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Exploring the affordances of e-learning for teaching and learning: A case study in higher education with Special Education Teachers in Singapore

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The advantage of e-learning environments is that it allows for enhanced interaction amongst learners and educator. While we are aware of the advantages of this technology, more research can be done in this field of technology to add to current body of knowledge of pedagogical strategies in an effort to create engaging and meaningful learning environments for special educators. The objective of this study is to begin to examine the affordances of e-learning as part of a blended delivery model for a group of in-service special educators to supplement traditional face to face classroom sessions and to consider strategies of integrating it into teaching and learning. This study utilized the Blackboard Learning Management System at the National Institute of Education, Singapore. The research objective for this study was: what evidence is there that e-learning promotes social interactions to support learning processes? Data collection was done via the analysis of the archives of e-learning sessions and an online survey conducted to gather students and lecturers feedback on their perceptions of e-learning. The outcomes explored how e-learning benefitted learners in terms of enhanced interaction patterns, motivation, and collaborative learning (Bates, 2005) and how a sense of togetherness and shared experience or camaraderie helped offset the danger of attrition where students study both remotely and individually.

Keywords: affordances of e-learning, Singapore teachers, online social interactions

Introduction

Synchronous learning environments can be defined as online environments in which communication between learners and the facilitator takes place in real time where those involved in the communication process are present all at the same time, but not necessarily in the same place (Jolliffe, A., Ritter, J., & Stevens, D., 2001). When more than one participant is involved in an educational interaction there is the potential to produce this social presence: the sense of being together with others and having a sense of engagement with them (Biocca, Harms, & Gregg, 2001; Hills, 2005).

We chose to focus our study on the chat feature in the video conferencing tool, as we wanted to find out how learners were utilizing the chat rooms as an add-on to what was happening in the main lesson.
Chat-rooms are where a number of people have simultaneous text conversations synchronously. To an educator, there is a need to understand why these online relations work so well, especially in the classroom. Chat rooms allow people to communicate with each other in a unique new way. They can be used to supplement asynchronous types of activities, such as threaded discussions, with social interactions to better support meaningful learning and allow students to make knowledge their own or to replace some of what was lost by not meeting face-to-face. These discussions are opportunities for students to better understand the content by hearing others' interpretations while sharing their own.

In synchronous delivery of lessons, it is important to provide authentic social interactions that are crucial for deep meaningful learning and allow students to construct knowledge on their own (Roberson and Klotz, 2001; Vygotsky, 1978). Synchronous small group discussions can replace much of what is lost in the absence of face-to-face classroom sessions (Verba 1994). These groups act very much as student support groups as they provide opportunities for students to better understand the material by hearing others' interpretations while sharing their own. The analyses reported in this article are an effort to provide more disciplined evidence regarding these impressions.

The guiding question for this paper is: what evidence is there that e-learning promotes social interactions to support learning processes?

For purposes of data analysis, the following guiding questions were used:
1. What statements show opportunities for students to better understand the material by hearing others' interpretations while sharing their own?
2. What statements show students getting to know their peers?
3. What statements show students requesting feedback from the instructor?
4. What statements show students' group problem-solving strategies?

Guiding principles for learning design

To ensure rigour in the construct of the online learning activities, these learning design principles were adopted for the synchronous events.

Variety: engaging and maintaining learner's attention (Lee and Boling, 1999)
Lecturers needed to present text in short paragraphs with sub-headings used as navigational cues. Questions and prompts were placed in text to encourage learners to engage actively with the content. The amount of text was limited to ensure scrolling was kept to a minimum and text was interspersed with illustrations and diagrams. These devices helped chunk the material into manageable amounts.

Action: getting learners to participate in online activities (Laurillard, 2002)
Educators must provide an environment where learners can act on, generate and receive feedback on how they are progressing. Questions and prompts can encourage learners to engage actively with the content by asking them to think critically about aspects of the subject.
Application: encouraging learners to extend content to other contexts (Boud and Feletti, 1998)
This can be done via problem-solving or problem-based learning as a way of constructing meaning and extending this new knowledge in new situations. This is excellent for enabling students to act as practitioners, engaging in authentic problems where decisions can be made.

Interaction: allowing learners to change or comment on content (Laurillard, 2002)
In the age of web 2.0 technologies, this is an excellent teaching strategy associated with dialogue and adaptation. The opportunity for interaction and adaptation is supported through online chat activities, contributing to knowledge construction (Jonassen & Land, 2009).

Scaffolding: guiding learners (Lave and Wenger, 1991)
Scaffolding, associated with Vygotsky (1978) and Bruner (1966), sees learning building on previous experiences, with support provided by educators to help students carry out tasks. Though teachers are not directly present in all online activities, they can guide students by providing a range of pedagogical components to scaffold learning processes.

Research Design

The study was conducted for a period of one month with 4 lecturers and 83 teacher trainees.

Instructional Context and Procedure

Different lecturers used the web conferencing tool for various purposes. Presentation of PowerPoint slides, explanation of physics java applets on the web, project showcase, discussions on a photo uploaded etc were some of the activities that the classes were involved in. Some of the students were also split into break out rooms to discuss in their groups.

There was frequent interaction during the sessions. Lecturers asked questions to their students at several intervals to gauge their understanding and to relate the topic to the previous topics taught. While the lecturers were conducting the session the students communicated with each other via the chat tool.

Data Collection

Data was collected in the following ways:
- Analysis of the archives of the recorded chat sessions
- Online survey conducted to gather students and lecturers feedback on the use of the tool.

The major portion of the data was collected from the chat messages that were posted by the students and the lecturers during the 4 web conferencing sessions carried out. A detailed analysis of the students chat messages allowed the authors to develop a framework for categorizing the messages and explain interaction patterns.
Data Analysis

**Online Survey**

At the end of every web conferencing session, students and teachers were surveyed to gather information about their perceptions about the tool. The quantitative data was analyzed using Microsoft Excel while the qualitative data gathered through the surveys was categorized into favorable and non-favorable use of the tool.

**Archives of Chat Messages**

For the analysis of the chat messages there were no pre-set categories for grouping the messages. The data collected was thoroughly examined and interpreted and six main categories emerged from analyzing the data. The categories, with explanations and illustrative examples, are shown in Table 1.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Explanations</th>
<th>Illustrative Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Content</td>
<td>Messages posted directly relating to the content being taught</td>
<td>• “let's take a look at a text to see what the rhetorical moves are”</td>
</tr>
<tr>
<td>Consensus-Seeking</td>
<td>Responses given to agree or disagree with one another. Students thanking each other or the teacher.</td>
<td>• “yup, agree”</td>
</tr>
<tr>
<td>Socialising</td>
<td>Friendly messages not pertaining to the subject.</td>
<td>• &quot;Welcome everyone!!&quot;</td>
</tr>
<tr>
<td>Providing Support</td>
<td>Students asking for help or clarification on the topic being taught or messages pertaining to the support provided</td>
<td>• &quot;Do we critique the statement and offer opinion?&quot;</td>
</tr>
<tr>
<td>Navigating the Live Classroom</td>
<td>Messages concerning technical matters like setting up the wizard, troubleshooting etc.</td>
<td>• “Click your talk button to respond.”</td>
</tr>
</tbody>
</table>

**Results and Discussion**

Of the 83 students involved, 52 students responded to the online survey conducted.

From the data collected it was evident that almost all the students (92%) found the text chat easy to use.

From the open ended data collected it was also evident that some of the students found the chat tool a good support for their learning.

- “Everything can be done at my own time, even if i was to miss anything, i could scroll back in the chat log.”
- “I could get instant response from my classmates.”
While there were positive responses on the use of the chat tool, there were also students who were not very comfortable using the tool. As shown in the quantitative data gathered in Table 1, 6% of the students found it difficult to use the tool.

- "Think the situation is a little bit chaotic, too many people posting different thing with different theme at a time, plus a little bit of conversation here and there in the room, a bit hard to concentrate on what the instructor is saying."
- "I need to give my opinions quickly. Because when I were typing my comment, my classmates had give their comment already. And our comment is same."

A total of 1,377 text messages were posted by the students and lecturers during the session.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Content</td>
<td>22%</td>
</tr>
<tr>
<td>Consensus-Seeking</td>
<td>15%</td>
</tr>
<tr>
<td>Socialising</td>
<td>41%</td>
</tr>
<tr>
<td>Providing Support</td>
<td>6%</td>
</tr>
<tr>
<td>Navigating the Live Classroom</td>
<td>16%</td>
</tr>
</tbody>
</table>

Course Content

In a live classroom, there are learners who dominate the discussions and those who are quiet. This can be lessened in the online environment. Everyone has to contribute online or they are invisible. This is good for educators as it helps contribute to the learning processes of their learners.

Socialising

The literature points to interaction as the key to successful synchronous learning environments in education and the evidence emerging from this study suggests that students did a lot of socializing online. Periods prior to, or between, synchronous learning events can offer useful opportunities for learners to undertake tasks either individually or in groups, which are then discussed or covered during the on-air slot with time for questions and discussion. These virtual conversations extend class time and provide for an ongoing exchange of ideas.

Navigating the Live Classroom, and Providing Support

These two categories had fairly low incidences but seemed to serve very important functions. Students could pose questions and discuss what each thought the answer should be. Learners felt this was an extremely effective method of studying. Navigating the Live Classroom consisted of helping each other learn how to use the technology. Having this peer guidance available seemed to stave off frustration and anxiety for learners.
Consensus Seeking

As evidenced by the online answers and discussions of the students, they were able to check their understanding of assignments against each other and to avoid referring back to the lecturer. It also allowed students to sound out their peers to hear how they were progressing on assignments, elicit strategies that others found useful, and, often, commiserate on how much work there was to do.

Conclusion

Chat rooms have promised benefits in terms of real-time interaction, immediacy, motivation, and collaborative learning (Bates, 2005). There is the sense of togetherness and shared experience, a camaraderie which can help offset the particular danger of attrition where students study both remotely and individually (Bates, 2005; Wheeler, 2005; Wheeler & Amiotte, 2004).

However, educators need to remember that chat forums are not conducive for effective communication among large numbers of participants (Murphy & Collins, 1997) because of coordination problems. However, this can be overcome if regular online meetings are arranged. Another challenge can be keyboarding skills needed for effective participation. Finally, participants for whom English is not a strong medium of communication, may be at a disadvantage if the conversation flows so quickly that they don't have sufficient time to reflect, frame questions, and compose responses.

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