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Comparing Synchronous Virtual Classrooms:
Student, Instructor and Course Designer Perspectives

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Abstract

The synchronous tool that is right for developing an online course depends on the context, needs and priorities. This report compares synchronous, virtual classroom systems Elluminate Live! v. 9 and Dimdim v. 4.5. The researchers compared the features of each system in terms of facilitation of communication, presentation of course content and logistical requirements. Similarities and differences are outlined. Online workshops were conducted with each of the systems to collect feedback from instructors and students regarding overall perceptions of the systems and ease of use. Recommendations are provided for those making decisions about the selection and implementation of a synchronous, virtual classroom system.

Comparing Synchronous Virtual Classrooms:

Student, Instructor and Course Designer Perspectives

The Distance Course Design and Consulting Group (DCDC) was established through a federal grant focused on increasing the number of certified teachers in Hawai'i through developing online courses. The DCDC is proactive in finding and incorporating open-source products and open educational resources when appropriate. This project was documented to share our approach to choosing products.

Online courses present a particular challenge in creating a community among the instructor and students, and helping establish this community is an important consideration for course designers (Anderson, 2004). Synchronous communication is one way to meet this challenge. Some synchronous systems offer real-time meetings, or web conferences. The features of these systems can “include an interactive whiteboard, text chat, audio, video, polling, application sharing, web browsing, file sharing and presentation (PowerPoint) tools” (Siemens & Tittenberger, 2009, p. 49).

Product comparison approach

The primary goal of this report is not simply to compare two virtual classrooms but to provide educators with criteria and examples of them in practice. While educators should be concerned with the pedagogical aspects of virtual classrooms, the technology itself must be examined closely because it may place limits on the pedagogical usefulness of a tool. For example, if an educator wishes to use a virtual classroom to teach French pronunciation, high sound clarity and two-way video conferencing may be required, and a tool that does not have

these is not pedagogically viable.

Harvey (2002) made another argument for closely scrutinizing technology, claiming that "in practice the technology shapes the instructional design of any online course" (p. 59). Because the field of online education concentrates on learning theories, the designs produced "are perhaps not as well suited for the online environment as they are for the face-to-face classroom" (p. 59). Therefore, instead of fighting the tendency to design for the technology, we should embrace it.

Schullo, Hilbelink, Venable and Barron (2007) compared the virtual classrooms Macromedia Breeze and Elluminate Live! from an educational point of view, including both criteria and examples. They examined a list of criteria, but did not find that one of the systems was objectively better: "The best product for one organization may not be the best for another organization" (p. 342).

Rather than compare products, some studies have examined individual virtual classrooms for their strengths and weaknesses. Pullen (2004) reviewed his institution's in-house virtual classroom and found that "Internet conferencing systems typically do not have the right combination of features for teaching or low enough cost to be acceptable for higher education" (p. 178). This is certainly no longer true, as evidenced by the many schools that hold online classes.

The virtual classroom systems

The DCDC compared two synchronous software systems, Elluminate Live! v. 9 (Elluminate) and Dimdim v. 4.5 (Dimdim). These systems allow instructors to hold class

sessions in real time; a participant can be anywhere that has an Internet connection. Many similar products are available to provide synchronous meetings online. One of the goals of this project was to compare a fully featured, licensed product (Elluminate) with the free version of an open-source product (Dimdim). Elluminate was chosen because it was available to the researchers through a license provided by their institution. Dimdim was chosen as a free, open-source alternative that marketed similar features and usage. (Although open source "doesn't just mean access to the source code" (Open Source Initiative, 2006), at its most basic, open source means free access to the source code of an application.)

Product Comparison

The two systems were examined for differences in interface design and available features. First, screenshots of the system interfaces are provided (Figures 1 and 2). Second, the features of each system are objectively compared in three areas: communication, content and logistics.

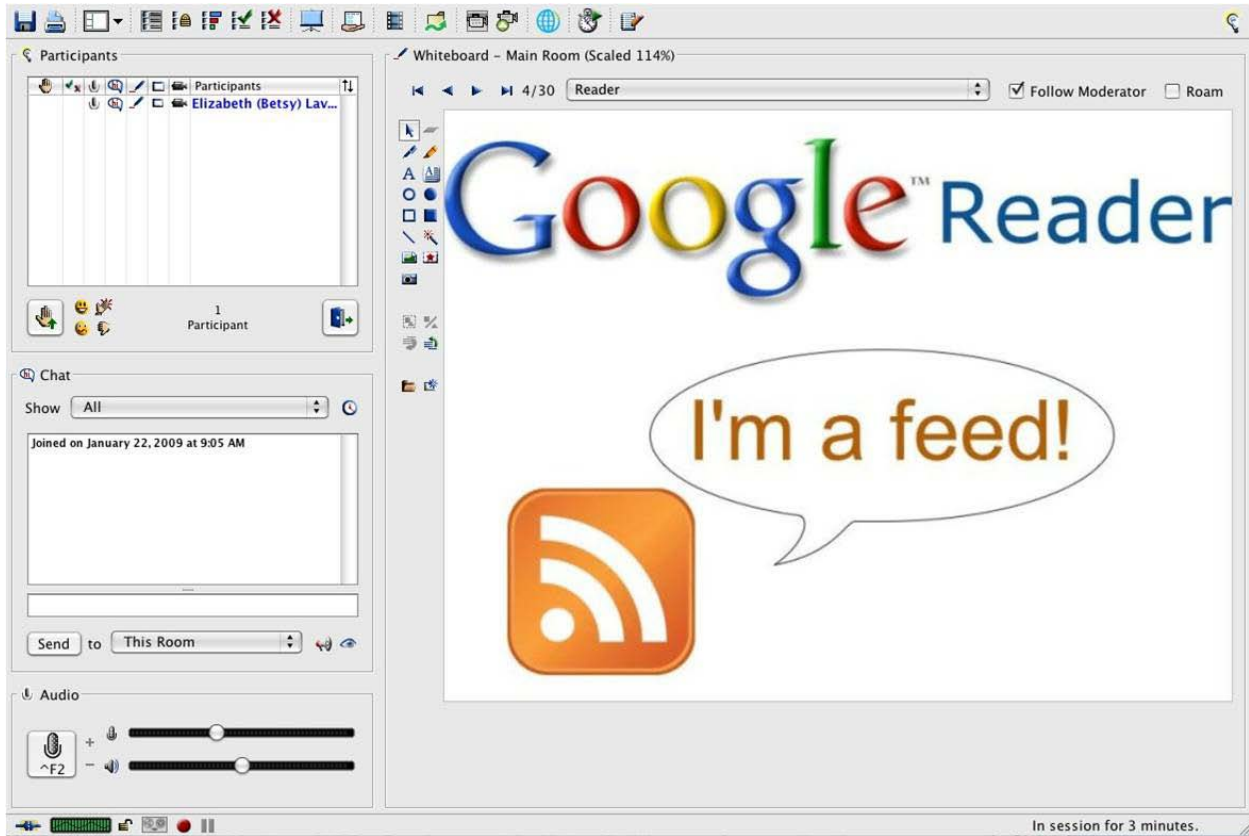


Figure 1. Screenshot of the Elluminate Live! v.9 virtual classroom interface.



Figure 2. Screenshot of the Dimdim v.4.5 virtual classroom interface.

Interface comparison

The two systems provide nearly the same features. The major difference between the them is that Elluminate is a standalone Java application, and Dimdim runs within a web browser (Internet Explorer, Firefox, or Safari). Each system has a text-chat window, whiteboard/slide presentation window, participant list and video/audio control panel.

Feature comparison

Each researcher individually evaluated the systems using a matrix modified from that of Schullo, Hilbelink, Venable and Barron (2007). The researchers then discussed their findings and agreed on the comparison outlined below.

Communication. The two systems have different communication capabilities, as shown in Table 1. Elluminate allows unlimited participants; Dimdim limits participants to 20. Both systems have text and voice chats. Elluminate allows up to six participants to use the voice chat at the same time; Dimdim allows up to four. Elluminate can broadcast up to six videos simultaneously; Dimdim allows one.

Table 1

Communication Tools and Features

	Elluminate	Dimdim
Participants	Unlimited	≤ 20
Voice chat	≤ 6 speakers	≤ 4 speakers
Text chat	Yes	Yes

Video	≤ 6 videos	≤ 1 video
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Content. For content sharing, as shown in Table 2, Elluminate provides more choices to a moderator (a participant with administrative powers) than Dimdim, such as polling and quizzing, the presentation of multimedia such as video files, and application sharing, where a moderator can allow a participant to control an application on the moderator's computer. Each system has basic content sharing, including guided web browsing, an interactive whiteboard, slide presenting, desktop sharing and simple feedback (e.g., the ability to display a smiley face).

Table 2
Content Tools and Features

	Elluminate	Dimdim
Guided web browsing	Yes	Yes
Interactive whiteboard	Yes	Yes
Slide presenting	Yes	Yes
Polling and quizzing	Yes	No
Multimedia presenting	Yes	No
Application sharing	Yes	No
Desktop sharing	Yes	Yes (plug-in required)
Simple feedback	Yes	Yes

Logistics. In terms of logistics, the two systems are similar (Table 3). Both can record

and play back sessions. Both can be secured with a password, and both are cross-platform (usable on Windows, Mac OS and Linux). Both systems can run a software check on the user's computer to ensure that current plugins are installed.

The systems have two notable differences. First, Elluminate allows breakout rooms, unlike Dimdim. This feature allows a moderator to create sub-rooms, where participants meet in smaller groups within the virtual classroom. Another difference is the plugins required: Elluminate requires Java, and Dimdim requires Flash.

Table 3

Logistics Tools and Features

	Elluminate	Dimdim
Breakout rooms	Yes	No
Recording & playback	Yes	Yes
Password secured	Yes	Yes
Cross platform	Yes	Yes
Plug-ins required	Java	Flash

Workshops

The researchers developed a workshop to elicit opinions on the two systems from participants. In the hour-long workshop, the researchers explained how to use Google Apps, which are web-based office applications. The researchers presented the workshop twice: once using Dimdim and once using Elluminate. The two presentations were as similar as possible.

Participants only attended one workshop, and unless they had prior experience with the other system, they could not directly compare the two.

At the end of each workshop, the researchers asked the participants to visit a URL to complete a voluntary questionnaire about their impressions of the virtual classroom system used. The complete questionnaire is shown in the appendix.

Participant Demographics

Completed questionnaires were received from 12 participants in the Elluminate workshop and five in the Dimdim workshop. The 12 Elluminate participants identified as instructors ($n = 7$), course developers ($n = 4$) and a student ($n = 1$). The five Dimdim participants identified as students ($n = 2$) and "other" ($n = 3$; a staff member, librarian and curriculum specialist). Many of the participants in both workshops (Elluminate: 7; Dimdim: 3) indicated that they had previously used Elluminate, but none had used Dimdim.

Participant Responses

Five questions were specific to the virtual classroom systems.

1. Would you consider using Elluminate/Dimdim in your teaching? Why or why not?

In the Elluminate workshop, all 11 of the participants said that they would consider using Elluminate. The reasons given were analyzed and coded into five categories:

- Useful and exciting tool
- Facilitation of learner needs
- Good supplement to a face-to-face course

- Multiple interactivity modes
- Ability to record for later viewing

In the Dimdim workshop, three participants said that they would consider using Dimdim, and two said that they would not. Those who said that they would consider using Dimdim gave reasons that fit into the following categories:

- Synchronous group communication across locations
- Ease of use
- No cost

Although all of the Elluminate workshop participants said that they would consider using Elluminate, one of these participants mentioned "lack of budget" as a reason that might prevent its use.

The two participants in the Dimdim workshop who said that they would not consider using Dimdim gave the following reasons:

- Less familiarity with Dimdim than Elluminate
- Not currently teaching

2. How easy or difficult was Elluminate/Dimdim to use?

The participants rated the ease of using Elluminate or Dimdim as very easy, easy, not easy or difficult, difficult, or very difficult (Table 4). In the Elluminate workshop, eight participants (67%) and in the Dimdim workshop, three (60%) rated the systems easy or very

easy.

Table 4

Participants' Rating of Ease of Use of Elluminate and Dimdim

		Workshop	
		Elluminate	Dimdim
Experience	Elluminate	7	3
	Dimdim	-	-
	Other virtual classroom	2	1

3. What was difficult about using Elluminate/Dimdim?

In the Elluminate workshop, some of the difficulties reported involved audio, Internet connections, readability of slides, and learning to use the interface (Table 5). In the Dimdim workshop, some of the difficulties involved audio, Internet connections, navigation and screen size (Table 5).

Table 5

Participants' Difficulties Using Elluminate and Dimdim

Table 6

How easy or difficult was Elluminate to use?	What was difficult about using Elluminate?
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	For some reason, I wasn't able to use my earphone/mic. but it could be just my computer problem. I was using Adobe Connect prior this workshop and maybe my computer needs a reboot.
Very easy or easy (<i>n</i> = 8)	Not difficult at all, it takes a short time to get used to the functions and layout.
	easy once you have done it
	Easy as a student; not sure how difficult it would be to be the moderator or to set up the session.
	Sometimes students may have bad connections and this may cause problems.
	Screen shots are too small and hard to read.
Not easy or difficult (<i>n</i> = 3)	Just the learning curve.
	learning about all the features (microphone, camera, chat rooms) and then practicing
Difficult (<i>n</i> = 1)	I haven't used it before, so as a recipient of the workshop I didn't figure out how to respond right away. There was no chance to ask how to use the program--questions were only elicited about the topic. I finally figured out the smily face (it wasn't a video of me, but what role does the auto-video play in this program for the instructor. Also, the oral responses by peers were not intelligible but the chat room was fine.

4. What do you like about Elluminate/Dimdim?

Participants in both workshops mentioned that they liked virtual classrooms because they were user friendly, interactive and “free.” Note that the participant who thought that Elluminate was free may not have been aware that his/her college pays for a licensed version.

The participants in the Elluminate workshop mentioned that they liked Elluminate because of its many tools, the ability to use it from remote locations and the ability to record sessions to view later. These reasons reflect the nature of synchronous systems in general and not one specific system over another.

5. Do you have any other comments about Elluminate/Dimdim?

The comments about Elluminate indicated that it is a convenient system to use but that some participants would like to have more features available. The comments of the participants in the Dimdim workshop indicated that their curiosity about the system was piqued. See Table 6 for some representative comments.

Table 6

Participants' Other Comments about Elluminate and Dimdim

Elluminate	Dimdim
Elluminate allows [me to attend today] without the inconvenience of my leaving my space, in order for me to maximize my time.	i plan to give it a try, thanks for introducing me to it.
I'd like to see Elluminate linked up as a synchronous instructional option to the Laulima [Sakai learning management system] sites, rather than operating from separate platforms.	I'm wondering about some of it's features that weren't used today - such as webtour, viewing desktop, etc.
Needs a better designed GUI.	

Discussion

Presenter opinions

As presenters experienced with both systems, the authors can directly compare them, although clearly not disinterestedly. Both Elluminate and Dimdim were found to have advantages, disadvantages and features that are advantages or disadvantages depending on the circumstances.

Elluminate had two clear advantages over Dimdim. First, an Elluminate virtual meeting room is persistent, meaning that the room remains available if the presenter logs out or if his/her computer crashes. A Dimdim meeting room, on the other hand, closes if the meeting host logs out. If the host's computer crashes or loses its Internet connection, the meeting room should remain available for participants (Miccalizzi, 2009). However, during the Dimdim workshop of this project, some of the participants seemed to have been ejected from the room when the host computer crashed.

Elluminate's second advantage is its audio system. In the Dimdim workshop, some of the participants could not hear any of the other participants, including the presenter. During the Elluminate workshop, no such problems occurred. Elluminate has an audio set-up wizard that is easy for participants to use. Dimdim does not have a set-up wizard, so for participants to adjust the volume or change other audio setting, they must use the Flash settings, which is not an obvious way to adjust audio. Another possible cause of this difference in audio issues is the participants' relative familiarity with Elluminate compared with Dimdim.

Dimdim had one clear advantage: its whiteboard/slide presentation space, which was easier to use for several reasons. First, the interface shows thumbnails of slides next to the presentation space. These thumbnails helped the presenters navigate through the slides during

the workshops. Elluminate does not have thumbnails, which can complicate the process of finding a slide. Second, graphics in the presentation slides appeared clearer in Dimdim than in Elluminate. This is a crucial point because slides are imported to both Elluminate and Dimdim as static images. Thus, unclear images can mean that text on slides is difficult to read. Third, displaying the mouse pointer as a laser pointer is more intuitive in Dimdim. When using Elluminate, the presenter must hold down the mouse button to make a laser pointer appear to other participants. When using Dimdim, the presenter's mouse pointer automatically appears as a laser pointer whenever the mouse cursor is in the whiteboard/slide presentation space.

Some of the differences between the two systems were not clear-cut advantages or disadvantages. These differences involve presentation uploading, text-chat capabilities and mood icons.

Three aspects of presentation uploading were notably different between the systems. First, Dimdim uploads slides at a set resolution; Elluminate offers a choice of resolutions. This choice is helpful for people who know what they want, but complicates the system. Second, a disadvantage for Dimdim is that only the “presenter” can upload a document. Only one person can be designated as the presenter at a time, and the meeting host must designate the presenter. In Elluminate, only “moderators” can upload presentations, but the number of simultaneous moderators is unlimited. An advantage for Dimdim is that each presentation is uploaded as a separate document, so finding the first slide of a presentation is simple. Elluminate, on the other hand, adds uploaded slides to a continuous list, so finding the start of a presentation involves scrolling through a list of individual slides from all uploaded presentations.

The text-chat capabilities of each system have advantages and disadvantages. Both systems have private and public text-chat windows. In Elluminate, a private chat is shared with its intended recipient and all moderators. This gives the moderator control over the text conversations, but sacrifices privacy. If a participant is unaware of this characteristic of the chat, he/she inadvertently shares private messages with the moderator. In Dimdim, only the intended recipient sees a private chat. A disadvantage for the Dimdim text chat is that the private chat window blocks part of the whiteboard and cannot be moved. Another disadvantage of Dimdim is that the main text-chat window closes when the presentation is changed, so users must click to reopen it each time a presentation begins. In Elluminate, the private text chat appears in the same window as the public chat; the window is always open in the same place and cannot be easily closed or lost.

The icons that are available for displaying moods are different in the two systems. In each system, you can choose a mood icon, which will appear as a small graphic next to your name. These mood icons are unintuitive to use in Dimdim because they must be accessed by clicking through multiple layers of menus (Figure 3). In Elluminate, the mood icons are clickable buttons on the interface, meaning that they are visible and quickly accessible without using menus (Figure 4).

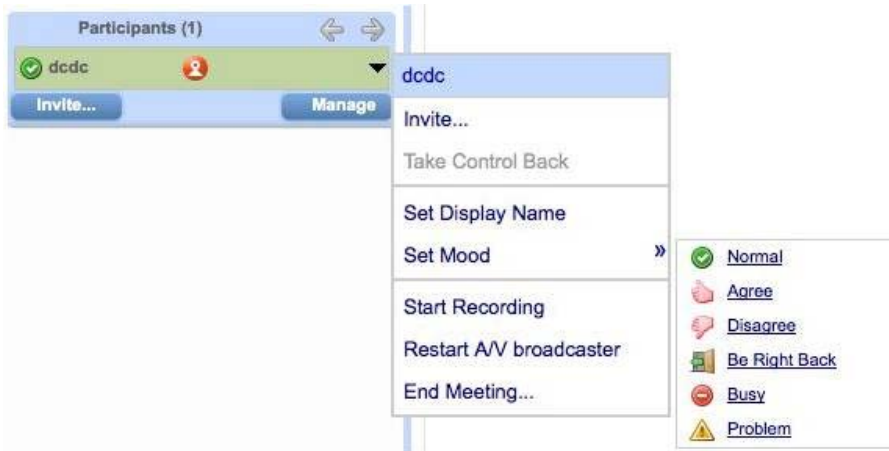


Figure 3. Screenshot of the layered menu access to Dimdim v.4.5 mood icons.



Figure 4. Screenshot of clickable Elluminate Live! v.9 mood icons.

In addition to mood icons, Dimdim offers clickable emoticons in the text-chat window (Figure 5). Elluminate does not offer these.



Figure 5. Clickable Dimdim v.4.5 emoticons.

Workshop participants' opinions

From the authors' perspective as researchers and users of Elluminate and Dimdim, some of the participant responses about features apply equally to both systems. These two systems are quite similar in their basic capabilities, and the participants perceived that they are useful in similar ways.

The participants also wrote about differences between the systems. Elluminate has been available since 2001 and has been used at the University of Hawai'i since at least 2006. Dimdim, on the other hand, has been available only since September 2007 ("Dimdim launches," 2007), and to the best of the authors' knowledge, the University of Hawai'i has never used it in an official capacity. Thus, the participants would be expected to be more familiar with Elluminate than Dimdim, which was confirmed by their questionnaire data.

In general, the participants seemed willing to use an online tool in their classes and felt that the tools were flexible and interactive. Perhaps the most important difference mentioned by the participants is cost. An example of this is in one of the answers to whether the participants would use Elluminate in their classes: "Yes and no. Yes because it seems to be a very good tool. No, I don't think we have budget for the program."

Half of the users found Elluminate easy or very easy to use, while only one found it difficult. Similarly, the majority of the Dimdim participants found it easy or very easy to use. Thus, neither online environment was difficult to use. The single participant who did have a difficult time using Elluminate stated that he or she had not used Elluminate before and did not

have adequate time to review the environment.

In both workshops, participants reported difficulties with audio and Internet connections. In the Elluminate workshop, other difficulties involved the readability of slides and learning to use the interface. In the Dimdim workshop, other difficulties reported involved navigation and screen size.

The learning environment difficulties may have stemmed from the users' machines and their familiarity with online learning tools. One Elluminate participant said that the screenshots used in the workshop presentation were too small. The researchers attribute this difficulty to the size of the user's screen because the display resolution is controlled by the local computer. Other responses indicated difficulties because of a "learning curve" and a lack of practice time. Therefore, Elluminate may not have been difficult to use, but it may require familiarization.

The Dimdim users had different types of difficulties than the Elluminate users. The majority did not have problems using Dimdim, but felt that using the interface was neither easy nor difficult due to small screens and personal Internet connection problems. Dimdim was not difficult to use, as indicated by the lack of responses rating it difficult or very difficult to use.

Most of the participants indicated that they liked using the systems. Elluminate in particular yielded responses that focused on how it allows others to join a session regardless of their locations, and the participants wrote that the tools available were interactive and useful in connecting everyone through the Internet. Dimdim was identified as very user-friendly and free of cost to the end user. (While we did not explicitly tell participants that Dimdim was free, they had easy access to that information from within the interface.) It was also identified as

providing dynamic content and an interactive environment.

Implementing a Synchronous Virtual Classroom

Many synchronous tools are available to online course developers and instructors (Coy, 2008), including Elluminate and Dimdim. The tool that is right for your job depends on your priorities. The following section outlines some key points to consider when selecting a synchronous system for use in an online course.

Custom features

If a priority is choosing the resolution at which presentations are uploaded or creating breakout rooms, a more full-featured product may be the best choice. Depending on the content being taught and types of interactions needed, this factor may be important in your choice of a synchronous system.

One-click feedback

Both Elluminate and Dimdim offer multiple options for participants to express their moods. The differences lie in the ways that emoticons are accessed by participants. If having access to feedback that requires only one click is important, this access should be fully evaluated before making a product choice.

Stability

The researchers found that the connection to the Dimdim system seemed somewhat dependent on the host's computer. (The host of a Dimdim room is the individual who creates the room.) That is, when the host's computer crashed, some of the participants were ejected from the room. However, "accidental disconnect shouldn't kick out the participants," and the "host should be able to rejoin [a meeting] unless the host intentionally closes the meeting"

(Miccalizzi, 2009). The specifics of how the technology functions should thus be evaluated before making a product choice or purchase.

Costs

If no funding is available for adding synchronous software to a course, free services are available. Dimdim provides a viable alternative to Elluminate, offering comparable basic features.

Limitations

First, the number of participants was small, and the groups participating in the workshops were not matched in numbers or demographics, so they cannot be directly compared. Second, the study was not experimental, so the results are not generalizable. Third, the researchers were also the workshop presenters and may have added their bias to the process. Finally, software constantly changes, which means that the versions of Dimdim and Elluminate used in the study are different from those currently available.

The researchers did not compare the availability of training and support for Elluminate and Dimdim; however, this is an important area to consider. Tutorials, set-up rooms and help desks can be important, especially for those who are new to the technology. Additional studies would be enhanced by adding support features to the comparison.

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Appendix

Questionnaire

Participants in the workshops responded to the questions below using a web-based form. The answer choices are given in square brackets. In cases where no answer choices are shown, the participants typed responses into a text box. For the Dimdim workshop, "Elluminate" in questions 12 and 14–17 was replaced with "Dimdim."

1. Your gender: [Male, Female]
2. Your native language: [English, Japanese, Korean, Mandarin, Vietnamese, Other]
3. If you chose "other" above, what is your native language?
4. Your age: [Under 18, 18 to 22, 23 to 25, 26 to 28, 29 to 35, 36 to 45, 46 or above]
5. How often do you use computers? [Never, Once a week or less, More than once a week, but less than every day, Once a day, More than once a day]
6. Which of the following best describes your role in online courses? [Student, Instructor, Course Developer, Other]
7. If you chose "other" above, please describe your role.
8. Do you have teaching experience? [Yes, No]
9. If you have teaching experience, in which mode have you taught? (Check all that apply.)
[Face to face, Synchronous online (using a system like Dimdim, Elluminate, chat, or Skype), Asynchronous online (using a system like discussion boards in Lulima or WebCT), Other]

10. Have you used virtual classrooms like Dimdim or Elluminate before today's presentation (as either a student or teacher)? [Yes, No]
11. If you have used virtual classrooms before, which ones have you used?
12. Would you consider using Elluminate in your teaching? [Yes, No]
13. Why or why not?
14. How easy or difficult was Elluminate to use? [Very easy, Easy, Not easy or difficult, Difficult, Very difficult]
15. What was difficult about using Elluminate?
16. What do you like about Elluminate?
17. Do you have any other comments about Elluminate?

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