

## **Learning through Discussions**

Ellis, R.A.

Institute of Teaching and Learning

University of Sydney

Calvo, R and Levy, D.

Department of Electrical and Information Engineering

University of Sydney

Tan, K.

Faculty of Education (PhD Candidate)

University of Technology, Sydney

### **contact details for correspondence**

Ellis, R.A.

Institute of Teaching and Learning

F07 - Carslaw

The University of Sydney

NSW 2006 Australia

[r.ellis@itl.usyd.edu.au](mailto:r.ellis@itl.usyd.edu.au)

## **Learning through Discussions**

### **Abstract**

Students studying a third year e-commerce subject experienced face-to-face and online discussions as an important part of their learning experience. The quality of the students' experiences of learning through those discussions is investigated in this study. This study uses qualitative approaches to investigate the variation in the students' understanding of what they were learning through discussions, and how they went about engaging in them. Quantitative analyses are used to investigate how the students' experience related to their performance. Key outcomes of the study include that the quality of the students' experience of learning through discussions is positively related to their performance and that face-to-face and online discussions have qualitatively different benefits for learning.

### **Introduction**

Learning through discussions or conversations is a fundamental part of teaching and learning. In the field of Higher Education, it has been the focus of relatively early research into theories of learning (Pask, 1976), it has been identified as a characteristic of good teaching (Ramsden, 1992:168), it has been closely associated with a quality approach to teaching (Trigwell and Prosser, 1996), and it is argued as an appropriate activity for quality learning in tutorials (Biggs, 1999:86).

Learning through discussions is going through a transformation. This transformation is being fuelled by the availability and enthusiasm for new communication technologies used for learning. Not only are traditional distance curricula embracing the new learning technologies, but so too are traditional campus-based curricula. This may seem curious as one may wonder what benefits for learning a technology may offer that cannot be better achieved in a face-to-face situation.

The contribution of communication technologies to quality experiences of learning through discussions is an area that requires more rigorous evidence, especially of how it relates to quality learning, although there has been some significant research in this area. Laurillard (1993, 2002) offers an extremely useful way of classifying the role of discursive media in learning through a conversation (2002; 87). Other research (Dutt-Doner and Powers, 2000; Chou, 2001; Svensson, 2002) has investigated the contributions and differences of asynchronous communication systems, in which participants use the system at different times, and synchronous communication systems, in which participants use the system at the same time. This type of research does not tend to focus on quality learning through discussions in which quality learning is defined as a deep engagement with the subject matter (Entwistle and Ramsden, 1983; Ramsden 1992; Marton and Booth, 1997; Prosser and Trigwell, 1999).

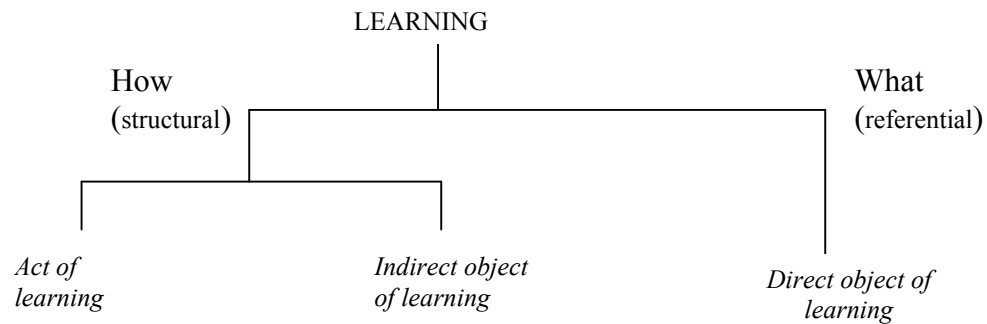
This study has been designed to investigate quality learning through discussion. It is situated in a third year university subject and the contribution of discussions, both face-to-face and online, to a quality learning experience is evaluated. To evaluate the contribution of the discussions to a quality experience, a phenomenographic approach to researching student learning is adopted.

The following begins with a discussion of the learning model, previous research and features of the learning context that are important to this study. Then the method of research, the results of the qualitative study and quantitative analyses, and the implications and significance of the outcomes are considered and evaluated.

### **The Learning Model and Previous Research**

A phenomenographic model of learning is used in this study to investigate the quality of learning through discussions. Figure 1 is a representation of the model.

Figure 1.1. The Experience of Learning



(Marton and Booth, 1997:91)

Learning, as depicted in Figure 1 can be divided into two fundamental aspects; the *how* of learning, its structural aspect, and the *what* of learning, its referential aspect. Each of these aspects can be recursively expressed in the same terms. While the *What* of learning identifies its outcome as the direct object of learning, the *How* of learning is more complex. The *How* of learning has at least two clear parts: the act of learning and the indirect object of learning, the latter referring to the type of capabilities the learner is trying to master (Marton and Booth, 1997:85). The way learning is structured into its *How* and *What* in Figure 1, is used to structure the analyses of the student learning experience of discussions in the results section of this study.

Previous research consistent with this model of learning has identified qualitatively different experiences of students in the same learning situation, despite being exposed to the same teaching, materials and other contextual factors (Marton and Saljo, 1976a, 1976b; Entwistle and Ramsden, 1983; Hounsell, 1987; Prosser and Millar, 1989; Prosser and Trigwell, 1999). The quality of what students think they are doing (the direct object of learning) and the quality of how they approach their learning have been found to be closely associated. This research has found that some students tend to adopt approaches that tend towards reproduction (surface approaches), while other students adopt approaches to learning that are more meaningful (deep approaches) in which an active engagement with the subject matter is evident. Furthermore, the quality of these

approaches have been found to be consistently related to the level of the success of the students' performance.

Research investigating quality teaching consistent with this model of learning has identified the importance of discussions for quality learning (Trigwell and Prosser, 1996). In order to investigate the congruence amongst intention and strategy for teachers, the study developed an inventory of approaches to teaching from interviews with academic lecturers. Strategies underpinning the highest quality teaching approach, the approach that sought conceptual change in the students' understanding, foregrounded discussions as a way of helping the students engage with the content deeply in order to effect conceptual change (Trigwell and Prosser, 1996:82).

Research outside of a phenomenographic model of learning, but focusing on learning through discussions using technology focuses on a wider variety of issues than just the quality of learning. Motivation, peer learning, new teaching methodologies, the socialization of learning, and workload implications are some common themes (Dutt-Doner and Powers, 2000; Chou, 2001; Salmon, 2001; Svensson, 2002). This area of research, often referring to as learning through electronic discussions, has identified a number of advantages and disadvantages created by the technology. On the positive side, the public nature of electronic discussions has been found to promote a sense of community and belonging amongst the learners (Selfe and Meyer, 1991), and greater equity of participation in the learning process as a result of the use of the technology. (Harasim, 1989). On the negative side, inappropriate language or 'flaming' has been reported in a number of studies (Kiesler et. al., 1984; Kremers, 1988, Dowling, 1999). The absence of social context clues such as age, ethnicity, race, status and mood as the result of the use of electronic discussions can lead to inappropriate behaviour, such as flaming, by the participants. Communication anxiety has also been linked to the use of electronic discussions (Feenberg, 1987). Some students have been found to become inhibited in communicating through technology without the non-verbal signs of communication that are provided by a face-to-face context. This area of research has tended not to investigate the relationship between learning through discussions and the

quality of the experience where quality is conceptualised as engaging deeply with the subject matter.

To investigate the contribution of discussions to quality learning, including whether or not the new communication technologies have anything to add to the benefits of face-to-face discussions, this study focuses particularly on what students thought they were learning through discussions and how and why they went about engaging in face-to-face and online discussions.

### **The Learning Context**

This study investigates the learning experience in a third year engineering subject, E-Commerce. The purpose of the subject was to help students develop the ability to understand and apply the different user-needs of e-commerce from the perspective of a business engaging in project management processes. The assessment of the subject included a final examination (50%), an E-commerce project, an electronic shop, laboratory groupwork (30%), and online discussions, short answer questions and quizzes (20%). The project and laboratory work involved weekly face-to-face discussions amongst the students and the lecturer as groups of students worked towards the design of an e-commerce website. The purpose of the online discussions, short answer questions and quizzes was to help the students engage with the needs of users in a deep way so that they could better understand how to design the e-commerce website from the user perspective. To engage in the online discussion, students used a common e-learning platform, WebCT, version 3.1. The online discussions were carried out using the discussion tool, a bulletin board for asynchronous communication.

### **Method of Research**

To investigate the contribution of discussions, both face-to-face and online, to the quality of the learning experience, an open-ended questionnaire was administered to 54 students (representing 54% of the cohort of 100 students), and three 30 minute interviews were

conducted with the three subject tutors. The design of the questions used in the open-ended questionnaire and the interview were trialled on students not included in the sample. The design of the questions also benefited from approaches adopted in previous studies reported in the literature (Crawford, et. al, 1994; Prosser et. al., 2000; Hazel, et. al., 2002).

The questionnaire investigated what the students thought they were learning through discussions, and how and why they went about engaging in both the face-to-face and online discussions. The questions used to guide the structure of the questionnaire were:

- 1. What, do you think, is the purpose of the discussions in E-commerce? This includes all of the discussions that you were involved in the subject (that is any discussions held in lectures, tutorials, labs, workshops, online etc)*
- 2. How did you approach engaging in face-to-face discussions in E-commerce? What sorts of things did you do to engage (or not) in the discussions? Why did you use those strategies to engage (or not) in the discussions?*
- 3. How did you approach engaging in the online discussions in E-commerce? What sorts of things did you do to engage (or not) in the discussions? Why did you use those strategies to engage (or not) in the discussions?*

In terms of the model of learning in Figure 1, question 1 was designed to elicit the students' conception of what they thought they were learning through discussions in the subject. Questions 2 and 3 were designed to investigate how the students went about engaging in the face-to-face and online discussions, both what they did (their strategies) and why they used them (their intention).

The questions used to structure the interviews of the tutors were:

- 1. Why do you think the subject coordinator used discussions as a way of learning in the subject? What did he want the students to learn?*

*2. How did you approach discussions with students in the laboratory? What did you do? Why did you do it?*

*3. How would you approach moderating the online discussions? What would you do? Why did you do it?*

The first question was designed to probe the tutors' understanding of the purpose of the discussions in the subject. This included the purpose of both the face-to-face and online discussions. This question aligns with the first question in the students' questionnaire. The second question was designed to probe the tutors' approach to the discussion in the laboratory and the third question was designed to probe the tutors' approach to moderating the online discussions. The interview questions were designed to align with the questions in the open-ended questionnaire to better understand the extent of congruity between student and tutor conceptions and approaches of learning through discussions.

The process of analysing the student responses followed a phenomenographic procedure (Crawford, et. al., 1994; Cope, 2000). The process of analysing one of these areas, student conceptions of the learning through discussions, is taken as an example for the following description.

1. The section of each questionnaire relating to student conceptions was analysed for variation in the response.
2. The sections were initially read to get an overall feel for the depth and breadth of variation of conceptions about discussions.
3. Illuminating responses about student variation were identified and notes about the aspects of the variation formed the beginning of themes (Marton and Booth, 1997:98). Using the extracts and the notes, a number of qualitatively different conceptions began to emerge. As the transcripts are read repetitively, they appear to change in appearance, as the researcher cannot be simultaneously aware of all

aspects reported in the data with the same degree of acuity (Marton and Booth, 1997:134).

4. From the responses highlighted and the notes made, themes were grouped into logically related categories, some of which overlapped each other in the developing outcome space.
5. All the conceptions reported in the data were then again read in relation to the overlapping draft categories and initial structural relationships. The shape of the categories shifted and responded to the rereading of the pool of meaning provided by all of the student responses. A draft set of categories that revealed meaning and structure was established.
6. Representative extracts from the questionnaires were discussed with supporting researchers in relation to the draft categories that had emerged. Discussion led to a re-working of the categories and the reclassification of some of the student responses in the representative extracts. This led to the reconsideration of all of the responses in relation to the redrafted categories. Both the final version of the category descriptions and the recategorisation of the extracts were agreed upon by all researchers.
7. The redrafted categories became the final version and extracts from student responses that best represented the draft categories were selected. The draft categories and the representative extracts formed the outcome space for this part of the phenomenographic study and draw on the SOLO taxonomy as a way of structuring the hierarchy (Biggs, 1999;118).

This process is used to create the outcome spaces of this study, which are represented as a hierarchy of qualitatively different categories of conceptions and approaches and representative quotations from the questionnaires.

## Results of the Questionnaires

In this study, the outcome spaces discussed below are a major finding of the study.

### *Student Conceptions of Learning through Discussions*

Table 1 shows the students' conceptions of learning through discussions.

Table 1. Categories of Conceptions of Learning through Discussions

<i>Category</i>	<i>Description</i>	<i>Representative Quotation</i>
<i>A</i>	To understand the ideas that are closely related to the subject's goals from a number of perspectives.	<i>My view is that the discussions were aimed at getting students to talk. By talking to each other we firstly are exposed to other people's points of view (which normally might never have occurred to us) and second it causes us to think about a topic in greater detail, resulting in greater understanding. This is especially useful with subjective topics, like graphical user interface, where there is no correct answer. I think the lecturer used these to give us a greater understanding of the topics used in the discussions.</i>
<i>B</i>	To understand the ideas that are closely related to the subject's goals.	<i>To make students think for themselves, to come up with their own ideas, impressions etc., about website design. As a whole, I learnt about various ways of implementing an (e-commerce) shop, designing, implementing etc. Also learnt what other students thought of different designs.</i>
<i>C</i>	To exchange ideas to find the answers	<i>Discussing is better than individual learning since we have a chance to share the ideas and save much time to learn new things. But people will start to rely on each other to answer questions.</i>
<i>D</i>	To develop communication skills	<i>E-commerce benefits from discussion. I think that's the main motivation for the lecturer's focus on discussion. It helps people bring out their opinions in an environment that encourages the exchange of ideas. Basically it encourages communication.</i>

Column 1 in Table 1 identifies the label applied to each category. Column 2 provides the description of the conception and column 3 shows a representative quotation highlighting key aspects of the conception. The following paragraphs discuss the referential and structural aspects of this outcome space.

In referential terms, category D focuses on skills. There is an absence of an awareness of the link between the content being studied, and the purpose of the discussions. Category C focuses on finding an answer, with no sense of relating the discussions to the goals of the subject. Category B foregrounds a close association between the purpose of the discussions and the subject's goals, and category A goes further by identifying the existence of varying perspectives.

Structurally, there is a qualitative shift between the pairs of categories A/B and C/D. Categories C and D are fragmented conceptions. They do not indicate awareness of a close association between the purpose of the discussions and the goals of the subject. In contrast, categories A and B are cohesive. They reveal a clear awareness of how discussions contributed to engaging with the goals of the subject. Finally in category A, the focus goes beyond identifying the purpose of the discussions in relation to the goals of the subject, but acknowledges there can be more than one useful perspective on a solution to e-commerce.

The categories are logically inclusive. Table 2 shows the nature of the relationships amongst the categories.

Table 2. The Referential and Structural Relationships amongst the Categories of Conceptions of Learning through Discussions

<i>Referential - the "what" of the conceptions</i>	<i>Structural - the "how" of the conceptions</i>	
	Cohesive	Fragmented
(1) As in (2) and a number of perspectives	Category A	
(2) As in (3) and understand relevant ideas	Category B	
(3) As in (4) and finding answers		Category C
(4) Communication skills		Category D

Table 2 shows that the categories of the conceptions are logically inclusive in their referential order. The referential aspects of category A are inclusive of those in Category B. There is an extension in the student awareness in category A from category B in that a number of perspectives on the relevant ideas are perceived. Similarly, there is an extension in the student awareness between the lower categories. For example, category B not only conceives the discussions to be about collecting information, but that only some parts of the information collected will provide relevant ideas. Category C not only conceives of the discussions to be about finding answers, but that they also develop communication skills. While Table 2 shows that the referential aspects of the conceptions are logically inclusive, the conceptions in terms of their structural aspects cannot be considered logically inclusive since cohesive and fragmented conceptions are mutually exclusive.

### *Student Approaches to Face-to-Face Discussions*

Table 3 shows the student approaches to face-to-face discussions.

Table 3. Categories of Approaches to Face-to-Face Discussions

<i>Category</i>	<i>Description</i>	<i>Representative Quotation</i>
<i>A</i>	To engage in face-to-face discussions to learn about the project from the experience of others	<i>Normally I discuss the work required and other people's ideas and experiences. This gives me a feel for the level of work expected by me and what the work covers. Therefore I learn things I may not have come across. I ask other how they are going with the work and what they are doing.</i>
<i>B</i>	To engage in face-to-face discussions to understand how to solve problems related to the project.	<i>In our team, in the first couple of meetings, we had a proper discussion. All of us expressed their opinion about what shop we wanted to design. We discussed the pros and cons. We also subdivided the task. In subsequent discussions, we came together to report on what was being done and only spoke if there were problems.</i>
<i>C</i>	To engage in face-to-face discussions to finish tasks	<i>For our group meeting, we just gather together to try to finish the work before the deadline. Since we meet each other not that often, we just talk about what we need to get done and get straight to work. We discuss as we go or encounter a problem.</i>
<i>D</i>	To engage in face-to-face discussions to develop communication skills	<i>Face-to-face discussions were good. The group needed a leader, so I volunteered to be manager. Although its sometimes hard not to be critical. Everyone participated well because we all encouraged everyone to say something even if it wasn't on the topic. Good for morale.</i>
<i>E</i>	To not engage in face-to-face discussions.	<i>I didn't really discuss things face-to-face. I found I didn't really need to talk to others.</i>

The student categories of approaches were analysed for their referential and structural aspects, the students' intentions when discussing face-to-face and the strategies used to achieve them.

In referential terms, Category E involves the choice of avoiding discussions. Category D focuses on discussing things for the sake of communicating, "*even if it wasn't on the topic*". Category C involves a focus on the task, discussing things in order to solve problems as they come up. Category B shows an awareness of a link between the discussions and the design process of the electronic shop (the E-commerce project). Category A shows an awareness of a link between the discussions, the project and the learning experience of others.

There is a qualitative shift between categories A&B and categories C,D&E. The former reveal an awareness of a close association between the discussions and the object of study, the electronic shop. The intention behind these approaches suggests that it is possible to engage with the E-commerce project in a meaningful way through the discussions. In contrast, the latter group of categories does not reveal an intention of engaging with the E-commerce project in a meaningful way. These intentions seem to be either to not engage in discussions, to engage in discussions to develop a generic skill of communicating, or to use the discussions mainly as a way of finishing the tasks according to a deadline. The latter three categories are marked by a lack of intention to understand the project more fully through the discussions.

Table 4 summarises structural aspects of student approaches to face-to-face discussions.

Table 4. The Structural Relationships amongst the Categories of Face-to-Face Approaches to Learning through Discussions.

<i>Structural - the “how” of approaches</i>	<i>Quality of Approach</i>	
	Deep	Surface
(1) Discuss to understand project through different perspectives	Category A	
(2) Discuss to understand project	Category B	
(3) Discuss just enough to finish tasks		Category C
(4) Say something		Category D
(5) Avoid discussing		Category E

In structural terms, the approaches in E revealed the strategy of avoiding discussions, the approaches in D revealed a strategy of saying something, even if it was not relevant, and approaches in C discussed issues just enough so that tasks could be finished. Approaches B and A adopted strategies which involved a more full discussion of the project in order to better understand its complexity, and as in category A, sometimes from a number of perspectives.

The categories of approaches are not logically inclusive as an intention of saying nothing or very little cannot simultaneously also reflect an intention to discuss in order to better understand the project.

#### *Student Approaches to Online Discussions*

Table 5 shows the student approaches to online discussions.

Table 5. Categories of Approaches to Online Discussions

<i>Category</i>	<i>Description</i>	<i>Representative Quotation</i>
<i>A</i>	To reflect on the problems discussed from different perspectives to deepen understanding	<i>I generally found these useful. I ended up reading a few other peoples' postings before submitting my own to gauge what was required. It did however prompt be to investigate some of the issues raised by the other postings.</i>
<i>B</i>	To reflect on the problems discussed from different perspectives to improve understanding	<i>I look at the questions before I reply, then brainstorm the issue, then before I reply, I will look at other's postings to enhance my answer (if there are any of help). This is because sometimes, other's might have said the things you missed.</i>
<i>C</i>	To engage in online discussions by waiting and seeing what others do	<i>My approach is mainly reading other posts and trying to get the general idea of what the discussion is trying to achieve. Another habit that I used to do when replying to read all the other replies, so I won't repeat what other already mentioned. Basically trying to protect myself from being called "idiot" or "ignorant".</i>
<i>D</i>	To engage in online discussions to fulfill subject requirements	<i>I only did them because they were worth marks, I usually did them at the last moment before they were due and generally wrote answers to the questions posed.</i>

As in the previous analyses, the student responses were analysed for their referential and structural aspects.

In referential terms, category D reveals an intention of engaging in online discussions to received marks and category C reveals an intention of protecting oneself, while those in B and A reveal an intention to reflect to better understand. Thus, there is a qualitative shift between categories A&B and C&D from a focus on deep learning, reflection and understanding, to a focus on surface learning, "face" or marks.

Table 6 summarises structural aspects of student approaches to face-to-face discussions.

Table 6. The Structural Relationships amongst the Categories of Online Approaches to Learning through Discussions.

<i>Structural - the "how" of approaches</i>	<i>Quality of Approach</i>	
	Deep	Surface
(1) Reflect on problems to deepen understanding	Category A	
(2) Reflect on problems to improve understanding	Category B	
(3) Protect "face"		Category C
(4) Gain marks		Category D

In structural terms, Table 6 shows the approaches in category D revealed the strategy of making postings only to gain marks, and the approaches in C to wait before posting for fearing of appearing an “idiot”. Approaches B and A adopted strategies which involved reflection on the problems of the project that led to a fuller understanding of the issues involved.

As in the approaches to face-to-face discussions, the categories are not logically inclusive, as the intention of primarily saving face cannot simultaneously also be an intention to primarily reflect on the postings in order to better come to grips with the subject matter.

## **Results of the Interviews**

The major results of this study are the qualitative categories described in the previous sections. In this section, these categories are related to the conceptions and approaches of the tutors supporting the students. Since the possible population for the investigation of the tutors could be a maximum of three, the results of the analyses can only be considered to be illuminative of the types of congruent or incongruent relationships amongst student and tutor conceptions and approaches. The following discusses responses from two of the tutors that illuminate the range of the conceptions and approaches held.

### *Conceptions of Learning through Discussions*

#### *Tutor 1*

Tutor 1 thought the lecturer included discussions in the laboratories for the following reasons:

*T1: I think to have students, ah, get them a start, get them involved in the online shop design. Because it is quite different to other courses in Engineering. Other courses are just talking about techniques. But you can not only talk about the*

*techniques, you have to talk about some concepts about how the business is growing.*

When asked to expand on what he meant by “concepts”, the tutor continued:

*T1: How is the business running? How the factor of the economy overnight can affect the customers? How to make an e-shop, an online shop... successful? It is quite important for Engineering students...it (discussing) is very good to push students and help students so the students find out what is the problem there and how to solve the problem.*

Interestingly, tutor 1 conceived that the discussions were not just for the students.

*T1: I think all students want their answers to the questions. Some students get them quite clearly. Some students are very slow to understand so you ... you can test them ...to get the answer...and it (discussing) gets me involved into the course...to understand the students. Also it pushes me to get the knowledge which is new for me.*

*Tutor 2*

When tutor 2 was asked why he thought the lecturer included discussions in the laboratories, he felt that they were used to solve problems.

*T2: If students are doing some task, so obviously they expect the tutor to help them out if they have a problem. This is the level of discussion they have with us.*

When asked if the discussions dealt with the E-commerce project, the specification document and related tasks, tutor 2 replied:

*T2: No, not really...Actually, we didn't discuss those things because this was already discussed in the handouts, so they were only using that and they were not talking to us about it.*

When asked how often and when the discussions took place, tutor 2 replied:

*T2: Not much. I mean, they just were trying to finish or if they had a problem on doing some part of the implementation of the Web page or some other thing or other parts, they tried to reach us and ask us about helping.*

In terms of congruence between the tutors and students experiences, the conception held by Tutor 1 seems to be closer to Category A in the students' conceptions of learning through discussions. Not only does this category focus on understanding the techniques of design and the business side of e-commerce, but the different perspectives on the issue discussed helps even the tutor to better understand the knowledge being discussed. The conception of Tutor 2 seems to be most congruent with student Conception C, "To exchange ideas to find the answers". What seems to be foregrounded in this type of conception is that discussions primarily are used only to find the right answer. It does not foreground the benefits from discussions for a more holistic and deeper understanding of the issues being discussed.

#### *Approaches to Face-to-Face Discussions in the Tutorial*

##### *Tutor 1*

Tutor 1 adopted a different approach to the face-to-face discussions.

*T1: There are two ways. One is just going around and I say to students 'what's going on?' But, sometimes students ask lots of questions. They just ask you all the time for help to get answers to questions... get some solutions ...and sometimes students know the answer.*

When asked to expand on this, tutor 1 answered:

*T1: (the second way) I think that sometimes you can not just tell students what is the answer. You can push them, tell them how to get there.*

*Tutor 2*

When asked how he approached face-to-face discussions in the tutorial, tutor 2 replied:

*T2: Actually, my approach was to show them the resources they could go and look at...I mean, not only the computer, but the lecture notes maybe or from...curriculum materials. We have to find the material about their type of difficulty.*

When asked why he showed the students the curriculum materials that they possessed, he answered:

*T2: Because they never go (to the materials). I noticed that they should look at the material much more than what they do.*

When asked what other strategy he used, tutor 2 replied:

*T2: This is the main one.*

In terms of congruence between the tutors and students approaches to face-to-face discussions, the approach by Tutor 1 contrasts with the approach adopted by Tutor 2. Tutor 1 does not approach the discussions simply to tell the students the answer. Rather, he feels that the students often already know the answer and sometimes it is better to push them in the right direction, rather than giving them the answer. This approach seems to be most congruent with student approach B, "To engage in face-to-face discussions to understand how to solve problems related to the project". The approach adopted by Tutor 2 seems to be congruent with student approach C, "To engage in face-to-face discussions to finish tasks". The tutor's approach appears to be quite an instrumental one, showing the students where to find the answers to their questions in their curriculum materials.

The tutor seems to approach the discussion primarily in a goal-orientated manner, helping the students to find the answer as quickly as possible.

### *Approaches to Online Discussions*

#### *Tutor 1*

When Tutor 1 was asked how he approached the online discussions, he replied:

*T1: At first I checked some notes from the lecturer, also the task objectives.*

When asked why he did this, he continued:

*T1: What is the expectation the lecturer was asking his students...so I look for the students' answer and I find some students, pick some good responses...to post some encouraging remark.*

Tutor 1 also commented on how he helped the poorer students.

*T1: Some students do a very bad job so I push them and tell them where you need to go... you need to talk about what's good for this type of shop, o.k. How this shop will be successful.*

When asked why he approached the good and poor students in this way, he answered:

*T1: To get all the students involved...because maybe, it's interesting...for me...Yeah, very interesting cause you can know what's, even I want to know what's going on with e-commerce. What's going on with existing (e-commerce) shops.*

Tutor 1 was asked about any other strategies he employed online.

*T1: I think that as a separate task, asking students to answer the other students' questions...you can get students start discussing*

Asked why he did this, he replied:

*T1: They talk to each other...more people are involved in discussing, you get more ideas. Some people just think about one aspect and the more students... you get more aspects. It is very healthy for students.*

*Tutor 2*

When Tutor 2 was asked how he approached the online discussions, he replied:

*T2: Actually I didn't, I mean, I didn't write much to the students only, I tried once in the first discussions ...none of the students were interested in the opinion which I emailed (posted) to them. Maybe I should have tried but I didn't actually send any emails (postings).*

When asked why he did not pursue moderating the discussions, he continued:

*T2: Because they were discussing with themselves then why should I bother? ...Once or twice I think I sent a very short email because one of them saying something a bit insulting to the other students. So that's it.*

When pressed, he indicated that his moderating was not necessary.

*T2: It wasn't something, maybe, if I don't discuss it they go to the wrong direction, no it wasn't like that.*

The approach by Tutor 1 to the online discussions seems to be most congruent with student approach A, “To reflect on a variety of perspectives on the problems discussed to deepen understanding”. Tutor 1 felt that understanding a variety of aspects on the problems discussed was “very healthy” for the students. His approach involved encouraging the good students, pointing the poorer students in the right direction and encouraging the students to interact amongst themselves. Tutor 2’s approach to online discussions does not appear to be congruent with any of the approaches displayed by the students. Tutor 2 mainly chose to not engage in the online discussions. whereas as a minimum, the student categories of approaches towards online discussions revealed the intention to engage in them even if it was only to fulfill subject requirements.

### **Relationships within the Experience of Learning through Discussions**

In this section, the relationship amongst the parts of the experience of learning through discussions, the students conceptions and approaches, are investigated. First the distribution of the student responses to the questionnaire are discussed. This distribution is analysed to see if any patterns exist that may be helpful to understand why students adopt the approaches they do. Patterns found in the data are then related to the students’ achievement as measured by the mark they received for the whole subject.

Table 7 shows the distribution of the student responses.

Table 7. The Distribution of Conceptions and Approaches

Conception/Approach		N	% of responses
<i>Conception</i>			
Cohesive	A	8	15
	B	9	16
Fragmented	C	29	54
	D	8	15
Total		54	100
<i>Approach Face-to-Face</i>			
Deep	A	2	04
	B	7	13
Surface	C	20	37
	D	21	39
	E	4	7
Total		54	100
<i>Approach Online</i>			
Deep	A	2	04
	B	8	15
Surface	C	29	54
	D	15	27
Total		54	100

Table 7 shows that in the first two categories, 31% of the conceptions reported by students were classified as cohesive leaving 69% in the second two categories classified as fragmented. In terms of approaches to face-to-face discussions, 17% of the statements made by students were classified in the first two categories as deep, leaving 83% classified in the last three categories as surface. For the approaches to online discussions, the first two categories show that 19% were classified as deep while the last two categories show that 81% were classified as surface.

Table 8 identifies relationships amongst the parts of the experience of learning through discussions.

Table 8. Relationships amongst the Parts of the Discussion Experience

Conceptions of learning through discussions	Approaches		Totals
	Deep Approaches <i>Categories A&amp;B</i>	Surface Approaches <i>Categories C,D,E</i>	
<hr/>			
Cohesive	<i>Face-to-face</i>		
(A,B)	9(17%)	8(15%)	17
Fragmented			
(C,D)	0	37(68%)	37
Total	9	45	54
<hr/>			
Cohesive	<i>Online</i>		
(A,B)	10(18%)	7(14%)	17
Fragmented			
(C,D)	0	37(68%)	37
Total	10	44	54

Face-to-face:  $\chi^2 = 23.5$ ,  $\phi = .67$ ,  $p < 0.001$ ,  
Online:  $\chi^2 = 26.7$ ,  $\phi = .70$ ,  $p < 0.001$

Table 8 identifies the quality of the experience of learning through discussions. Cohesive conceptions and deep approaches are elements of a quality experience. Table 8 shows a strong and statistically significant relationship between the conceptions of learning through discussions and approaches to face-to-face discussions ( $\phi = .67$ ,  $p < 0.001$ ). It also shows a strong and statistically significant relationship between the conceptions of learning through discussions and approaches to online discussions ( $\phi = .70$ ,  $p < 0.001$ ). These results show; that the majority of students who adopted approaches consistent with a surface approach to discussions also held conceptions consistent with a fragmented conception of discussions. Similarly, about half or a little more of students who adopted approaches consistent with a deep approach to discussions held conceptions that were consistent with a cohesive conception of learning through discussions.

Table 9 relates the quality of the students' conceptions and approaches to the discussions to student achievement as measured by the mark they received for the whole subject.

Table 9

Relationship Between Conceptions, Approaches and Achievement.

Aspects of learning through discussions	Final Mark		
	Mean#	SD	Effect size
Conceptions			
Fragmented	67.3	7.0	.85
Cohesive	73.4	8.3	
T test: $T=$	2.8*		
Approaches face-to-face			
Surface	68.1	7.2	.86
Deep	74.6	9.3	
T test: $T=$	2.3*		
Approaches online			
Surface	67.9	7.6	.96
Deep	75.0	6.1	
T test: $T =$	2.7*		

n=54, \*p<0.05, #=Mark out of 100

Table 9 shows that students who held a conception of the discussions consistent with a cohesive conception tended to perform at a higher level than students holding a conception that was consistent with a fragmented conception ( $t=2.8$ ,  $p<0.05$ ,  $es =0.85$ ). Similarly, students adopted an approach consistent with a deep approach to the discussions tended to perform at a higher level than students who adopted an approach consistent with a surface approach (face-to-face:  $t=2.3$ ,  $p<0.05$ ,  $es=0.86$ ; online:  $t=2.7$ ,  $p<0.05$ ,  $es=0.96$ ). These are large effect sizes, similar to the effect sizes found in related studies (Crawford et. al, 1994:341).

## Discussion

The issues discussed below focus on the significance of what students thought they were learning through discussions, how they approached the face-to-face and online discussions, and the relationship between the variation in the quality of their experience to achievement. Then, the student experience will be related to the approaches adopted by the tutors. Finally implications for practice arising from the analyses are considered.

The analyses show that students did not agree about what they thought they were learning through discussions. The results show that significant misunderstandings in the student population existed about the purpose of the discussions, both online and face-to-face. Some students thought that their main purpose was to develop communication skills, or to find the correct answer. They were not aware that discussions were part of an experience of reflecting on, and engaging with, the user needs of e-commerce sites in a deep way that promoted a more thorough understanding of the issues involved. This is a significant finding, especially since all the students were exposed to the same learning materials and context that explicitly revealed to them the purpose of the discussions.

The students' responses revealed variation in the quality of the approach they adopted to the face-to-face and online discussions. Some used the experiences as an opportunity to engage with the subject matter, those who adopted approaches that were consistent with categories A and B, while others restricted their opportunity for more surface foci, those who adopted approaches that were consistent with categories C, D and E. A quality approach to the discussions related them to the subject's goals and used them as a way of better understanding the complexity of the issues involved, often by seeing the issues from a number of perspectives. In contrast, a poor quality approach did not reveal an intention to understand the issues from a variety of perspectives, but primarily used the discussions to seek out a correct answer, despite many of the issues not having a single correct answer.

An interesting outcome from the analyses was the different aspects of learning that the face-to-face and online discussions brought to the foreground. Quality approaches to the online discussions foregrounded reflection in the process as the students absorbed the comments of their peers to inform their own thinking. Reflection was not an aspect of learning that was foregrounded in quality approaches to face-to-face discussions. This is not meant to suggest that reflection is not an aspect of face-to-face discussions. However, it is clear that the control over time held by participants in asynchronous discussions allows reflection to come to the fore. It would seem that online discussions are a useful way of foregrounding reflection in the learning process.

Not only was there significant variation in the quality of the students' experience of learning through discussions, the interviews with the tutors revealed interesting variation in the congruence amongst the tutors and students' conceptions and approaches. The quality approach adopted by tutor 1, an approach that tended to guide the students towards the right answer, rather than showing them where to find the answer, was one that displayed most congruence with the quality approaches adopted by the students. Tutor 1 revealed that his role as tutor was not just as a guide, but also as a learner in the conversation, benefiting from rapid changes in the field of e-commerce from the students' research related to their projects. Not only was there congruence amongst the approaches of tutor 1 and quality approaches adopted by students, there was also congruence amongst the tutor and students about what they thought they were learning from the discussions. The congruence amongst tutor 1 and a quality student experience contrasts strikingly with the lack of congruence amongst the experience of tutor 2 and a quality student experience. Tutor 2's minimalistic approach to the discussions, both face-to-face and especially online found congruence only with the surface approaches adopted by some students. Clearly, tutor 2 would benefit from better understanding the purpose of the discussions and how to approach them both in face-to-face contexts, as well as online, as much as the students who reported an experience congruent with categories C, D and E.

An important outcome from the analyses was the relatedness of the parts of a quality experience to each other and to achievement. A little more than half the students who held conceptions that were consistent with a cohesive conception of the learning through discussions, adopted approaches to the face-to-face and online discussions that were consistent with a deep approach and tended to perform and significantly higher levels than those students who held a fragmented conception. Significantly, no students who held conceptions of learning through discussions that were consistent with fragmented categories, tended to adopt deep approaches. The relatedness of these outcomes has implications for practice.

If we wish to help students improve the quality of their experience of learning through discussions, either face-to-face or online, it seems they will be helped if they better conceive of the close relationship between the purpose of the discussions and the subject's objectives. Without a cohesive conception of learning through discussions, the results suggest that students are much less likely to approach discussions in a meaningful way. To help students with their approaches, it seems that different strategies are required. Face-to-face discussions seem to be most useful to students if they use them to consider the issues discussed from a number of perspectives in order to more fully understand the complexity of the issues as they relate to the subject's objectives. Too often, it seems that students can lose sight of the purpose of the face-to-face discussions so that the close association to the subject's goals can become obscured. Similarly but also differently, approaches to online discussions seem to be most fruitful if students use their peers' postings to reflect on the issue in a deep way. The students reporting this type of approach tended to better understand the full range of issues related to the discussions, even if it meant engaging in further research after reading the other postings. The results suggest that support for students to better conceive of what they are doing and how they go about doing it, by helping to understand why, is likely to have positive results for their understanding and achievement from learning through discussions.

When considering the role of tutors in the student learning experience, especially in large cohorts, then much of the practical advice provided for students would seem to be equally valid for the tutors. The interviews suggest that it cannot be assumed that tutors will automatically adopt the most useful approach to mediating discussions as they may not fundamentally understand their purpose. Clearly tutor training, especially for new communication technologies, to ensure quality learning is a growing need for the experience of students' learning in higher education.

Learning through discussions is a fundamental and key aspect of the higher education experience. Perhaps because it is such a fundamental aspect of the learning experience, it can sometimes be overlooked, and we assume that all students will understand what they

are supposed to be learning from discussions, and how to best go about the. All students in this study did not seem to know what they should be learning through the discussions or how they could best go about engaging in them. This also proved to be true for the tutors. Clearly both need stronger guidance about the purpose of the discussions and how to best engage in them. This is particularly true for discussions using new technologies such as bulletin boards that tend to foreground reflective aspects of the learning process. Students would seem to need clear guidance about how to best use the postings of their colleagues, and make their own, to reach the desired learning outcomes, rather than making purposes other than learning. Also, new moderating skills seem to be needed by tutors, so that some do not resort to opting out of the process. Studies such as this one are needed if we are to evaluate and better understand the increasing variety of ways students can engage in quality learning through discussions.

## References

Biggs, J. B. (1999). *Teaching for Quality Learning at University*. Buckingham: Society for Research into Higher Education & Open University Press.

Chou, C. C. (2001). Formative evaluation of synchronous cmc systems for a learner-centred online course. *Journal of Interactive Learning Research*, 12(2/3), 173-192.

Cope, C. (2000). *Educationally Critical Aspects of the Experience of Learning About the Concept of an Information System*. Unpublished thesis, La Trobe University, Melbourne.

Crawford, K., Gordon, S., Nicholas, J., & Prosser, M. (1994). Conceptions of mathematics and how it is learned: The perspectives of students entering university. *Learning and Instruction*, 4, 331-345.

Dowling, C. (1999). Talking In Class: The Roles Of Software Agents and Other Participants In The Social Construction Of Knowledge Within Online Learning Environments. In *Responding to Diversity: the 16<sup>th</sup> Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education (ASCILITE), Australia 5-8 December 1999*. Queensland: Queensland University of Technology.  
<http://www.ascilite.org.au/conferences/brisbane99/papers/papers.htm>

Dutt-Doner, K.M., Powers, S.M. (2000). The use of electronic communication to develop alternative avenues for classroom discussion. *Journal of Technology and Teacher Education*, 8(2), 153-172.

Entwistle, N., & Ramsden, P. (1983). *Understanding Student Learning*. London: Croom Helm.

Feenberg, A. (1987). Computer conferencing and the humanities. *Instructional Science*, 16, 169-186.

Harasim, L. (1989). Online education: A new domain. In R. Mason & A. Kaye (Eds.), *Mindweave: Communication, Computers and Distance Education* (pp. 50-62). New York: Pergamon Press.

Hounsell, D. (1987). Essay writing and the quality of feedback. In J. Richardson, M. Eysenck & W. Piper (Eds.), *Student Learning: Research in Education & Cognitive Psychology* (pp.109-119). Milton Keynes: Society for Research Into Higher Education & Open University Press.

Kiesler, S., Siegel, J., & McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist*, 39, 1123-1134.

Kremers, M. (1988). Sherman Hill meets ENFI: An inquiry and a retrospective. *Computers and Composition*, 5, 69-7.

Laurillard, D. (1993). *Rethinking University Teaching: A framework for the effective use of educational technology*. London: Routledge.

Laurillard, D. (2002). *Rethinking University Teaching: A framework for the effective use of educational technology* (2nd ed.). London: Routledge.

Marton, F., & Booth, S. (1997). *Learning and Awareness*. New Jersey: Lawrence Erlbaum Assoc, Publishers.

Marton, F., & Säljö, R. (1976a). On qualitative differences in learning. I. Outcome and process. *British Journal of Educational Psychology*, 46, 4-11.

Marton, F., & Säljö, R. (1976b). On qualitative differences in learning. II. Outcome as a function of the learner's conception of the task. *British Journal of Educational Psychology*, 46, 115-127.

Pask, G. (1976). Conversational techniques in the study and practice of education. *British Journal of Educational Psychology*, 46, 12-25.

Prosser, M. (2000). Evaluating the new technologies: A student learning focused perspective. *Uniserve Science May Workshop*, unpublished.

Prosser, M., & Millar, R. (1989). The 'how' and 'what' of learning physics. *European Journal of Psychology of Education*, 4, 513-528.

Prosser, M., & Trigwell, K. (1999). *Understanding Learning & Teaching: The Experience In Higher Education*. Buckingham: Society for Research into Higher Education & Open University Press.

Prosser, M., Hazel, E. & Waterhouse, F. (2000). Students' experiences of studying physics concepts: The effects of disintegrated perceptions and approaches. *European Journal of Psychology of Education*, 15(1), 61-74.

Ramsden, P. (1992). *Learning to Teach in Higher Education*. London: Routledge.

Salmon, G. (2001). *E-moderating: The Key to Teaching and Learning Online*. London: Kogan Page.

Selfe, C. L., & Meyer, P. R. (1991). Testing claims for online conferences. *Written Communication*, 8, 163-198.

Svensson, L. (2002). Discursive evaluation in a distributed learning community. *Australian Journal of Educational Technology, 18*(3), 308-322.

Trigwell, K., & Prosser, M. (1996). Congruence between intention and strategy in science teachers' approach to teaching, *Higher Education, 32*, 77-87.