

# Communication Aspects of Virtual Learning Environments: Perspectives of Early Adopters

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**Abstract:** Virtual Learning Environments (VLEs) are increasingly used in higher education to support communication and collaboration among students. However, there is little research into the effectiveness of VLE communication tools, and how they might be improved. This paper reports findings from interviews with teaching staff at UK universities who were early adopters of VLEs. The interviews revealed how these staff used VLE communication tools, what benefits and problems they experienced, and how VLEs might be improved to provide better support for collaborative learning.

## Introduction

Computer-based communication tools have been used in education for a number of years (Mason & Kaye, 1989; Harasim, 1990). They fulfil practical requirements for students to keep in touch with their peers and teachers. They also allow for a wide range of collaborative activities, in line with social constructivist views on learning (Jonassen et al., 1995; Garrison, 1997; McConnell, 2006). A number of different technologies have been used for these purposes: for example, email, discussion forums and chat rooms. With the increasing use of Virtual Learning Environments (VLEs), such communication tools are often available within a single environment, which can be used by all the students and staff of an educational institution (Weller, 2007).

Although communication tools have many benefits in education, a number of problems can arise (Murphy et al., 2001). For example, some students feel that asynchronous communication is impersonal and frustrating (Wegerif, 1998; Vonderwell, 2003). Some students are confused and daunted by the volume of messages (Hiltz & Turoff, 1993; McConnell, 2006, p.73). These problems, and others, can result in low participation and disengagement by students. There are many factors which can influence the effectiveness of online communication in education (Arbauch & Benbunan-Fich, 2005), but relatively little attention has been paid to the communication tools themselves. Given the prevalence of VLEs in higher education (Browne et al., 2006; Weller, 2007 p. 140), it is important that the communication tools they provide are critically assessed.

This paper reports on research focused on the communication facilities of VLEs. The research aimed to explore the benefits and problems of using communication tools within VLEs, and to consider how these tools could be improved. Interviews and observations were carried out with members of staff at UK universities who were early adopters of VLEs. The interviews asked teachers about:

- how they used the communication elements of the systems;
- their perceptions of the benefits and problems which arose;
- their ideas for improvements to VLE communication facilities.

The paper discusses the interview findings, and considers the implications for future development of VLE communication tools.

## Method

### Interviewees

Six members of staff from four different universities were interviewed. Each of the universities used a different VLE (Tab. 1). The interviewees were ‘early adopters’ of communication technologies at their institutions. Their subject specialisms included History, Art, Community Studies and Healthcare, and their students included undergraduates and postgraduates.

Interviewee	University	VLE
Eleanor	A	WebCT
Michael	A	WebCT
John	B	Moodle
Judith	B	Moodle
Mark	C	Blackboard
Henry	D	In-house VLE

**Table 1:** The interviewees (not their real names), their universities and VLEs

### Interviews and Observations

Each interview was carried out at the interviewee’s institution, in their office, with their own computer available. A semi-structured interviewing approach was used, based on a schedule of questions covering:

- how the interviewee used VLE communication tools as part of their teaching;
- what they liked and disliked about the VLE tools;
- what problems they or their students experienced;
- what system improvements they would like to see;
- their views on the educational value of using VLE communication tools.

For each interview, an observation was also carried out, where the interviewee demonstrated aspects of their use of the VLE. In most cases this observation was carried out after the interview, but some interviewees showed features as they answered the questions. For each interview, hand-written notes were made on a copy of the interview transcript and typed up after the interview. An audio recording of each interview was also made (with the interviewee’s permission).

### Data Analysis

The notes from the interviews were analysed using the *Atlas-ti* qualitative analysis software. The package was used to code multiple short segments of the interview notes. These extracts were assigned codes (such as ‘usability’, ‘time’) which indicated topics to which they related. The codes were defined while working through the data, consistent with a grounded qualitative analysis approach. New codes were created as needed, and existing codes assigned to new extracts as the analysis progressed. For example, the following extract from one interview was assigned the codes ‘student attitudes’ and ‘assessment’.

‘Barriers mean that if they had a choice they wouldn’t do it. So the assessment makes them do it.’

## **Results**

This section presents the findings from the interviews. The section starts by presenting a brief overview for each interviewee. It then discusses the findings in more detail, organised under the main themes which emerged from the data analysis.

### **Brief Overviews of Interviews**

Eleanor worked at University A. The courses she described were concerned with local government and community work, Eleanor's main concerns were to do with community and learning. Her aim was to link work-based distance learners with full-time campus students, so that they could work collaboratively and learn from each other. However she found that students had problems dealing with the large volume of messages and threads in discussion forums. Eleanor was interested in exploring synchronous tools such as chat and shared whiteboards in the future.

Michael also worked at University A. His main role was in the management and support of the university's VLE, but he also taught on staff development courses which used the VLE for action learning. Michael would have liked more integration of communication tools and resources, and more scope for visual aspects. He felt that the hardest thing for students was dealing with text-based communication e.g. issues of permanency, volume and how discussions are organised. Michael felt that the element of reflection was important, so he preferred forums to chat rooms. However he would have liked to see more use of electronic whiteboards.

John worked at University B. The context he discussed was his use of the university's VLE with students learning to be Art and Design teachers. John focused on issues of community and communication for these students, particularly when they were away on teaching practice. The VLE provided support for students while they were undergoing a difficult role change. However, John found that problems with the system acted against these benefits. Students found the threading confusing and there were difficulties with non-text media. John had tried a chat room, but thought that students preferred to reflect on their contributions and edit them before 'going public'.

Judith also worked at University B. She used the VLE for group project work with postgraduate Visual Arts students. The system allowed for time-flexible discussion among Judith's students and preparation for face-to-face sessions, which could then be more like workshops. Judith would have liked to see the VLE being used to build a rich learning environment outside formal courses, so that students could initiate activities for themselves. The technical limitations of the system, particularly visually, were a frustration to her. She tried to make the online spaces look more interesting, even though this took a lot of time. She thought that flexibility was important, so that teachers could do things in different ways.

Mark worked at University C, where he taught courses in Health. The course he discussed had several hundred students and was taught entirely online. Students worked in small groups, posting up their work and carrying out peer reviews. Mark's main focus was on educational issues, particularly using the VLE to support an enquiry-based approach. It was important to him to have the flexibility to fit the system to the educational design. Many of his students were not confident with ICT and many lived away from the university, so any technical problems were an issue. Mark only used small groups because of the 'anarchy' which can arise in large online groupings. He would have liked to use synchronous tools, but found the chat tool in the university's VLE not very usable.

Henry taught History at University D, which has developed its own VLE. He used the VLE in a quite specific way, as a place for students to post work and give comments on the work of other students. The longer discussions then took place in face-to-face sessions. Henry did not like discussions in forums because he felt they were incoherent and that the threading confused students. Henry concentrated on the learning benefits of shared preparation, via the VLE, for face-to-face work. Henry also commented on usability issues and how these could put off both students and staff. Henry's use of the VLE started with synchronous chat, but he felt this was not effective as it depended too much on his interventions.

### **Students' and Teachers' Activities**

The interviewees mentioned a range of activities which they or their students carried out using the VLE. The tasks set for students usually included collaborative work such as discussion or peer review, often carried out in small groups. Some of the interviewees required their students to write short papers and post these in a course VLE forum for other students to critique. Interviewees also mentioned other aspects of their VLE use with students. These included: marking students' online work; providing resources; maintaining a course calendar; setting quizzes; facilitating discussions; and giving technical help. In addition, interviewees mentioned management tasks that they needed to carry out: creating a suitable course structure on the VLE; putting students into groups with their own forums; tracking students' participation; and archiving messages.

## **Educational Aspects**

All the interviewees were convinced of the value of using the communication facilities of a VLE with their students. When asked to what extent use of the VLE provided educational value, they responded using expressions such as "huge" and "tremendous". Their views were that the VLE provided a richer learning environment for students, encouraged them to be more active and engaged, and resulted in deeper learning. For example, Eleanor said, of her campus-based and distance students:

"being able to bring together these two groups of students in an online environment - the inexperienced with the experienced in terms of the subject and the world of work - is where I'm hoping that a lot of the learning will take place."

Interviewees said that VLEs could support different learning and teaching styles and facilitate an approach based on learning as a social and active process. Equality of participation was also mentioned, both in relation to the balance among students (encouraging quieter students to take part) and the balance between teachers and students (allowing students to challenge teachers).

Two of the interviewees mentioned that having the VLE environment led to improvements in face-to-face classes. The VLE was used for preparatory resources and activities, which freed up time in face-to-face sessions. Henry commented:

"they're much better prepared for the seminars when they come, and consequently the tutorials are much more interactive - everybody's done something, everybody's answered a question and they're much more willing to participate."

The asynchronous nature of VLE forums was seen as an advantage in terms of reflective learning. Interviewees pointed out that students have time to think about what they want to say, and can edit their contributions before they post them. However, interviewees also said that the public and permanent nature of the forums could cause anxiety for some students.

## **Community and Communication**

Interviewees highlighted the role of the VLE in building community among their students. The flexibility of time and place provided by asynchronous forums was seen as particularly important to distance or part-time students and to those who were on placements. It was also beneficial for campus-based students, who often found it difficult to arrange times to meet face-to-face.

Several interviewees mentioned the value of the VLE as a medium for providing information and notices to students. This was normally done via a course calendar for events and a news area or forum for more general information. John said that the VLE provided a "virtual life" for his student teachers, who spent most of their time away from the university on teaching practice, and often felt isolated and lonely. For these students, knowing that others were in the same situation and facing similar problems was reassuring. John commented:

“it’s really nice for them to log on and just go and tell somebody else and to hear somebody else saying “Well, yeah, you know, I had that.”

The interviewees were clearly confident that it was possible to build relationships, understanding and community online.

### **Participation and Assessment**

One problem which the interviewees mentioned was low participation by some students. Interviewees felt that there were a number of factors which discouraged students from taking part in online activities. These included: lack of experience and confidence with ICT; technical/usability problems with the VLE systems; and time demands. Some students were nervous; some did not want to do online work; and some were “technophobes”. Interviewees pointed out that negative attitudes exhibited by some students could easily spread to others. To address the issue of participation, several of the interviewees included online activities as part of their course assessment strategy.

Interviewees discussed aspects of the VLEs which were related to participation and assessment. Tools for tracking students were highlighted as useful, for example seeing when a student had last logged on or how many messages they had read and written. Several of the interviewees expressed a need for students’ work to be submitted anonymously. This was to support peer review processes, and so that students’ work, feedback and grades could be shared while still maintaining privacy.

### **Time Problems**

Interviewees reported that the time they spent working with the VLE varied considerably, and several said that time was the biggest problem for them. During intensive teaching periods they might log in three or four times a day, spending up to two hours per day. During quieter periods they might log in about three times a week.

Interviewees discussed two areas of their VLE work which took time. The first was learning how to do things, overcoming small hurdles and helping students with technical problems. The second was closer engagement with students, and having them constantly in touch. Interviewees also pointed out that students faced similar issues in relation to the time needed for online work. In particular, they needed to log on often enough to keep up with the volume of messages.

### **Forums**

Several of the interviewees mentioned the benefits of discussion forums. They reported that forums helped them to keep in touch with their students and helped students keep in touch with each other, which was important for building community. The forums allowed students to ask questions and gain answers from the teacher or from other students. Interviewees also pointed out that forums can build into a resource based on students’ own knowledge, giving a sense of ownership.

However, the interviewees pointed out a number of problems which arose when using forums for discussion. These relate to handling the large number of forums, messages and discussion threads which can build up in an active course. Interviewees said that the volume is often too great and that this can demoralize students. Michael commented:

“it’s being able to manage that wall of information that you’ve got, that permanency. You’ve got to almost be able to filter the information much more effectively. In some sense be quite ruthless: ‘I’m going to reply to that but I’m not going to reply to that’. And recognise that it’s OK to do that. And it’s those sorts of issues that students can be overwhelmed by.”

Interviewees explained that students have difficulties finding their way through the different discussion threads. Discussions can easily be “lost”, and when students need to refer back to a message, they cannot find it. The interviewees reported that students often put messages in the wrong place: they start a new thread when they should be replying to an existing one; or they begin discussing a new subject in the current thread. One of the interviewees reported that, because of the lack of coherence of some forums, he did not use them for discussion, but as a place for students to post pieces of work and give feedback. For similar reasons, another interviewee did not use large discussion forums - only those for small groups.

### **Synchronous Communication**

Several of the interviewees mentioned having tried, or wishing to try, synchronous tools such as chat rooms and shared whiteboards. Some interviewees thought that students might find chat rooms helpful, particularly for decision-making, which could be difficult using asynchronous communication. However, the interviewees who had tried chat rooms had not had much success. One interviewee had started his VLE use with chat rooms, but felt unable to be “present enough” for students’ needs. Other interviewees felt that chat rooms were difficult to manage if there were more than a few people, and that the discussions lost structure and depth. Overall, the interviewees had mixed feelings about the use of synchronous chat. Mark reported a similar mixture of reactions from his students:

“There was a variety of feedback. Some saying I could never get on, some saying I could never get on at the right time, others saying we got in there and we made some decisions quickly and it was very useful.”

### **Visual Aspects**

Several interviewees mentioned limitations in the visual aspects of VLEs. Interviewees wanted to be able to customise features in order to create a sense of identity and a pleasing appearance. Judith explained:

“For me it’s quite important that all these things are the right size, that things kind of look as nice as possible, like having pictures and things in there.”

Interviewees mentioned wanting to replace textual links with clickable images, choose different icons, and change fonts and colours. These things were possible, but, on the whole, were difficult and time-consuming to do. Interviewees also wanted students to be able to work with non-text media such as graphics and video, but this was not easy.

### **Usability Issues**

Many of the comments made by interviewees related to technical problems and usability issues. The specifics of these varied from system to system, and included: compatibility with different browsers and computers; difficulties with certain system tools, such as wikis and whiteboards; problems with passwords and time-outs. There were also specific tasks teachers needed to carry out which seemed unnecessarily complicated. For example, four of the interviewees mentioned problems checking that students were correctly registered in the system. In general, interviewees described technical problems and usability issues as “quirks” which were “irritating”. A significant theme was that these hurdles were off-putting to both staff and students, and led to lack of participation.

A further theme that emerged was the need for flexibility. The interviewees reported that the systems did not quite do what they wanted. One interviewee said that he had spent the last few years “designing around the restrictions”. Interviewees wanted to use system features in different ways, and to customise the environment. They did not want to be restricted to a particular structure, style or model of learning and teaching.

Overall the interviewees wanted systems to be straightforward and logical, particularly in terms of navigation. Eleanor gave her thoughts on this issue:

“What’s a shame is when the technical problems or the complexity of navigation prevent the learning from taking place [...]”

However, interviewees also pointed out that no system will be intuitive for everyone, and that there is a tension between the need for a system which suits most users and one which can be tailored to individuals.

## **Discussion and Implications**

As university teachers, the interviewees were naturally focused on the learning aspects of using a VLE. Their comments tended to be about the educational and social benefits and issues, rather than commenting on specific VLE features. Moreover, as early adopters of these systems, they had commitment to the benefits, and had themselves overcome many of the problems. However, the interviews did highlight a number of areas where the communication aspects of VLEs are not fulfilling their potential. This section discusses these aspects and draws out ideas on how VLEs might be improved.

### **Discussion Forums**

The interviewees all used discussion forums with their students, and they saw benefits in terms of learning and community-building. However, it was clear from the interviews that the volume of messages in discussion forums causes problems. Student can feel overwhelmed by the quantity of messages and forums, and by the complexity of the message threading. Because students are confused about how the discussions are represented, they post messages in the wrong place, leading to further confusion and incoherence. Harasim et al. (1995 p. 223) describe these problems:

‘Early in the course, as students learn to navigate around the system, the sense of being lost in cyberspace can trigger an experience of information overload. A sense of place has not yet been established, and the conference may feel like a maze. Additionally, students may send notes to the wrong conference, creating confusion for readers.’

For students who may already be daunted by the public and permanent nature of discussion forums, difficulties such as these will make them even less willing to participate.. Addressing these issues requires careful design and evaluation of the structures and user interfaces of discussion forums. The forums and their contents need to be organised and displayed in ways which make the relationships between messages clear to users. It should be easy for users to follow the separate ‘conversations’ in a discussion forum, and to see the context for each message. Users should also be able to keep track of messages which they might want to return to later. Well-designed facilities for displaying and navigating through threads can play an important part in this. Tools which allow users to filter out certain messages, and flag others for attention would also be of value.

### **Synchronous Communication**

Most of the interviewees mentioned synchronous communication tools, such as chat rooms and shared whiteboards, as potentially beneficial in educational settings. Tools such as chat rooms can add vitality to online communication, making it seem less impersonal, and helping to develop a sense of community among participants. Chat tools also avoid the frustrating time lags of asynchronous communication, and are therefore more effective for group decision-making.

However, not many of the interviewees had used synchronous communication tools with any degree of success. A general feeling was that chat discussions become confusing and unstructured. This may mean that they need to be represented in a different way. Rather than simply displaying the sequence of contributions in chronological order, a different representation could separate speakers and topics more clearly (McAlister et al., 2004). A facility to keep a transcript of the chat session would also be beneficial. This would give students an opportunity to reflect on the discussion afterwards, and would provide a record for those students who could not take part.

## **Tools for Teachers**

The interviews revealed that teachers wanted to create well-structured and inviting VLE spaces for their students. Their aim was to create a sense of identity in the VLE - for a specific group or course. In order to facilitate this, VLEs need flexible tools for changing visual features such as icons and fonts, and for adding images. Tools are also needed to support teachers in creating and maintaining discussion forums. It should be straightforward to create forums, set permissions, add or remove students and automatically archive messages.

The teachers also discussed the need to track their students' online work. One basic requirement is for teachers to know that their students are all correctly registered in the VLE. This requires integration with university registration systems. Once students are registered, teachers should be able to check that they are participating. Systems need to keep a record of when each student logs on and what activities they carry out. Tools should be provided which enable teachers to easily monitor each student's participation and progress, and which provide summaries for the class as a whole. As Coppola et al. (2002, p. 186) point out, in online learning:

‘the managerial role, which deals with class and course management, requires greater attention to detail, more structure and additional student monitoring’.

## **Usability and Flexibility**

The interviews highlighted the fact that technical and usability issues cause serious difficulties for users of VLEs. These problems can result in disengagement and lack of participation by students (Weller, 2007, p. 16). Hopefully, technical problems will decrease with time, but usability issues also need to be addressed as a priority. It is important that VLEs have straightforward navigation, use clear terminology, and are based on structures and processes that make sense to students.

As well as the need for systems that are easy to use, it is important that VLEs are flexible. Weller et al. (2005, p. 258) point out that:

‘as learners and educators become more sophisticated with their use of online technologies, the need for systems which are easily configurable to suit the demands of a particular learner or cohort becomes apparent’

The teachers interviewed in this study wanted to tailor the system to their own educational purposes and settings. Moreover, some students - those with more confidence and experience - will also want to personalise the system to suit their own preferences. Designing VLE systems which are flexible and which also have good usability is a significant challenge. But it is a challenge which must be met if these systems are to achieve their educational potential.

## **Conclusions**

This research has brought together the views and experiences of a number of university teachers who use the communication facilities of VLEs to support their students. The teachers used a range of different VLEs for different purposes, but all had the aim of enhancing learning for their students. The teachers were positive about the use of communication facilities in VLEs and felt that there were significant gains in learning and community-building. However, it is clear that there are also problems with the communication facilities in VLEs, and that these problems are detrimental to students and staff.

The main issue identified by interviewees was the volume of messages in asynchronous discussion forums. When there are large numbers of messages, students have difficulties finding their way through the forums and message threads. A related issue arises in synchronous discussion tools, where the discussions can become confusing. There is a need for further research in the design of discussion forums and chat tools, and in particular of their user



interfaces. More generally, there is a need for high usability in VLE systems. If usability is poor, this will lead to disengagement by students.

A second issue which emerged is that teachers need facilities to help them manage their online teaching. They need to set up and maintain attractive course areas in the VLE. They need systems which automatically register students and tools for monitoring participation. Finally, VLE systems need to be flexible, so that teachers can use their preferred educational approaches, rather than having to adjust their teaching to fit the system.

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