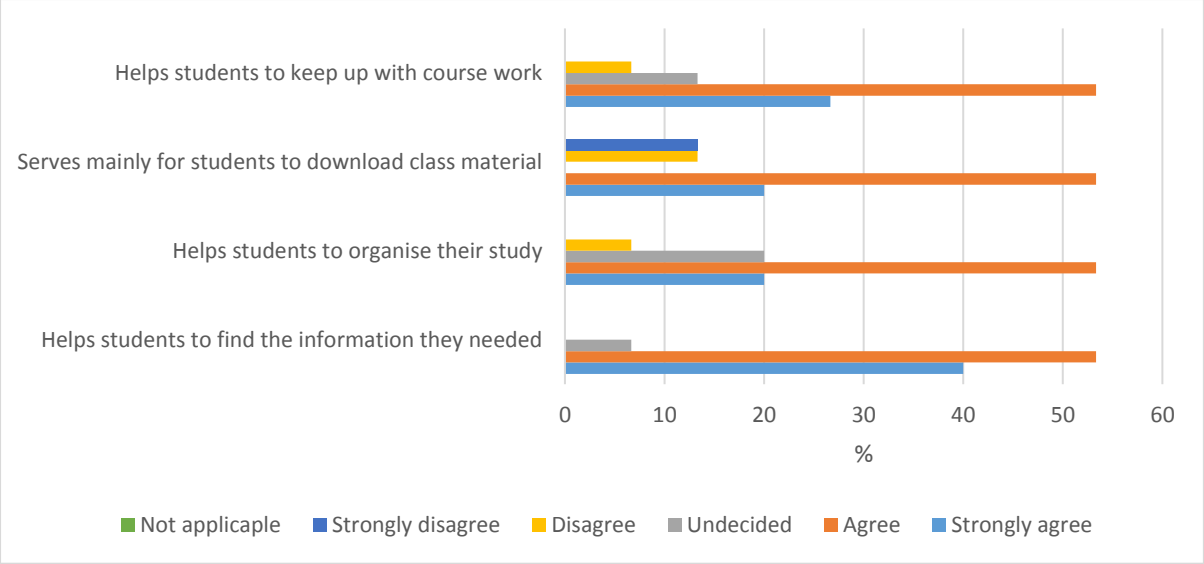


Figure 4.3: Academic Support: Moodle:

Figure 4.5 shows that 87% of lecturers agreed or strongly agreed that Moodle helped them to clearly communicate module learning outcomes. 93% of lecturers agreed or strongly agreed that Moodle helped them to clearly communicate important module topics. 100% of lecturers agreed or strongly agreed that Moodle helped them to clearly communicate and important due dates/times for learning activities, continuous assessment and examinations.

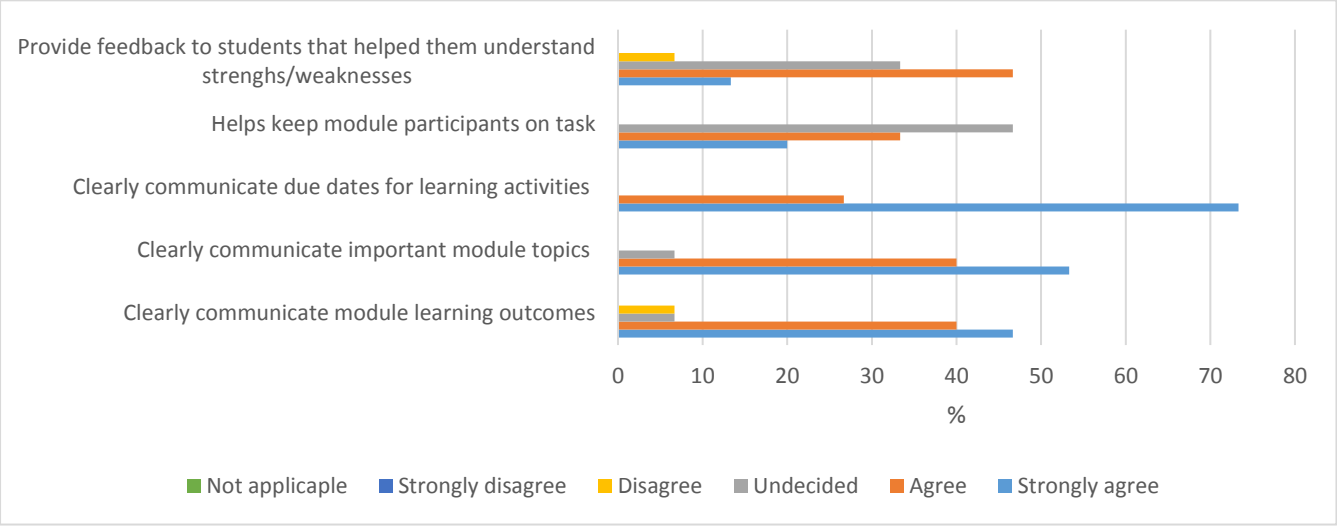


Figure 4.5: Moodle helped me to:

However, lecturers did not agree that engagement with Moodle facilitates deeper levels of scaffolding. Only 53% agreed or strongly agreed that Moodle helped keep students on task. In terms of functions used, Figure 4.6 shows that only 33% of

lecturers used Moodle often or very often to provide rubrics in Moodle to give feedback on assessments. 14% of lecturers used Moodle often to award badges for tasks completed. 13% of lecturers used Moodle often to facilitate conditionality whereby activities are combined into sequences where results feed later activities.

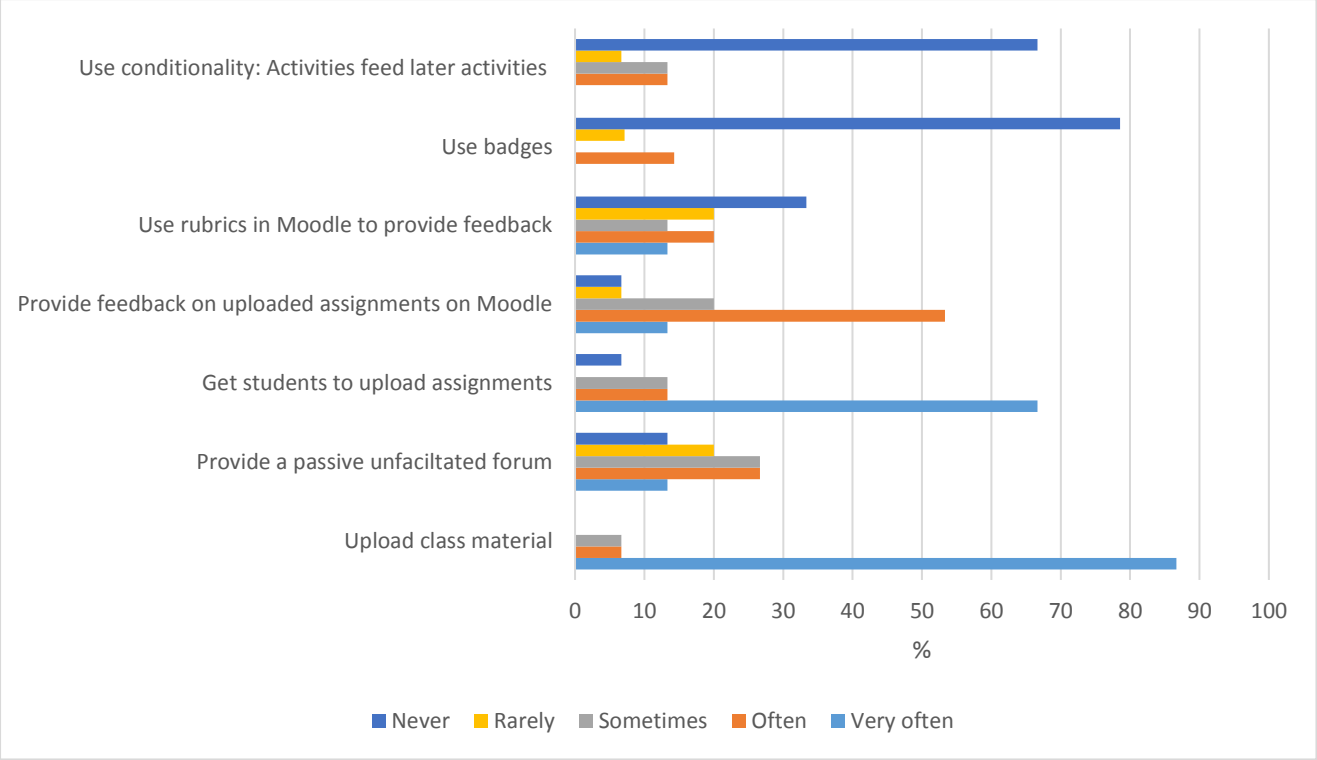


Figure 4.6: Frequency of lecturers' function use in Moodle

4.2.2 KNOWLEDGE CONSTRUCTION

Knowledge construction as a central theme of social constructivism suggests that "people learn best by actively constructing their own learning: students are presented with opportunities to build on prior knowledge and understanding in order to construct new knowledge and understanding" (Cole, 2009, p. 142). This section considers how engagement with Moodle facilitates knowledge construction in this group.

4.2.2.1 STUDENT PERSPECTIVE:

Students agree that engagement with Moodle facilitates knowledge construction. Figure 4.7 shows that 76% of students agreed or strongly agreed that lectures used Moodle to encourage module participants to explore new concepts in the module using external links. 76% of students agreed or strongly agreed that lectures used Moodle to help them reflect on module content and learning. However, only 34% of students

agreed or strongly agreed that online discussions in Moodle were valuable in helping them to appreciate different perspectives.

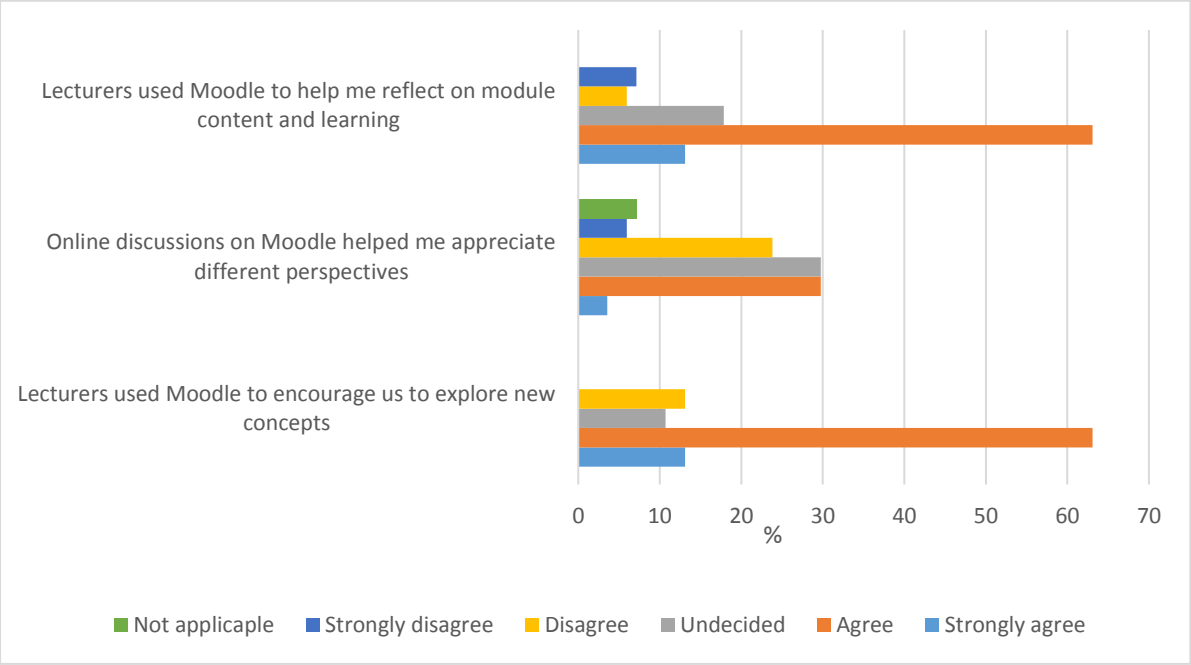


Figure 4.7: Knowledge construction

4.2.2.2 LECTURER PERSPECTIVE

Lecturers believed engagement with Moodle facilitates knowledge construction to a limited degree. Figure 4.8 shows that 40% of lecturers agreed or strongly agreed that Moodle helped them to encourage module participants to explore new concepts in the module using external links. Only 27% of lecturers agreed or strongly agreed that online discussions in Moodle were valuable in helping students to appreciate different perspectives. 53% of lecturers agreed that Moodle helped them to facilitate reflection on module content and learning. In addition, lecturers did not tend to use Moodle functions that would facilitate knowledge construction. For example, the percentage of lecturers who used the following functions often or very often include: 5% used wikis, 14% used databases, 0% used workshops, 7% used glossaries, 0% used peer review options like workshop and 14% facilitated and guided forums.

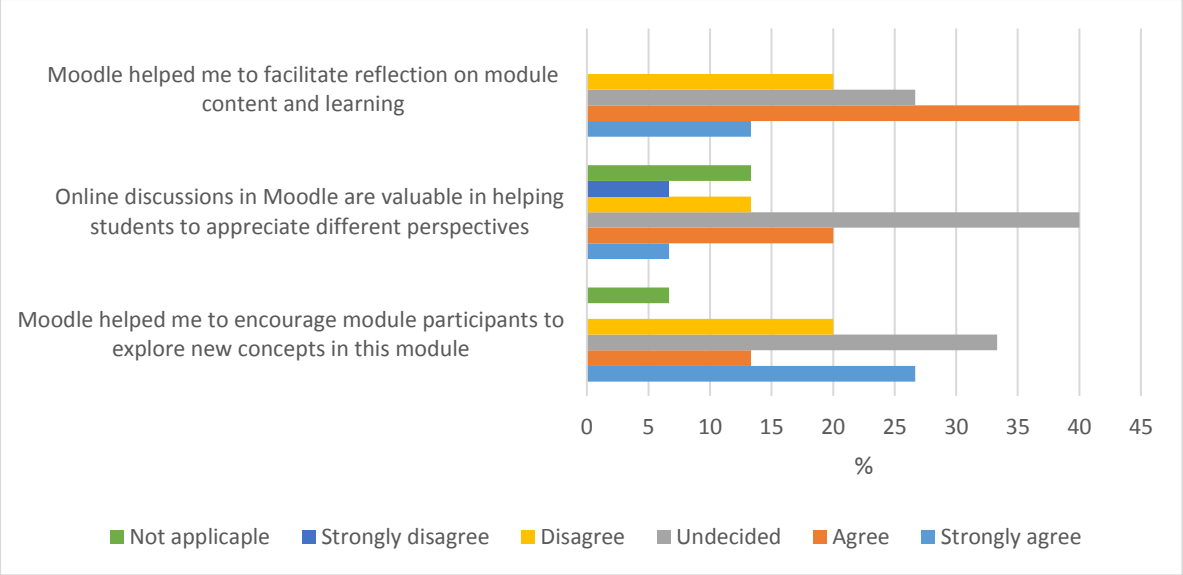


Figure 4.8: Knowledge construction

4.2.3 ACTIVE LEARNING

Active learning as a central theme of social constructivism suggests that people learn best by actively constructing their own learning (Harkness, 2009, p.248). This section considers how engagement with Moodle facilitates active learning in this group.

4.2.3.1 STUDENT PERSPECTIVE:

The findings suggest that engagement with Moodle facilitates active learning from a student perspective in the final year of a GMIT business degree to a limited degree. Figure 4.9 shows that only 51% of students agreed or strongly agreed that lectures used Moodle to help keep module participants engaged and participating in productive dialogue through forums. Only 43% of students agreed or strongly agreed that learning activities on Moodle made them feel curious and motivated to explore content related questions. Only 49% of students agreed or strongly agreed that learning activities on Moodle helped them construct explanations/solutions.

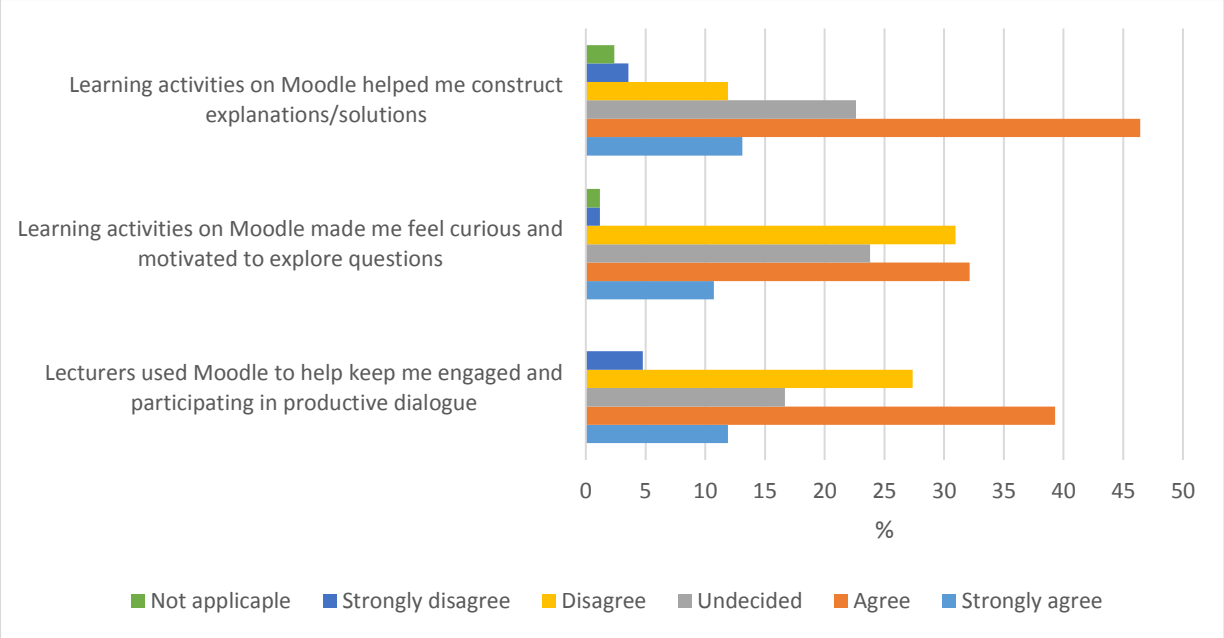


Figure 4.9: Active learning

4.2.3.2 LECTURER PERSPECTIVE

Figure 4.10 shows that there was mixed support as to whether Moodle facilitated active learning. 67% of lecturers agreed or strongly agreed that Moodle helped students engage in active learning. However, only 47% of lecturers agreed or strongly agreed that Moodle helped them to keep module participants engaged and participating in productive dialogue through forums or other Moodle functions. 21% of lecturers agreed or strongly agreed that learning activities on Moodle helped them to make students curious and motivated them to explore content related questions. 40% of lecturers agreed or strongly agreed that learning activities on Moodle helped them to get students to construct explanations/solutions.

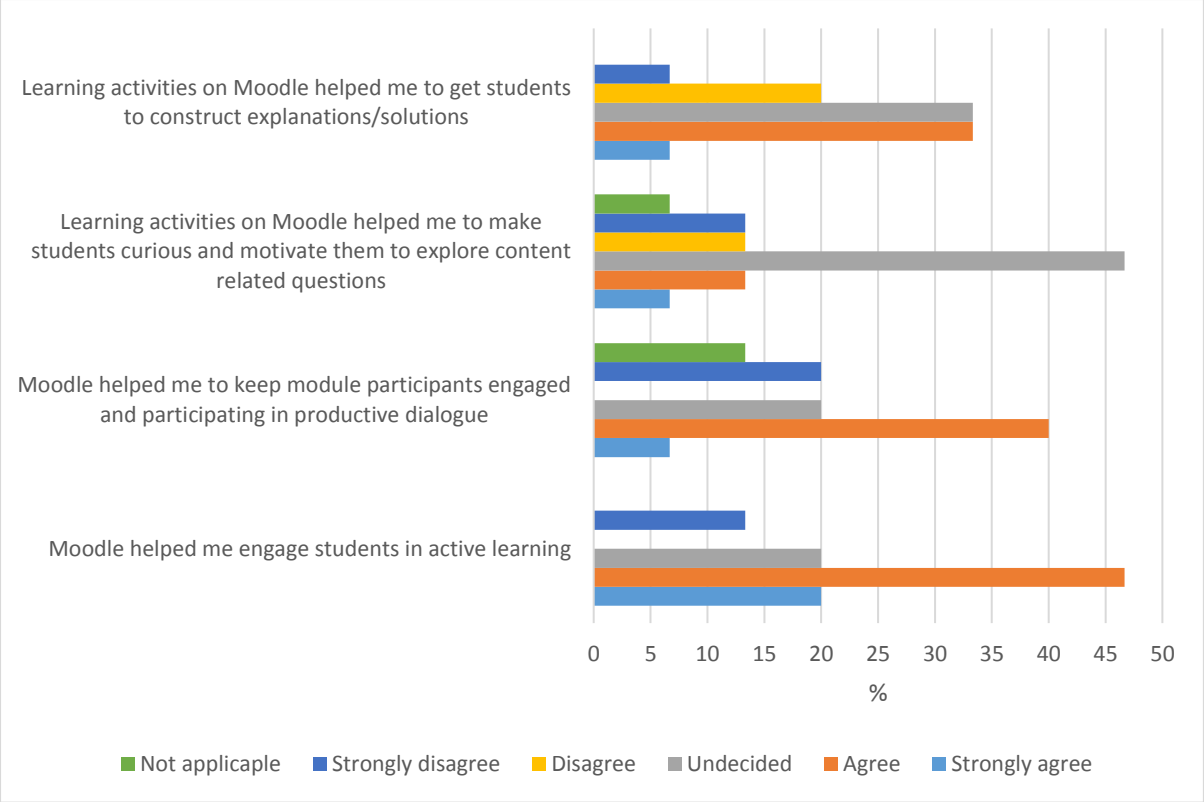


Figure 4.10: Active learning

Figure 4.11 shows that 50% of lecturers use quizzes on Moodle often or very often. 14% of lecturers use roles implementation often or very often.

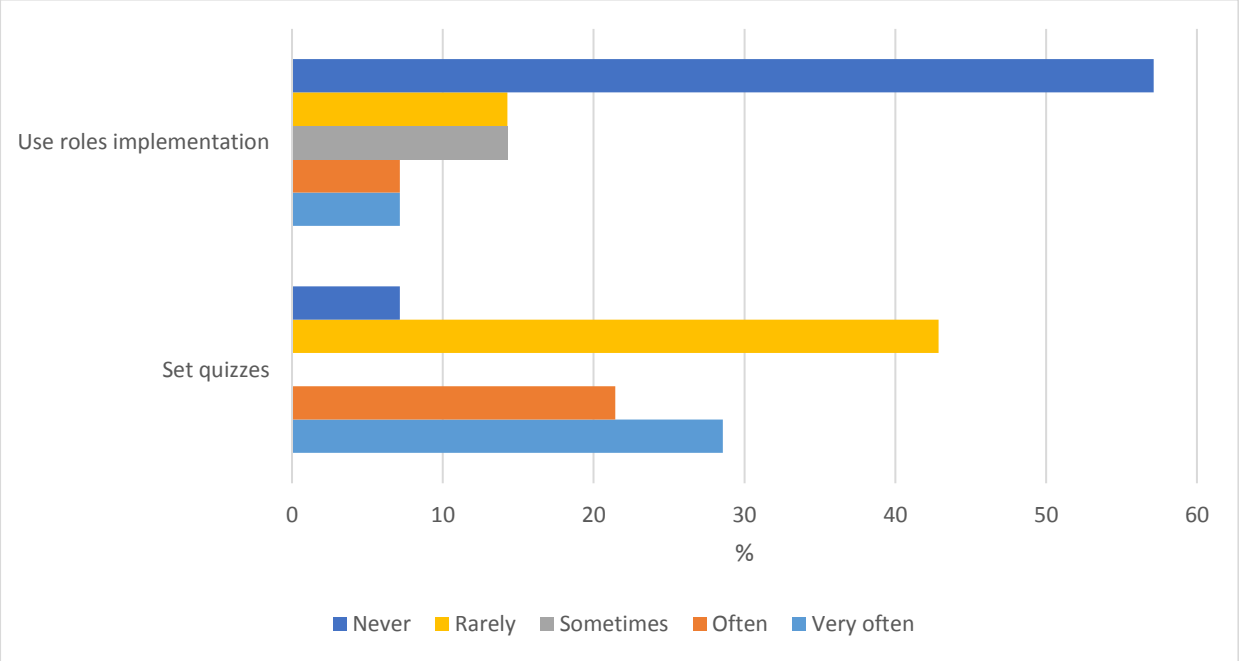


Figure 4.11: Active learning.

4.2.4 SOCIAL INTERACTION

Social interaction as a central theme of social constructivism believes that knowledge is constructed through interaction with others (McKinle, 2015, p.1). This section considers how engagement with Moodle facilitates social interaction in this group.

4.2.4.1 STUDENT PERSPECTIVE:

The findings suggest that engagement with Moodle facilitates social interaction from a student perspective in the final year of a GMIT business degree to a limited degree. Figure 4.12 shows that while 64% of students agreed or strongly agreed that using Moodle helps them communicate with lecturers, the other findings were less supportive of social interaction. Only 42% of students agreed or strongly agreed that using Moodle helps them with group work. Only 40% of students agreed or strongly agreed that using Moodle helps them to communicate with other class participants.

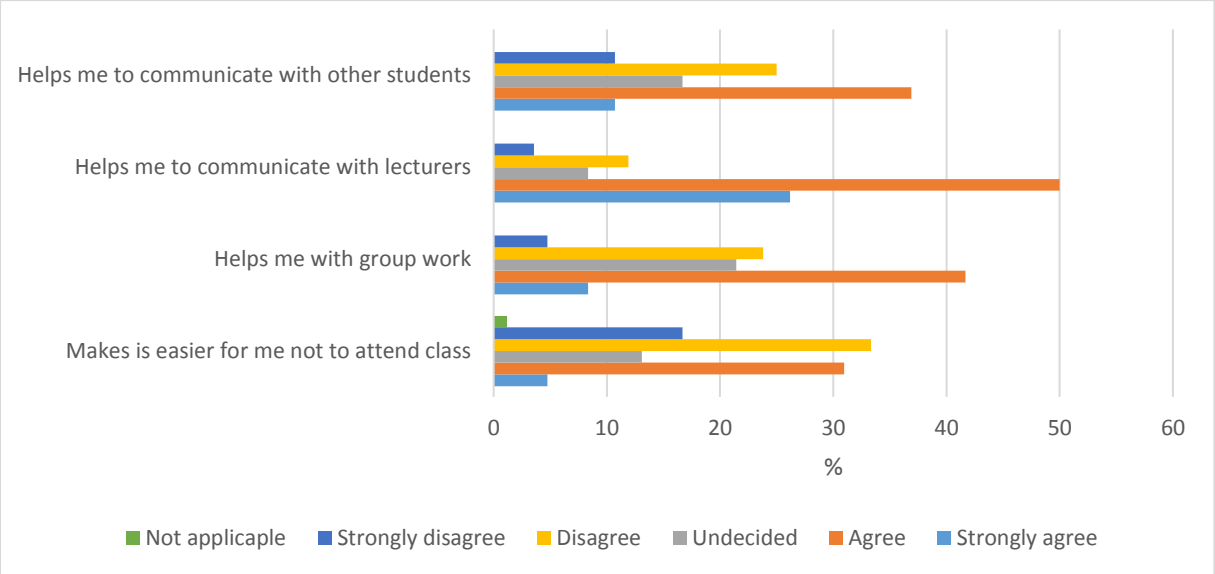


Figure 4.12: Social interaction

Figure 4.13 shows that only 23% of students agreed or strongly agreed that online discussions on Moodle helped them to develop a sense of collaboration with their group. Only 31% of students agreed or strongly agreed that lecturers used Moodle to reinforce the development of a sense of community among module participants. Only 18% of students agreed or strongly agreed that Moodle allowed them to get to know other module participants, which gave them a sense of belonging in the module. Only

21% of students agreed or strongly agreed that they were able to form distinct impressions of some module participants using Moodle.

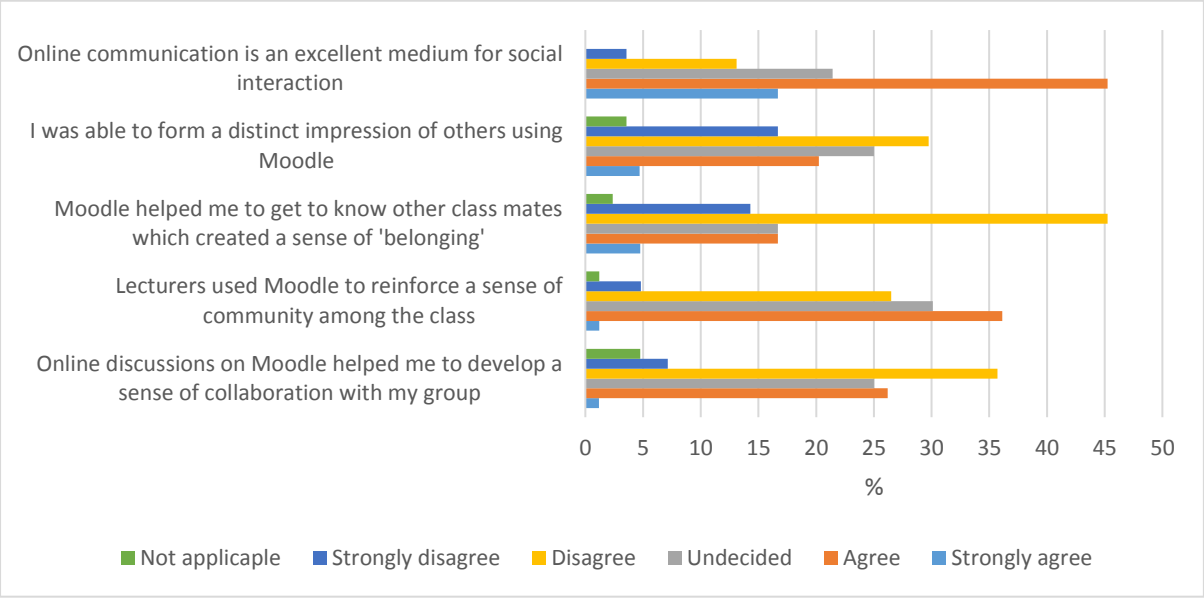


Figure 4.13: Social interaction

4.2.4.2 LECTURER PERSPECTIVE:

Lecturers did not believe that Moodle facilitates social interaction in the final year of a GMIT business degree to any great extent. Figure 4.14 shows that 33% of lecturers agreed or strongly agreed that Moodle facilitates students working in groups. 20% of lecturers agreed or strongly agreed that Moodle helps students communicate with each other. 40% of lecturers used Moodle often or very often provide to a passive unfacilitated forum.

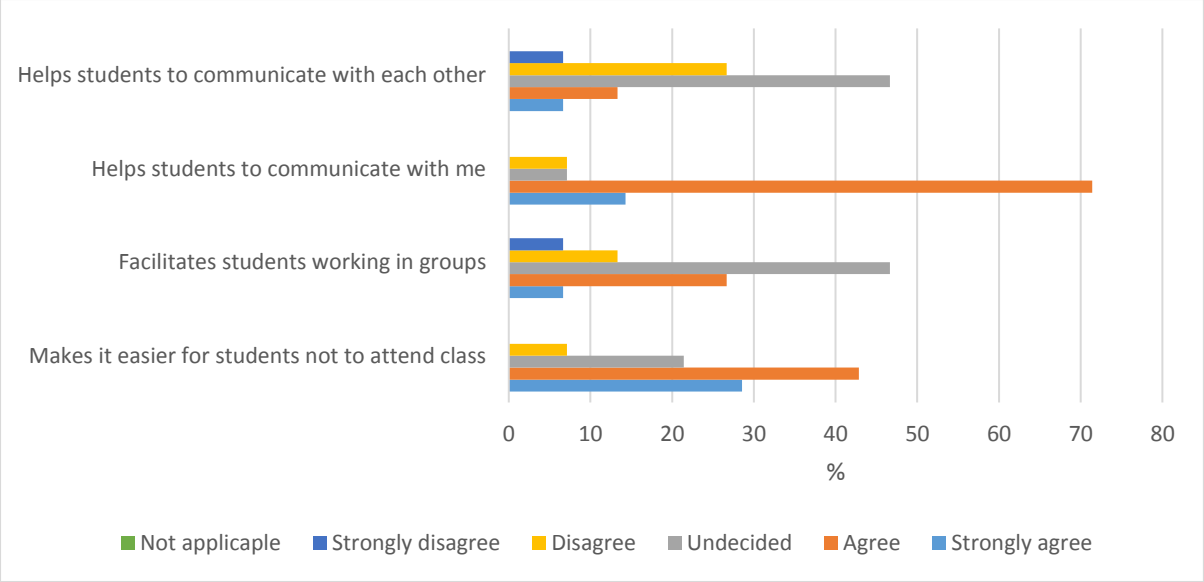


Figure 4.14: Social interaction

Figure 4.15 shows that 13% of lecturers agreed that online discussions in Moodle helped them to develop a sense of collaboration within the group. 20% of lecturers agreed that Moodle helped them to reinforce a sense of community among module participants. 20% of lecturers agreed or strongly agreed that Moodle allowed them to encourage students to get to know other module participants, which gave them a sense of belonging in the module. 0% of lecturers agreed that Moodle allows students to from distinct impressions on one another.

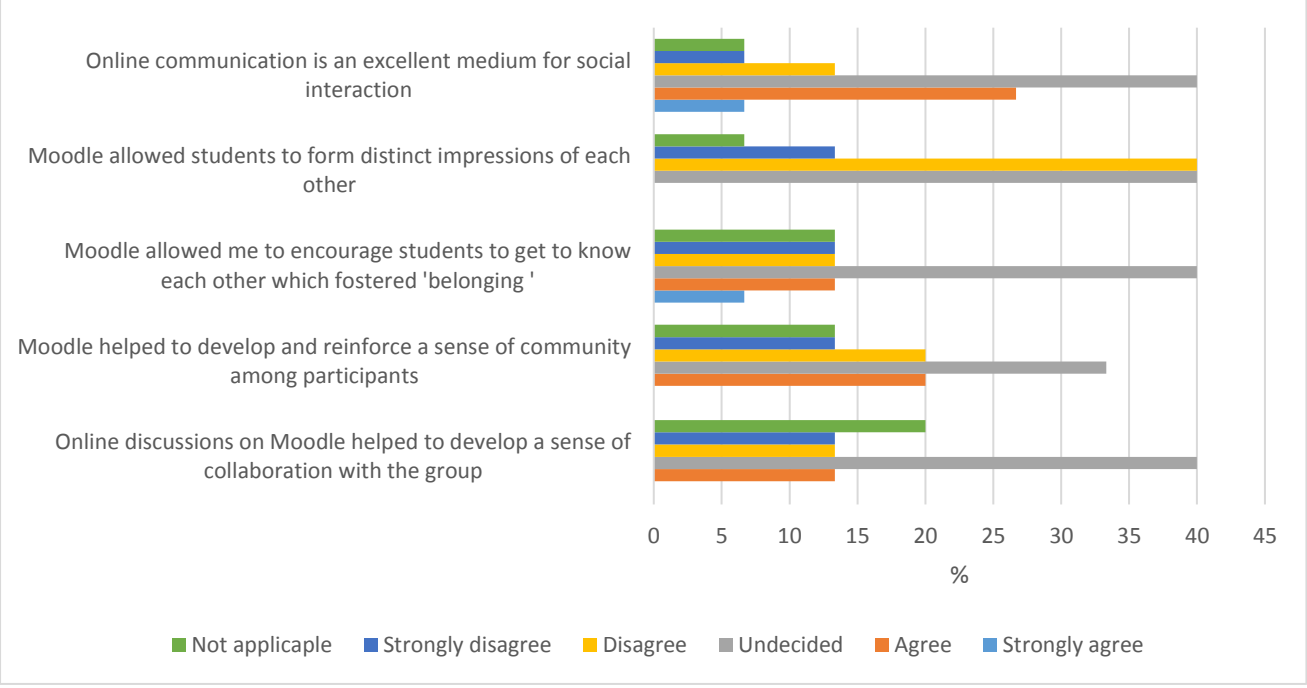


Figure 4.15: Social interaction

Figure 4.16 shows that while 87% of lecturers used Moodle often or very often, to message students, other forms of social interaction were not that apparent. 7% of lecturers used Moodle often to facilitate wikis. 13% of lecturers used Moodle often to facilitate glossaries. 20% of lecturers used Moodle often or very often to facilitate databases. 0% of lecturers used Moodle often or very often to facilitate peer review options like workshops. 20% of lecturers used Moodle very often to facilitate and guide forums.

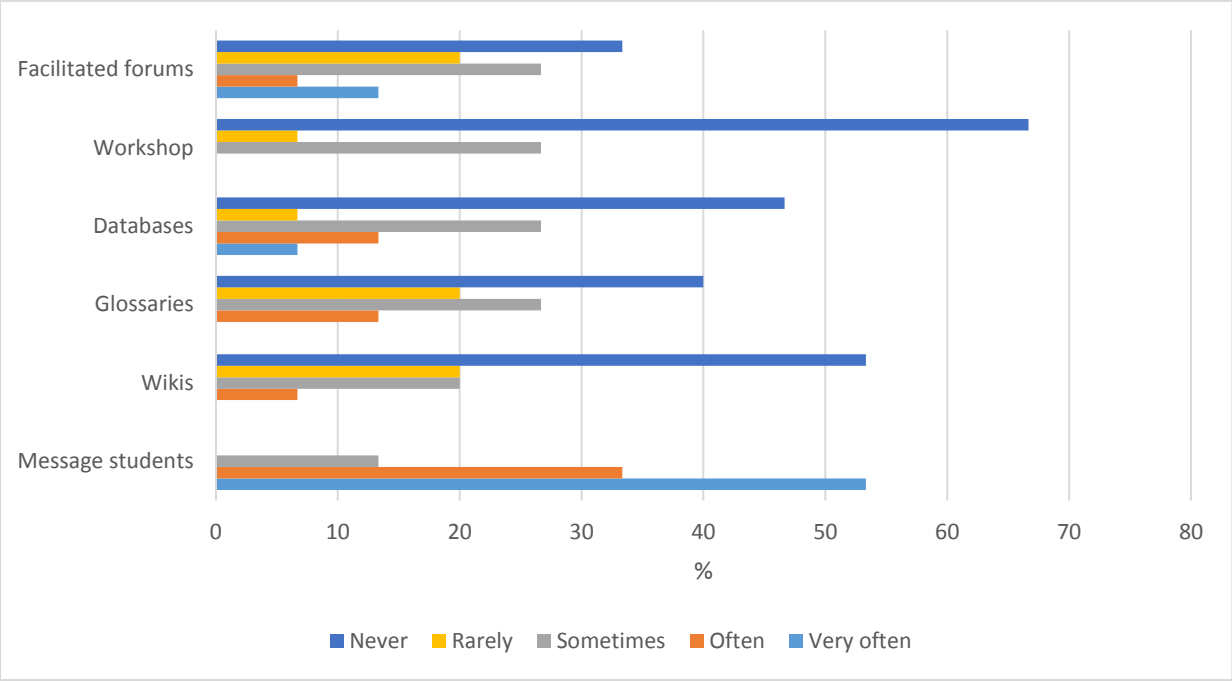


Figure 4.16: Social interaction

Students did not feel that Moodle had much of an impact on class attendance. For example, only 36% of students agreed or strongly agreed that Moodle made is easier for them not to attend class. 69% of lecturers agreed or strongly agreed that Moodle make it easier for students not to attend class.

4.3 SUMMARY QUANTITIATIVE FINDINGS

This section summarises the quantitative results and identifies what findings need to be further explained. Students and lecturers agreed that engagement with Moodle does not facilitate social constructivism principles such as social interaction or active learning. Students agreed that engagement with Moodle did facilitate knowledge construction but this was not echoed by lecturers. While students and lecturers agreed

that engagement with Moodle did facilitate conceptual scaffolding, they also agreed that it did not facilitate procedural, strategic or metacognitive scaffolding.

These quantitative findings are also mirrored in Table 4.1 which shows a summary of social constructivism principles mapped against lecturer usage of Moodle functionality as adapted from Dougiasmas (2013, Section 3) outlined in Table 2.2. Section 4.4 will present the qualitative findings from the focus groups and Section 4.5 will interpret how the qualitative data explains the quantitative results, and in particular, why engagement with Moodle does not facilitate social constructivism principles to any great extent in the final year of this GMIT business degree.

Table 4.1: Summary of quantitative data

Social constructivism principle	Lecturers used function facilitating social constructivism principle very often or often in fourth year of GMIT business degree	Yes /No
Knowledge construction:	Passive unfaciltated forum 40% Active and guided forum 20% Provide feedback on uploaded assignments 67%	No
Active learning:	Active and guided forum 20% Quizzes 50% Feedback on uploaded assignments 67% Wikis 7% Databases 20% Glossaries 13% Roles implementation 14%	No
Social interaction: .	Message students 87% Upload notes and readings 93% Wikis 7% Glossaries 13% Databases 20% Workshop (peer-review function) 0% Active and guided forum 20%	No
Conceptual scaffolding:	Communicate course structure and administration 87% Communicate module learning outcomes 87%: Communicate important module topics 84% Download class material 93%	Yes
Procedural scaffolding:	Badges 14% Conditionality 13% Rubrics 33%	No
Strategic scaffolding:	Active and guided forum 20% Provide feedback on uploaded assignments 67%	No
Metacognitive scaffolding:	Active and guided forum 20% Rubrics 33% Workshop (peer review function) 0%	No

4.4 QUALITATIVE FINDINGS

The focus groups provided multiple perspectives and increased understanding of subjective student and lecturer experiences on engagement with Moodle facilitating social constructivism. The focus groups corroborated the survey findings regarding Moodle facilitating conceptual scaffolding, which emerged as a significant theme. For example:

> With the learning outcomes at the beginning of the year, it goes through stages, what you expect to learn, so it keeps you on track during the semester.
>
> Frank, Student, 1: 4-6.

> When they put the rubric up, it's good to refer back to, especially if you're doing essays. I know with most exams, it's on a marking scheme so it keeps you on line.
>
> Jim, Student, 1: 14-16.

> Keeping them on task, I think just the way I lay it out and I reveal it section by section so that when they go on to Moodle, they know where they are on the syllabus.
>
> Debbie, Lecturer, 1: 23-24

Metacognitive scaffolding emerged as a significant theme for lecturers but not for students but it was skewed towards one lecturer who mentioned it four times. For example:

> I use Moodle to, I get them to watch a short video and then I get them to do questions on that video. Sometimes, I do a small case study and I get them to answer questions on that in a reflective journal on Moodle.
>
> Susan, Lecturer, 1: 8-12.

> I got them to do a forum where I got them to critically assess each other, I put a statement up and I want them to write 50 words or 60 words, a very quick comment on what that meant to you, looking at communication. Everybody had to write about that and someone else had to critically assess it, and say well actually I think that meant such and such a thing, and you had to show the two links.
>
> Susan, Lecturer, 8-9: 368-379.

The focus groups corroborated the survey findings regarding active learning and knowledge construction, which did not emerge as significant themes from student or

lecturers' perspectives. In addition, social interaction did not emerge as a significant theme from the student focus group and in fact, the opposite perspective came through. For example:

> It's just not very interactive, you go on and you download the slides and sometimes I wouldn't go on it again, I check my emails everyday but I wouldn't go back and check the course.
>
> Gail, Student, 3: 127-129.

However, social interaction did emerge as a significant theme from the lecturer focus group, although this was skewed towards two lecturers. For example:

> I use databases so I might give them an exercise in a tutorial and then ask them to input their output from that, into a data base, at some point over the next week or two and then everybody can see that. So, it could be a summary of a report or something.
>
> Debbie, Lecturer, 1-2: 44-48

> Well, it could be a group and one person puts up what they did [on a data base]. It is about seeing what other people are doing and seeing that other people are working and doing things. I find that useful, it gives them a jolt, they think I didn't think she was really serious about us actually reading this and summarising it. Brackets added.
>
> Debbie, Lecturer, 2, 56-60

> When they see people putting stuff up [using workshop], they sort of change their behaviour because just the very fact that it is happening, they don't have to have looked at another student's work, but they know other students work is going up and being shared. So, and that is one of the things we want them to do, to change their behaviour. Brackets added.
>
> Andrew, Lecturer, 2: 76-82.

4.5 QUALITATIVE FINDINGS EXPLAINING QUANITATIVE RESULTS

This section interprets how the qualitative data explains the quantitative results. In particular, the findings from the focus groups sought to find out why Moodle facilitated social constructivism principles to a limited extent in this group given that it is a VLE that is rooted in social constructivism. Two key themes emerged as significant in the focus groups, which help to explain why engagement with Moodle does not facilitate social constructivism principles, with the exception of conceptual scaffolding, in the final year of this GMIT business degree. Level 2 in Figure 4.17 shows the

predetermined themes arising from the four key social constructivism principles and their limited representation and the new themes that emerged from the data analysis. Qualitative findings are presented under these two new themes. Section 4.5.1 shows that lecturers prefer to leverage Moodle to facilitate social constructivism principles in the traditional classroom. Section 4.5.2 shows that there are a number of barriers to Moodle facilitating social constructivism.

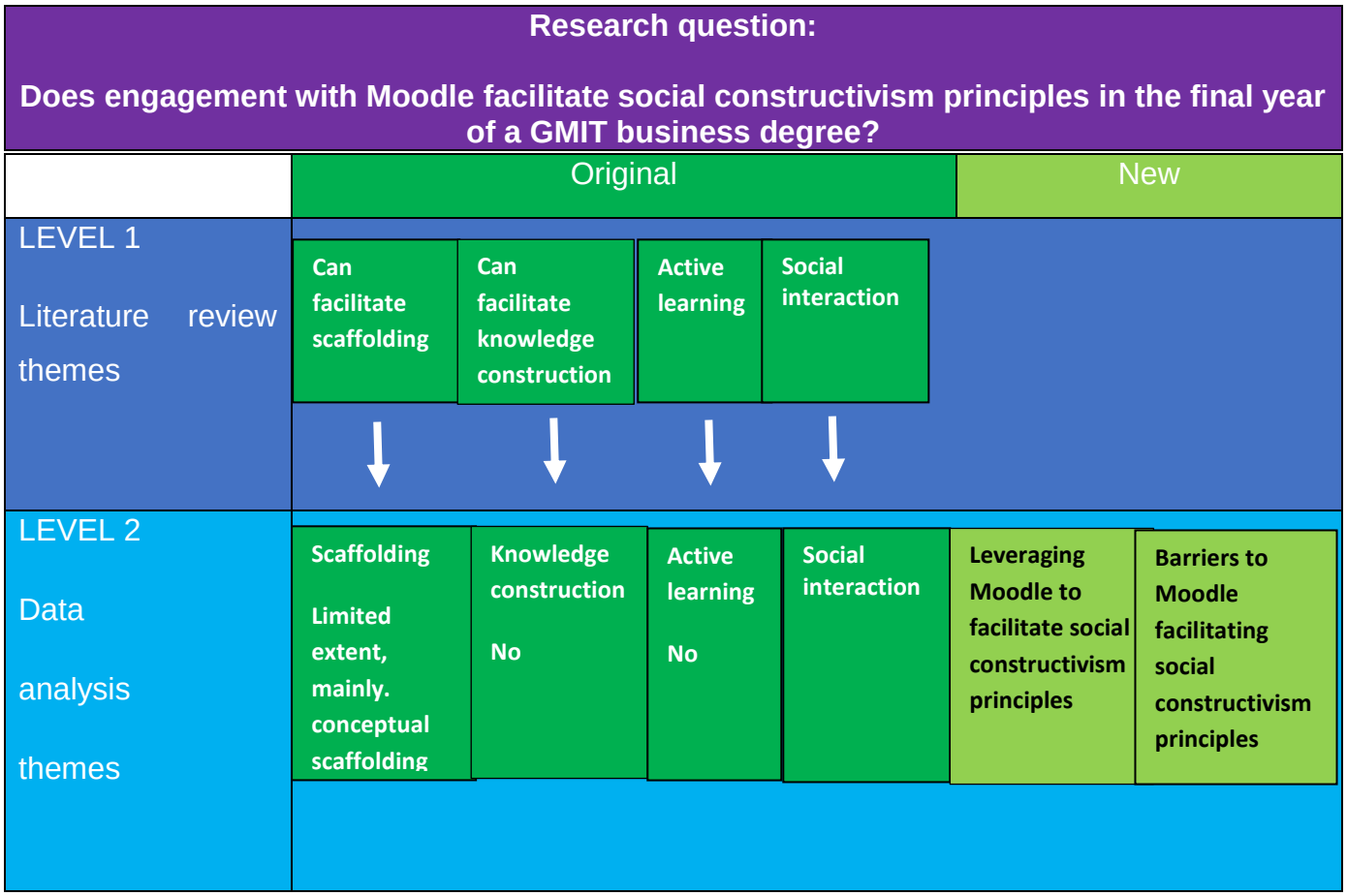


Figure 4.17: Research Findings Themes

4.5.1 LEVERAGING MOODLE TO FACILITATE SOCIAL CONSTRUCTIVISM PRINCIPLES IN THE CLASSROOM

This section considers how Moodle is leveraged to facilitate social constructivism principles in the classroom in the final year of a GMIT business degree from a lecturer perspective. In particular, it considers how Moodle is leveraged to facilitate scaffolding, knowledge construction, active learning and social interaction in the classroom.

4.5.1.1 ON FACIILITATING STRATEGIC SCAFFOLDING IN THE CLASSROOM

Lecturers reported (n=3) using Moodle tools in the classroom to strategically scaffold students to help them to find alternative strategies and methods to solve complex problems (Jumaat et al, 2014, p. 75-76). For example:

> I might do Monday homework for a Wednesday lab class and then Wednesday lab class I can see they're struggling with something so I just create another assignment and the answer to that assignment will take 15 minutes.
>
> Andrew, Lecturer, 4, 162-165.

> I do a sales plan, which is a big piece of work but I break it down and I give marks, 10%, 5%. I let them upload the first section, I don't mark it but I give them feedback or we could glance through it, and say this is a good piece of work because it does this piece of research, it's referenced, it's this and it's that,
>
> Elizabeth, Lecturer, 5, 203-208.

4.5.1.2 ON FACILITATING KNOWLEDGE CONSTRUCTION IN THE CLASSROOM

Lecturers reported (n=5) that Moodle was used to present students with opportunities to build on prior knowledge and understanding in order to construct new knowledge and understanding (Cole, 2009, p. 142) in the classroom setting. For example:

> If they see assignments getting talked about in class every week, you'll get participation rates up at least two thirds all the time. You wouldn't have half the class not turning up, because they can't, it's all done in class.
>
> Andrew, Lecturer, 4-5: 185-190.

> I would pop up a hypothetical good answer to a question in an exam and a bad one, and you can see them thinking, I'd be more over in the bad corner than the good corner.
>
> Elizabeth, Lecturer, 11: 489-491.

4.5.1.3 ON FACILITATING ACTIVE LEARNING IN THE CLASSROOM

Lecturers reported frequently (n=5) that Moodle facilitated them being more active in the classroom than they could otherwise be. For example:

> People talk about Moodle use as a repository, but if Moodle provides all the resources and the material and online activities and the students use it in a fairly passive sense, it enables you to be much more active in the classroom.
>
> Andrew, Lecturer, 7: 291-294.

> So every time they do something, the advantage, every single thing they do all year long is an exercise that is collected. So it's always on Moodle, so even though it's not marked, it's there, to be looked at and then usually I would pick one of the assignments out and I would go through that. Andrew, Lecturer, 4, 168-174.

4.5.1.4 ON FACILITATING SOCIAL INTERACTION IN THE CLASSROOM

Lecturers reported frequently (n=4) that Moodle was used to facilitate social interaction in the physical classroom. For example:

> I like the classroom, I use Moodle more as a resource, but if I can in the classroom, so a huge part is get the students talking, make them feel comfortable, getting them interacting, getting them presenting, if, if I can do that, that type of work in the classroom, if the numbers allow, I'd rather do it in the classroom.
>
> Elizabeth, Lecturer, 7: 284-289

> I say we're looking at Johns now, we go through his for 10 minutes and then afterwards, I say well, we will use that, I'll leave it up there and you can all look at it whether it's a brilliant one or a terrible one, either way.
>
> Andrew, Lecturer, 11: 502-505.

4.5.2 BARRIERS TO MOODLE FACILITATING SOCIAL CONSTRUCTIVISM PRINCIPLES

The quantitative analysis showed that Moodle was not used to facilitate social constructivism principles in the final year of a GMIT business degree to any great extent, the qualitative analysis helped to explain this observation. Barriers, defined here, as factors that create a barrier to using Moodle to facilitate social constructivism principles in the final year of a GMIT business degree, was a very frequent theme in both the student and lecturer focus groups. This section documents the barriers

reported and include technical issues, lack of time and training, availability of alternative technologies, social interaction more effective face to face and inhibitions.

4.5.2.1 TECHNICAL ISSUES

Lecturers displayed a willingness and an appetite to use Moodle but cited (n=3) technical issues as a barrier to using Moodle. For example:

> I have done wikis before, they're a little bit clunky, or it was when I used it in, but I haven't used it lately.
>
> Debbie, Lecturer, 1: 26-30.

> Now the workshop facility is quite awkward like the Wiki, it's a very clunky mechanism; it's very non-transparent in the way it works.
>
> Andrew, Lecturer, 3: 99-100.

> I used databases all the time, and I just switched last year because Moodle…there was another step added to it along the way, and I thought this is just going to take me forever with 160 in the class.
>
> Susan, Lecturer, 5: 226-231.

4.5.2.2 LACK OF TRAINING AND TIME

Lecturers showed a willingness to embrace new functions in Moodle that would facilitate social constructivism principles. However, they often cited (n=5) a lack of training and time as a barrier to using Moodle. For example:

> The difficulty is in knowing how to use all these things. You spend hours, like, when I used the Wiki; I probably spent a full week, 40 hours, at least, trying to figure it out because nobody knew how it worked.
>
> Debbie, Lecturer, 7: 295-299.

> I would love to use a Wiki but I don't have the time.
>
> Elizabeth, Lecturer, 7: 301-305

> It won't get replicated. Few people with a class of 100 will [get students to answer two questions per week in the journal function on Moodle and evaluate these answers]. Brackets added.
>
> Andrew, Lecturer, 6: 248-249.

I got them to do a forum where I got them to critically assess each other's comments…. I nearly killed myself with all the work I had to do.

Susan, Lecturer, 9:368, 379-380.

4.5.2.3 ALTERNATIVE TECHNOLOGIES:

The availability of other technologies with similar functionalities was a recurring theme in both the student (n=6) and staff (n=5) focus groups. This may because students prefer the familiarity of platforms they are already using socially or because alternative technologies are more user friendly. For example:

They might be more likely to ask somebody one on one, like in a Facebook message rather than put it public [on a Moodle forum] where everybody can see it. Brackets added.

Gail, Student, 4, 152-154.

A lecturer got us do a project using it all through google docs where we would upload all our stuff through that.

Frank, Student, 175-177.

I've told my groups to use google drives, because they're familiar enough with google drives and they can monitor each other, and they can send me a link.

Elizabeth, Lecturer, 7: 301-305

I got them to meet offline on google hangouts or some or some tool that they'd actually use, like zoom or something, and just meet outside but then write about meeting.

Susan, Lecturer, 10: 424-426.

They could be on a what's app group and they can just send loads of messages to each other so there are more convenient ways. Moodle has competition.

Elizabeth, Lecturer, 10: 429-431.

And as forums, I think the Facebook page, like every class has a Facebook page.

Debbie, Lecturer, 10: 433-434.

The lecturer did a quiz in class [with Kahoot]… so we did questions, and then you'd to answer it and we could see the answers coming in.

Joni, Student, 3: 110-115.

4.5.2.4 SOCIAL INTERACTION MORE EFFECTIVE FACE TO FACE:

Lecturers reported frequently (n=4) that the most effective forum for social interaction to support learning was face to face in a full time programme such as this one and that this displaced the need for social interaction on the Moodle platform. For example:

> Maybe they feel that they've had that discussion in class and there's no need to have it online.
>
> Jim, Student, 4, 149-150.

> There's a difficulty with Moodle forums in GMIT, where you are teaching students and you are meeting them three times a week, it's very hard to convince them to engage, actively online, because they are, sure, we're in class three times a week, and they're not going to get motivated, it's not an enabling technology for them.
>
> Andrew, Lecturer, 8: 337-342.

> When you think about it, I don't know about building the community on Moodle when you've got a full time course.
>
> Andrew, Lecturer, 11: 453-457.

> Two people, debating for, two more against, and they prefer the face to face debate, because it's actually more effective than a Moodle forum.
>
> Nicola, Lecturer, 8: 344-346

> I'd say it would be better for part time courses, for adult courses, for distance learning but if you are seeing them three times a week, there's probably no, no need.
>
> Elizabeth, Lecturer, 9: 393-395.

4.5.2.5 INHIBITIONS

Both students (n=2) and lecturers (n=3) alluded to inhibitions as a barrier to using Moodle for social interaction. For example:

> Maybe the lecturer seeing what you're putting up or discussing… they might feel they are asking the wrong questions.
>
> Frank, Student, 4, 148, 151
>
> I did a feedback thing to see how they felt about [forums], and most of them said they didn't want to look like a fool asking questions, so it was that they feel stupid.
>
> Susan, Lecturer, 8: 344-346

Table 4.2 shows the primary research question mapped to a summary of the overall quantitative and qualitative data (citing frequency of codes) findings. Four key themes emerge from the data: First, Moodle is not used to facilitate social constructivism principles such as knowledge construction, active learning or social interaction. Second, Moodle is used to facilitate conceptual scaffolding. Third, lecturers leverage Moodle to facilitate social constructivism principles in the classroom in this business final year degree. Fourth, there are a number of barriers to Moodle facilitating social constructivism principles in this group.

Table 4.2: Mapping of quantitative and qualitative data to research question.

Research Question: How does engagement with Moodle facilitate social constructivism principles in the final year of a GMIT business degree?					
		Students		Lecturers	
		Quantitative	Qualitative	Quantitative	Qualitative Frequency
Literature review theme	Conceptual scaffolding	**Yes**	**Yes** **9**	**Yes**	**No** **1**
Literature review theme	Procedural scaffolding	**No**	**No** **1**	**No**	**No** **2**
Literature review theme	Strategic scaffolding	**No**	**No** **2**	**No**	**No** **0**
Literature review theme	Metacognitive scaffolding	**No**	**No** **0**	**No**	**Yes** **5 (2 lecturers)**
Literature review theme	Knowledge construction	**Yes**	**No** **2**	**No**	**No** **2**
Literature review theme	Active learning	**No**	**No** **0**	**No**	**No** **3**
Literature review theme	Social interaction	**No**	**No** **0**	**No**	**Yes** **6 (2 lecturers)**
Data analysis theme - New	Leverage Moodle to facilitate social constructivism principles in the classroom				
Data analysis theme - New	Barriers to Moodle facilitating social constructivism principles				

4.6 CONCLUSION.

This chapter presented the key findings, which emerged, from the student and lecturer surveys and focus groups. The findings were presented according the explanatory sequential design model where the qualitative data was used to explain the quantitative data. The quantitative data showed that the Moodle was not used to

facilitate social constructivism principles in this final year GMIT business degree to any significant degree. The qualitative data helped to explain this and barriers to using Moodle emerged as a key theme. In addition, the findings show that lecturers do use Moodle to facilitate social constructivism in the physical classroom rather than online in this full time business programmes final year. Chapter Five discusses these key findings with reference to the literature.

CHAPTER FIVE: RESEARCH ANALYSIS

5.1 INTRODUCTION

This Chapter discusses four main themes arising from the data findings presented in Chapter Four with reference to the literature review in Chapter Two and relates directly to the research question: How engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. This Chapter is divided into six sections. Section 5.1 shows the research journey which crystallised these four themes: limited degree to which Moodle facilitates social constructivism principles; Moodle facilitates scaffolding; Moodle being used to facilitate social constructivism principles in the classroom and barriers to Moodle facilitating social constructivism principles. Section 5.2 considers the limited degree to which Moodle facilitates social constructivism in the final year of a GMIT business degree. Section 5.3 looks at how Moodle facilitates scaffolding in this group. Section 5.4 considers how Moodle is used to facilitate social constructivism principles in the classroom. Section 5.5 outlines some barriers to Moodle facilitating social constructivism principles. Section 5.6 relates to the conclusions and implications of the findings.

5.2 RESEARCH JOURNEY

Three levels of the research journey are presented in Figure 5.1. Each level explores the themes that emerged in turn from the literature review, the data analysis and findings and consequently the key discussion themes. Level one shows the themes that emerged from the literature review surrounding social constructivism in Chapter Two including knowledge construction, active learning, social interaction and scaffolding. Level two shows these four predetermined themes arising from the literature review and their limited representation in practice and the new themes that emerged from the data analysis. Level three shows the main discussion themes arising from the research findings in Chapter Four. The findings suggest that there is little evidence that Moodle is used to facilitate social constructivism principles in this group. However, the findings suggest that Moodle is used to facilitate scaffolding, and in particular, conceptual scaffolding. In addition, two new themes emerged from the data collection and findings, which include leveraging Moodle to facilitate social constructivism principles in the classroom and barriers to Moodle facilitating social

constructivism principles. The following sections will discuss each of these themes in turn.

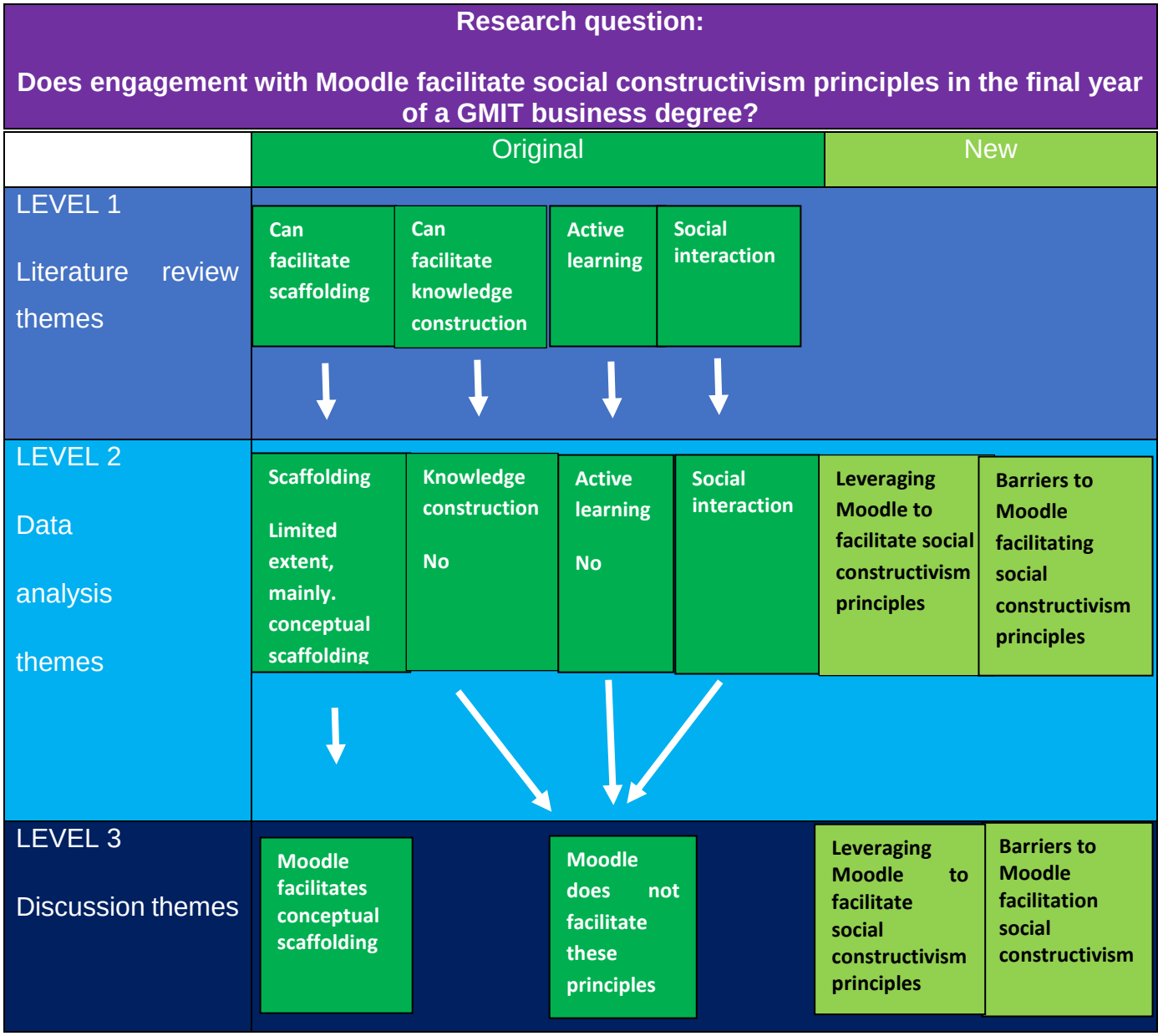


Figure 5.1: Emergence of themes for discussion from the research process

5.3 LIMITED DEGREE TO WHICH MOODLE FACILITATES SOCIAL CONSTRUCTIVISM

Despite the fact that Moodle is rooted in social constructivism principles (Smith 2006, p. 3, Helling and Petter, 2012, p. 1040), there is no clear evidence that engagement with Moodle facilitates social constructivism principles in practice in this group.

Students and lecturers largely agreed that Moodle did not facilitate active learning. Furthermore, students criticised the lack of active engagement within Moodle. In addition, functions, which support these principles, were used to a very limited degree. For example, 14% of lecturers provided a guided forum, 0% used wikis, 7% used glossaries, 14% used databases, 15% used roles implementation and 0% used peer review functions like Moodle.

Students and lecturers did not believe that Moodle facilitated social interaction. The evidence did show that while some pioneering lectures pilot Moodle functions promoting social interaction such as wikis or workshop, they were often abandoned due to the substantial time investment. These barriers to Moodle facilitating social constructivism principles will be discussed further in Section 5.6. In addition, the literature suggests that VLEs may impact negatively on class attendance and may even hinder social interaction in higher education (Donelly & O Rourke, 2007, para. 5; Lyng, 2011, p. and Lyndon and Hale, 2015, p.57). However, students and lecturers reported that Moodle did not affect class attendance at fourth year level. This may reflect the fact that the group under study is a final year programme, which requires higher order skills, which are traditionally taught in the classroom in this programme in GMIT.

Student surveys did show that Moodle supported knowledge construction but this was not corroborated in the student focus groups. Staff disagreed that Moodle facilitated knowledge construction to any degree. In fact, the evidence suggests that the delivery of module content and module administration continues to be the most common way in which this VLE is used to support teaching and learning in this group with most teaching and learning occurring in the classroom. This corresponds to what Francis and Raftery (2005, p. 2) categorise as Mode 1 usage which is labelled ‘baseline course administration and learner support’ with most learning activities still occurring in the classroom. The literature suggests that baseline use of Moodle is not unique to GMIT’s School of Business. For example, Blass and Davis (2003, p. 227) and Carvalho (2011, p. 824) consider that VLEs provide very limited active learner participation and are often construed as simply putting existing teaching materials ‘on the Web’. Donelly and O’Rourke (2007, p.7) suggest that eLearning products are often lauded on the basis of their constructivist approach to learning, but in reality sustained inter-student

contact and discussion can be difficult to maintain. Jenkins et all (2010, p.447) suggest that the delivery of course content continues to be the most common way in which VLEs are used to support teaching and learning from a UK survey of higher education institutions. Costa at al (2012, p.342) found similarly that Moodle functions that enable the interaction, the collaboration and the real time communication between students were not used on a Moodle platform in a university in Portugal.

5.4 MOODLE FACILITATES SCAFFODLING

There was evidence to suggest that engagement with Moodle does facilitate scaffolding in the final year of a GMIT business degree at a superficial level. For example, both students and lecturers strongly agreed that Moodle facilitates conceptual scaffolding, which helps students decide what to consider in learning, and guide them to key concepts (Jumaat et al, 2014, p. 75-76). This came through in both surveys (section 4.2.1) and focus groups (section 4.4). Students reported that Moodle is used to outline learning outcomes and this 'keeps you on track during the semester'. Another student reported that the rubric was useful to refer back to when doing assignments. Lecturers also reported Moodle allows you to reveal the syllabus section by section so students know where they are on the syllabus.

There is limited evidence from surveys or focus groups to suggest that Moodle is used to facilitate deeper forms of scaffolding such as strategic (helps students find alternative strategies and methods to solve complex problems) or procedural (helps students use appropriate tools and resources effectively) (Jumaat et al, 2014, p. 75-76). For example, only 15% of lecturers used conditionality where activities are combined into sequences, where results feed later activities.

There was limited evidence of metacognitive scaffolding with two lecturers reported that they used Moodle to prompt students to think about what they are learning throughout the process and assists students reflecting on what they have learned (Jumaat et al, 2014, p. 75-76). For example, one lecturer got students to answer questions on a case study in a reflective journal on Moodle and got students to critically assess each other's comments on a forum but abandoned the latter based on the

onerous time commitment. Another lecturer reported getting students to reflect in writing what they had learned each week using the assignment function.

5.5 LEVERAGING MOODLE TO FACILITATE SOCIAL CONSTRUCTIVISM PRINCIPLES

While the data shows that Moodle does not facilitate social constructivism principles in the final year of a GMIT business degree to any great degree, with the exception of conceptual scaffolding, what did emerge as a strong theme in the focus groups is that lecturers leverage Moodle to facilitate social constructivism principles in the classroom. Lecturers reported how Moodle facilitated scaffolding, knowledge construction, active learning and social interaction in the classroom. For example, lecturers used Moodle to facilitate strategic scaffolding in class, which is defined as helping students find alternative strategies and methods to solve complex problems (Jumaat et al, 2014, p. 75-76). For example, one lecturer reported getting students to upload an assignment in a programming module and then helping students to solve the problems in the classroom if they were experience difficulties. Another lecturer reported getting students to upload a sales plan in bite sized pieces and offering formative feedback in class on students' work.

Lecturers used Moodle to facilitate knowledge construction in the classroom. For example, one lecturer reported regularly going through a student's work uploaded to Moodle in class allowing other students to build on their knowledge and understanding in order to construct new knowledge and understanding. Another lecturer used Moodle to give examples of good and poor practice regarding examinations. Lecturers reported uploading readings or instructions and getting students to do an assignment based on this and then have a discussion in class around this and suggested that Moodle enables you to be much more active in the classroom.

5.6 BARRIERS TO MOODLE FACILITATING SOCIAL CONSTRUCTIVISM PRINCIPLES

The focus group findings help to explain why the survey findings suggest that Moodle was not used to facilitate social constructivism principles. The main barriers reported to using Moodle to facilitate social constructivism principles are lack of training and time, availability of alternative technologies, more effective face-to-face social interaction and inhibitions.

First, it is well documented that good technical support is a motivating factor for teachers to use VLEs (Donelly & O'Rourke 2007, p.8). Lecturers in this study reported a desire to use other functions in Moodle but cited a lack of training and support as a barrier to Moodle use. For example, one lecturer reported using Wikis, which would foster social interaction and knowledge construction but abandoned it due to lack of IT support and it being 'clunky and awkward'. Another lecturer cited that workshop was 'awkward' and 'very non-transparent the way it works'. In line with this study, a lack of support has been identified as a barrier to VLE use by Browne et al (2006, p. 447) and Lyng (2011, p.77).

Second, lecturers reported time as a constraint in setting up new functions in Moodle, a theme reflected in the literature. For example, Donelly & O Rourke (2007, p. 8) suggest that a primary limiting factor for teachers is their ability to commit time to the innovation in VLEs. It emerged that some lecturers did pilot Moodle functions that promoted social constructivism. For example, one lecturer reported using forums where students posted comments and critically assessed each other's comments, which does promote social constructivism principles such as knowledge construction and social interaction but abandoned it after one iteration due to the unreasonable time investment. The same lecturer also used the journal function in Moodle where each student responded to two questions at the end of each week and the lecturer marked them. However, it was noted that given the time investment in this activity, it was unlikely to be replicated across modules given large class sizes. While Fox and Mackeogh (2010, p.121) do consider VLE functions that promote higher order learning and do not make excessive demands on tutor time, it is acknowledged that further

work is required to demonstrate conclusively that eLearning can enhance higher-order learning with reasonable levels of lecturer input.

Third, lecturers reported that their preference was the classroom environment over the VLE environment to facilitate social constructivism principles in a full time programme. In essence, they reported it was more effective to promote scaffolding, knowledge construction, active learning and social interaction in the classroom given that they were physically meeting students three times a week. This correlates with the literature where social constructivists see learning as essentially a social process, which cannot effectively be replaced by technology, although technology may facilitate it (Bates, 2015, Section 2.5.1). In addition, Donelly and O'Rourke (2007, p.7) suggest lecturers may revert to using VLEs as a method for distributing lecture notes when VLEs fail to reproduce or simulate an equivalent face-to-face experience. De Leng at al (2006, p.573) suggest that when there is regular face-to-face contact in tutorial group meetings, the conditions for the successful implementation of discussion boards on VLEs will only be met in exceptional circumstances. Perhaps the VLE's potential can only be harnessed with fully online modules with web-dependent instruction and student participation (De Leng et al, 2006, p. 573).

Fourth, lecturers and students reported bypassing Moodle and using other technologies to facilitate learning. Lecturers reported that some Moodle functions had technical difficulties, that alternative technologies were more student friendly and that students may be inhibited using public forums like Moodle when other less public forums were available. This is somewhat reflected in the literature. For example, (Allen, 2015, p. 14) found a clear preference for social media rather than an institutional VLE as a forum for the discussing content related questions. Hollyhead et al (2012, p. 369) suggest that students' voluntary use of social network sites as a complement to formal learning is culturally embedded in HEI and constitutes a widely accepted 'integral' part of the learning experience. This may represent difficulties around control of content and ensuring that the platform is exclusively accessible by students and staff from the institution and mainly being used for academic purposes (Hatzipanagos and John, 2017, p.151).

Fifth, students and lecturers reported that student displayed inhibitions when using online forums and that they were more likely to communicate privately. This is also echoed in the literature, for example, Lyndon (2015, p. 62) and Rowett (2016, para. 4) considers social and cultural factors, such as feelings of 'doing something wrong' in an exposed environment, suggesting that there may have been more engagement with forum discussions if comments were anonymous.

5.7 CONCLUSION

This chapter discussed the three major themes that emerged from the study. The research question is how engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. The main conclusions are that: Moodle does not facilitate social constructivism principles in this group. However, Moodle does facilitate limited scaffolding and in particular, conceptual scaffolding. In addition, lecturers leverage Moodle to support social constructivism principles in the traditional classroom setting. Finally, there are many barriers to using Moodle to facilitate social constructivism principles in this group. Chapter Six offers some concluding remarks and recommendations in light of the main findings of this study.

CHAPTER 6: CONCLUSION

6.1 INTRODUCTION

This study set out to investigate how engagement with Moodle facilitates social constructivism principles in the final year of a GMIT business degree. This study used a case study research strategy, which explored student and lecturer engagement with Moodle in this group using a mixed methods research choice. The data collection instruments include surveys and focus groups with final year business students and lecturers to capture different dimensions of the same question. This final Chapter is divided into four parts. Section 6.2 considers the main conclusions of the study. Section 6.3 notes the main limitations of this study. Section 6.4 identifies possible future research work relevant to the findings. The final section offers some concluding remarks and recommendations.

6.2 MAIN CONCLUSIONS

This case study helps broaden our understanding of how Moodle facilitates social constructivism principles in one group at one point in time. The main conclusions are that: Moodle does not facilitate social constructivism principles in the final year of a GMIT business degree. However, Moodle does facilitate limited scaffolding and in particular, conceptual scaffolding. In addition, lecturers leverage Moodle to support social constructivism principles in the traditional classroom setting. Finally, there are many barriers to using Moodle to facilitate social constructivism principles in this group. Chapter 5 provides an overview of these themes.

6.3 STUDY LIMITATIONS

There are a number of limitations regarding this research. Section 1.4 outlined some limitations prior commencing research including the fact that the study only considers the final year of a GMIT business degree and the social constructivist approach to teaching and learning and that the sample size was reasonably small. Section 3.3.5 included a discussion on the limitations of conducting 'insider research' and sampling using self-selection and its associated bias. In addition, there are a number of limitations which arose from a critical reflection on the research process.

First, this is an education research case study that is particular to a point in time and there is no scope for statistical generalisation. While an individual person's report of their experience may be accurate, when it is aggregated with other peoples' reports and merged with quantitative data, it presents a snapshot picture of a group of people. This is subject to change over time, due to changes in the composition of the group, behaviour of the group members or their socio-economic context. While it is accepted that the findings from this case study are not statistically generalisable, it does, however, offer useful conceptual insights and in depth understanding and provides analytical rather than statistical generalisation as discussed in Section 3.2.4 and 3.3.4.

Second, any research study faces difficulties in the area of validity, especially in the measurement of perspectives, attitudes and behaviour, as there are always doubts about the true meaning of responses made in self-reported accounts of behaviours and attitudes. The data collection activities undertaken in this study are reliant on student and lecturers own reports in the form of responses to a survey or focus group.

Third, there are a number of limitations to using an electronic survey to gather data. These include, *inter alia*, verifying identity, informed consent, protection of participants and data protection (British Psychological Society, 2007, p. 8). It is not possible to verify identity in any way, and thus people who should be excluded from the survey may in fact complete the survey. In addition, it is not possible to provide an oral explanation of the study, or to take oral consent. This was mitigated to some extent by explaining the survey in a lecture to students. However, it was not orally explained to lecturers. This was somewhat alleviated by providing all of the relevant information in an email and the first eight questions in each survey dealt with consent. Moreover, protection of participants and data protection are issues as everyone who has access to the electronic survey account in GMIT has access to the data from all surveys which means that surveys cannot be held confidentiality. This is somewhat balanced by the fact that there is no way of tracing respondents. Finally, there is no guarantee that the responses will be equivalent to those that would have resulted from a paper-based survey.

6.4 FUTURE RESEARCH WORK

This case study hones in on the final year of a business degree in GMIT mainly due to time constraints. It does not consider other groups, programmes, disciplines or higher education institutions. Future research work could consider a replicated study in the final year of a business programme in other Irish higher educational institutes. The evaluation of Moodle usage to facilitate social constructivism principles would help inform what is occurring in Moodle from a social constructivism perspective and advance Moodle use from a policy and practice perspective to a position where it might be used as constructed: to support learning and teaching from a social constructivism perspective.

6.5 FINAL WORDS

The research shows that two necessary conditions exist for Moodle to facilitate social constructivist principles in teaching and learning. First, Moodle has the potential to facilitate such principles. Second, lecturers and students have an appetite for Moodle to facilitate such principles. For example, the focus group showed that lecturers often did not know what they were missing in terms of using Moodle more efficiently and effectively and displayed an appetite to learn more. However, these findings show that these conditions are not sufficient to creating a context to harness Moodle to facilitate the social constructivist principles upon which it was founded. Based on this research study, I suggest a number of enablers that might move GMIT's School of Business closer to this position. These recommendations are shown in Figure 6.1 which shows the chain of research that has led to these recommendations, which are categorised under technical, policy and cultural enablers.

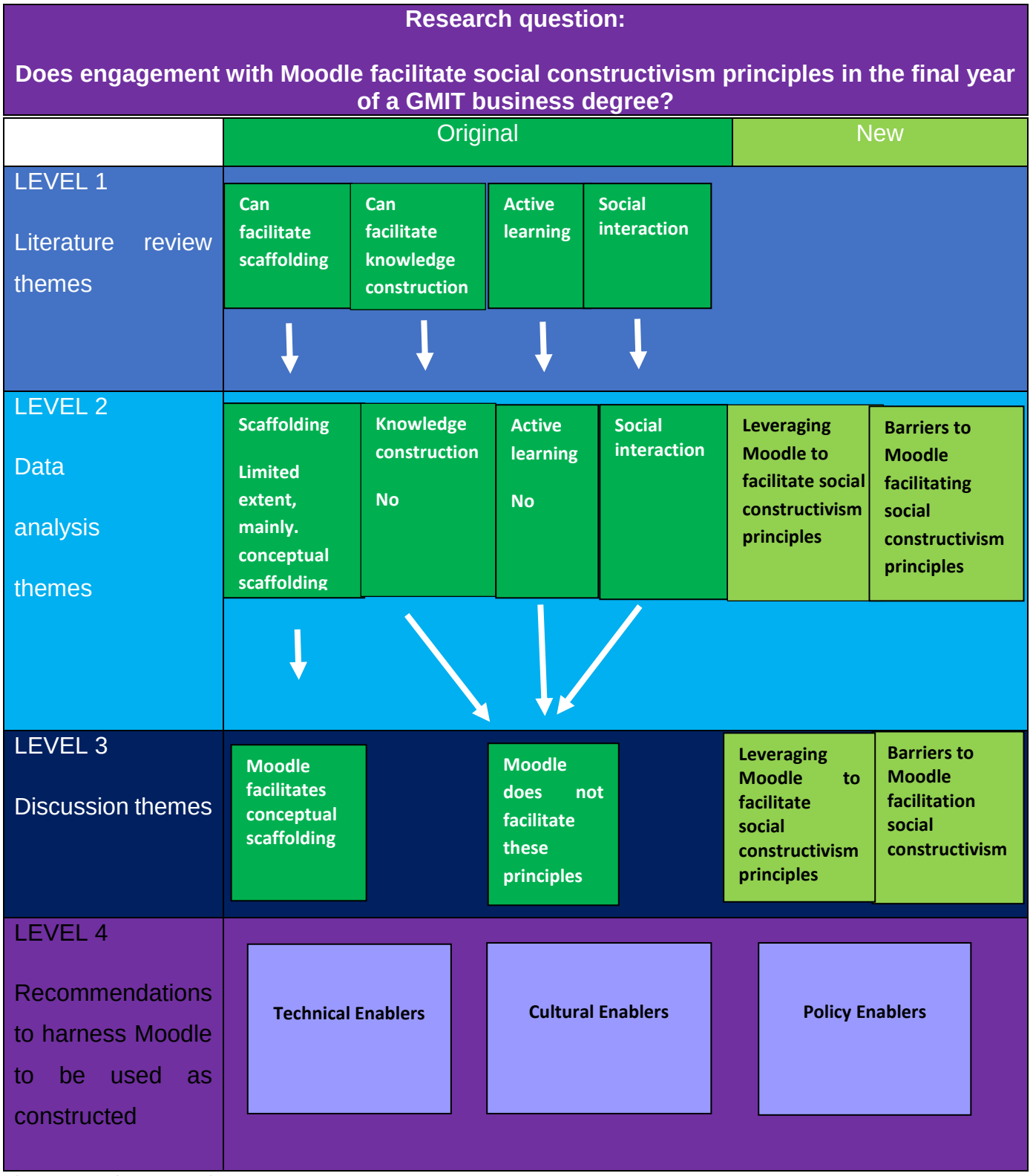


Figure 6.1: The research process

6.6.1 TECHNICAL ENABLERS

It is important that technical barriers for both students and lecturers are considered and addressed. For example, it is important to ensure sufficient training and more importantly, on-going support for Moodle use. Online support for GMIT is available through a Moodle forum facilitated by the GMIT educational technology officer but this support could be strengthened. In particular, the educational technology officer could work with lecturers to assist them to continually innovate, review, develop, populate and maintain modules in the online enviroment. In addition, if the institutionally controlled Moodle could be aligned with the user friendliness of other social media, lecturers and students might be less likely to bypass Moodle and use other technologies in its place.

6.6.2 CULTURAL ENABLERS

Changes in policy and technical development are easier to implement than cultural changes in the way that teaching and learning activities are delivered. In terms of changing the culture, the School of Business could develop some programmes that are Moodle dependent and do not rely on the traditional classroom. As long as the traditional classroom exists, it is unlikely that lecturers will use Moodle to its full potential as they consider traditional face-to-face interaction effective. This would then build up expertise in the Moodle space and harness its potential to facilitate social constructivism principles in fully online, blended and traditional forms of delivery.

In addition, Moodle could be promoted based on solving teaching challenges and problems that lecturers face rather than lecturers taking the time to learn ‘a new Moodle function’. There has to be a clear rationale and payback for time-constrained lecturers to harness Moodle’s potential so perhaps a module could be built which addresses teaching challenges by using Moodle functions.

6.6.3 POLICY ENABLERS

In terms of encouraging Moodle use from the bottom up, Moodle use and a Moodle module could be accredited as part of a teaching award. This could then be used as an explicit barometer for promotion. Recognition structures by management is seen to is considered to be an important motivator to embrace VLEs (Donelly et al, 2007)

In terms of encouraging Moodle use from the top down, evidence of Moodle use to facilitate the achievement of learning outcomes could be included at the module and programme approval process. For example, a learning outcome at level 8 for an honours degree is to act effectively under guidance in a peer relationship with qualified practitioners; lead multiple, complex and heterogeneous groups (QQI, 2014, p.5). This learning outcome mirrors social constructivism principles such as scaffolding, knowledge construction and social interaction. Lecturers could show in the module and programme approval process how this and other learning outcomes would be achieved using Moodle functions such as wikis, managed forums and workshop.

Kafai and Resnick (1996, p.3) argue that constructivism is not a static set of ideas and that we are continually reconstructing and elaborating what we mean by constructivism and continually constructing new educational activities and tools to help us in that effort. It is hoped that this study joins in that effort by exploring how Moodle facilitates social constructivism in the final year of a GMIT business degree, explaining what is actually occurring and reconstructing new we might move more towards a position whereby Moodle is harnessed to its full potential to facilitate the social constructivism principles that underpin it.

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APPENDICES

APPENDIX 1

PARTICIPANT INFORMATION LEAFLET EMAILED TO STUDENTS:

1. Title of study: Applying social constructivism using Moodle: A GMIT case study.

2. Introduction: I am currently conducting research for the MA in Teaching and Learning in GMIT, Galway. The purpose of the research is to determine attitudes to Moodle and Moodle use in the School of Business in GMIT. I invite you to participate in a research study entitled 'Applying social constructivism using Moodle: A GMIT case study'.

3. Procedures: GMIT students have been chosen for this research as Moodle is the online platform that is used in GMIT and the majority of students use it. Participation involves answering a short survey that should take approximately 5 minutes to complete.

Your participation in this research project is completely voluntary. You may decline altogether, or leave blank any questions you don't wish to answer.

Your responses will remain confidential and anonymous. Data from this research will not be available to anyone but me and reported only as a collective combined total.

4. Benefits: It is hoped that the research will produce an overview of Moodle use at a point in time and identify ways in which Moodle can effectively and efficiently support teaching and learning and address teaching challenges using a social constructivism approach.

5. Risks: There are no known risks from participating in the research.

6. Confidentiality: All identifying features will be removed.

7. Compensation: This study is covered by standard institutional indemnity insurance. Nothing in this document restricts or curtails your rights.

8. Voluntary Participation: You have volunteered to participate in this study. You may withdraw at any time. If you decide not to participate, or if you withdraw, you will not be penalised and will not give up any benefits that you had before entering the study.

9. Stopping the study: You understand that the investigator may withdraw your participation in the study at any time without your consent.

10. What will happen to the information which you give? All paper documents will be stored in a locked cabinet in GMIT with access strictly restricted to me. All computerised data will be restricted access and be pass worded. All computerised data/information collected will be anonymous by using identity numbers for the participants. The data/information will be stored for the duration of the study, i.e. until the work is fully reported and disseminated. It will then be kept in a locked cabinet for five years, unless the MA in Teaching & Learning Research Ethics Committee dictates the data be stored for a longer time period (GMIT Research Ethics Policy 2010, p.20).

11. What will happen to the results? The results will be presented in the thesis. They will be seen by my supervisor, internal and external examiners and the research advisory panel of the GMIT MA in teaching and Learning. The thesis may be read by future students on the course. The study may be published in an academic journal.

12. Permission: Ethical approval has been sought from the MA in Teaching & Learning Research Ethics Committee.

12. Further information: You can get more information or answers to your questions about the study, your participation in the study, and your rights, from Marie Finnegan who can be telephoned at 091 742473 or emailed at marie.finnegan@gmit.ie. If I learn of important new information that might affect your desire to remain in the study, you will be informed at once.

APPENDIX 2

PARTICIPANT INFORMATION LEAFLET EMAILED TO LECTURERS:

1. Title of study: Applying social constructivism using Moodle: A GMIT case study.

2. Introduction: I am currently conducting research for the MA in Teaching and Learning in GMIT, Galway. The purpose of the research is to determine attitudes to Moodle and Moodle use in the School of Business in GMIT. I invite you to participate in a research study entitled 'Applying social constructivism using Moodle: A GMIT case study'.

3. Procedures: GMIT lecturers have been chosen for this research as Moodle is the online platform that is used in GMIT and the majority of lecturers use it. Participation involves answering a short survey that should take approximately 5 minutes to complete.

Your participation in this research project is completely voluntary. You may decline altogether, or leave blank any questions you don't wish to answer. Your responses will remain confidential and anonymous. Data from this research will not be available to anyone but me and reported only as a collective combined total.

4. Benefits: It is hoped that the research will produce an overview of Moodle use at a point in time and identify ways in which Moodle can effectively and efficiently support teaching and learning and address teaching challenges using a social constructivism approach.

5. Risks: There are no known risks from participating in the research.

6. Confidentiality: All identifying features will be removed.

7. Compensation: This study is covered by standard institutional indemnity insurance. Nothing in this document restricts or curtails your rights.

8. Voluntary Participation: You have volunteered to participate in this study. You may withdraw at any time. If you decide not to participate, or if you withdraw, you will not be penalised and will not give up any benefits that you had before entering the study.

9. Stopping the study: You understand that the investigator may withdraw your participation in the study at any time without your consent.

10. What will happen to the information which you give? All paper documents will be stored in a locked cabinet in GMIT with access strictly restricted to me. All computerised data will be restricted access and be pass worded. All computerised data/information collected will be anonymous by using identity numbers for the participants. The data/information will be stored for the duration of the study, i.e. until the work is fully reported and disseminated. It will then be kept in a locked cabinet for five years, unless the MA in Teaching & Learning Research Ethics Committee dictates the data be stored for a longer time period (GMIT Research Ethics Policy 2010, p.20).

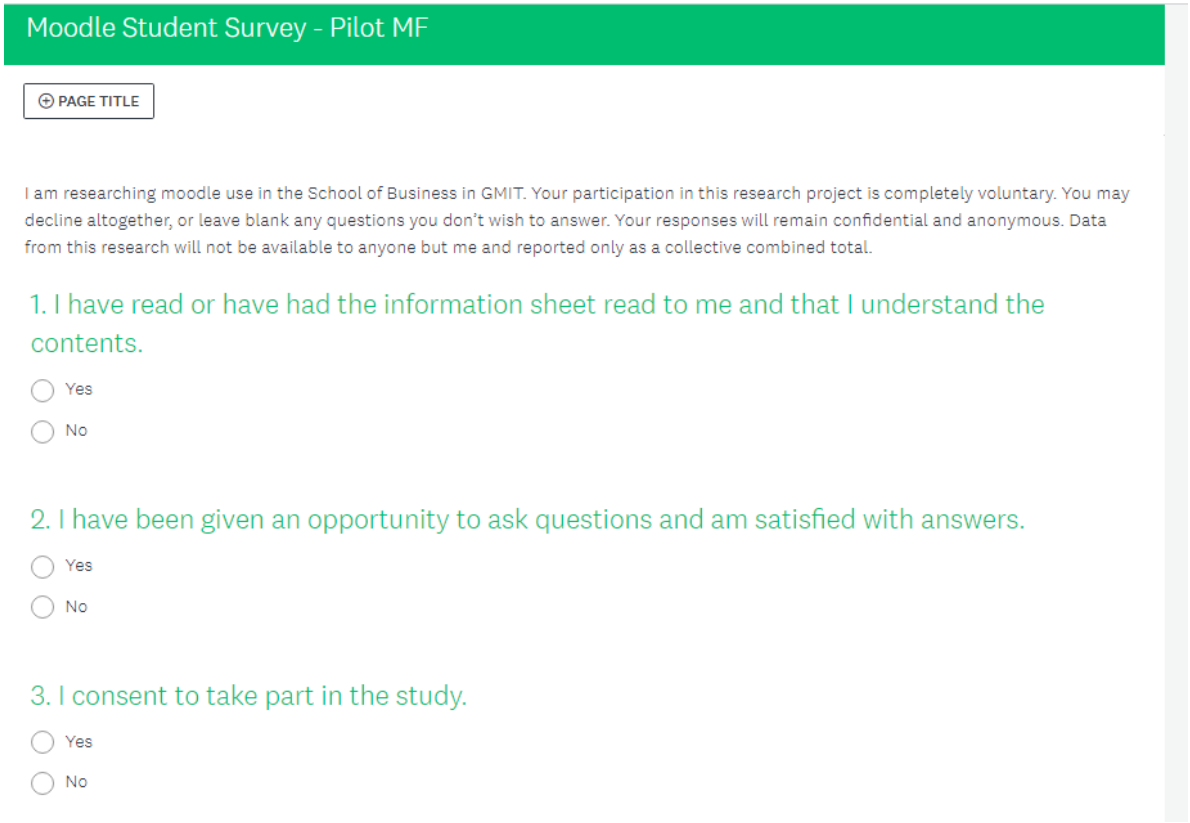
11. What will happen to the results? The results will be presented in the thesis. They will be seen by my supervisor, internal and external examiners and the research advisory panel of the GMIT MA in teaching and Learning. The thesis may be read by future students on the course. The study may be published in an academic journal.

12. Permission: Ethical approval has been sought from the MA in Teaching & Learning Research Ethics Committee.

13. Further information: You can get more information or answers to your questions about the study, your participation in the study, and your rights, from Marie Finnegan who can be telephoned at 091 742473 or emailed at marie.finnegan@gmit.ie. If I learn of important new information that might affect your desire to remain in the study, you will be informed at once

APPENDIX 3:

PILOT SURVEY SENT TO STUDENTS



Moodle Student Survey - Pilot MF

⊕ PAGE TITLE

I am researching moodle use in the School of Business in GMIT. Your participation in this research project is completely voluntary. You may decline altogether, or leave blank any questions you don't wish to answer. Your responses will remain confidential and anonymous. Data from this research will not be available to anyone but me and reported only as a collective combined total.

1. I have read or have had the information sheet read to me and that I understand the contents.

- ◯ Yes
- ◯ No

2. I have been given an opportunity to ask questions and am satisfied with answers.

- ◯ Yes
- ◯ No

3. I consent to take part in the study.

- ◯ Yes
- ◯ No

4. I understand that participation is voluntary and that I can withdraw at any time.

- ◯ Yes
- ◯ No

5. I understand that withdrawal will not affect my access to services or legal rights.

- ◯ Yes
- ◯ No

6. I consent to possible publication of results.

- ◯ Yes
- ◯ No

7. I give my permission to for you to use the data obtained other future studies without the need for additional consent.

- ◯ Yes
- ◯ No

8. I have read or have had the information sheet read to me and that I understand the contents.

- ◯ Yes
- ◯ No

9. Using moodle:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
...helps me find the information I need	◯	◯	◯	◯	◯
...helps me organise my study	◯	◯	◯	◯	◯
...serves mainly to download class materials	◯	◯	◯	◯	◯
...helps me to keep up with the course work	◯	◯	◯	◯	◯

10. Lecturers used moodle:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
...to clearly communicate module learning outcomes	○	○	○	○	○
...to clearly communicate important module topics	○	○	○	○	○
...to clearly communicate important due dates/time frames for learning activities	○	○	○	○	○
...to guide the class towards understanding module topics in a way that helped me clarify my thinking	○	○	○	○	○
...to help keep the module participants on task in a way that helped me to learn	○	○	○	○	○
...to provide feedback that helped me understand my strengths and weaknesses	○	○	○	○	○

11. Please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Lecturers used moodle to identify areas of agreement and disagreement on module topics that helped me to learn	○	○	○	○	○
Lecturers used moodle to encourage module participants to explore new concepts in this module	○	○	○	○	○
Online discussions on moodle were valuable in helping me appreciate different perspectives	○	○	○	○	○
Reflection on module content and discussions on moodle helped me understand fundamental concepts in this class	○	○	○	○	○

12. Please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Lecturers used moodle to help to keep module participants engaged and participating in productive dialogue	○	○	○	○	○
Problems posed via moodle increased my interest in module issues	○	○	○	○	○
Module activities on moodle made me curious and I felt motivated to explore content related questions	○	○	○	○	○
Learning activities on moodle helped me construct explanations/solutions	○	○	○	○	○

13. Moodle:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
...made it easier for me not to attend class	○	○	○	○	○
...helps me with group work	○	○	○	○	○
...helps me to communicate with lecturers	○	○	○	○	○
...helps me to communicate with other class participants	○	○	○	○	○

14. Please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Online discussions on moodle helped me to develop a sense of collaboration with my group	○	○	○	○	○
Lecturers used moodle to reinforce the development of a sense of community among module participants	○	○	○	○	○
Lecturers helped to focus discussion using moodle on relevant issues in a way that helped me to learn	○	○	○	○	○
Moodle allowed me to get to know other module participants which gave me a sense of belonging in the module	○	○	○	○	○
I was able to form distinct impressions of some module participants using moodle	○	○	○	○	○
Online or web-based communication is an excellent medium for social interaction	○	○	○	○	○

APPENDIX 4:

FINAL SURVEY SENT TO STUDENTS

Moodle Student Survey - MF Final

⊕ PAGE TITLE

I am researching moodle use in the School of Business in GMIT. Your participation in this research project is completely voluntary. You may decline altogether, or leave blank any questions you don't wish to answer. Your responses will remain confidential and anonymous. Data from this research will not be available to anyone but me and reported only as a collective combined total.

1. I have read or have had the information sheet read to me and that I understand the contents.

- ◯ Yes
- ◯ No

2. I consent to take part in the study.

- ◯ Yes
- ◯ No

3. I understand that participation is voluntary and that I can withdraw at any time.

- ◯ Yes
- ◯ No

4. I understand that withdrawal will not affect my access to services or legal rights.

- ◯ Yes
- ◯ No

5. I consent to the possible publication of results.

- ◯ Yes
- ◯ No

6. I give my permission for you to use the data obtained in other future studies without the need for additional consent.

- ◯ Yes
- ◯ No

7. I have been given an opportunity to ask questions and am satisfied with answers.

- ◯ Yes
- ◯ No

8. I have read, or had read to me, this consent form. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction. I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights. I understand I may withdraw from the study at any time.

- ◯ Yes
- ◯ No

9. What is your gender?

- ◯ Male
- ◯ Female

10. What year are you in at college?

- ◯ First year
- ◯ Fourth year

11. Academic support: Taking an overview of moodle use on modules in my programme:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
...helps me find the information I need	◯	◯	◯	◯	◯	◯
...helps me organise my study	◯	◯	◯	◯	◯	◯
...serves mainly to download class materials	◯	◯	◯	◯	◯	◯
...helps me to keep up with the course work	◯	◯	◯	◯	◯	◯

12. Academic support: Lecturers on the programme used moodle:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
...to clearly communicate module learning outcomes	○	○	○	○	○	○
...to clearly communicate important module topics	○	○	○	○	○	○
...to clearly communicate important due dates/time frames for learning activities, continuous assessments, exams	○	○	○	○	○	○
...to help keep me focused on the next task in a way that helped me to learn	○	○	○	○	○	○
...to provide feedback that helped me understand my strengths and weaknesses	○	○	○	○	○	○

13. Knowledge Construction. Please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
Lecturers used moodle to encourage module participants to explore new concepts in this module using external links	○	○	○	○	○	○
Online discussions on moodle were valuable in helping me appreciate different perspectives	○	○	○	○	○	○
Lecturers used moodle to help me reflect on module content and learning	○	○	○	○	○	○

14. Active learning: Please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
Lecturers used moodle to help to keep module participants engaged and participating in productive dialogue trough forums	○	○	○	○	○	○
Learning activities on moodle made me curious and I felt motivated to explore content related questions	○	○	○	○	○	○
Learning activities on moodle helped me construct explanations/solutions	○	○	○	○	○	○

15. Social interaction: Using moodle in modules in my programme:

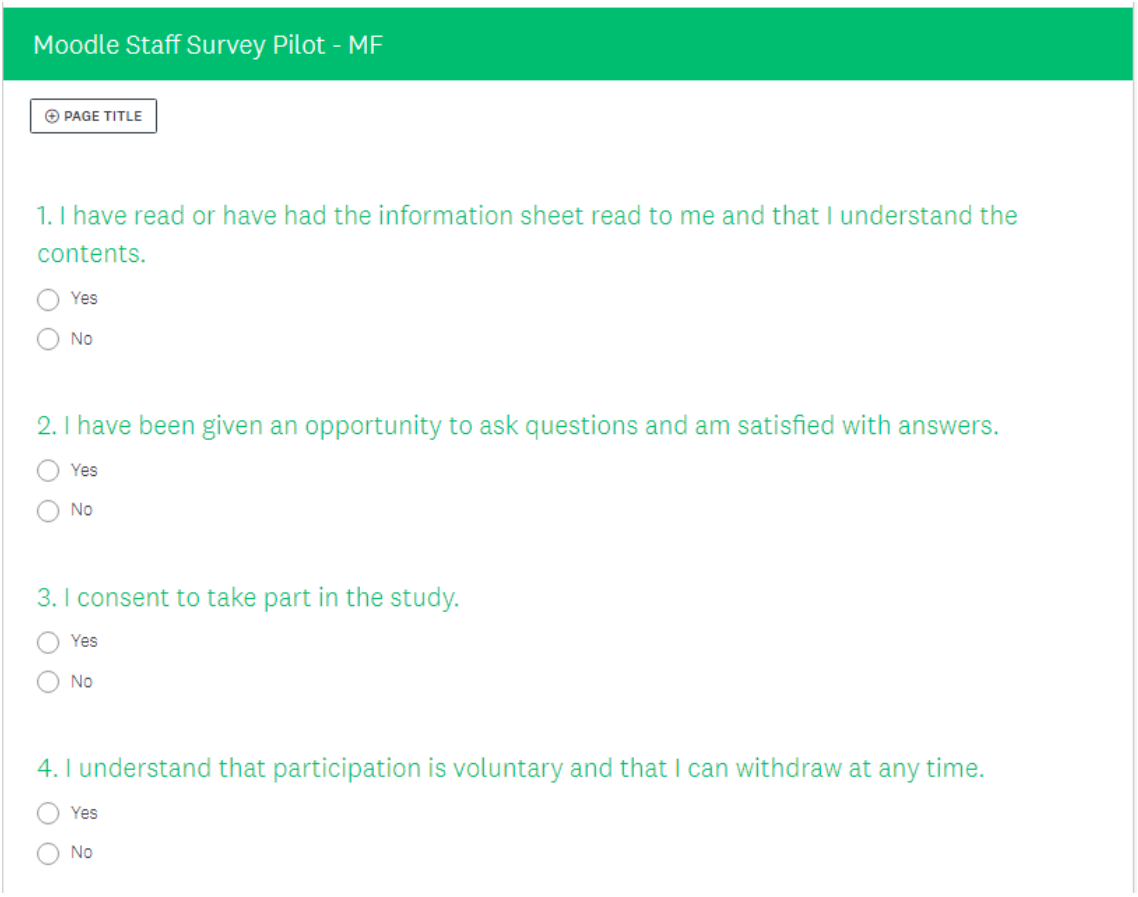
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
...makes it easier for me not to attend class	○	○	○	○	○	○
...helps me with group work	○	○	○	○	○	○
...helps me to communicate with lecturers	○	○	○	○	○	○
...helps me to communicate with other class participants	○	○	○	○	○	○

16. Social interaction: Please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
Online discussions on moodle helped me to develop a sense of collaboration with my group	○	○	○	○	○	○
Lecturers used moodle to reinforce the development of a sense of community among module participants	○	○	○	○	○	○
Moodle allowed me to get to know other module participants which gave me a sense of belonging in the module	○	○	○	○	○	○
I was able to form distinct impressions of some module participants using moodle	○	○	○	○	○	○
Online or web-based communication is an excellent medium for social interaction	○	○	○	○	○	○

APPENDIX 5:

PILOT SURVEY SENT TO LECTURERS



Moodle Staff Survey Pilot - MF

⊕ PAGE TITLE

1. I have read or have had the information sheet read to me and that I understand the contents.

- ◯ Yes
- ◯ No

2. I have been given an opportunity to ask questions and am satisfied with answers.

- ◯ Yes
- ◯ No

3. I consent to take part in the study.

- ◯ Yes
- ◯ No

4. I understand that participation is voluntary and that I can withdraw at any time.

- ◯ Yes
- ◯ No

5. I understand that withdrawal will not affect my access to services or legal rights.

- ◯ Yes
- ◯ No

6. I consent to possible publication of results.

- ◯ Yes
- ◯ No

7. I give my permission for you, to use the data obtained, in other future studies without the need for additional consent.

- ◯ Yes
- ◯ No

8. I have read, or had read to me, this consent form. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction. I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights. I understand I may withdraw from the study at any time.

- ◯ Yes
- ◯ No

9. Moodle:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
...helps students to find the information they need	◯	◯	◯	◯	◯
...helps students to organise their study	◯	◯	◯	◯	◯
...serves mainly for students to download class material	◯	◯	◯	◯	◯
...helps students to keep up with the course work	◯	◯	◯	◯	◯

10. Moodle helped me to:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
...clearly communicate module learning outcomes	○	○	○	○	○
...clearly communicate important module topics	○	○	○	○	○
...clearly communicate important due dates/time frames for learning activities/exams	○	○	○	○	○
...guide the class towards understanding module topics in a way that helped them clarify their thinking	○	○	○	○	○
...help keep the module participants on task in a way that has helped them to learn	○	○	○	○	○
...provide feedback to students helped them understand their strengths and weaknesses	○	○	○	○	○

11. Please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Moodle helped me to identify areas of agreement and disagreement on module topics that helped students to learn	○	○	○	○	○
Moodle helped me to encourage module participants to explore new concepts in this module	○	○	○	○	○
Online discussions on moodle are valuable in helping students to appreciate different perspectives	○	○	○	○	○
Moodle helped me to facilitate reflection on module content and discussions to help students understand fundamental concepts in module	○	○	○	○	○

12. Please indicate the extent to which you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Moodle helped me to keep module participants engaged and participating in productive dialogue	○	○	○	○	○
Moodle helped me to get students to raise problems to increase their interest in module issues	○	○	○	○	○
Learning activities on moodle helped me to make students curious and motivate them to explore content related questions	○	○	○	○	○
Learning activities on moodle helped me to get students to construct explanations/solutions	○	○	○	○	○

13. Moodle:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
...made it easier for students not to attend class	○	○	○	○	○
...facilitates students working in groups	○	○	○	○	○
...helps students to communicate with me	○	○	○	○	○
...helps students communicate with each other	○	○	○	○	○

14. Please indicate the extent to which you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Online discussions on moodle helped me to develop a sense of collaboration with the group	○	○	○	○	○
Moodle helped me to develop and reinforce a sense of community among module participants	○	○	○	○	○
Moodle helped me to focus discussion on relevant issues in a way that helped students to learn	○	○	○	○	○
Moodle allowed me to encourage students to get to know other module participants which gave them a sense of belonging in the module	○	○	○	○	○
Moodle allowed students to form distinct impressions of one another	○	○	○	○	○
Online or web-based communication is an excellent medium for social interaction	○	○	○	○	○

15. Please indicate how often you use the following functions in moodle:

	Very often	Often	Rarely	Never
Upload class materials	○	○	○	○
Provide a passive unfacilitated forum	○	○	○	○
Get students to upload assignments	○	○	○	○
Provide feedback on uploaded assignments on moodle	○	○	○	○
Use rubrics function in assessments for feedback	○	○	○	○
Use Badges	○	○	○	○
Use conditionality: Combining activities into sequences, where results feed later activities	○	○	○	○

16. Please indicate how often you use the following functions in moodle:

	Very often	Often	Rarely	Never	
Message students	○	○	○	○	○
Wikis	○	○	○	○	○
Glossaries	○	○	○	○	○
Databases	○	○	○	○	○
Peer review options like workshop	○	○	○	○	○
Facilitate and guide forums	○	○	○	○	○

17. Please indicate how often you use the following functions in moodle:

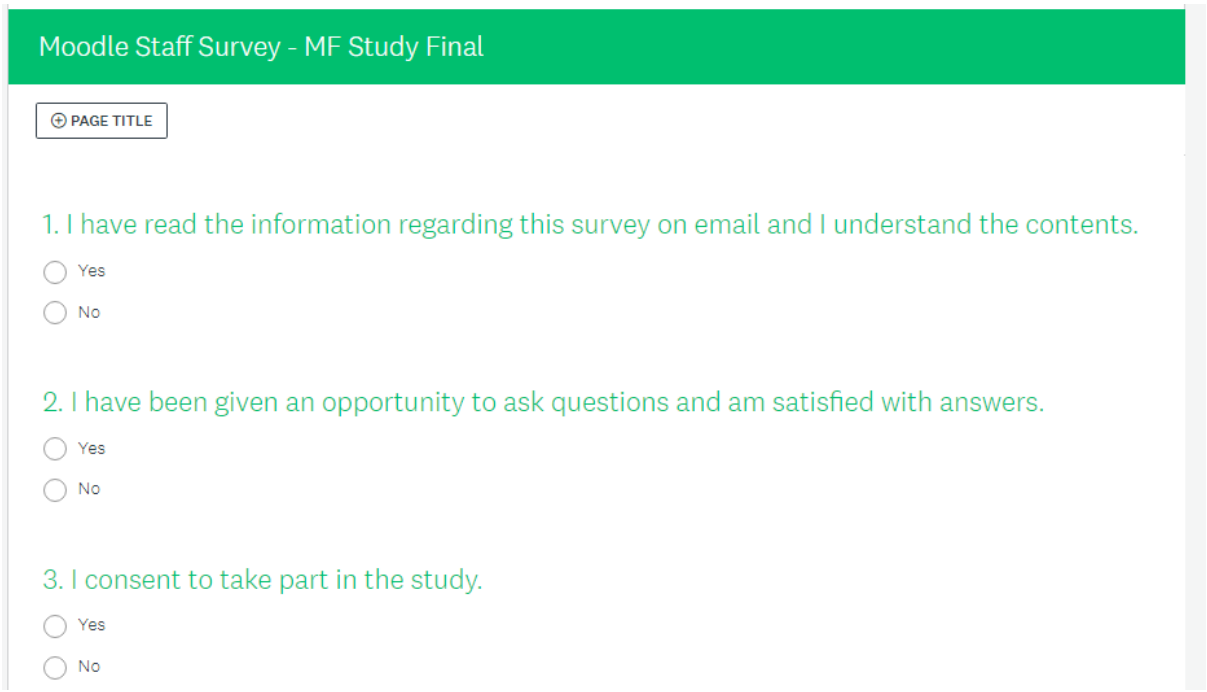
	Very often	Often	Rarely	Never
Set quizzes	○	○	○	○
Use roles implementation	○	○	○	○

18. Please indicate how often you use the following functions on moodle:

	Very often	Often	Rarely	Never
Get students to blog on issues	○	○	○	○
Use survey module to study and reflect on course activity	○	○	○	○
Provide RSS feeds	○	○	○	○
Use chats rooms for students to meet and exchange ideas	○	○	○	○

APPENDIX 6

FINAL SURVEY SENT TO LECTURERS



Moodle Staff Survey - MF Study Final

PAGE TITLE

1. I have read the information regarding this survey on email and I understand the contents.

- Yes
- No

2. I have been given an opportunity to ask questions and am satisfied with answers.

- Yes
- No

3. I consent to take part in the study.

- Yes
- No

4. I understand that participation is voluntary and that I can withdraw at any time.

- Yes
- No

5. I understand that withdrawal will not affect my access to services or legal rights.

- Yes
- No

6. I consent to the possible publication of results.

- Yes
- No

7. I give my permission for you to use the data obtained in other future studies, without the need for additional consent.

- Yes
- No

8. I have read, or had read to me, this consent form. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction. I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights. I understand I may withdraw from the study at any time.

- ◯ Yes
- ◯ No

9. How many years have you been lecturing for?

- ◯ 0-5 years
- ◯ 6-10 years
- ◯ 11-15 years
- ◯ 16-20 years
- ◯ More than 20 years

10. What is your gender?

- ◯ Male
- ◯ Female

11. Academic Support: Moodle:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
...helps students to find the information they need	◯	◯	◯	◯	◯	◯
...helps students to organise their study	◯	◯	◯	◯	◯	◯
...serves mainly for students to download class material	◯	◯	◯	◯	◯	◯
...helps students to keep up with the course work	◯	◯	◯	◯	◯	◯

12. Academic support: Moodle helped me to:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
...clearly communicate module learning outcomes	○	○	○	○	○	○
...clearly communicate important module topics	○	○	○	○	○	○
...clearly communicate important due dates/time frames for learning activities/continuous assessments/exams	○	○	○	○	○	○
...help keep the module participants on task	○	○	○	○	○	○
...provide feedback to students helped them understand their strengths and weaknesses	○	○	○	○	○	○

13. Knowledge construction: Please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
Moodle helped me to encourage module participants to explore new concepts in this module, for example, using external links	○	○	○	○	○	○
Online discussions on moodle are valuable in helping students to appreciate different perspectives	○	○	○	○	○	○
Moodle helped me to facilitate reflection on module content and learning	○	○	○	○	○	○

14. Active learning: Please indicate the extent to which you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
Moodle helped me engage students in active learning	○	○	○	○	○	○
Moodle helped me to keep module participants engaged and participating in productive dialogue through forums or other moodle functions	○	○	○	○	○	○
Learning activities on moodle helped me to make students curious and motivate them to explore content related questions	○	○	○	○	○	○
Learning activities on moodle helped me to get students to construct explanations/solutions	○	○	○	○	○	○

15. Social interaction: Moodle:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
...makes it easier for students not to attend class	○	○	○	○	○	○
...facilitates students working in groups	○	○	○	○	○	○
...helps students to communicate with me	○	○	○	○	○	○
...helps students communicate with each other	○	○	○	○	○	○

16. Social interaction: Please indicate the extent to which you agree or disagree with the following statements:

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
Online discussions on moodle helped me to develop a sense of collaboration with the group	○	○	○	○	○	○
Moodle helped me to develop and reinforce a sense of community among module participants	○	○	○	○	○	○
Moodle allowed me to encourage students to get to know other module participants which gave them a sense of belonging in the module	○	○	○	○	○	○
Moodle allowed students to form distinct impressions of one another	○	○	○	○	○	○
Online or web-based communication is an excellent medium for social interaction	○	○	○	○	○	○

17. Academic support: Please indicate how often you use the following functions in moodle:

	Very often	Often	Sometimes	Rarely	Never
Upload class materials	○	○	○	○	○
Provide a passive unfacilitated forum	○	○	○	○	○
Get students to upload assignments	○	○	○	○	○
Provide feedback on uploaded assignments on moodle	○	○	○	○	○
Use rubrics function in assessments for feedback	○	○	○	○	○
Use Badges	○	○	○	○	○
Use conditionality: Combining activities into sequences, where results feed later activities	○	○	○	○	○

18. Social interaction: Please indicate how often you use the following functions in moodle:

	Very often	Often	Sometimes	Rarely	Never
Message students	○	○	○	○	○
Wikis	○	○	○	○	○
Glossaries	○	○	○	○	○
Databases	○	○	○	○	○
Peer review options like workshop	○	○	○	○	○
Facilitate and guide forums	○	○	○	○	○

19. Active learning: Please indicate how often you use the following functions in moodle:

	Very often	Often	Sometimes	Rarely	Never
Set quizzes	○	○	○	○	○
Use roles implementation	○	○	○	○	○

20. Knowledge construction: Please indicate how often you use the following functions on moodle:

	Very often	Often	Sometimes	Rarely	Never
Get students to blog on issues	○	○	○	○	○
Use survey module to study and reflect on course activity	○	○	○	○	○
Provide RSS feeds	○	○	○	○	○
Use chats rooms for students to meet and exchange ideas	○	○	○	○	○
Provide active and guided forum	○	○	○	○	○

APPENDIX 7:

QUESTIONS FOR FOCUS GROUP: STUDENTS

Scaffolding:

Q: How does Moodle help to guide your learning?

Prompts:

Guide you to key concepts and get them to keep on task

Use appropriate tools and resources effectively,

Find alternative strategies and methods to **solve complex problems**

Get you to think about what they are learning throughout the process and assists students **reflecting** on what they have learnt (self-assessment).

Receive **feedback** showing strengths and weaknesses

Knowledge construction

Q: Is Moodle used to facilitate discussion or reflection?

Introduce culture and context to learning. How?

Active learning

Q: How is Moodle used to engage you in active tasks or learning?

Social interaction

Q: Do you think Moodle facilitates collaborative learning among students? How?

Prompts:

Working on a group project

Encourage peer learning.

Sense of community in the class

APPENDIX 8

QUESTIONS FOR FOCUS GROUP: LECTURERS

Scaffolding:

Q: Do you use Moodle to guide learning? How?

Prompts:

Guide them to key concepts and get them to keep on task

Use appropriate tools and resources effectively,

Find alternative strategies and methods to **solve complex problems**

Get students to think about what they are learning throughout the process and assists students **reflecting** on what they have learnt (self-assessment).

Provide **feedback** showing strengths and weaknesses

Knowledge construction

Q: Do you use Moodle to get students to engage in discussion or reflection?

Introduce culture and context to learning. How?

Active learning

Q: Do you use Moodle to engage students in active learning. How?

Social interaction

Q: Do you think Moodle facilitates collaborative learning among students? How?

Prompts:

Working on a group project

Encourage peer learning.

Sense of community in the class

APPENDIX 9

Data dictionary

How does engagement with Moodle facilitate social constructivism principles in the final year of a GMIT business degree?

how engagement with Moodle facilitates scaffolding, knowledge construction, active learning and social interaction.

Code	Definition	No of times mentioned by respondents
Conceptual scaffolding:	helps students decide what to consider in learning and guide them to key concepts Jumaat et al (2014, p. ?)	Total: 10 Students: 9 Staff: 1
Procedural scaffolding:	helps students use appropriate tools and resources effectively Jumaat et al (2014, p. ?)	Total: 3 Students: 1 Staff: 2
Strategic scaffolding:	helps students find alternative strategies and methods to solve complex problems, for example, through feedback Jumaat et al (2014, p. ?)	Total: 2 Students: 2 Staff: 0
Metacognitive scaffolding:	prompts students to think about what they are learning throughout the process and assists students **reflecting** on what they have learnt (self-assessment). Jumaat et al (2014, p. ?)	Total 5 Students: 0 Staff: 5

Knowledge construction	Students are presented with opportunities to build on prior knowledge and understanding in order to construct new knowledge and understanding (Cole, 2009, p. 142).	Total: 4 Students: 2 Staff: 2
Active learning	Students learn by actively constructing their own learning (Cole, 2009, p. 14, Harkness, 2009, p.248).	Total 3 Students: 0 Staff: 3
Social interaction	Knowledge is constructed through interaction with others (McKinle, 2015, p.1).	Total 6 Students: 0 Staff: 6
Barriers	Factors that create a barrier to using Moodle to facilitate social constructivism principles in the final year of a GMIT business degree	Total: 32 Students: 10 Staff: 22
Support social constructivism in class	Use Moodle to facilitate social constructivism principles in the classroom	Total: 16 Students: 0 Staff: 16
Not used	Moodle is not used to facilitate social constructivism principles in the final year of a GMIT business degree	Total 4 Students: 4 Staff: 0
Suggestions	How Moodle could be used to facilitate social constructivism principles in the final year of a GMIT business degree	Total 2 Students: 1 Staff: 1

No impact	No impact on class attendance	Total 4 Students: 2 Staff: 2