How and what university students learn through online and face-to-face discussion: conceptions, intentions and approaches

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Abstract

This paper reports a phenomenographic investigation into students’ experiences of learning through discussion – both online and face to face (F2F). The study context was a second-year undergraduate course in psychology for social work in which the teacher had designed discussion tasks to begin in F2F mode and to continue online. A combination of open-ended questionnaires and semi-structured interviews was used to investigate students’ conceptions of what they were learning, their intentions and their approaches to learning through discussion. Analysis of the interview and open-ended questionnaire data identified a number of qualitatively different conceptions, intentions and approaches to learning through discussion. Associations were found between what students thought they were learning through discussions, their approaches to learning through discussion and their course grade. Students with a cohesive conception and students adopting a deep approach (to learning through online discussion) got better course grades. There was no significant difference between deep and surface approaches to F2F discussion and course grade. The outcomes of this study have implications for the design of online and F2F discussion tasks and in particular for helping students adopt richer conceptions of what they stand to gain through discussion.

Keywords

blended learning, discussions, online learning, undergraduate.

Introduction

The use of Web-based or ‘online’ learning technologies is becoming part of the everyday experience of campus-based university students. For brevity’s sake, we will refer to Web-based learning as ‘eLearning’ and to systematic combinations of eLearning and face-to-face (F2F) learning activity as ‘blended learning’. In so doing, we acknowledge both the pedagogical heterogeneity and the conceptual fuzziness associated with these labels (Oliver & Trigwell 2005).

No longer is it sensible to ask the question ‘Why should students use eLearning since they are coming on campus?’, but rather ‘How is eLearning contributing to the quality of their campus-based experience?’ This question is growing in significance, for at least the following, related, reasons:

1. students are expecting eLearning resources to be available to support their campus-based experiences;
2. academic publishers are providing useful learning resources in electronic format;
3. academic researchers are publishing research (in and across the academic disciplines) that is available online and relevant for students’ learning; and

Acknowledgements

This research was supported by funding from the Higher Education Academy, York, England.

References

4. the online environments that students are using include tools that support interaction with peers and teachers, online discussion, etc.

In the face of this expanding set of potential opportunities for students to benefit from blended learning, the challenge for research is to: (a) identify the circumstances under which students learn best from appropriate blends of F2F and online activity, and (b) describe and explain these circumstances in ways that help students and teachers make the most of such experiences. An eventual goal for our programme of research is to produce such an account, rendered in a way that can inform educational design, teaching and student learning.

In this study, we investigate aspects of the learning experiences of some second-year undergraduate students studying social work in a metropolitan Australian University. Discussion was a key part of the learning experience. The students engaged in structured F2F discussion activities in large and small groups in class, as well as in structured asynchronous discussions online. The course design required the students to start a discussion in their F2F groups and continue it online. The study was designed to investigate how the students approached discussions in both the F2F and online contexts; what they thought they were learning through their discussions; and how these key aspects of the learning experience were related to their course outcomes. Whether the F2F and online discussions should be studied as a single phenomenon or as two distinct but connected phenomena is a moot point. Our research speaks to both these perspectives but the account presented below offers separate treatments of the F2F and online discussions – mainly so that we can see whether there are differences between the two. In future work, we will also focus on students’ experience of the integration, or otherwise, of F2F and online discussions.

Prior research and theoretical background

To explore the social work students’ experience of learning through discussions, we have drawn upon methodologies from the field of research on student learning (Marton & Saljo 1976a,b; Entwistle & Ramsden 1983; Marton & Booth 1997; Prosser & Trigwell 1999; Laurillard 2002; Ramsden 2002). In particular, to investigate how students approach discussions in F2F and online contexts, and to understand how the quality of these approaches is related to what they thought they were learning through discussions, we used a phenomenographic approach to understanding the experience of learning (Prosser & Trigwell 1999).

Figure 1 shows that the experience of learning can be divided into referential and structural aspects: what the students think they are learning (referential), and how they go about their learning (structural). The structural aspect of the experience of learning can be divided into further structural and referential aspects: the act of learning and the intention underpinning the act. When looking at significant differences in the way students approach learning, past research has identified two qualitatively different categories of approaches:

- ‘deep approaches’ (having an underlying intention to understand the phenomenon being studied), and
- ‘surface approaches’ (having an intention to be able to reproduce the description of the phenomenon being studied – for example, for an exam. Prosser & Trigwell 1999).

In blended learning situations, one needs to consider how students learn through both F2F and online discussions, see Fig 2.

Figure 2 acknowledges the more complex nature of student approaches when they are required to learn in F2F and online contexts. Whether student, teacher or researcher, it would be unwise to assume that the act of learning through F2F discussion is the same as learning through online discussion, or that knowledge of how to learn in F2F contexts is the same as knowledge of how to learn in online contexts. Moreover, blended learning also entails – at least in
principle – considerations of strategy and intention at a meta-level. For example, students may find themselves needing to decide whether to do something in the F2F or the online setting. Articulation of F2F and online learning activity requires more than knowledge of how to work effectively in each of these areas. Consequently, this study is designed to investigate qualitative variation in students’ approaches in and across these two different contexts, and to ask whether and how they are related to the students’ conceptions of what they think they are learning through discussions.

Research into how students discuss in class and online is not just restricted to one theoretical field. Research into how students use technologies for discussions has focused on the significance of role-allocation and the provision of collaboration scripts in helping structure and sustain online debates (Pilkington & Walker 2003; Weinberger et al. 2005), how some kinds of contribution are more likely than others to promote and sustain, or conversely to close down, productive discussion (see e.g. Henri 1992; Hara et al. 2000; de Laat & Lally 2003) and associations between how students use the technologies and the nature of tasks, discourse and cognitive change (Dillenbourg 1999). Research has also investigated what students have learnt through discussions, such as the learning of argumentation skills (e.g. Marttunen & Laurinen 2001) or of communication skills more generally (e.g. McAteer et al. 2002), and the refinement of conceptual artefacts (Bereiter 2002).

Within the field of student learning research, there have been significant studies of the student experience of learning in higher education and in the approaches they adopt to their work as learners. Some of these conceptions and approaches correlate well with indicators of academic success and failure. This line of phenomenographic research into conceptions of, and approaches to, learning and teaching has only recently been extended to the area of online discussions (see e.g. Jones & Asensio 2002; Goodyear et al. 2003, 2005; Roberts 2003; Ellis et. al. 2004).

Recent studies into learning through discussion have found significant associations between what students think they learn through discussions and how they approach these discussions in F2F and online contexts (Ellis et al. 2004; Ellis & Calvo 2004). These studies also indicated that qualitative differences within these approaches and concepts were associated with levels of performance. The research context investigated in these studies was a third-year undergraduate e-commerce course in which students used F2F and online discussions as a way of learning how to write a technical report (Ellis et al. 2004). The purpose of the report was to put forward a proposal for establishing an e-commerce business, and students shared the identification of their business proposals, use-case descriptions and cost–benefit analyses of their proposals through online discussions with their peers. A key outcome from the Ellis et al. study was that a significant number of students did not seem to be able to see a relationship between the quality of their online postings, what they were saying in class and the quality of their final report. These students tended to perform relatively poorly in comparison with those students who reported understanding that there was a close association between their discussions and their final report.

Our current study complements and extends this earlier work by carrying out the research in the context of a different professional preparation course – this time in social work. The new study involves F2F and online discussions and looks at how these are related, from a student perspective, to the course readings, to core theoretical ideas in social work, and to practice as a professional social worker.

The learning context for the current study

The course was psychology for second-year social work students and was one semester (14 weeks) long.
The students engaged in structured discussions through most of the semester. The purpose of the discussions was to help students come to terms with knowledge and theories in the psychology and social work literature, and to help them relate these ideas to their own experiences and to the experiences of other students, in ways that would help them to better understand key ideas in professional practice. To do this, they discussed their readings in tutorials in both large and small groups. They also discussed them online by making at least two postings of 200 words each week. They had the choice of starting their own discussion thread, or alternatively they could reply to a posting made by another student. Typically, the online discussion was a continuation of that week’s F2F discussion. The discussion moved on to a new topic each week. The students were awarded 13% of their final mark for the quality of their online postings. This mark was added to the student results from a 3 h examination comprising three papers on counseling, personality and human development (57%), and a diary kept by students identifying key issues and concepts from tutorials (30%). These three assessments were added together to provide the students’ final mark. All postings by students were made using the discussion tool in WebCT, campus version 4.1.

Research methods

One hundred and five students were taking the course. Fifty-one students volunteered to complete an open-ended questionnaire. A review of student grades showed that the population sample had a similar spread of course results (M = 66.67; SD = 8.9) and similar number of online postings (approximately 48 per student) as the whole cohort and consequently were a reasonable representative selection on these criteria. A subsample of 20 of these students agreed to take part in semi-structured interviews. This resulted in one trial interview and 19 completed and usable interviews.

Our aim in using the open-ended questions on the questionnaire and the subsequent semi-structured interviews was to investigate the associations between (a) what the students thought they were learning by taking part in discussions (both F2F and online), and (b) how they approached taking part in these discussions (both F2F and online). We were interested in qualitative variations in their conceptions of what they were learning and in their approaches to discussion. We were also interested in seeing whether there was a relationship between their conceptions or approaches and their academic performance, as measured by their end-of-course mark.

The interviews were conducted one on one and took about 30 min each. Each interview was conducted by one of three members of the research team. The interviewers were not involved in teaching the course. The questions used to structure the interview were based on the open-ended questions used earlier in the questionnaire:

1. What did you learn through discussions in your course? This includes all of the discussions that you were involved in the course (that is any discussions held in lectures, tutorials, workshops, online etc)
2. How did you approach engaging in face-to-face discussions in your course? 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 your course? 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?

The structure of these questions reflects the structure of the experience of blended learning sketched in Figs 1 and 2. Question 1 is designed to investigate the student conceptions of what they think they learn through discussions in social work, and Questions 2 and 3 investigate the strategy (what did they do) and intention (why did they do it) aspects of the students’ approaches to discussion in both F2F and online contexts. The design of the questions benefited from approaches adopted in previous studies reported in the literature (Prosser & Millar 1989; Crawford et al. 1994; Ellis et al. 2004).

The interviews were tape-recorded and transcribed in full. The interview transcripts and open-ended questionnaire material were analysed using a phenomenographic approach (Marton & Booth 1997). The process of analysing the students’ conceptions of learning through discussions, as documented in the interview transcripts, is described below and is an example of how all the analyses were completed. The analysis process results in an ‘outcome space’ (Prosser & Trigwell 1999), which is represented as a hierarchy of qualitatively different categories of conceptions and approaches.
Steps in transcript analysis: example – Question 1, students’ conceptions of learning through discussion

1. Each of the researchers independently read all 19 Q1 transcriptions. At this stage, the researchers were aiming to get a sense of the depth and breadth of variations in the students’ responses.

2. This first reading highlighted illuminating responses from students – revealing variations in the conception of learning through discussion. The illuminating responses became the basis of themes associated with a developing set of qualitatively different categories of conception (cf. Marton & Booth 1997, p. 98).

3. The Q1 transcripts were read repeatedly. This process of repetitive reading produced new insights into the data. As Marton & Booth (1997, p. 134) point out, the researcher cannot be simultaneously aware of all aspects of the data, nor can each element be perceived with the same degree of acuity.

4. The categories arising out of the themes noted in the student responses suggested logical relations, some of which overlapped each other in the ‘outcome space’ that was being developed.

5. All the Q1 transcripts were read again in relation to the initial structural relationships of the emerging categories of conceptions.

6. The most illuminating transcripts were discussed within the research team, in relation to the draft categories that had emerged. This led to a significant re-working of the categories, which improved their communicability (Säljö 1988, p. 45).

7. Some changes were brought about through a re-classification of some of the student responses. Both the final version of the category descriptions and the recategorization of the extracts were agreed upon by the researchers.

8. The redrafted categories became the final outcome spaces. Extracts from student answers in the interviews that best represented the draft categories were selected for illustrative purposes. The draft categories and the representative quotations formed the outcome space. They draw on the SOLO taxonomy as a way of structuring the hierarchy (Biggs 1999), that is, they situate the categories in a relational way that describes a variety of experiences ranging from simple to more complex.

The process described for the categorisation of the conceptions above was also used for the analyses of the categories of approaches to discussions in the F2F (Q2) and online (Q3) contexts.

An issue in this kind of transcript analysis is the extent to which the outcomes are dependent on the idiosyncratic views of a single researcher. To provide some check on this, three researchers were involved in the process. The degree of agreement between Researcher 1 and Researchers 2 and 3 is shown in Table 1.

The percentages shown in Table 1 give the initial level of inter-researcher agreement as well as the level of agreement after consultation between the researchers about category definitions, etc. Final levels of agreement in the classifications after consultation range from 88% to 100%.

Research results

The categories of student conceptions and approaches to learning through blended discussions revealed in Tables 2–5 are the major outcomes of this study. It is important to note that these categories exist across the whole student sample, rather than any category necessarily existing within one single student.

Table 1. Inter-researcher agreement and the communicability of the categories developed through the analysis of learning through discussions.

<table>
<thead>
<tr>
<th></th>
<th>Conceptions (Q1)</th>
<th>Face-to-face approaches (Q2)</th>
<th>Online approaches (Q3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% agreement after initial categorization</td>
<td>% agreement after consultation</td>
<td>% agreement after initial categorization</td>
</tr>
<tr>
<td>Researcher 2</td>
<td>71</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>Researcher 3</td>
<td>88</td>
<td>100</td>
<td>71</td>
</tr>
</tbody>
</table>
Conceptions of learning through discussions

Table 2 summarizes the qualitative variations in conceptions of learning through discussions (Q1).

Table 2 identifies the variation in the ways the social work students in this study think about learning through discussions. The first column in Table 2 contains the category labels that suggest the main thrust of the conception. The second column shows the category description and the third column present an extract from the interview transcripts chosen to best represent the category of conception.

The categories in Table 2 are hierarchical and relational. In referential terms, categories C and D are less complex. There is no awareness that the discussions are a way of challenging ideas or improving understanding. Rather, they emphasize a limited conception of learning that is more about checking and accumulating ideas. Categories A and B are conceptions underpinned by an awareness of the understanding that can arise through discussions: discussions as a way of going into the topics more deeply by considering other perspectives and testing beliefs.

The referential aspects of the categories in Table 2 are logically inclusive. Referentially, acquiring the right ideas, in category C, encompasses checking whether one’s ideas are correct, in category D. Improving one’s ideas through discussions in category B encompasses the notion of acquiring more ideas in C. Developing understanding through discussions in A encompasses the idea of improving one’s ideas in B. While the referential aspects of the categories of conceptions are logically inclusive, their structural aspects are not, as fragmented and cohesive conceptions are mutually exclusive. These associations are shown in Table 3 (which is best interpreted by reading from the bottom up).

Categories of approaches to learning through discussions

Table 4 shows the variation in approaches to learning through discussions. For ease of comparison, Table 4 includes both F2F and online approaches (Q2 and Q3). This is not meant to suggest that the adoption of approaches consistent with category A in F2F contexts necessarily entails the adoption of a referentially similar approach in the online context. The tendencies and relationships among these categories will be discussed in relation to Table 7.

The categories of approaches were examined for their referential and structural relationships.

In referential terms, the F2F categories C&D did not reveal an analytical aspect to the discussions. Rather,

Table 2. Categories of conceptions of learning through discussions.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Representative quotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Challenging</td>
<td>Discussions as a way of challenging ideas and beliefs in order to arrive at a more complete understanding</td>
<td>It (discussing) challenges my beliefs, which is always good . . . because a belief is something that is based on knowledge and experience and your understanding of the world, and if it is being challenged you are testing it. . . . If my beliefs are challenged, I believe that my understanding of concepts is more complete</td>
</tr>
<tr>
<td>B Developing</td>
<td>Discussions as a way of challenging and improving your ideas</td>
<td>It sort of gives you different views of what people are getting out of the readings and stuff . . . it helps me, I guess, just because I am not getting stuck in just this one mindset, it sort of makes me for a topic to go deeper, and just get other perspectives . . . I guess it gives me an appreciation that people do see it differently, that it’s not clear cut. It’s one thing having my opinion, and it will mean different things to different people</td>
</tr>
<tr>
<td>C Acquiring</td>
<td>Discussions as a way of collecting ideas</td>
<td>It elaborates the readings even more like it sort of expands the readings out a bit . . . when you go to the tutorials and you express your ideas, it sort of makes them valid to yourself. Like you sort of remember it a bit more by the end of the tutorial . . . you just get to learn a bit more about the other people’s ideas</td>
</tr>
<tr>
<td>D Checking</td>
<td>Discussions as a way of checking your ideas</td>
<td>Getting the teacher’s point of view . . . it’s good being able to talk and make sure you are really learning what you are supposed to be learning. It is just sort of reassuring</td>
</tr>
</tbody>
</table>

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these categories emphasized an intention to use discussions as a way of hearing about the experiences of others and of meeting one’s obligations as a student. In contrast, categories A&B suggest an intention to use the discussions as a way of developing understanding through analysing the experience and opinions of others and, in the more complex category A, of doing so in ways that emphasized feedback.

In referential terms, the online categories C&D reveal an intention to use postings to clarify ideas. There is no sense here of using the postings to deepen understanding. In contrast, categories A&B emphasized an evaluative aspect through which the postings could be used to challenge and reflect on the key ideas being raised in the discussions.

In both the F2F and online approaches, there is a qualitative shift between categories A&B and C&D, in which the former are marked by intentions of promoting understanding through analysis and evaluation, and the latter are marked by the absence of such intentions. The former are referred to as ‘deep’ approaches, and the latter ‘surface’, as comparatively their structural aspects are qualitatively different.

The structural relationships between these categories of approach are shown in Table 5.

In structural terms, the F2F approaches in categories C&D revealed strategies that involved hearing about experiences and engaging in discussion only because the course required it. In contrast, categories A&B revealed strategies involving the analysis of experiences.

In structural terms, the online approaches in C&D revealed strategies of using postings to add to ideas or to avoid repetition (of other people’s ideas). In contrast, categories A&B emphasized strategies of using the postings to reflect on, and challenge, ideas. In neither the F2F nor the online approaches are the categories logically inclusive: strategies of engaging with ideas and experiences to promote understanding cannot also simultaneously be strategies of hearing and adding to ideas or fulfilling course requirements.

Unanticipated responses: affective aspects of learning through discussion

When analysing the interview transcripts and the open-ended questionnaires, the researchers became aware of responses made by students that highlighted some aspects of their feelings about their experience of learning through discussions: about affective aspects of the experience. As the interviews and questionnaires were not designed systematically to reveal responses about feelings, it was difficult to identify clear relationships between the students’ approaches, conceptions and course performance (on the one hand), and how they felt about posting their thoughts online or talking in groups (on the other). This section briefly describes the most prominent tendencies in the students’ feelings about the experience of making postings every week. Our purpose is to sketch an aspect of learning through discussions that may be important to investigate in relation to conceptions and approaches in the future.

In the interview transcripts, a number of responses revealed reluctance to post or to post early.

“I am one of those people who likes to not put my own ideas out there. I like to respond to others and until someone has put up something original and then I will agree or disagree with it or add to it.”

“I have never actually started a conversation yet. I wanted to one week I wanted to be the first one to get on and say my point. I tend to read other people’s, some of them I find interesting, some of them I either agree with and have an opinion on, or some of them I disagree with.”

In contrast, some students displayed very positive feelings about the process of posting online.
Table 4. Categories of approaches to learning through discussions.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Representative quotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Engaging in face-to-face discussions to analyse experiences and opinions through feedback</td>
<td>As far as learning, I like other people’s ideas. I am never presumptuous enough to think that anything I say is the absolute truth and um for all I know I could be completely wrong. . . . I like to see how other people absorb my information. It is important to me that I have explained it well enough so other people can learn off it. I have always thought that if you can explain something to someone else, for example my girlfriend is in Year 12 right now and I really didn’t do well in chemistry and after tutoring her I am like I could do my HSC now. To me it is important that I can explain my ideas so it is good to be able to let other people in and plus I get their feedback on it as well immediately.</td>
</tr>
<tr>
<td></td>
<td>Engaging in online discussions to evaluate postings to reflect on key ideas</td>
<td>It just makes me think, like the ideas, like someone today when a post I made this morning and one two days ago, which was about men in counseling and about how they just feel society pretty much pushed them out of it. It wasn’t really that original but it was something which I hadn’t thought of before. So I mean, I didn’t respond to it because I didn’t have much to say. It was just something for me to think about it as I come to University, and it will be something that I have already thought about and probably be able to apply it.</td>
</tr>
<tr>
<td>B</td>
<td>Engaging in face-to-face discussions to analyse experiences and opinions</td>
<td>I do enjoy being there and having that instantaneous kind of being able to converse and everything, like I like that one person has one opinion and then straight away that can be like someone else can say the opposite thing and it is always . . . I mean it gives you a chance to kind of reflect on what you think and everything, like your own thoughts.</td>
</tr>
<tr>
<td></td>
<td>Engaging in online discussions to evaluate postings to challenge ideas</td>
<td>Benefits, I guess it’s what I said earlier, it (on-line discussion) is about what these readings are saying and really reflecting on them seriously because I guess the tutorial you can quite easily get away without doing the reading, without thinking about them that much, so in that way I think online discussion is beneficial, it really makes me take the time to re-read and to consider it.</td>
</tr>
<tr>
<td>C</td>
<td>Engaging in face-to-face discussions to hear other experiences and ideas</td>
<td>Usually, like because we go around and usually by the last people your ideas and everything has been said you end up coming to basically the same sort of answer, give or take a few different sorts of points or once it gets around the last group doesn’t usually have much to say because it is, you know everyone is coming to the same ideas.</td>
</tr>
<tr>
<td></td>
<td>Engaging in online discussions to use postings to add to ideas</td>
<td>I am one of those people who likes to not put my own ideas out there. I like to respond to others and until someone has put up something original and then I will agree or disagree with it or add to it . . . I guess I find it easier . . .</td>
</tr>
<tr>
<td>D</td>
<td>Engaging in face-to-face discussions to fulfil task requirements</td>
<td>I don’t think there is that much learning the most amount of learning would happen in lectures . . . I don’t think there is that much learning, I think it’s just embracing different ideas and I don’t think you are actually learning something, I think what’s in the readings it’s not what you actually learn it’s just stringing them all together and engaging, yeah.</td>
</tr>
<tr>
<td></td>
<td>Engaging in online discussions to read postings to avoid repetition</td>
<td>I tend to read all of them first. Because I tend to want to write something a bit different to all of them and sort of stand out a little bit because I thought I would get good marks for that, but that’s not the point. But then if I read all of them as well I can reply to some of them, that’s the thing like if I agree with someone’s posting, then I can reply which is always good and then extend on from what they have just said. So yeah I tend to read all of them first yeah.</td>
</tr>
</tbody>
</table>

“I think that the on-line things are really good because some people might feel really shy in class or something and feel like they can’t express themselves. Some people can express themselves better in writing than in talking.”

“Oh I think it is so good. I love on-line yeah. I think it is better because you get to think about what you are going to write. You don’t have to sort of say it, you get to think about what you are going to type first and then post it and so you can say so much more and it makes much more sense when it comes out of your mouth like it’s more formal too. And I just love hearing other people’s opinions as well like if they reply, especially if they reply to your posting, it’s like the best because they sort of agree or disagree or whatever and then you get to hear their point of view of your subject of your posting so that is really interesting to hear other people’s, yeah, views of what you’ve just said so yeah, it’s great.”
Variation such as that shown in the quotations above is likely to be an important area of investigation if a systematic methodology can identify associations among positive and negative feelings and the quality of approaches to postings and/or performance. If this area is investigated, it may also add to the model of the experience of learning sketched in Fig 1, by adding ‘affect’ to the experience of learning – a limitation of phenomenographic research on student learning noted by other researchers (Trigwell et al. 2005).

### Associations between aspects of the student experience of learning through discussions

In this part of the study, associations between aspects of the student experience of learning through discussions in social work are presented and analysed. The distribution of students between categories is considered. The strength of the associations between the categories is assessed. Associations between the categories and student performance are presented.

Table 6 shows the distribution of the responses made by 51 students in the sample across the categories of conceptions and approaches. Here, we have applied the categories derived earlier to a classification of responses in the open-ended questionnaire data (and the interview data, for those students for whom it was available).

Table 6 has five columns. Columns 1 and 2 show the labels and categories of the conceptions and approaches, and columns 3–5 identify the number and percentage of responses classified in each of the categories. It shows that 45% of responses about conceptions were classified as cohesive, and 53% as fragmented. Eighteen per cent of responses about F2F approaches were classified as deep, and 82% as surface: and 29% of responses about online approaches were classified as deep, and 71% as surface.

Table 6 has five columns. Columns 1 and 2 show the labels and categories of the conceptions and approaches, and columns 3–5 identify the number and percentage of responses classified in each of the categories. It shows that 45% of responses about conceptions were classified as cohesive, and 53% as fragmented. Eighteen per cent of responses about F2F approaches were classified as deep, and 82% as surface: and 29% of responses about online approaches were classified as deep, and 71% as surface.

Table 7 shows the strength of associations between approaches and conceptions.

Table 7 shows a strong and statistically significant relationship between the conceptions of learning
through discussions and approaches to F2F discussions ($\pi = 0.47, P < 0.001$). It also shows a strong and statistically significant relationship between the conceptions of learning through discussions and approaches to online discussions ($\pi = 0.69, P < 0.001$). These results suggest that surface approaches to F2F discussions were closely related to fragmented conceptions of discussions: and similarly, a deep approach to discussions online tended to be closely related to a cohesive conception of learning through discussions.

Table 8 shows the associations among conceptions, approaches and student performance. Table 8 shows that cohesive conceptions were related to a higher level of performance than were surface approaches ($t = 2.8, P < 0.05, e's = 0.36$). Similarly, deep approaches to discussions online were related to a higher level of performance than were surface approaches (online: $t = 2.2, P < 0.05, e's = 0.67$). These are, respectively, medium and large effect sizes, similar to the effect sizes found in related studies of student learning in higher education (Crawford et al. 1994, p. 341). There was no statistically significant association found between performance and F2F approaches.

**Table 8. Relationships between conceptions, approaches and performance.**

<table>
<thead>
<tr>
<th>Aspects of learning through discussions</th>
<th>Final mark</th>
<th>Mean$^1$</th>
<th>SD</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fragmented</td>
<td></td>
<td>63.5</td>
<td>8.4</td>
<td>.36</td>
</tr>
<tr>
<td>Cohesive</td>
<td></td>
<td>70.0</td>
<td>8.4</td>
<td></td>
</tr>
<tr>
<td>$T$ test: $T =$</td>
<td></td>
<td>2.8*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approaches online</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface</td>
<td></td>
<td>64.9</td>
<td>8.6</td>
<td>.67</td>
</tr>
<tr>
<td>Deep</td>
<td></td>
<td>70.6</td>
<td>8.7</td>
<td></td>
</tr>
<tr>
<td>$T$ test: $T =$</td>
<td></td>
<td>2.2*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$n = 51, *P < 0.05, ^1$Mark out of 100.

**Discussion**

This analysis of qualitative variations in conceptions of, and approaches to, learning through discussions provides a new picture of key aspects of the experience from a student perspective. It is significant that this new perspective is informed by data from a course in the human sciences – psychology for social work. Previous work reported by Ellis et al. (2004) drew upon an e-commerce course run in an engineering faculty. Notable differences included the nature of the variation in the way students approached postings when discussing online, and the emphasis on using personal experiences, and the experiences of others, to deepen understanding in F2F and online contexts. This new study has also identified some affective aspects of the student experience that offer promising ground for future studies.

The qualitative categories in this study, and the empirical relationships between those categories, offer some basis for developing ideas that can inform a theory of learning through discussions. We must be cautious about overgeneralizing from the findings of this study – some aspects of what we found will be
specific to the context of this course, its teacher and this cohort of students. But from a pragmatic point of view, so little is known about learning through discussion that we feel practitioners that may benefit from considering the following propositions.

Worthwhile learning through 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 F2F 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.

This study suggests that it is these types of conditions that are likely to lead to a higher level of performance and a higher quality of understanding arising from discussions.

**Implications for practice**

Such results can inform practice through at least two routes: by embedding well-founded pedagogical ideas in shareable designs and by informing teachers’ strategies for moderating discussions. Previous research has shown that designs can act as carriers of good practice (Pirolli 1991; Goodyear 1997). Guidelines for managing (online) discussions have also attracted significant attention (Goodyear et al. 2001; Goodyear 2002; Salmon 2001, 2002). Having well-tried and customisable designs at hand, for online discussion tasks for example, makes a significant difference to the work of preparing and managing an online discussion (Fox & MacKeogh 2003).

It is interesting to note the relationships among the qualitatively different categories of conceptions and approaches discussed in the second part of this paper. We offer two observations connected to the improvement of practice. Firstly, the distribution of students shown in Table 7 suggests that the outcomes could be improved if more students had a better understanding of what they could learn through discussions and how to approach discussions in different contexts. Table 7 identifies that in both contexts, some students may be more ready to improve their approach than others. In both the F2F and online contexts, there were students who reported a conception of discussions consistent with a cohesive category, but reported an approach that was consistent with a surface category. Secondly, the cohesive categories of learning through discussions were more closely related to the higher quality approaches than the surface approaches. The first observation suggests that if we are interested in maximising the benefits arising from learning through discussions, then we first need to understand why there might be discontinuities between stated conceptions of, and approaches to, discussions. In this study, the student responses suggested that while some understood the purpose of discussions, unsystematic or last-minute strategies used to deal with discussions, especially in the online context, need addressing. This type of insight can help us to better design activities that help students to understand and engage in discussions. Perhaps an orientation exercise at the beginning of the semester should not only reinforce the benefits of what can be learnt through discussions, but also models successful approaches to discussions, both in F2F context and online (Wozniak & Silveira 2004). The second observation suggests that if we achieve either of these outcomes from the orientation, then the strength of the associations among the conceptions and approaches is such that they are likely to assist in the development of the more desirable aspects of the student experience. In other words, if we can help students to develop a conception of discussions consistent with the cohesive categories, then this may encourage deeper approaches. Similarly, if we can help students to develop deeper approaches to discussions, then they may understand how discussions can help them really get to the meaning of what they are studying. This observation has strong implications for educational design: of tasks in general but especially of assessment tasks. Inauthentic assessment of students’ contributions to online discussion is likely to amplify other factors which promote surface or strategic approaches to study.

The introduction of new technologies into learning situations at the university level is providing fresh opportunities for teachers and researchers to renew and reinvigorate their approach to understanding and researching learning. Further research from a student learning perspective is required if we are to understand
how students can be helped to make best use of new technologies. In the next phase of our research, we intend to continue identifying key aspects of learning through discussions by supplementing the use of phenomenographic interviews, with interviews and observations rooted in representations of students’ online and F2F discussion activity, and with quantitative analyses that extend our approach. We intend to identify ways of capturing the design implications of this empirical research through the construction of pedagogical design patterns (Goodyear 2005), and investigate a model of blended learning and teaching which is based on an iterative cycle of design, use, evaluation and redesign.

Acknowledgements

We are pleased to acknowledge the financial assistance of the Australian Research Council (Grant DP0559282 awarded to Goodyear, Ellis & Prosser) in funding used to carry out this study. We would also like to thank Michael Lawrence-Slater for assistance with data collection.

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