

**University teachers' conceptions of learning through online
discussion**

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discussion**

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To mum, dad, my brothers and sisters, and beautiful Fangyan

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Abstract

Online discussion is placed at the centre of many university courses nowadays whether delivered in online-, distance-, external- or internal-mode. There has been significant specialized research investigating *students'* conceptions of learning through online discussion, however to the best of our knowledge no studies have been conducted which investigate *teachers'* conceptions. This study adopts a phenomenographic approach to reveal teachers' conceptions of 'learning through online discussion'. To address the gap in the literature, teachers' conceptions are reported based on the research question – *What does learning through online discussion mean to university teachers?*

Fifteen teachers at a large research-intensive metropolitan Australian university were asked about their experiences with 'learning through online discussion' in semi-structured interviews. The interview transcripts were systematically analysed using a phenomenographic approach to reveal four qualitatively different categories of conception.

1. *Learning through online discussion as a way to **provide time and access***
2. *Learning through online discussion as a way to **engage learners***
3. *Learning through online discussion as a way to **foster a community of learners***
4. *Learning through online discussion as a way to **enable higher-order cognition and learning***

The findings of this study contribute to knowledge by building on research into teachers' conceptions of e-learning and learning technologies, and complementing research into students' conceptions of learning through online discussion. There are implications for teachers, educational designers, academic developers and all those involved with the enhancement of student engagement, learning experiences and outcomes in higher education. Specifically, the findings will inform designers of professional development courses for university teachers to learn about effective use of online discussion for learning.

CHAPTER I: INTRODUCTION

This study is based on an epistemology that considers *learning* as a relationship between the learner and the world, sometimes mediated by teachers and sometimes mediated by technology (Ellis, Hughes, Weyers, & Riding, 2009; Laurillard, 2002). Increasingly, the learner's *world* is influenced by new technologies such as mobile smart phones, tablet computers, faster broadband Internet and e-books. Higher education learners are more frequently using these new technologies as part of their everyday activity in higher education. This increasing trend is reflected in the learners' educational experiences and reported by peak educational technology bodies around the world (CAUDIT, EDUCAUSE, JISC, & SURF, 2010, pp. 8-9). University campuses are planning, designing and developing infrastructure to accommodate the new technologies for learning (e.g. Green, 2010).

A phenomenographic perspective is taken as the approach to this research. Such an approach emerged out of research into students' approaches to and conceptions of learning (See Marton & Säljö, 1976). The aim of the study is to reveal the qualitatively different ways university teachers think about *learning* through online discussion in their pedagogy. Particular attention is given to teachers' conceptions of *learning* rather than *teaching* as the study is underpinned by a focus on understanding how students learn, what conditions enable effective learning, and how teachers' conceptions and approaches are related to the outcomes of students' learning. It is hypothesised that teachers' conceptions of *learning through online discussion* will be dependent on their conceptions of *learning* and *discussion*, and the *application of technology for learning*. Beliefs and attitudes toward each of these phenomena may also shape a teachers' conception of learning through online discussion (Hativa & Goodyear, 2002).

At the outset it is important to describe some common and interchangeable terminology. A *conception* is one's internal representation (conceptualisation) of a phenomenon (Oxford English Dictionary, 2010). It is the way one understands a phenomenon. The term *teacher* is used here to describe one of many roles performed by academic staff in higher education. *Online learning* is interchangeable with *e-learning*. It refers to learning *and* teaching that is mediated by *web-based* or *Internet-based* computer technologies. It encompasses networked technologies that facilitate, support and enhance learning. *Blended learning* refers to a mixture of face-to-face and online learning *and* teaching. *Learning technologies* are technologies that support and/or enhance learning. This term is interchangeable with *educational technologies*. *Discussion* encompasses all the various forms of interactive communication between two or

more people such as conversation, dialogue, chat, debate, and argument, questioning and answering.

There are additional terminologies specific to Phenomenography used through this dissertation. *Qualitatively different* ways of experiencing phenomena are revealed by describing the relationships between the categories of conceptions. As will be detailed later, the categories are presented in hierarchy from least complete to most complete – based on the current state of knowledge. Often in the literature, the ways people experience phenomena is described differently. For example a study referenced in this dissertation refers to conceptions as fragmented or cohesive. Like all approaches to research there is inconsistency with terminology. As is revealed in table 5, this study describes the hierarchical scale from less complete and more complete.

Research overview

What the study aims to do

This study aims to reveal the qualitatively different ways university teachers' experience learning through online discussion. A phenomenographic approach is applied to systematically explore and reveal the ways teachers conceptualise the phenomenon 'learning through online discussion'. Categories of conception emerge from teachers' descriptions of their experiences and the qualitative variation between the categories is identified to describe the hierarchical nature of categories. The possible conceptions are found at the collective level, rather than categorising each participant to a particular category.

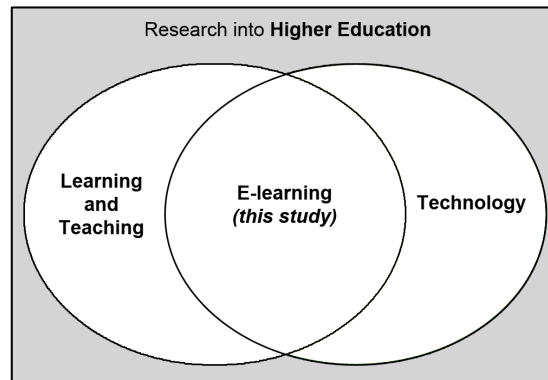
More specifically, the study aims to *extend* recent research into university teachers' conceptions of and approaches to e-learning (Ellis, et al., 2009; González, 2009, 2010) and blended learning (Ellis, Steed, & Applebee, 2006) by investigating a single but central component of e-learning courses – online discussion (Palloff & Pratt, 2007, p. 148). Additionally, this study aims to *complement* research into students' conceptions of and approaches to online discussion (Ellis & Goodyear, 2010; Ellis, Goodyear, O'Hara, & Prosser, 2007) by identifying and discussing relationships between students' and teachers' conceptions of learning through online discussion.

The higher education background: Research context

This study is situated within research into higher education, learning and teaching, and learning technologies. This field is often described as 'e-learning' in higher education (See figure 1). Research into higher education is important because, among other things, universities are

supposed to prepare students for handling situations in professional working life now and for an unknown future. They are places of research, teaching and learning where knowledge is constructed and discovered. They are important contributors to global challenges such as climate change, financial crisis and poverty. Universities are the cornerstones of education (Goodyear & Ellis, 2007).

Figure 1 Research context



Learning and teaching

Learning and teaching researchers in higher education seek to develop and improve our theoretical understanding of learning. Learning theory is used to design enhanced learning experiences for students. Such theory includes the Presage, Process and Product (3P) model that is today widely adopted in university learning and teaching programs (Biggs, 1993). The model has been adapted for this study to provide a framework for studying 'learning through online discussion'. It is used in this study to highlight the importance of research into teaching and learning, specifically, the teaching and learning context (environment), and teacher competence, teaching method, classroom climate, assessment and importantly, the medium of instruction. This model is described in further detail in the *Theoretical Framework* section of this chapter (See figure 4).

Universities around the world have established specialised learning and teaching departments to facilitate the central activities in higher education by providing services such as foundation learning and teaching courses and professional development programs addressing research, learning and teaching in higher education. Among the services nowadays are workshops that focus on the application of learning technology in education. Teachers who are adopting new technologies such as blogs, wikis, e-books, tablet computers, smart-phones, social networking

and video-conferencing often require some specialist training to learn the technical and pedagogical implications of such technologies. This study will inform educational designers and academic developers in learning and teaching departments who often provide this support and specialised training.

Technology and learning

A recent review of higher education in Australia revealed several key factors affecting the quality of students' experiences (Bradley, Noonan, Nugent, & Scales, 2008). One of those factors is information and communications technologies (ICT). Additionally, students often juggle employment, personal time and learning in a busy routine where flexibility in learning is important. Indeed, they appreciate the flexibility that ICTs afford to help their learning while at the same time they value opportunities for more direct (face-to-face) interaction with their teachers and peers (Woo, et al., 2008). They stress that balance and proper interaction is important (Ellis & Goodyear, 2010).

In addition to flexibility for learning, technologies influence educational design to support and enhance it. While e-learning might suggest a balance of technology and learning, it is often associated with the mere digitizing of content and dissemination to large groups of students with little input from the teacher – a step backward in what we know about learning. One's focus of attention should remain on quality learning that is situated in activity. This study embraces a focus on *learning* in the title because although teachers teach with technology they require time to make sense of new technology. E-learning requires a focus on *learning*, because each new 'wave' of technology is likely to bring about uncertainty thus distracting from a focus on quality learning (Ellis & Goodyear, 2010).

Laurillard (2002) advocates that the promises of a transformed pedagogy can only be fully realised by first understanding of how students learn. From this standpoint one is better positioned to choose appropriate media for learning. She describes media as either *narrative*, *interactive*, *adaptive*, *communicative* or *productive*. *Narrative media* are found as a linear presentation orientated media. They include print, text, graphics, audio, tapes, CDs, DVDs and broadcasting all intended to be transmitted in one direction. They are a non-interactive form of media. *Interactive media*, on the other hand, included such media as hypermedia, multimedia and web-based resources. *Adaptive media* take advantage of modelling capabilities of a computer. They are programs that accept input from the learner, transform the state of the model, and present the resulting output back to the user. They include simulations, virtual

worlds, tutorial simulations and games. Productive media includes media such as PowerPoint where students are about to produce a product.

Communicative media such email, conferencing software, and online discussion boards were designed to solve a ‘*logistical problem rather than a pedagogical one*’ (Laurillard, 2002, p. 145). Like many technologies pedagogy is not central to their design. This becomes important when integrating technology into learning. Distance-learning universities traditionally used these types of media but as noted earlier, they are increasingly used in campus-based courses to provide flexible learning opportunities for busy students.

University students, staff, programs and administration are becoming increasingly mobile. Learning and teaching is no longer bound by traditional time and location constraints. As a result of mobilisation, students are more socially and culturally diverse. Pedagogies are undergoing transformation as they adapt to embrace these changes in the learner’s world. Online or ‘web-based’ technologies such as learning management systems (e.g. WebCT, Blackboard and Moodle) and lecture recordings are no longer restricted to distance, external or online teaching and learning. They are becoming part of the everyday experience of campus-based university students (Bliuc, Ellis, Goodyear, & Piggott, 2010; Ellis, Goodyear, Prosser, & O’Hara, 2006; Ellis, Steed, et al., 2006). Nowadays a student’s learning experience will involve various online activities such as online discussion, interactive case studies, quizzes, inquiry, reflection, and assessment. Often teachers are challenged by the complexity of a technology-enhanced pedagogy; indeed teachers are required to be ‘*content facilitators, designers, technologists, managers, administrators, process facilitators, advisors, counsellors, assessors and researchers*’ (Goodyear, Salmon, Spector, Steeples, & Tickner, 2001, p. 69).

There is no doubt that technology advances at an exceptional rate. Higher education institutions are increasingly engaged in the use of web 2.0 and social tools including wikis and blogs. Such tools afford collaborative and cooperative learning in networked environments. Furthermore, the necessary open and free design inherent in the Internet has led to philosophical shift toward open and free education (e.g. MIT OpenCourseWare – <http://ocw.mit.edu>). The amount of information to be discovered on the Internet makes it an enormous place for students to find information from their mobile devices, anywhere, anytime (CAUDIT, et al., 2010, p. 8). Moreover, as it was wisely stated by Nobel laureate Herbert Simon, the meaning of ‘knowing’ has shifted from being able to remember and repeat information to being able to find and use it (Simon, 1996, cited in National Research Council, 2000, p. 5).

The 2010 National Survey of Information Technology in Higher Education in the United States shows that institutions are preparing learning environments to facilitate modern day technologies. 70.3% of participants consider mobile learning management system applications for hand-held devices to feature in campus planning. 78.6% agree/strongly agree that electronic book (e-book) readers will be important platforms for instructional content in the next five years. 60.5% of participants agree/strongly agree that lecture capture is an important part of their campus plans for developing and delivering instructional context. Getting the infrastructure right is necessary, as Laurillard (2002) notes that *'the most stunning educational materials ever developed will fail to teach if the context of delivery fails.'* (pp. 208-209). While teachers' rely on technology for learning, they are challenged to learn about technology for teaching. This presents an important background for a study such as this one.

Online discussion

The phenomenon of learning through online discussion is relatively new but has rapidly become a central component of many distance, online, blended and campus-based courses in higher education. From a pedagogical perspective, it is a useful medium for learning because it necessitates peer-to-peer and peer-to-teacher interaction, collaboration and socialisation. It is well represented at annual conferences and in the literature. A recent study at one Australian university it was found that seventy-five percent (75%) of one hundred and eighty academics use online discussion in formative assessment (McNeill, Gosper, & Hedberg, 2010). It has been described as the *'heart and soul'* of online learning (Palloff & Pratt, 2007, p. 148).

At a technical level, online discussion is either synchronous or asynchronous. Discussion (data) is transmitted as text, audio or video, or a combination that might include image data. A common form of online discussion is asynchronous text-based discussion (see e.g. figure 2) but various other forms are used in education (See table 1). Asynchronous text-based discussion allows students to discuss issues over an extended period of time. The text-based discussion *thread* persists in *'virtual space, ready for the next 'speaker' to access when required in the course of a conversation'* (Ellis & Goodyear, 2010, p. 53). This kind of discussion affords extensive time for meaning-making, interpretation, conceptualisation and reflection. Synchronous discussion on the other hand does not afford such time luxuries. When using this form of discussion students participate in real-time discussion. Strategies are required such as *'turn taking'* while the learner's touch-typing proficiency has a direct impact on engagement.

Figure 2 Asynchronous discussion in the Blackboard learning management system

The screenshot displays the Blackboard Learning System interface for the University of Sydney. The course is '2010 Semester 2, ABED1001 Mathematics in schools'. The user is viewing a discussion forum titled 'Project 1: SUBMISSION area for 9am group'. The forum is set to 'Threaded' display and is 'Conditional'. The description states: 'Use this forum to post your critique and provide comments to your peers' critiques.' The forum settings include: Topic Type: Threaded, Graded: No, Peer Review: No, Posting Restrictions: Allow post and reply, and User Identification: User Name.

The discussion list shows the following messages:

Subject	Messages	Author	Date
IWB "Flags of Africa" (New)		COHEN	24 August 2010 16:42
Simon's critique of the IWB		SIMON	19 August 2010 06:42
Aaron's critique of Pythagoras' Theorem 2		AARON	19 August 2010 06:41
Juliana's critique of the IWB Resource "Pushing and Pulling"		JULIANA	19 August 2010 02:13
Frank's comments on Ivy's IWB resource "Pushing and Pulling"		FRANK	19 August 2010 06:00
Critique of the IWB resource "Silent Invaders."	3	LYNDA	18 August 2010 20:23
Re: Critique of the IWB resource "Silent Invaders."		FANGYAN	18 August 2010 11:03
Re: Critique of the IWB resource		GEORGE	19 August 2010 08:59

Table 1 Examples of technologies for online discussion

		Data type		
		Text	Audio	Audio/Video
Transmission type	Asynchronous	Message board, bulletin board, discussion board , blogging, micro-blogging (Facebook and Twitter), Email	Radio, Wimba Voice Board	Video Blogging
	Synchronous	Microsoft Messenger, Google GChat, Apple Chat, Adobe Connect Chat	Telephone, VoIP (Skype)	Video Conferencing, Adobe Connect, iPhone FaceTime, Video Phone (Skype, Microsoft Messenger, Smartphone)

Online communities of learners

The considerable uptake of educational technologies in higher education has led to significant research into building effective online learning communities (e.g. Bruckman, 2006; Hazemi & Hailes, 2002; Palloff & Pratt, 2007; Zhang, Scardamalia, Reeve, & Messina, 2009). Research into online communities is important in this study because the glue that often connects community members is discussion. It unites the community members as one collective group. The underpinning of computer-mediated communication in online communities enables rapid information exchange and connects people from all over the world. Online discussion in these communities allow learners to ‘connect their own interests and expertise with those of the community to achieve their individual and collective goals’ (Amar, 2002, cited in Zhang, et al., 2009, p. 9). This area of research is particularly useful because online communities are often engaged in online discussion (Palloff & Pratt, 2007).

Theoretical framework

Learning and discussion

This study is based on an epistemology that considers learning situated in social activity. This perspective is based on the paradigm of constructivism and Vygotsky’s social development theory (Vygotsky, 1978). The foundation of this paradigm is that social interaction plays a fundamental role in the process of cognitive development. Development, consciousness and cognition are the product of socialisation and social behaviour. This paradigm places importance on social interaction with someone more knowledgeable (an expert). Thus, the

social interaction can be with a more knowledgeable teacher or peer. Additionally, Vygotsky considered learning to take place in the Zone of Proximal Development (ZPD). The ZPD is the distance between the student's ability to perform a task independently and to perform the task with support and guidance. This support is referred to in the literature as *scaffolding*.

Discussion, one of several aspects in this study, is a way to mediate social interaction. Indeed, Paul Ramsden describes teaching as 'a sort of conversation' where learners and teachers are equally listening and talking (Ramsden, 2003, p. 160). It is a valuable way to reveal diverse and complex views about a topic as learners are guided to explore questions, challenge beliefs and learn about other perspectives. It can enliven classrooms by creating a balance of students' and teachers' voices while maintaining moral, political, and pedagogic integrity (Brookfield & Preskill, 2005). Interestingly, it is often a large component of university courses but rarely articulated in curriculum documents. It is often central to cooperative and collaborative learning designs but taken-for-granted. Brookfield and Preskill (2005) present fifteen benefits of discussion for learning summarised in figure 3.

Figure 3 Fifteen benefits of discussion, Brookfield and Preskill (2005)

- 1. It helps students explore diversity of perspectives.**
- 2. It increases students' awareness of and tolerance for ambiguity or complexity.**
- 3. It helps students recognise and investigate their assumptions.**
- 4. It encourages attentive, respectful listening.**
- 5. It develops new appreciation for continuing differences.**
- 6. It increases intellectual agility.**
- 7. It helps students become connected to a topic.**
- 8. It shows respect for students' voices and experiences.**
- 9. It helps students learn the processes and habits of democratic discourse.**
- 10. It affirms students as co-creators of knowledge.**
- 11. It develops the capacity for the clear communication of ideas and meaning.**
- 12. It develops habits of collaborative learning.**
- 13. It increases breadth and makes students more empathic.**
- 14. It helps students develop skills of synthesis and integration.**
- 15. It leads to transformation.**

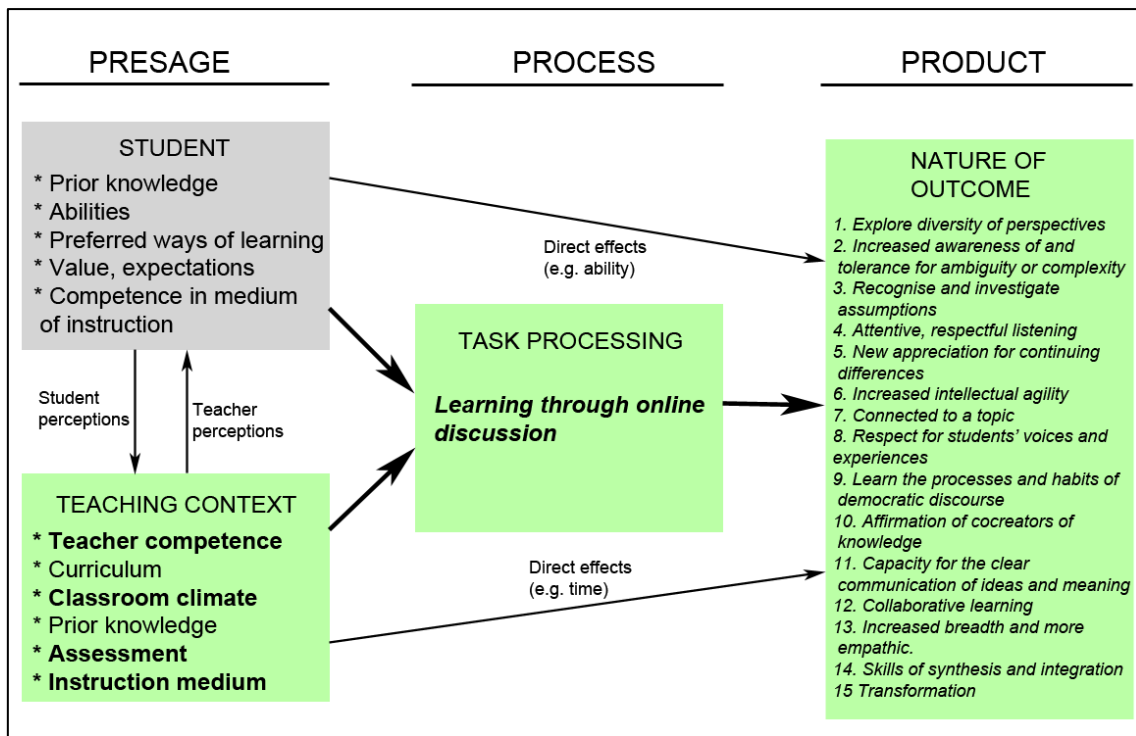
(pp. 21 - 41)

Learning through discussion has always been central to university courses and recently many courses have moved discussions from traditional face-to-face contexts to online and blended contexts. Brookfield and Preskill (2005) highlight that often online discussion is experienced as sterile, unfriendly and alienating. Evidently, many of the contextual cues we have come to rely on in traditional face-to-face discussion such as the speaker's tone, tenor, intonation, and facial expression are removed. Like many faculty teaching staff, Brookfield and Preskill were sceptical of a trend to commodify and strip courses of the presence of a face-to-face teacher (2005, p. 215), but as will be revealed in this research, teachers think about many benefits for learning through online discussion.

The Presage, Process, Product (3P) model of teaching and learning

Research into student learning has for some time been interested in establishing relationships between the teaching context, student learning processes, and learning outcomes. This has been formalised in various versions of the Presage, Process, Product (3P) model which has been adapted for this study and presented in figure 4 (Biggs, 1993). Biggs describes the *Presage* component of the model as a way to capture the relationships between the learner and learning context. The *Process* component describes what the learner does. The *Product* component describes the outcomes of learning. All three components of the model interact '*in a systemic way until equilibrium is reached*' (Watkins & Biggs, 1996, p. 7).

Figure 4 Adapted 3P model of teaching and learning



(Biggs, 1993, p. 75; Brookfield & Preskill, 2005, pp. 21 - 41)

The adapted model in figure 4 is an important framework for this study because it describes the variables in learning and teaching, including students’ and teachers’ conceptions of learning through online discussion. Those are represented in the ‘presage’ component while the outcomes of learning through online discussion are acknowledged in the ‘product’ component. The act of learning through online discussion itself is represented in the ‘process’ component. Although the focus of this study is on the teacher and ‘teaching context’, all three components are equally important as they act together in balance as a whole system. Indeed, a more complete version of figure 4 would show a number feedback loops. Teachers’ conceptions of learning through online discussion will affect ‘teacher competence’, ‘classroom climate’, ‘assessment’, task processing and the ‘product’. This study advocates that the ‘product’ of learning through online discussion should be the benefits of discussion as outlined by Brookfield and Preskill (2005, pp. 21-41).

Phenomenography

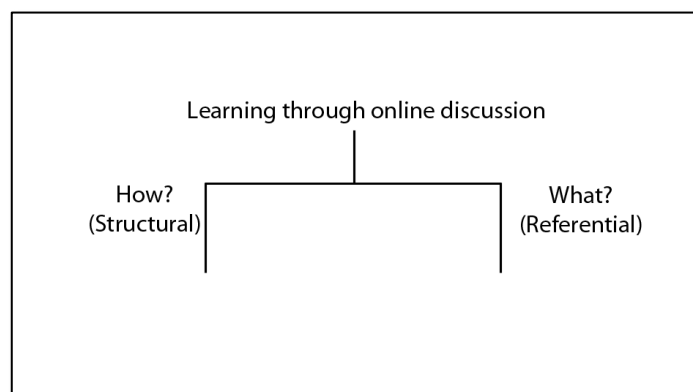
Phenomenography as an approach to research emerged in the late 1970’s (See Marton & Säljö, 1976). Its original use was to reveal students’ conceptions of what it was they were learning. It has since been adopted for a variety of studies to research conceptions of, and approaches to,

other phenomena in educational contexts. There are many phenomenographic studies of students' conceptions of, and approaches to, learning as summarised in Prosser and Trigwell (1999). However, there are few studies into teachers' conceptions of, and approaches to, learning and related educational phenomena (Prosser & Trigwell, 1999).

Phenomenography is not a research methodology, but rather it is a systematic approach to research used to describe the various ways that people experience phenomena in education (Marton & Booth, 1997, p. 111). It is inductive, so concrete empirical evidence is analysed which leads to the development of confirmation of theory. The approach is based on a second-order perspective view of phenomena (Marton, 1981). That means a phenomenon is understood by studying how other people experience it. This is in contrast to the researcher directly studying the phenomenon, which would be a first-order perspective.

An epistemological underpinning in phenomenography is the theoretical separation of a conception's 'referential' and 'structural' aspects (See figure 5). The referential aspect is often referred to as the 'what' aspect of the conception whereas the structural aspect is often referred to as the 'how' aspect of the conception. Although the 'referential' and 'structural' aspects of a conception are different, they are intertwined and inseparable.

Figure 5 Referential and structural aspects of the conception (Based on Ellis, Calvo, Levy & Tan, 2004)



Phenomenographers distance themselves from the data by not imposing preconceived knowledge during data collection and analysis. The result of phenomenographic research is a set of categories of conception known as the 'outcome space' that represents the various ways the participants experience the phenomenon (Marton, 1981). The categories are presented in a hierarchy from the least complete category to the most complete. Importantly, the higher-order (more complete) categories encapsulate and extend the lower-order (less complete) ones. The

categories emerge from the data so there is no predetermined number of categories. There aren't any predetermined types of categories either.

Review of related empirical research

This section reviews related empirical studies of students' and teachers' conceptions of, and approaches to phenomena in education. The starting point for this review is seminal research into students' conceptions of, and approaches to learning. Several foundational studies by Noel Entwistle, Roger Säljö, Ference Marton, Lars Owe Dahlgren, Lennart Svensson and John Biggs paved the way for much subsequent research (Prosser & Trigwell, 1999, p. 88). Broadly, these studies revealed two qualitatively different ways that students approach learning. These are known as the 'surface approach' and 'deep approach' to learning (Prosser & Trigwell, 1999, p. 88). More recently, studies have investigated students' conceptions and approaches to e-learning (Ellis & Goodyear, 2010) and online discussion (Ellis, Goodyear, et al., 2006).

Additionally, studies into teachers' conceptions of and approaches to teaching in higher education have revealed several distinctive features in the way teachers think about teaching (e.g. Dall'Alba, 1991; Kember, 1997; Prosser, Trigwell, & Taylor, 1994). Teaching is described as 'teacher-centred' or 'student-centred', and with a focus on 'information transmission' or 'conceptual change' (Prosser & Trigwell, 1999, p. 156). Research investigating teachers' conceptions of teaching has been extended into the field of e-learning in recent studies (e.g. Ellis, et al., 2009; González, 2009, 2010).

Importantly, the relationship between how teachers approach their teaching and how their students approach their learning has been studied as well (e.g. Gow & Kember, 1993; Prosser & Trigwell, 1999; Trigwell, Prosser, & Waterhouse, 1999). Those studies revealed teachers who adopt more information transmission/teacher-focused approaches to teaching have students who adopt more surface approaches to study, while teachers with more conceptual change and development/student-focused approaches have students adopting deeper approaches to learning.

Students' experiences

Learning

Prosser and Trigwell (1999) synthesise many of the phenomenographic studies of students' conceptions of learning (e.g. Biggs, 1987; Entwistle & Ramsden, 1983; Marton & Säljö, 1976). As mentioned earlier, these studies revealed that students' approaches to learning could be described as 'surface' or 'deep'. In adopting the surface approach students see learning tasks as

enforced work. Learning is about coping with these tasks in order to pass assessment. By contrast a student who adopts a deep approach to learning will seek to understand meaning. There is intrinsic interest and enjoyment in carrying out the learning tasks. There is a genuine curiosity in the subject and connections with other subjects.

E-Learning and learning through online discussion

Recently, research into conceptions and approaches has extended to the field of e-learning and online discussion. The ways students think about learning through online discussion reveal an avenue for comparative analysis with the findings of how teachers' think about learning through online discussion. Phenomenographic studies have revealed students' conceptions of face-to-face and online discussion as four qualitatively different categories (Ellis, Goodyear, et al., 2006, p. 249) –

1. *Discussions as a way of checking your ideas are right*
2. *Discussions as a way of collecting ideas*
3. *Discussions as a way of challenging and improving your ideas*
4. *Discussions as a way of challenging ideas and beliefs in order to arrive at a more complete understanding*

They further revealed four categories of students' approaches to online discussion. These categories of approaches describe students' intentions and strategies –

1. *Engaging in online discussions to read postings to avoid repetition*
2. *Engaging in online discussions to use postings to add to ideas*
3. *Engaging in online discussions to evaluate postings to challenge ideas*
4. *Engaging in online discussions to evaluate postings to reflect on key ideas*

Their analyse of these approaches were compared with the early research on students' approaches to learning (e.g. Biggs, 1987; Entwistle & Ramsden, 1983; Marton & Säljö, 1976). They found that categories 1 and 2 represented *surface* approaches to learning through online discussion while categories 3 and 4 represented *deep* approaches. In addition to the findings in this study, the authors suggest that worthwhile discussion is most likely to occur –

- *‘when it is understood that the purpose of discussions is to **encourage holistic thinking and understanding through challenging ideas and beliefs***
- *when face-to-face approaches involve analyses of experiences and opinions to reflect on the key ideas of the topics under discussion; and*

- *when online approaches involve an intention to reflect on postings to evaluate them so that the key ideas being discussed can be **challenged**'.* (Ellis, Goodyear, et al., 2006, p. 254)

An earlier study revealed similar findings. Ellis, Calvo, Levy and Tan (2004) revealed four similar categories of conception to describe the ways that students think about learning through discussion (p. 79) –

1. *to develop communication skills*
2. *to exchange ideas to find the answers*
3. *to understand the ideas that are closely related to the subject's goals*
4. *to understand the ideas that are closely related to the subject's goals from a number of perspectives.*

They considered categories 1 and 2 as surface approaches and categories 3 and 4 as deep. Additionally, this study revealed the ways that students approach learning through *online* discussion. They found four categories of approaches to online discussion (Ellis, et al., 2004, p. 83) –

1. *to engage in online discussion to fulfil subject requirements*
2. *to engage in online discussion by waiting and seeing what others do*
3. *to reflect on the problems discussed from different perspectives to improve understanding*
4. *to reflect on the problems discussed from different perspectives to deepen understanding*

They considered categories 1 and 2 as deep approaches learning while categories 3 and 4 were considered surface approaches to learning. Correlations between the categories of conception are drawn here between these findings and those in the more recent study by Ellis, Goodyear, et al. (2006) as summarised in table 2.

The category 'to exchange ideas to find the answers' is similar to 'discussions as a way of checking your ideas are right' and 'discussions as a way of collecting ideas' because in both of these categories there is an explicit reference to *checking* and *collecting* which requires an *exchange* of ideas. Moreover, the category 'to understand the ideas that are closely related to the subject's goals from a number of perspectives' is similar to the 'discussions as a way of challenging and improving your ideas' and 'discussions as a way of challenging ideas and

beliefs in order to arrive at a more complete understanding’ because *understanding ideas from a number of perspectives* will necessarily involve *challenging* existing ideas.

Table 2 Correlations between studies of students' conceptions

	Students’ conceptions of learning through discussion (referential aspect)	
	(Ellis, et al., 2004)	(Ellis, Goodyear, et al., 2006)
Limited and fragmented conceptions	1. To develop communication skills	
	2. To exchange ideas to find the answers	1. Discussions as a way of checking your ideas are right 2. Discussions as a way of collecting ideas
Complete and cohesive conceptions	3. To understand the ideas that are closely related to the subject’s goals	3. Discussions as a way of challenging and improving your ideas
	4. To understand the ideas that are closely related to the subject’s goals from a number of perspectives.	4. Discussions as a way of challenging ideas and beliefs in order to arrive at a more complete understanding

Teachers’ experiences

In this section, related studies of teachers’ conceptions of teaching and e-learning are synthesized. They offer foundation for this study. Prosser and Trigwell’s (1999) note that ‘*there has been little relational research into teachers’ conceptions of teaching, and even less into their perceptions of the teaching context, their approaches to teaching, outcome of teaching and the relation these aspects of the experience of teaching*’ (pp. 20-21). This study is situated in this gap with particular focus on ‘learning through online discussion’.

Teaching

The way teachers think about teaching is useful in this study the way they think about teaching may inform their conceptions of learning through online discussion. Teachers’ experiences of teaching provide valuable insight into how they might Kember (1997) reviewed thirteen studies of university teacher approaches to teaching. He organised the results of analysis into five categories of conception that ranged from lower-order less complete conceptions through to higher-order more complete ones. The spectrum of conceptions ranged also from teacher-centred/content-orientated to student- centred/learning-orientated.

1. Imparting information – Teaching is purely the transfer of information
2. Transmitting structured knowledge – Teaching is the transfer of structured, logical and easily understood information

3. Student-teacher interaction – Teaching is a focus on interaction between the student and the teacher
4. Facilitating understanding – Teaching is helping individual students learn
5. Conceptual change/intellectual development – Teaching is changing student conceptions

Kember (1997) considered the first two categories as teacher-centred/content-orientated, the third category as a transitional one and the last two as student-centred/learning-orientated. This ‘research has found a high degree of consensus’ among several countries and a diverse range of universities (p. 273).

While these studies reveal valuable insight into the ways teachers think about and approach teaching, there is significantly more value in analysing the relationship between teachers’ conceptions and approaches, and students’ conceptions and approaches. There are few relational studies in the literature that do this. Trigwell, Prosser and Waterhouse (1999) is a noteworthy exception. They found that teachers with a focus on themselves, teaching and transmitting information led to surface approaches to learning and that teachers with a focus on students and on changing conceptions led to deep approaches to learning. These findings are significant as they confirm the delicate balance and the interconnectedness of all three components in the 3P model as discussed previously (See Theoretical framework section and figure 4).

E-learning

The extension of research into e-learning is a relatively new and specialised field. Roberts (2003) reports findings of a study conducted in Scotland where university teachers revealed conceptions far removed from the ‘*the most effective way to develop use of the Web for learning and teaching*’ (p. 127). These findings revealed teachers’ conceptions similar to those found by Kember (1997), that is, teachers’ conceptions of teaching with the Web were informed by their conceptions of learning and teaching. The findings were teacher-centred/subject-focused or student-centred/learning-focused conceptions. Importantly, this study revealed minimal cases where teachers consider using the Web for higher-order learning such as ‘*conceptual change*’.

These findings were confirmed in a later phenomenographic study by González (2010) where university teachers’ conceptions of e-learning were described in four qualitatively different ways –

1. *eLearning as a medium to provide information to students;*
2. *eLearning as a medium for occasional communication among unit participants;*
3. *eLearning as a medium for engaging students in online discussions; and*
4. *eLearning as a medium to support knowledge-building tasks.*

Categories 1 and 2 were considered less complete and less inclusive while categories 3 and 4 were considered more complex and more inclusive. González presents four dimensions of variation (structural aspect) that enable a rich description of the relationship between the four categories –

1. *the role of the teacher in relation to eLearning;*
2. *the role of students;*
3. *course participants' interaction; and*
4. *perception of embeddedness with the face-to-face component.*

While this study is different in design and detail to other studies, the findings confirm and complement those from Trigwell et al. (1999). It was found that teachers who focused on transmitting knowledge were more likely to design content-centred instruction. Conversely, teachers who focused on facilitating understanding were more likely to design student-centred instruction. Furthermore, González found that teachers thought about online learning as either informative with a focus on individual learning or as communicative with a focus on networked learning.

In another phenomenographic study, similar to González (2010), Ellis, et al. (2009) interviewed nineteen university teachers to discover what they think about learning technologies, and how they approach design and teaching with learning technologies. They found that the qualitatively different ways teachers think about learning technologies relates logically and positively to the qualitatively different ways that teachers design and teach with learning technologies. They suggest that teachers in their study think about learning technologies in two general ways – as a way enabling efficiency (a focus on the technology) and as a way of enabling learning. They found that teachers think about learning technologies in four qualitatively different ways –

1. *Learning technologies as tools for access*
2. *Learning technologies as tools for information delivery*
3. *Learning technologies as ways of providing active learning opportunities*
4. *Learning technologies as ways of building knowledge*

Ellis, et al. (2009) described categories 1 and 2 as fragmented with a focus on the tools while categories 3 and 4 were described as cohesive and supporting student learning. Table 3 shows the correlations between this study and González (2010). A central theme among these two studies is the qualitative shift from less complete to more complete conceptions. The shift is from teacher/content centred where technologies are thought of as ‘tools’ to ‘provide information’ ‘delivery’ and ‘occasional communication’ to conceptions that were student/learning centered where technologies are thought of as ‘engaging’ students in ‘active’ ‘knowledge building’ tasks.

Table 3 Correlations between studies of teachers' conceptions

	Teachers' conceptions of e-learning and learning technology	
	(Ellis, et al., 2009)	(González, 2010)
Less complete, less inclusive, focused on tools	1. Learning technologies as tools for access	1. eLearning as a medium to provide information to students
	2. Learning technologies as tools for information delivery	2. eLearning as a medium for occasional communication among unit participants
More complete, more inclusive, supportive of student learning	3. Learning technologies as ways of providing active learning opportunities	3. eLearning as a medium for engaging students in online discussions
	4. Learning technologies as ways of building knowledge	4. eLearning as a medium to support knowledge building tasks

CHAPTER II: METHODOLOGY

Overview

Phenomenography is a particularly useful approach to research how educational phenomena are understood. It seeks to understand a phenomenon by understanding how those who engage with it closely think about it. Specifically, learners and teachers are studied to reveal their experiences with educational phenomena. Phenomenography seeks to discover the various ways of experience (Marton & Booth, 1997). It seeks to reveal qualitatively different conceptions, or '*structures of awareness*' and to describe conceptions of the world around us (Marton, 1994; Marton & Booth, 1997). This study is adopting this research approach to understand the various ways that university teachers' understand learning through online discussion.

Phenomenography as proposed by Ference Marton (1981), is qualitative in nature. It is not described as a methodology in its own right, rather an approach to identifying, formulating and answering research questions about learning and teaching in educational settings (Marton & Booth, 1997, p. 111). As mentioned earlier (See Theoretical framework section), the end-goal of this research approach is to understand phenomena from a '*second-order perspective*' (Marton, 1981). In this way, a phenomenon is studied by revealing the various experiences of those closely engaged with it (learners and teachers).

Research question

The research question this study seeks to answer is – *What does learning through online discussion mean to university teachers?* In using a phenomenographic approach the answer to this question will be represented as a set of categories of conceptions known as the outcome space. It will encapsulate the qualitatively different ways that university teachers think about learning through online discussion.

Sampling

The research sample for this study is taken from the population of Australian teachers at one higher education institution who use online discussion in their pedagogy. There is no aim to create a representative sample of the entire population; rather the aim is to catch as many as possible of the various ways of experiencing the phenomena. The sampling strategy aligns with a suggestion from Flick (1998, cited in Neuman, 2006, p. 220) whereby qualitative researchers determine their sample based on the relevance of the participants to the research topic. Thus,

this project seeks specific participants drawing on quota and purposive sampling strategies to ensure that the participants of this study have used online discussion in their pedagogy. The sample size (N) was based on suggestions from experienced phenomenographers who indicate that fifteen to twenty participants adequately allows for saturation of categories (Bowden, 1996; Bowden & Walsh, 2000). Saturation means there will most likely be repeated conceptions in the sample but most importantly all the various conceptions are captured. A sample of fifteen was used for this study (N=15).

An important feature of a phenomenographic sampling strategy is to maintain adequate variation. The sample obtained for this study varies in teaching area (discipline); class size; level of study (postgraduate/undergraduate); teaching mode (online/blended); and years of experience with teaching with technology. Quota sampling was adopted to select a proportion of teachers from each faculty of the university. They are professors, associate professors, senior lecturers and lecturers. They teach undergraduate and/or postgraduate courses. The courses they teach may be delivered entirely by way of the Internet (online) or in blended (online and face-to-face) mode. The sample is described in table 4.

This sampling strategy offers control of the research when compared with probabilistic sampling (Neuman, 2006). By knowing the types of participants one is able to hypothesise potential research results. Quota sampling has an advantage because in indentifying variations in the sample the researcher is able to explore differences and similarities within population during analysis (Neuman, 2006). Importantly, the sample (N) in this study does not claim to be representative of all teachers who use online discussion, but rather to describe the experiences of a small set of teachers. The phenomenographic approach assumes that a similar project with a larger sample from more than one university would result in similar categories defined in the outcome space.

Table 4 Interviewee profiles

Teacher	Discipline	Class sizes	Level	Mode	Experience (Teaching with technologies)
1	Social Sciences (Philosophy)	< 50	Postgraduate	Blended	5 - 10 years
2	Higher Education (Academic Development)	< 50	Postgraduate	Blended	5 - 10 years
3	Primary and Secondary Education	> 200	Undergraduate	Blended	< 5 years
4	Primary and Secondary Education (Information and Communications Technology)	< 100	Undergraduate	Blended	10 - 15 years
5	Higher Education (E-learning)	< 50	Postgraduate	Blended	10 - 15 years
6	Higher Education (Academic Development)	< 50	Postgraduate	Blended	10 - 15 years
7	Arts (Language)	< 100	Postgraduate	Blended	< 5 years
8	Higher Education (Academic Development)	< 50	Postgraduate	Blended	5 - 10 years
9	Business and Economics	< 50	Postgraduate	Blended	5 - 10 years
10	Higher Education (Academic Development)	< 50	Postgraduate	Blended	5 - 10 years
11	Higher Education (E-learning)	< 50	Postgraduate	Blended	5 - 10 years
12	Primary and Secondary Education	> 200	Undergraduate	Blended	< 5 years
13	Higher Education (Academic Development)	< 50	Postgraduate	Blended	10 - 15 years
14	Higher Education (Research Development)	< 50	Postgraduate	Blended	10 - 15 years
15	Politics and Sociology	< 50	Undergraduate	Online	< 5 years

Data collection

Data was collected systematically via in-depth semi-structured interviews. The interview is the preferred method since it supports the exploration of a subjects' awareness by probing to reveal conceptions (Zmijewska, Unpublished). Additionally, interviews are selected because *'participants are encouraged to reveal, through discussion, their ways of understanding a phenomenon, that is, to disclose their relationship to the phenomenon under consideration.'* (Bowden & Walsh, 2000, p. 9).

The focus of the interviews was broadly around three main questions –

- (1) What does learning through online discussion mean to you?
- (2) How do you approach the design of online discussion learning experiences?
- (3) How do you approach mediation in online discussion activities?

The aim in this dissertation is to report the findings of the first of the questions listed above. In order to gain further insight in the participants' experiences the following set of sub-questions and probes were used for each interview –

- 'What does computer-mediated discussion mean to you?*
- How do you understand computer-mediated discussion?*
- How do you make sense of computer-mediated discussion?*
- What do you think it affords to learners?*
- How does it afford learning?*
- To what degree does it afford learning?*
- Why is it good for learning?'*

The full interview schedule is reproduced in *Appendix A*. The interviews lasted between twenty and forty minutes. They were recorded with an audio recorder and transcribed by the researcher.

The aim of data collection was to reveal the ways in which teachers experience learning through online discussion in their pedagogy. Participants were therefore encouraged to reflect on their experiences in a state of meta-awareness – being aware of their awareness (Marton, 1994). This was achieved by asking teachers to describe past experiences and talked about their thinking. It was the responsibility of the interviewer to probe for deeper reflections so as to bring to the surface the subjects' awareness (Prosser & Trigwell, 1999). The researcher was required to

keep the discussion on track. It was a joint interviewer-interviewee exploration, or in other words, constitution, of the phenomenon in question as seen by the interviewee (Bowden & Walsh, 2000). The researcher worked towards an articulation of the interviewee's reflections on experience. The researcher therefore needed to make the interviewee aware of his/her thoughts (Marton & Booth, 1997).

The unit of analysis and the outcome space

The unit of analysis in phenomenographic research is '*a conception*' which has been described as '*a way of experiencing something*' (Marton & Pong, 2005, p. 335). This study defines the unit of analysis as '*a conception of learning through online discussion*'. These conceptions are grouped together into categories in hierarchical-order. This is known as the *outcome space*. Importantly, logical relations between the categories are described to highlight the hierarchical arrangement. Higher-order categories of conception encapsulate and extend the lower-order ones (Bowden & Walsh, 2000). The categories of conception are therefore always formed at a collective level. The description we reach is a description of variation between the categories, not a description of an individual's experience (Marton & Booth, 1997).

Phenomenographic data analysis

Following the phenomenographic protocol advocated by Marton and Booth (1997), analysis began during the data collection stage of research. In between scheduled interviews, the transcribing and preliminary analysis started to reveal emerging ways of thinking, new themes, perspectives and conceptions that may have influenced subsequent data collection. The knowledge learned from early data analysis informed the direction of subsequent interviews and helped to focus probing and discussion on the area of investigation. For example,

Mid-way through the data collection, preliminary analysis of the first five transcripts began. The analysis involved the identification of various ideas that the teachers were describing in their experiences with online discussion. These ideas were grouped together based on similarities and differences to form preliminary categories. While completing the preliminary analysis, the researcher tried to maintain distance between the emerging categories of conception and preconceptions held by the researcher. The preliminary findings (See figure 6) were presented in a short conference paper (Parisio, 2010) –

Figure 6 Preliminary findings

Learning through online discussion as a way to –

1. to provide think-time
2. enable accessibility
3. foster a learning community
4. foster collaborative knowledge building

Once the fifteen interviews were complete and ten interviews were transcribed, thorough systematic analysis began. The ten transcripts of approximately 41, 500 words and the remaining five audio recordings of the interviews were analysed in three systematic iterations.

The first iteration involved reading the text-based transcripts line-by-line to identify utterances that related to the area of investigation. A line-by-line analysis of interview transcripts was conducted similar to the open coding in Grounded Theory (Corbin & Strauss, 1990). The analysis went beyond the words and content to explore the meanings people were conveying. As the analysis progressed it became apparent that the ways of thinking about ‘learning through online discussion’ were being repeated. Towards the middle of the first iteration of analysis, multiple codes were being applied to some utterances, which suggested that codes shared similarities. In this iteration of analysis the focus was not on the individual participant but rather the way of experiencing the phenomenon. Thus, one participant often referred to several ways of thinking about ‘learning through online discussion’ (Marton, 1994). The first iteration resulted in fifty-six codes describing various ways of experiencing ‘learning through online discussion’.

The second iteration involved bringing together the conceptions into groups by identifying similarities and differences in meanings. A conception was compared with the pool of meanings gathered from the first analysis and also within the context of the transcript (the context in which it came). In this process some conceptions were merged as they were essentially describing similar experiences. For example, teachers’ experiences coded as *fun*, *motivating learning*, *improving self-confidence*, *breaking-up routine*, *experimentation* and *taking risks* were all considered as ways to engage in learning.

The third iteration of analysis shifted focus to the relationships between the categories. The groups of quotes were arranged and re-arranged and narrowed into categories by testing them against the original data, adjusting, retesting, and adjusting again until eventually the whole system of meanings was stabilized (Marton, 1994). Logical relations between categories were

identified and illustrative quotations from the data were identified to represent the category and the borderline cases.

While completing these iterations, care was taken to distance the researcher from the data. As advised, it was important to keep an open mind and not impose categories on the data but to reveal the categories that emerge from the data (Marton, 1981). At the same time knowledge of prior similar research into students' conceptions of learning through online discussion and teachers' conceptions of e-learning was consciously not imposed on the data in this study. Distancing was implemented by focusing on the particular language used by participants.

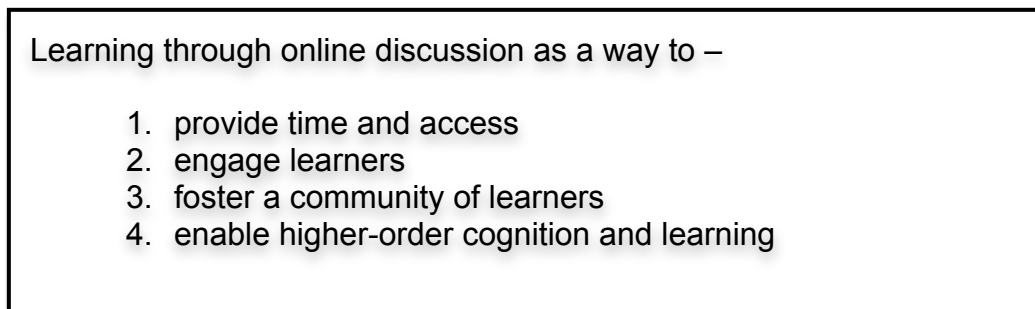
The analysis of data revealed qualitatively different ways in which university teachers experience, conceptualise, perceive, and understand learning through online discussion. The qualitatively different ways of knowing will be represented in as hierarchical set of categories known as the *outcome space* in which higher-level categories encapsulate and extend lower level categories (Bowden & Walsh, 2000), which is the focus of the following chapter.

CHAPTER III: RESULTS

Conceptions of learning through online discussion

The main findings of this study are presented as a set of categories of conception. They describe the qualitatively different ways that university teachers think about ‘learning through online discussion’. In phenomenographic terminology this is referred to as the *outcome space* (Marton & Pong, 2005). The *outcome space* presented here is hierarchical and relational. That is, category 1 is the least complete conception and category 4 is the most complete. The categories are relational because the more complete categories encapsulate and extend the less complete ones. The four categories of conception are described in figure 7. They are best read from the top-down as they increase in completeness.

Figure 7 Learning through online discussion: Categories of conception



The richness and variability of the knowledge that teachers have about learning through online discussion is evident in the four categories emerging from the interview data. Each of these four categories is elaborated below.

Category 1: provide time and access

‘Learning through online discussion as a way to provide time and access’

This category of conception refers to the pragmatic and technical features of ‘learning through online discussion’. There is a focus on provision of time and access to information. Underpinning this category is a focus on technology. The teachers who described experiences in this category talked about anywhere, anytime access to information and resources indicating an information/content centred conception. The representative quote for this category is –

[...] accessibility, so the fact that it's not only if you're off campus you can have access, but also for instance if you are the sort of student who has hearing problems, sometimes you can use text chat and so there is access to that [...] (Teacher 4)

This awareness is heavily weighted with technology. It is conceived of as the tool to overcome constraints or problems related to time and distance. Notably, this category of conception lacks a focus on *learning* and *discussion*. The following quotation highlights a focus on time and the facility to record discussion for access at a later time.

But for asynchronous, you've got this extra wait time to think things through. Now you don't get that in a tutorial room. Now that can be for each questions or the entire semester. You might only talk about this issue in week one and if you're in a tutorial you can't go back to that every time. But if you've got a discussion board you can. (Teacher 1).

In this quotation the teacher has described how the asynchronous discussion enables time for the students to think about their response. This affordance of 'learning through online discussion' was also linked to assistive purposes such as providing access for students with hearing impairments and students from non-English speaking backgrounds (NESB). The affordance of time was considered a significant benefit for students to think and formulate a response in the course of a discussion.

Additionally, this quotation makes reference to another technical feature of 'learning through online discussion'. That is the facility to record discussion and access the recordings at a later time. This type of thinking again focuses on the *access* to discussion. Students can access the discussion at anytime after the discussion has taken place. The recorded discussion was also considered as a kind of *frequently asked questions* repository that could be referred to when more than one similar question was asked.

Category 2: engage learners

'Learning through online discussion as a way to engage learners'

This category of conception encapsulates a focus to use online discussion to *engage* students in learning experiences. It encapsulates using online discussion as a way to enable confidence, self-efficacy, self-esteem and '*experimenting and risk taking with ideas*' (Teacher 2). Although there are some links with learning and discussion, the focus in this category remains with how

technology enables student engagement. This category of conception also reflects the affordance of technology to provide anonymity during the discussions. The representative quotation for this category is –

[...] where people feel safe and prepared to take a risk and where they support one another and comment and respond to what other people are saying in their own time. [...] I think there is anonymity in an online discussion forum, although students know each other's name. It is a safe environment where students are prepared to speak out. (Teacher 12)

The following quotation contrasts the online and face-to-face student contribution to a discussion. In this quotation the teacher has described a conception with a technical underpinning.

[...] online I think people can feel a bit freer, they're not on show, their not on display, they know people are going to respond but there's not this sense that they have to present for fifteen minutes, and they are not being looked at by everyone in an intimidating kind of classroom environment. (Teacher 10)

A similar utterance by another teacher describes how online discussions are thought to encourage self-efficacy –

[...] they seem to flourish with online discussion because they're able to sit down and in their own time rework and redraft contributions. Then that gives them more confidence to post it. So I think it really supports their sense of self-efficacy by giving them time. (Teacher 8)

Teachers' conceptions in this category also included a focus on learning through online discussion as something *different* which leads to students engagement –

So, one of the things we often look for is a way of changing the structure, doing something different, so, to some extent, I thought it might be an interesting tool to use just to break up the pattern of energy. (Teacher 9).

The difference between this category and the previous one is that here there is a greater focus on the indirect consequences of technology that encourage engagement in an online space.

Category 3: foster a community of learners

'Learning through online discussion as a way to foster a community of learners'

This category of conception is about how learning through online discussion is used to foster a learning community. It is about using a *'discussion forum ... to try and build-up that learning community'* (Teacher 11). In this category, online discussion is the tool used to create a student-owned space where the traditional teacher-student power relationships are broken down and where students feel free to share ideas. In this category there is a strong focus on students. The representative quotation for this category is –

First of all, [...] it leads to a kind of leveller playing field. There's lots of research that says it breaks down the usual kind of power structures and people are far more likely to contribute or to correct their instructor than they would be in class and if your whole aim is to get this open kind of discussion where they are taking control, that's a wonderful thing (Teacher 1).

This category describes an *intention* to establish a community. Teachers talked about *strategies* such as removing themselves from the community to help the students feel like they owned the community. This is highlighted in the following descriptions.

I emphasize to any of the teaching staff that are involved in my units, that the way to get **the community to take responsibility** is for you not to be that source of information and not to be an evaluator of their responses at the outset. You want to give them the freedom to contribute themselves.

The following quotation highlights again, a focus on encouraging students to feel ownership of knowledge in online discussion.

I want them to **own the knowledge** they come up with, um, and, that I have the best way to engage them with your course content is to give them that room. To let them **take ownership of their discussion**, the content that they're producing, even their assessment tasks, you know, it's all one and the same thing. (Teacher 1)

This category encapsulates and extends category 2 because it describes a qualitative shift in conceptions. Teachers' awareness has moved from the technology to learning. This is a significant shift as described in table 5.

Category 4: enable higher-order cognition and learning

'Learning through online discussion as a way to enable higher-order cognition and learning'

This category of conception encompasses higher-order cognition and learning. Teachers who described experiences in this category talked about online discussion as a way for students to *'be challenged on their ideas'* (Teacher 5). This category also describes teachers who use online discussion for students to *'question their own behaviour as part of reflective practice'* (Teacher 5). The representative quotation for this category is –

Those conversations tend to be had by two or three people thinking deeply about things, [...] all thinking deeply, reflecting and making deep meaningful comment, that tends to happen when you have got more time to think. (Teacher 8)

In addition to the representative quotation, the following highlights a distinct focus on higher order cognitive processes. While there is an awareness of the technology it is far removed. In this way it is qualitatively different to category 1 and 2. Additionally, this category extends category 3 by describing a focus on learning tasks. While learners are engaged in the community – mediated by discussion – they are using online discussion tools to facilitate the learning of higher-order cognitive skills such as synthesising, reflecting and creating – all with online discussion.

When I try to think about having interaction and collaboration online, I think what sort of tasks and levels of thinking I am interested in having students develop. So that's in terms of maybe something like Anderson and Krathwohl's framework, where you are looking at levels of knowledge and types of cognitive processes. [...] On that basis you are selecting tools to support the appropriate level of task and level of interaction. (Teacher 4).

This category encapsulates and extends the previous by focusing on cognitive skills and processes such as reflection. The technology that is thought about in lower-level categories is present although it is not in foreground. In this category teachers' conceptions are described as extending beyond the idea of a community of learners.

Hierarchical relationships between the categories of conception

The outcome space is described as the four categories, in hierarchical order from less complete to more complete. Category 1 is the least complete and category 2 encapsulates and extends this by focusing more on how *time*, *access* and *anonymity* lead to engagement in the course of study. This category is less focused on the technology and starts to signify a shift in awareness. Category 3 signifies another, more important qualitative shift to an awareness with greater focus on learning. Here the focus is on the group of students who are learning together in a shared environment – the community of learners. There is an explicit focus on interaction through the exchange of ideas. Category 4 encapsulates and extends category 3 by describing a focus now on higher-order cognitive processes such as, reflection and meta-cognition, which may be enabled by such a learning community.

Table 5 Hierarchical relationships between the categories of conception

Hierarchical order	Focus	Conceptions (Referential aspect)
Least complete	Technology and student	(1) provide time and access (2) As in (1) and to engage learners
More complete	Learning and student	(3) As in (2) and to foster a community of learners (4) As in (3) and to enable higher-order cognition and learning

CHAPTER IV: DISCUSSION

The findings reveal that each category of conception is focused on the student while they vary with focus on the technology (See table 5). This is in contrast to studies into teachers' conceptions of teaching that revealed a spectrum of conceptions ranging from teacher-centred to student-centred (Kember, 1997). Another interesting point to make is that there is no clear correlation with any of the similar empirical studies (See table 6). However, there are some patterns present in light of the results in this study.

Category 1 in this study describes conceptions with a focus on the technology like the lower-order categories that encapsulate teachers' conceptions to e-learning and learning technology (Ellis, et al., 2009; González, 2010). These categories all describe a consistent focus on *tools* for *access* to information. They are also *content-centred* conceptions with less focus on learning. Engaging students in online discussion was reported as a category of conception by González (2010). That category closely aligns with category 3 in this study but also represents a close alignment with the overall aim of this study. Students' experiences reported by Ellis, et al. (2004) and Ellis, Goodyear, et al. (2006) appear to be best aligned with the last two categories in this study – categories 3 and 4.

In reflecting on the finding presented in chapter 3 – Is possible to consider teachers' conceptions of learning through online discussion as being influenced by conceptions of learning, technology, and discussion? If so, could those conceptions be considered foundational? Additionally – It is possible to consider the order of importance of these foundational conceptions? It may be possible to suggest they are all equally important in a balance leading to one's conception of learning through online discussion. As mentioned earlier, a focus on technology will distract from good teaching and learning. Table 5 describes the point at which there is a greater focus on learning in the categories reported in this study.

Table 6 Summary of findings in relation to similar studies

Teachers' conceptions of learning through online discussion	Teachers' conceptions of e-learning and learning technology		Students' conceptions of learning through discussion	
<i>This study</i>	(Ellis, et al., 2009)	(González, 2010)	(Ellis, et al., 2004)	(Ellis, Goodyear, et al., 2006)
<p>(1) Learning through online discussion as a way to provide time and access</p> <p>(2) Learning through online discussion as a way to engage learners</p> <p>(3) Learning through online discussion as a way to foster a community of learners</p> <p>(4) Learning through online discussion as a way to enable higher-order cognition and learning</p>	<p>1. Learning technologies as tools for access</p> <p>2. Learning technologies as tools for information delivery</p> <p>3. Learning technologies as ways of providing active learning opportunities</p> <p>4. Learning technologies as ways of building knowledge</p>	<p>1. eLearning as a medium to provide information to students</p> <p>2. eLearning as a medium for occasional communication among unit participants</p> <p>3. eLearning as a medium for engaging students in online discussions</p> <p>4. eLearning as a medium to support knowledge building tasks</p>	<p>1. To develop communication skills</p> <p>2. To exchange ideas to find the answers</p> <p>3. To understand the ideas that are closely related to the subject's goals</p> <p>4. To understand the ideas that are closely related to the subject's goals from a number of perspectives.</p>	<p>1. Discussions as a way of checking your ideas are right</p> <p>2. Discussions as a way of collecting ideas</p> <p>3. Discussions as a way of challenging and improving your ideas</p> <p>4. Discussions as a way of challenging ideas and beliefs in order to arrive at a more complete understanding</p>

CHAPTER V: CONCLUSION

The outcome of this study has revealed teachers' conceptions of learning through online discussion as four qualitatively different categories. They range from a focus on technology to a focus on students and learning. Importantly, the highest two categories are likely to contribute to positive student experiences as they represent conceptions of online discussion that are well integrated into the teaching context (Goodyear, Jones, Asensio, Hodgson, & Steeples, 2005). Conversely, the lowest category describes conceptions with little or no focus on *learning* that could potentially lead to negative learning experiences.

Implications

This study contributes to knowledge in three significant ways. Firstly, to the best of our knowledge, it is the first phenomenographic study of university teachers' conceptions of learning through online discussion. It extends research into teachers' conceptions of teaching, e-learning and learning technology by investigating the application of online learning technologies for the purpose of discussion. This study identified four qualitatively different categories of conceptions that have implications for educational designers and academic developers who work closely with pedagogical design for online teaching and learning. These professionals will be better equipped with knowledge about why teachers think online discussion is good for learning in their courses. As previously stated, teachers' conceptions of learning through online discussion will affect teacher competence, classroom climate, assessment, task processing and student learning. Secondly, this study contributes to knowledge by offering findings that may be used in further comparative analysis.

Further research

This research has raised several questions about how teachers might *approach* the design of learning through online discussion. Further research is suggested to include an analysis of teacher approaches to design and facilitation of learning through online discussion. This would mean a focus on the *structural* aspect of teachers' conceptions (See figure 5). Categories of conceptions and categories of approaches will provide a more thorough representation of teachers' experiences with learning through online discussion (Marton & Booth, 1997). While this research is useful further research is suggested to increase validity and reliability. Triangulation techniques such as the provision of three researchers to determine the coding the transcripts and a summary of inter-coder agreement could strengthen those elements of quality research. Additionally, the categories could be given back to the participants and they could be

asked to apply the categories back to the transcripts. This would further validate the results.

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APPENDIX A

Interview schedule

Opening statement: The aim of this research is to describe the different ways in which university teachers make use of computer-mediated discussion in their teaching.

In this interview with you, I would like to explore your ideas—the ways you think about it and the way you use it. I have prepared several key questions to ask you within three areas—

1. the idea of computer-mediated discussion itself;
2. the design of computer-mediated discussion for learning and;
3. the mediation of computer-mediated discussion for learning

As we agreed when I first contacted you, I will be recording the interview, as it will be transcribed along with others in this study. Participants will remain anonymous. Is that still OK with you?

Questions

These questions have been designed around a similar structure to the those used by Ellis, Hughes, Weyers and Riding (2009).

PHASE 1: Introduction and background of interviewee (Approx. 5 minutes)

1. Could you tell me about your teaching background?

Probes:

- a. Years of experience? (Using Computer-mediated discussion?)

This year / last year:

- i. Current discipline(s)? Current courses/units? ii. Number of students in current course(s)? iii. Internal/external (distance) students?

2. What kinds of technologies do you use for discussion?

Probes: a. Asynchronous / synchronous? b. Text-based, audio-based, video-based? c. LMS – Blackboard (WebCT) / Moodle / Other? d. Wiki / Other Web 2.0 social media tool?

PHASE 2: Conceptions and approaches (Approx. 35-45 minutes)

Conceptions of computer-mediated discussion for learning (10 minutes)

1. What does computer-mediated discussion mean to you? (5 minutes)

Probes:

- a. How do you understand computer-mediated discussion?
- b. How do you make sense of computer-mediated discussion?

Transition to most important aspect: Learning (8-10 minutes)

- c. What do you think it affords to learners?
- d. How does it afford learning?
- e. To what degree does it afford learning?
- f. Why is it good for in learning?

Designing and planning for computer-mediated discussion for learning (10 minutes)

What the teacher does: (5 minutes)

1. How do you approach the design of computer-mediated discussion learning experiences?

Probes:

- a. How do you prepare for computer-mediated discussion?
- b. What do you do?
- c. How do you build-in opportunities to for discussion in your online teaching (Brookfield & Preskill, 2005, p. 216)?
- d. How do you leave room for improvisation and spontaneity?

Transition into most important aspect: Why? (8-10 minutes)

Why the teacher does what they do: (8-10 minutes)

2. Why do you approach the design/preparation in that way?

Facilitating computer-mediated discussion for learning

What the teacher does: (5 minutes)

1. How do you approach mediation in computer-mediated discussion activities?

Probes:

- a. What do you do? What do you do to keep the discussion on track?
- b. What do you do to encourage learning when students engage in computer-mediated discussion?

Transition into most important aspect: Why? (8-10 minutes)

Why the teacher does what they do:

2. Why do you approach facilitation in that way?