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Facilitating in a demanding environment: Experiences of teaching in virtual classrooms using web conferencing

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Abstract

"How to" guides and software training resources support the development of the skills and confidence needed to teach in virtual classrooms using web-conferencing software. However, these sources do not often reveal the subtleties of what it is like to be a facilitator in such an environment—what it feels like, what issues might emerge and what personal challenges will be faced. This paper reports findings from a phenomenological study guided by the following question: "how do experienced teachers describe and understand their experiences in synchronous virtual classrooms?" which aimed to find out what it is like to be a teacher in a virtual classroom. The transcripts of semi-structured interviews with four experienced web-conferencing users across the UK were analysed using interpretative phenomenological analysis. One of the themes that emerged—"facilitating in a demanding environment"—is explored in this paper to give an insight into participants' experiences and some of the challenges faced when encouraging interaction in an environment where feedback is limited. The discussion may be relevant to those developing their practice in virtual classrooms, as well as staff developers and software designers.

Introduction

There has been a recent upsurge in the use of web conferencing in higher education. Uptake is expected to continue to increase, for example, at a rate of 11.5% per annum between 2009 and 2014 (Greenberg, 2009). The user community is expanding rapidly and set to continue to grow as universities purchase institution-wide licences and engage in routine use of web conferencing with distance learners. Widely used web-conferencing software includes packages such as Blackboard Collaborate, Elluminate Live!, Wimba and Adobe Connect. Chatterton (2010) provided a useful summary of the features of Elluminate Live!, a typical web-conferencing system, noting that the programme was "designed with educational uses in mind" (p. 3). It offered audioconferencing, videoconferencing, real-time polling and quizzes, application sharing, text chat, playing of audio and video files, file transfer, whiteboard, shared web browsing, break-out rooms for small group discussion and recording functions. Chatterton (2010) pointed out that these tools support a wide range of teaching and learning methods and styles, and have the potential to enable engaging and collaborative learning. Wang and Hsu (2008) suggested not only that web conferencing provides "a nearly face-to-face environment" (p. 175) but also that it was hard to replicate the "learning atmosphere" of a face-to-face classroom (p. 185).

Grant and Cheon (2007) highlighted the need for instructors to undergo training to ensure that they are comfortable with web-conferencing technology and can adapt to new instructional approaches. Other authors echo this call. For example, Reushle and Loch (2008) maintained

Practitioner notes

What is already known about this topic

- Web-conferencing use is on the increase.
- There is a need for help and support on pedagogic issues for web-conferencing facilitators because they may lack experience as learners in a virtual classroom.
- New facilitators experience challenges when making the transition to teaching in a virtual classroom.

What this paper adds

- Evidence from the lived experience of four experienced web-conferencing facilitators.
- Experienced facilitators also find teaching in a virtual classroom an intense and demanding experience, and develop strategies to encourage interaction and obtain feedback.
- Adopting learner-centred strategies using web conferencing is challenging for some facilitators: they may retreat towards teacher-led approaches although others embrace the opportunities offered by the technology.

Implications for practice and/or policy

- Practical advice provided by other resources developed to support facilitators can be supplemented by a deeper understanding of individual experiences.
- To help new facilitators prepare for teaching with web conferencing, attention should be paid to individual experiences and existing practices.
- Resources to support facilitators should address pedagogic challenges as well as technological issues.

that staff training in the technical aspects of the tools, as well as pedagogical approaches to using them, is vital for successful use of web conferencing. De Freitas and Neumann (2009) argued that there is a "pedagogic basis" (p. 993) for the effective use of web conferencing and advocate "pedagogic-driven planning" (p. 983) to support use. "How to" and best practice guides (eg, Chatterton, 2010; Shepherd, Green & Sampson, 2011), recordings of online sessions (eg, Shepherd & Sampson, 2010) and online training materials from vendors have also supported new facilitators. Note that, throughout this paper, the term "facilitator" is used synonymously with instructor, tutor or teacher. Chatterton (2010) suggested that his "Good Practice Guide" was needed because "there is a tendency for those with limited experience of Elluminate to treat it as a 'broadcast' system and therefore miss out on its full potential for promoting engagement amongst users" (p. 5). He also noted the tendency for users "not to draw on what is basic good practice in more traditional scenarios and apply it within the [web conferencing] environment" (p. 5). Although no evidence is provided to support Chatterton's assertion, this raises questions. If teachers do fail to draw on their prior experiences of good practice in other environments to help them create successful learning experiences in a web-conferencing environment, why is this the case and what type of support or training would best empower them to do this? While the "Good Practice Guide" and other resources outlined above provide considerable support for the development of skills in using the software products, it may be that because many new facilitators have limited experience as learners using web conferencing they have questions that are not easily answered by such guides and something additional is required to help them fully appreciate what will work best in a virtual classroom.

Some of the questions that are asked by new facilitators have been reported. For example, Cornelius and Gash (2012) noted questions including the following: How do you know if anyone

is there (in your virtual classroom) or if learners are paying attention? Does the need for preparation prevent spontaneity by a facilitator? Do you need two facilitators to prevent overload? Although some of these questions can be answered by directing users to the appropriate software tools (for example, presence or "tool use" indicators can help a facilitator understand who is actively engaged in an activity), others suggest a need for a better understanding of the experience of being a facilitator—what it is like, what is possible and how it is different from (or similar to) face-to-face teaching. While existing research has often focused on the experiences of new facilitators (eg, Kear, Chetwynd, Williams & Donelan, 2012), this research examines the experiences of established facilitators who may be better placed to help us answer some of these questions.

Researchers have highlighted the lack of literature available on experiences with synchronous online technology (eg, Ward, Peters & Shelley, 2010) and more widely across online environments (Conceicao, 2006). Studies of synchronous experience to date have been mainly small scale case studies (eg, Wang & Hsu, 2008; Ward *et al*, 2010). There is a lack of research across disciplines or involving experienced participants. Gudea (2008) was able to identify only a "handful" of relevant studies on the teacher's point of view (p. viii). An interesting example is Bower (2011), who provided examples of a facilitator's misuse and misunderstanding of the technology and discussed the impact of these on collaboration. Bower suggested that teaching effectively in web-conferencing environments is not a simple matter of transferring face-to-face approaches.

While models do exist to assist online teachers, most have been developed in asynchronous rather than synchronous contexts. Examples include Salmon's (2000) model of e-moderation and Vlachopoulos and Cowan's (2010) model developed from the examination of practice of moderators of asynchronous discussion. Thus, the nature of synchronous online teaching requires further exploration and is particularly important given that, as Kearsley (2010) recognised, online teaching is likely to become a normal part of the practice of all teachers, even if at the moment it is still a new activity for the majority. The growth in the adoption of web-conferencing technology suggests that teaching in a virtual classroom will become part of the regular practice of many teachers and empirical evidence is needed to improve our understanding of facilitators' experiences in these environments. This research aims to begin to fill this gap.

Research approach

Interpretative phenomenological analysis (IPA) has an established history in health psychology and is growing in application in education-related areas, including educational technology. IPA was used in the large-scale LEX project that investigated learners' experiences of technology (Creanor, Trinder, Gowan & Howells, 2006; Mayes, 2006) and more recently in a study of teachers' experiences with second life (Heaney & Arroll, 2010). Cilesiz (2011) suggested that IPA has been underutilised in educational technology research and identifies teachers' experiences with new technologies as an area that would benefit from research using this approach.

For this study, the phenomenon of "teaching in a virtual classroom" has been explored. IPA was applied largely in accordance with the recommendations of Smith, Flowers and Larkin (2009). No pre-existing hypothesis was used, but an open question focused on experiences was articulated: *How do experienced educators describe and understand teaching in a real-time virtual classroom?* The phenomenon was explored through the accounts of four experienced teachers obtained from semi-structured interviews. IPA requires a homogenous sample and participants were selected purposively using the following criteria:

- They were "living the experience"—ie, actively engaged in teaching using synchronous web conferencing.

- They were experienced teachers—in both online and offline settings.
- They were using web conferencing to facilitate interaction, discussion and activities—reflecting guidelines for the effective use of web conferencing for learning (eg, Anderson *et al*, 2006; Chatterton, 2010; Shepherd *et al*, 2011).

Participants were recruited by referral from contacts made at conferences and similar events with whom the research project and required characteristics were discussed. This resulted in more potential participants than were required, so a selection was made to include a balance of male and female respondents who met all the criteria above. Homogeneity was provided by the experience that these interviewees had of the phenomenon, rather than by other external or personal characteristics. The participants were teaching in four different UK higher education institutions and represented a range of discipline areas. All had experience of teaching using web conferencing at postgraduate level, with one also involved in undergraduate level teaching. Three were users of one web-conferencing tool, while the fourth used a different product.

The overarching purpose of an IPA interview is to allow the interviewer to enter the interviewee's life world and the participant to recount their experience (Smith *et al*, 2009); thus, the interview schedule for this study was designed to encourage participants to tell stories of their experiences and explore feelings and thoughts on these where appropriate, to encourage reflection on their practice as a facilitator and to help the researcher develop a fuller understanding of the interviewee's experiences and the meaning they placed on these. Interviews were conducted and recorded using the Elluminate Live! web-conferencing software between November 2010 and March 2011 and varied in length from 50 to 90 minutes. The researcher had extensive personal experience of teaching with web conferencing but remained aware of the importance of impartial and open engagement with respondents and data and of adopting a reflexive approach throughout the study.

Data analysis was informed by the work of Smith *et al* (2009), Mayes (2006), Hefferon and Ollis (2006) and Shaw (2010). It involved two stages: (1) transcription and analysis of individual interviews and (2) cross-case comparisons and theme summaries. In line with the ideographic approach of IPA, the full analysis process for one interview was completed before analysing the next.

The analysis of individual interviews began with close reading and the preparation of initial descriptive summaries. The transcript was then interpreted phenomenologically using three guiding questions: What are the key features of the experience? What is important about the experience for the participant? What experiences, cares and concerns are described by the participant?

Interpretative coding followed to identify patterns and conflicts, interesting words and phrases, metaphors and images, and emerging questions and interpretations. Emerging themes were then identified and sorted, superordinate themes noted and individual narrative accounts created. All of these steps were conducted iteratively to maintain a focus on the participants' words. Quantitative cross-checking of coding was inappropriate, but a "critical friend" produced a descriptive summary for one interview for cross-checking against the researcher's version and the final narrative account to check the validity of emerging issues.

Cross-case comparison required the creation of a master table of themes that were sorted to identify initial similarities and differences, then re-sorted to improve the "fit" across cases. For each theme, a separate table was created including a theme description and extracts from original transcripts. A summary table was then constructed and final theme descriptions written. As with the analysis of individual cases, notes and reflections were recorded at each stage of the process and iterative cross-checking was undertaken by constant reference back to earlier outputs

Table 1: Summary of final themes, sub-themes and their occurrence within cases

	Ann	*Bob*	*Claire*	*David*
Theme 1: Developing relationships and social presence				
1. Developing relationships with learners		✓	✓	✓
2. Social presence	✓	✓	✓	
Theme 2: Planning for learning				
3. Creating a learning community	✓	✓		✓
4. Preparing learners	✓	✓		✓
5. Planning learning activities	✓	✓	✓	✓
6. Combining technologies	✓	✓	✓	✓
Theme 3: Technology shapes practice				
7. Technology shapes practice	✓	✓	✓	✓
8. Technology in use	✓	✓	✓	✓
Theme 4: Facilitating in a demanding environment				
9. The demands of web conferencing	✓	✓	✓	✓
10. Roles and responsibilities	✓	✓	✓	✓
11. Facilitating interaction	✓	✓	✓	✓
12. Feedback	✓	✓	✓	✓
Theme 5: Understanding and managing self				
13. Understanding and managing self	✓	✓	✓	✓

and original transcripts. The research question was also kept in mind throughout this stage of the analysis. A final check with the descriptive summaries produced for each participant was also undertaken.

Five themes emerged from the analysis. These are presented in Table 1 along with sub-themes and occurrence by participant. Pseudonyms are used to distinguish participants.

IPA offers a robust and philosophically grounded approach to the analysis of qualitative data and has helped to provide an insight into what it is like to be a teacher in a virtual classroom. The aim of IPA is not to produce generalisable, theoretically valid findings but, in line with other qualitative research approaches, to produce findings based on research that is sensitive to context, conducted with commitment and rigour, transparent and coherent, and has impact and importance (Yardley, 2008). The findings presented here are grounded in participants' experiences, draw extensively on their own words and reflect the researcher's interpretation of these. The next section focuses primarily on findings associated with Theme 4: Facilitating in a demanding environment in order to explore the experiences of experienced facilitators and provide a rich account of what it is like to be a teacher in a virtual classroom. The material presented provides research informed evidence, which may supplement good practice guides and other existing training materials.

Findings: experiences of facilitation in a virtual classroom

Four sub-themes emerged from the data for Theme 4: Facilitating in a demanding environment, and these are presented below in three sections. The first section combines data from the sub-themes "facilitating in a demanding environment" and "roles and responsibilities," while the second and third align with Themes 3 and 4: "facilitating interaction" and "feedback." The account uses the words of participants as much as possible, explicitly within quotations and also within narrative text.

A demanding role

All four participants described teaching in a virtual classroom as an "intense" or "demanding" experience requiring concentration or focus. The demanding nature of synchronous online

teaching has also been reported in other studies (eg, Kear *et al*, 2012; Ng, 2007). For participants, the environment was complex and the simultaneous use of different tools and media for communication could be overwhelming and exhausting. Respondents suggested that there was a lot to pay attention to, a lot to do and that time went faster than in a face-to-face setting. Claire, who noted that she "would do roughly the same tutorial face-to-face and [with web conferencing]" described her feelings:

"There's no time to waste, you just do have to move on and it's quite\ . . . I find I need to concentrate and really keep things together, and it's a different sort of environment in that way, it's quite intense" (Claire).

In the extract below, David explained some of the demands and hinted at the responsibilities on him as a tutor, as well as the impact of the environment:

"There is so much going on . . . obviously you have the verbal communication, you have the written communication of the text chat . . . we're monitoring who's in the session, some people come in and out, some people come in late, some go out early . . . sometimes they lose connection because something goes wrong . . . monitoring who's got good connections and who's not, if it's very interactive monitoring who's speaking, when they're speaking, . . . the order in which things happen and just trying to manage [that] . . . Then of course you've got the slides. Sometimes they're writing on there, you're writing on there . . . monitoring the discussion board, so there's so much, and obviously you're moving between windows—it's not just Elluminate you're working with, you're working on . . . word documents to get information . . . So in terms of levels of concentration, in terms of the things you've got to pay attention to, it's . . . extremely demanding, for me and everyone else" (David).

David's words indicate that facilitators can be working across not only multiple tools within web conferencing but also other external resources and software.

All of the participants engaged in standard pedagogic tasks such as opening the session, initiating discussion, organising group work, summarising contributions, managing time, making links to other learning activities and trying to keep learners "on track." In addition, they engaged in monitoring and management tasks. Continual monitoring of learners' technical status (eg, attendance and audio problems) and contributions (for example, to ensure that everyone was heard or responded to) was also necessary.

Some participants employed metaphors to describe their role in the virtual classroom. These included "chair of a meeting" and "conductor of an orchestra." Ann described herself as both as "chair" and "conductor" and provided a description of her fulfilling these roles during a discussion:

"So you do have to come in a little bit more as if you're chairing a panel than running a seminar and say that 'OK I saw that so-and-so also wanted to make a point there, so over to you' or 'I can tell that so-and-so also or thing-a-mi-bob also want to come in, so let's start with thing-a-mi-bob' and try and bring them in, a little bit like conducting an orchestra, try to bring them in when you know kind of when they go in, or the point they want to make, trying to facilitate. They would normally have more responsibility for that face-to-face, but they just can't see the cues in the same way" (Ann).

This quotation suggests that Ann perceived this as a different experience from that associated with managing a face-to-face discussion. It also hints at a reluctance to hand over the chairing role to learners based on the assumption that they may not have sufficient awareness of the environment to be able to fulfil this responsibility.

Facilitating interaction

Participants outlined careful planning for sessions, and some were more able than others to adopt a flexible learner-centred approach within sessions. Claire described how she tried to "make [sessions] interactive [. . .] to make sure everybody is being carried along and they are following," but participants also needed to manage their learners' actions to ensure effective interaction.

Bob's strategy for managing the demands of the environment was to keep tight control of the timing and structure of sessions. He overtly managed contributions to discussions, using an

approach he termed the "democratic cycle of talking" so that he could "definitely make sure, even in [a] bossy or more pushy way, that everybody has at least their chance to speak." Bob managed contributions by allowing everyone equal time to speak in turn, but other participants preferred not to put individuals "on the spot" or pressurise those who did not wish to contribute. Trying to identify when learners wanted to speak was a challenge, although Ann's approach suggested a more relaxed facilitation style. She explained that

"it's more just continuing the conversation and also watching the body cues, [. . .] I'll keep an eye on who does want to speak and who does want to be involved and just draw them in" (Ann)

and she described how clues could be picked up from learners' use of the tools:

"Watching when the microphone starts to sort of flash as though 'I'm taking in a breath I want to speak', so that I'll keep an eye on who does want to speak and who does want to be involved and just draw them in" (Ann).

Participants encouraged the use of emoticons to provide feedback, set protocols for microphone use, created break-out groups or managed group dynamics with flexibility when technical difficulties occurred. David provided an illustration of the challenges that could arise and the need for him to be flexible and adaptable:

"When it goes wrong [you have to] figure out how to manage the group dynamics. So, you know, you're having the seminar and you ask someone a question and suddenly their microphone goes dead . . . that's a kind of issue that you don't have face-to-face, people don't just suddenly lose their voice for no reason. . . . You've got to . . . adapt to that kind of situation . . . just finding ways of shifting around" (David).

Learners sometimes demonstrated confusion over the use of the tools, for example, they forgot to switch microphones on and off. In some cases, participants had articulated protocols to help learners develop appropriate ways to take turns. Bob, however, preferred taking control of learners' microphones to overcome problems and increase his own comfort level:

"I felt that a number of times [learners] were a bit confused . . . I mean they forgot to switch it off, they forgot to switch it on . . . [so I told them] I will activate and dis-activate [microphones] and you will just raise your hand and take the mic . . . I felt I needed to have control of the session otherwise I [did] not feel . . . comfortable" (Bob).

Most participants found silences could be difficult to interpret and tactfully interrupting the speaker who "hogs the floor" was awkward, although one participant commented that he was more confident about interrupting people online than in a face-to-face classroom.

Ann talked about these challenges, first of managing overenthusiastic contributors in the absence of body language and then of the experience of silence:

"You sometimes get that person who hogs the floor a bit in tutorials . . . And then they don't kind of shut up. They don't get the same body language feedback that they would normally get either, so very occasionally . . . you might have to move in over them and find a way of interrupting them so that others have space to talk" (Ann).

In amidst all that chaos, you might ask a question and everyone is . . . 'I don't know how to answer that' and you have these sudden moments of silence . . . it's brilliant . . . [I'm] ok with waiting a little bit . . . it's not just waiting for something, it's giving people the space to create the response that they want to give . . . I'm fine with [silences]. I'll sometimes make a joke, I'll go 'I'll just blame the technology for that' or 'it's an unhappy wait' or whatever. It's not a worry" (Ann).

Ann clearly cherished these moments of silence as they aligned with her desire to give learners space to think and thus had specific strategies available to deal with them.

Not all participants facilitated small group discussions in break-out rooms. Claire did and she noted that contributing to these discussions could be difficult because she did not know whether learners were aware of her presence, making it difficult for her to interrupt. Claire explained the difficulties and the potential for her actions to appear underhand or even aggressive:

"In an Elluminate break-out room it seems quite intrusive to go into that room and there might be some discussion going on and the students might not notice I've gone into the room, so if I want to say something I'd have to butt in and possibly break up their conversation, which I wouldn't want to do. So I think because I can't be seen, I think that is different" (Claire).

Participants felt that the technology being used impacted the nature of discussion. Problems with audio were particularly significant and could be a reason for the concurrent use of the text chat. Text was useful for those with technical difficulties, to support socialisation, elaboration and explanation or simply to provide a parallel thread of discussion. However, the use of text and audio together as part of a discussion increased the demands on facilitators and could lead to disjointed, jerky conversation. For David, the use of text failed to capitalise on the opportunity that audio provided for immediate, natural and easily understood verbal conversation:

"You get this kind of disjuncture between people who are verbalising things in quite some detail and are really able to push things in an interactive way, which is much harder to do in text chat because of the nature of it really. So you get this disjuncture and it makes the discussion quite 'jerky' as you move from discussing in text chat to discussing aurally" (David).

Getting feedback

In the absence of visual feedback from learners, participants had developed strategies to gather information from learners about their engagement and understanding. Without these, one participant had "no idea" what the experience was like for learners. When no feedback was received from learners, participants could feel as if they were talking "to a wall" or "into the ether." It was difficult to diagnose when things were not going well and adjust activities accordingly. Claire explained that in a virtual classroom "you don't have that immediate feedback then on how the students are actually responding to the session." Wang and Hsu (2008) report similar challenges with receiving and giving feedback. Claire used clues provided by the software to give her some information, but this was not as comprehensive as the feedback she would have obtained from facial expressions in a face-to-face situation:

"I can see if the microphones are going off and on and if the whiteboard is being used, I can see things are happening in the same way as if it was a small group session in a face-to-face tutorial. I can see if there are interactions, if people are talking, if they are making notes . . . in a classroom you can see if somebody is engaging with an exercise more easily because you can see what they are doing and they might just give you a sort of concerned look and then you could go over and help, but that's not the case with Elluminate" (Claire).

The tools provided by the technology (emoticons, ticks, crosses, etc) were appreciated by participants and routinely employed in place of body language, although the information they provided was regarded as limited and had the potential to be misinterpreted.

The problems of giving feedback also made it difficult for one participant to encourage learners to deepen their contributions without disrupting their flow of their speech. Other authors report difficulties with feedback, for example, Cunningham, Beers Fagersten and Holmsten (2010) who considered that using webcams could tell teachers whether learners are paying attention, but also that gesture and body language were hard to use, and lip reading hindered by slow video refresh rates. They also noted that learners may be reluctant to use webcams. In this study, one of the participants regularly made use of webcams, while the other three rarely used webcams in their teaching.

The lack of feedback created anxieties for participants. Bob described the need not only to receive feedback from learners but also to acknowledge feedback and feed it back to learners to demonstrate receipt. David suggested that "the open question is genuinely 'please tell me something, because I've no idea' " and Bob said that he "agonises" for his learners in the absence of feedback. He compensated by asking repeatedly and explicitly for feedback. Claire was also concerned that it could be difficult for her to know "how it is from their perspective."

However, there were also some benefits resulting from the feedback tools available. Icons, for instance, may indicate which tools learners are using and thus give an indication of what they are doing. Participants also reported that they occasionally received applause—something that was unusual in a face-to-face classroom.

Discussion

Participants in this study described the experience of teaching in a virtual classroom as demanding and highlighted some of the challenges of facilitating interaction in an environment in which there is limited feedback from learners. They described the need for strategies to manage interactions, for example, to bring people into discussions, to ensure everyone is heard, for interrupting those who "hog the floor," for handling silences and for managing small group work, which were different from their face-to-face practice. There is evidence that some facilitators found giving learners responsibility and adopting learner-centred strategies challenging in the absence of visual feedback. Thus, this study, in common with other research (eg, Bower, 2011; Kear *et al*, 2012; Ng, 2007), suggests that teaching in a virtual classroom can be more demanding than face-to-face teaching. Ng (2007) suggests that more time is needed to prepare materials and that there is a need to multitask (handle multiple tasks and tools), monitor learner's progress and allay anxieties. In addition, additional demands on the facilitator are created by the inability to observe students' responses (Ng, 2007). It is difficult to tell if learners understand what is being said or done in the absence of the visual clues used intuitively in a face-to-face context, and feedback cannot be provided using body language by the instructor (Wang & Hsu, 2008). Similar issues were highlighted by participants in this study. While it might be argued that the use of webcams might overcome some of these issues, most participants in this study used these to a very limited extent, for example, at the start of a new course. Ann made the most extensive use of webcams and reported that this allowed emotional responses to become part of the experience and provided additional opportunities for social bonding. However, she also found that "body language is different and you have to read that differently." Her explanation for this was that "because you're not actually looking directly into the web cam . . . eye contact is different." Other challenges for facilitators include issues of pace and timing and the need to provide immediate responses. Ng (2007) suggests that some of these issues create additional stress for teachers.

Effective facilitation of interaction is important given evidence that interaction may have an impact on the effectiveness of a synchronous class (Offir, Lev & Bezalel, (2008), on students' satisfaction with their learning environment (Stephens & Mottet, 2008) and on "intellectual engagement" (Shi, 2010, p. 438). Theories such as Transactional Distance (Moore, 1997) and the Conversational Framework (Laurillard, 2002) also acknowledge the importance of interaction for learners in a variety of contexts, including distance learning.

Ward *et al* (2010) note that in a virtual classroom, instructors need to "capitalise on the available mechanisms for interaction and collaboration" (p. 57). Skylar (2009) provides an example of how this can be done when she suggests the use of questions every 3–4 minutes during "web conference lectures" (p. 78). Other research suggests that "instructors must be vigilant and proactive regarding student interaction and communication" (McBrien and Jones, 2009 p. 13). McBrien and Jones (2009) suggested, for instance, that instructors should manage the confusion created by too many simultaneous interactions by switching off or limiting the use of some communication channels. Other issues that impact on effective interaction include simultaneous talking leading to "tangled" conversation (Wang & Hsu, 2008). Participants in this study noted difficulties in managing both overenthusiastic and silent peers, along with offering support during small group discussions.

Empirical evidence of a relationship between interaction and activity design in web-conferencing environments is emerging. Bower and Hedberg (2010) found that, for a course in Information

Technology, student-centred designs resulted in more student discourse, greater student ownership of tasks and greater student contribution to content-based discussion. Thus, the adoption of learner-centred rather than teacher-led or teacher-centred practice in a virtual classroom may also have an impact on interaction. However, facilitating learner-centred activities appeared to be easier for some participants in this study than for others. While some were able to directly transfer practice from other contexts, others expressed difficulties in giving or accepting that learners could take control, even when such approaches were a normal element of their practice in other contexts. For David, the experience was contrary to this, and encouragement to adopt a learner-centred approach in the virtual classroom had a positive impact on teaching practice in other environments. He reflected:

> "I went straight for that didactic route initially . . . I'm having a struggle with this, it's the old habits sort of thing . . . as an academic, I was taught in the old system . . . one or two hour lecture, and then you have seminars . . . I think for me there is a kind of challenge in not taking that didactic role and really trying to be more reflective about what you can do with the technology . . . one thing I've got from it is a better approach to reflection on what the environment is and what I want to achieve in it which I maybe didn't have before" (David).

For those who found adopting learner-centred approaches challenging, it may be that the nature or extent of their virtual classroom experiences impacts on this aspect of their practice—despite their selection for this study as "experienced" virtual classroom facilitators, this experience amounted to a few years at most. An alternative explanation is that the absence of visual feedback and the demands of the environment generally impact on the confidence of a facilitator to draw on learner-centred strategies and encourage a retreat into a tutor-led approach. Tutor-centred and tutor-led approaches are often observed among newer teachers in other contexts, and it is also suggested that teachers' private theories have an influence on their decisions and actions, and transformation of these theories may be necessary to facilitate effective technology implementation (Churchill, 2006). This study did not attempt to uncover the participants' private theories in any detail, but this aspect might be a fruitful area for further study.

Conclusions

The research reported here does not attempt to offer an insight into the experiences of all web-conferencing facilitators but focuses on the lived experienced of just four individuals who volunteered to participate. While further research is necessary to assess the general applicability of the findings, the evidence presented suggests that for these individuals web-conferencing technology presented an environment where facilitation was an intense and demanding experience, and where strategies were needed to encourage successful interaction in the absence of effective feedback.

Chatterton (2010) suggested that web-conferencing facilitators tend not to draw on good practice in other settings, but the evidence from the participants in this study suggests that the situation may be more complex. While some facilitators may retreat towards teacher-led approaches, others embrace the opportunities offered by the technology to develop their practice and this may in turn impact on their pedagogical approach in other settings. It is clear that to support new facilitators, attention should be paid to individual experiences and existing practices, as well as technological issues, to help them facilitate learning within this demanding environment.

Overall, the participants emphasised the demanding nature of the experience of facilitating in a virtual classroom and the difficulties of managing interaction and feedback. Their responses provide an insight into some of the differences between teaching face-to-face and in a virtual classroom and supplement the practical advice provided by other resources developed to support facilitators. However, further research is necessary to fully understand the complex issues that

impact on a teacher's practice in a virtual classroom and how their practice develops over time. As the use of web conferencing becomes embedded in the practice of more educators, opportunities will arise to undertake further work with larger samples and over extended time frames. It may also be helpful to investigate the relationships between facilitators' experiences and their personal characteristics (including previous teaching experience and private theories about teaching) to help us understand how to best prepare them to support learners in virtual classrooms.

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