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Author	Sujata Surinder Kathpalia
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Blended E-learning: The Way to Go?

by Sujata S Kathpalia
Nanyang Technological University (Singapore)

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Abstract

Blending is an art which integrates different types of resources and activities to make learning more effective. In the last decade, blended learning has extended to include e-learning, with teachers in higher education integrating e-learning into traditional methods of teaching (Littlejohn & Pegler, 2007). The objective of this paper is to present one such experiment with blended e-learning, which combines face-to-face interaction and computer-mediated communication to teach oral presentation skills in a communication skills course. Through an analysis of student comments (on video presentations) in the discussion board of Nanyang Technological University's e-learning system, this paper aims to gauge whether blended e-learning is a student-centered and constructivist way of learning and how student participants feel about this type of learning. It is hoped that this preliminary investigation will throw light on the controversial issue of whether Information and Communication Technologies in education should be used to augment or replace the face-to-face learning environment.

Introduction

Blending is an art that has been practiced by inspirational teachers for centuries. It centers on the integration of different types of resources and activities within a range of learning environments where learners can interact and build ideas. Most recently, the term has been attached to the blending of e-learning with traditional methods of teaching. Blended learning is attracting the attention of many teachers in higher education (Littlejohn & Pegler, 2007) in contrast to the relatively poor response to teaching methods which predominantly or exclusively focus on e-learning, especially in situations where e-learning is expected to offer an unproblematic cost-saving replacement for traditional teaching methods. In fact, blended learning seems to be a reaction to the disillusionment with stand-alone online learning (Macdonald, 2008).

Although the term is a buzzword in higher education at present, academics seem to have different understandings of what blended learning entails. The term is commonly used to describe the incorporation of online media in a course while at the same time maintaining traditional modes of interaction such as face-to-face interaction in tutorials and conferencing sessions (MacDonald, 2008). It also applies to both synchronous and asynchronous online learning situations. There is a consensus among academics that in an educational setting, it is not an "either or" scenario of online versus face-to-face learning but a more balanced approach where a combination of the two approaches provides the best learning outcome (Laurillard, 2002).

Similarly, e-learning does not necessarily imply the exclusion of traditional educational values and practices that are the strength of a collaborative learning community. In fact, in an e-learning environment, a community of learners is essential in order to achieve the goal of higher-order learning through independent thinking as well as interdependent collaboration with other learners (Garrison & Anderson, 2003; Goodfellow & Lea, 2007). For higher education to be meaningful, learners need to be engaged in private reflection and critical discourse, fusing the subjective with the shared worlds of learning within a community of inquiry (CoI). In such a community, students learn by "negotiating meanings, diagnosing misconceptions and challenging accepted beliefs" (Garrison & Anderson, 2003, p. 28). This kind of learning environment could be very easily created in an e-learning setting because e-learning provides opportunities for reflection as well as interaction along with access to unlimited data sources.

In the CoI framework, there are three overlapping and recursive elements of cognitive presence, social presence and teaching presence (Garrison & Anderson, 2003). While cognitive presence is defined as knowledge building through the cyclical pattern of "trigger, exploration, integration and resolution," social presence is the ability of students to build interpersonal relationships through open and cohesive communication. Teaching presence is the glue that holds the other two elements together by facilitating and directing the communication to achieve learning outcomes and educational goals. These three elements of cognitive, social and teaching presence provide a coherent framework for the analysis of any e-learning activity in an educational setting.

Using the CoI framework as a starting point, the objective of this paper is to present an experiment with blended e-learning which combines face-to-face interaction and computer-mediated communication to teach oral presentation skills in a communication skills course at the Nanyang Technological University. Through an analysis of student comments (on three video presentations) in the discussion board of the university's e-learning system, the paper aims to gauge whether blended e-learning is a student-centered and constructivist way of learning that promotes higher-order thinking as has been claimed by previous studies. More importantly, the paper will show how student participants feel about this type of learning. To address the first objective, online student discussions were analyzed from the point of view of Bloom's taxonomy of higher order skills (1956). The second objective was addressed by categorizing student responses to the e-learning activity according to whether they were for it, against it or neutral.

E-learning activity and data

The blended e-learning activity discussed here was designed for the technical communication course offered to second year engineering undergraduates at the Nanyang Technological University. This activity was scheduled during the e-learning week in the semester and was made available to students through the university's e-learning platform. The data for this study comprised synchronous forum discussions of three tutorial groups with a total of 80 students.

The schedule for the e-tutorial on an oral project presentation was divided into three parts. The initial phase involved preparing the students by familiarizing them with guidelines for public speaking, going over the notes on the e-learning activity and instructing them on the use of the discussion board. In the following week, the e-tutorial was conducted in real time during the designated two-hour tutorial sessions. The final phase involved a review of the online discussions as well as in-class student presentations followed up by tutor feedback on student performance.

The online activity had three sub-parts of 30 minutes duration each. In each of the activities, students had to view a 5-minute video presentation of students' project presentations and comment on the introduction of the speech (Activity 1), the use of visual aids (Activity 2) and

the delivery of the speech (Activity 3). At the end of the session, students were asked to give their views on whether the on-line activity was a good way of learning.

Framework for analysis

The three aspects of the CoI framework comprising the cognitive, social and teacher elements will be considered in this study although focus will be on the cognitive aspect of e-learning. Within the broader model of CoI with its four phases of trigger, exploration, integration and resolution, cognitive analysis as applied to the present data will be concerned with the higher order learning that takes place through the interaction of ideas within a community of learners. This will be approached from the perspective of Bloom's taxonomy of higher order thinking skills (Bloom, 1956).

For analysis of the student discussions, a revised version of Bloom's taxonomy (Anderson & Krathwohl, 2001, p.31) with its six levels in the cognitive domain was applied to the data:

1. **Remember**: Retrieving relevant knowledge from long-term memory
2. **Understand**: Constructing meaning from instructional messages, including oral, written, and graphic communication
3. **Apply**: Carrying out or using a procedure in a given situation
4. **Analyze**: Breaking down material into constituent parts and determining how parts relate to one another and to an overall structure or purpose
5. **Evaluate**: Making judgments based on criteria and standards
6. **Create**: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure

Developing higher level thinking skills in students has been the goal of most teachers. However, because this is not an easy task and, historically, teachers have turned to Bloom's taxonomy for assistance, Anderson and Krathwohl (2001) have adapted the taxonomy to fit the needs of today's classroom by employing more outcome-oriented language, workable objectives and active verbs. Based on their framework, the cognitive categories and processes used for the identification of student contributions are as follows:

1. **Remember** – Recognizing and Recalling

2. **Understand** – Interpreting, Exemplifying, Classifying, Summarizing, Inferring, Comparing and Explaining
3. **Apply** - Executing and Implementing
4. **Analyze** – Differentiating, Organizing and Attributing
5. **Evaluate** – Checking and Critiquing
6. **Create** – Generating, Planning and Producing

These categories were used to identify the nature and quality of student contributions in the forum discussions. In any learning situation that involves student discussions, there will typically be ample evidence of the lower-order skills of knowledge, moderate evidence of the intermediate skills of comprehension and application and some evidence of the higher-order skills of evaluation and creativity.

Analysis of online student discussions

As mentioned earlier, there are four phases in the CoI model. The first two stages are the triggering event and exploration through brainstorming. In the context of this study, the first phase of inquiry or triggering event was the activity in question (Activity 1, 2 or 3), specifically the discussion questions that students had to address in their online discussions (e.g. What device did the speaker use in the introduction to gain attention from his audience?). The second phase involved brainstorming on the topic based on the PowerPoint slides and notes on speech introductions that were provided to students prior to the e-learning session. In this phase, students discussed the different ways in which one could gain attention through their introductions such as asking rhetorical questions, sharing an anecdote or telling a joke, among others.

Although all four phases are relevant in the unfolding of the discourse, particular attention will be paid in the current paper to the next two phases of integration and resolution as these are truly representative of higher order learning among students. It is in the third phase of integration that students began to construct meaning by applying concepts to the actual video presentation that they were tasked to critique. This phase is particularly challenging as it engages the students cognitively in critical discourse that shapes understanding and facilitates deep and meaningful learning outcomes. The final phase of resolution is when the learning experience becomes personally meaningful. This is the stage when students directly or

vicariously apply what they have learnt to other situations or when they begin to address related questions and issues which trigger new cycles of learning. These two phases will be examined from the point of view of higher order thinking skills within the framework of cognitive, social and teacher presence.

Cognitive Presence

As mentioned, Bloom identified six levels within the cognitive domain, from the simple recall or recognition of facts at the lowest level, through increasingly more complex and abstract mental levels, to the highest order, which is classified as evaluation. An application of the revised version of Bloom's taxonomy (Anderson & Krathwohl, 2001) to the data showed there was evidence of students applying both lower, intermediate and higher-order skills of thinking in their analysis of the video recordings. Examples of the discussion that reflect the application of the lower and intermediate thinking skills of Remember, Understand and Apply are presented below:

Lower-Order Thinking Skills

Remember: I think besides storytelling and asking rhetorical questions, the speaker can also gain audience attention by telling some facts that are shocking to the audience in order to generate audience's curiosity. Another way is probably to show a short 1 minute video related to the topic.

Understand: The speaker managed to show all 4 objectives in the notes. He started his presentation by telling a story before going through the introduction of his presentation. It is then followed by the objective of the presentation.

Apply: I feel that the third speaker was more prepared than the first two and in fact he sounded quite professional. He uses line-graphs to present the findings. He made use of model planes and his body movements to explain his results. The pics and graphs that he uses are big and generally easy to understand. He speaks slowly and that allows the audience to digest the info presented to them. Time was given for the info to 'sink in' before moving on to the next point.

In the first example, the student merely recalls information on oral presentation openings based on the PowerPoint discussion in class during the tutorial session prior to the e-learning session. In the second example, he goes a step further and identifies the different parts of an introduction, whereas in the third, he applies oral presentation guidelines to the speaker's presentation in the video recording.

For higher order skills, the examples below illustrate the students' analysis of the opening part of the speech, evaluation of how the performance of the speakers could be improved through more interesting delivery of the subject-matter, and, finally, reflective comments on what has been learnt through the critiquing activity.

Higher-Order Thinking Skills

Analyze: I think the speaker succeeded in fulfilling the 4 objectives of an introductory speech. To gain attention, he uses visual effects while telling an interesting real life story. Also he used organizational mind map to explain clearly which member to the group is explaining which part of the report. Topic of speech is not very clear at the beginning but at the end of the speech he explained clearly the objective of the speech which is to come out with a self water refilling device.

Evaluate: From the 3 presentations, it can be observed that they have researched extensively on their topic, backed by substantial facts and figures. However, although a detailed compilation of facts is essential for a good presentation, I feel the key factor to bring a presentation to a higher level is the way the presenter conducts him/herself. A boring topic like the one shown in the video can be made more captivating if the presenter could be more spontaneous and lively, instead of just talking to the audience with a blank expression. By capturing the audience attention, half the battle is already won.

Create: The first speaker did well in the story part, that's something we should learn to make our introduction interesting. The way the second speaker delivered his speech was good as a whole, although his part was too technical for our understanding. The last speaker was not at all good. That's why we should be enthusiastic and speak louder and clearly during the presentation.

The higher-order skill of creativity was not as apparent in the student discussions even though all the activities prompted students to comment on what they had learnt from the online tasks. Most of the student discussions focused on analyzing and evaluating the video clips but failed to take a step further by reflecting on their own learning.

It is apparent from the analysis that the students displayed a range of lower, intermediate and higher-order skills in their discussions. These online discussions prompted the construction of new ideas based on personal and shared foundations of past experiences among classmates, promoting both basic level as well as more advanced thinking skills. Interaction is the best way of promoting knowledge construction, especially through online discussions which encourage students to write their comments and respond to others' comments. These comments took the form of either agreement with peers' views, refutation of peers' views or a combination of agreement and concession sequences to indicate that they partially agreed with their peers' views. Examples of these are given below:

> **Agreement**: I agree with X. The concepts were too abstract and non-technical people will not be able to comprehend.
>
> **Refutation**: Contrary to what has been said, I felt that the aeroplane was a good means of explanation because I did not have to visualize and the exact angles were pointed out to me.
>
> **Agreement-Concession**: I agree with X that he should put in some points that he wants to present on the slides as one may not be able to follow if u missed out on what he was presenting. However, the good points of his slides are that the pictures are big enough for people to look at.

While agreement statements reaffirm the opinions of peers and maintain an atmosphere of collegiality among the participants, refutation and agreement-concession statements move the discourse to a higher level, compelling others to look at ideas from a new perspective. Through this exchange of ideas, cognitive dissonance is created, especially if a classmate's comments conflict or partially agree with a peer's original views. This dissonance facilitates

higher-order learning as it encourages students to revise their views and test them in light of further peer comments.

Most of the agreement statements from students provided cumulative support for a particular claim in the discussion. There were only one or two instances of direct refutations challenging the opinion of peers in the discussions of the three tutorial groups. In contrast, students favored agreement-concession sequences where they agreed with their peers in the first statement/clause but followed it up with a divergent point of view in the second statement/clause. There were also many places in the online discussion where students did not invite or respond to claims by peers; they merely expressed their positions on an issue and went ahead to support these by means of explanations. Although this would be considered unusual in a face-to-face interaction, stand-alone comments seem to be the norm in the virtual world.

In an e-learning forum, information is presented in several different ways by students and this facilitates learning. Students are exposed to comments of fellow classmates who are at different levels in the cognitive hierarchy and the real time interaction encourages those at the lower levels to develop their intellectual capabilities by forcing them to move a notch higher in the cognitive domain. Students have access to many different perspectives on the task or topic and learn to accept a point of view different from their own. In the process, they construct new ideas or knowledge based on personal, shared and new experiences.

Social Presence

The social aspect of the CoI model is represented by the interpersonal and intrapersonal aspects of communication which enable one to understand others' as well as one's own intentions, motivations and desires. Interpersonal communication enables one to work effectively with other people whereas intrapersonal communication helps in optimizing one's potential by learning through the example of others. Examples of these two surfaced in the student discussions with the former being predominant:

Interpersonal (Supporting Peer)

I agree with X {Student 1}, I was rather confused at the beginning of the presentation. I also felt that the speaker took too long to relate the story, which should have been shorter (perhaps like what Y {Student 2} suggested).

Intrapersonal

I've learnt that to give a good presentation, a related opening story might help, good composure and visual aids are useful tools. Varying the pitch to highlight certain points is effective also.

The main difference between the examples illustrating interpersonal and intrapersonal aspects of communication is that in the former the student focuses on supporting the views of his peer. In the latter, he goes a step further and personalizes the discussion by commenting on what he has learnt from the online activity.

Another way in which relations are maintained in online discussions is through short social interactions that are not related to the topic of discussion:

Er X {Student 1}, Y {Student 2} as in XXX {Student's full name} hasn't posted anything yet??? So why mention her name?

Rather than building ideational meaning, students use these comments to encourage, entertain or tease each other. According to Coffin et al. (2009), these dialogues serve an important interpersonal function and lead to more focused debates among students.

Teaching Presence

The entire learning exercise would have been incomplete without the tutor; the tutor prepared the students for the e-learning activity in the tutorial session prior to the e-learning session and also facilitated the online discussion. The tutor's presence was also evident in the online discussions when she initiated the discussion for each activity, responded to student comments and summarized to close the discussion.

Opening

Thread: Welcome to the HW210 E-tutorial

Post: Welcome to the HW210 E-tutorial

Author: Tutor

Dear Students

Welcome to this e-tutorial. Before we begin, here are some quick reminders:

- Attempt the activities in the order specified
- Respond to the questions in the handout through your discussion threads
- Read your classmates threads and respond to these to make the session more interactive
- Do not spend more than 30 minutes on each activity

I hope you are all set to participate in the activities.

Your tutor

Middle (Responses to student comments)

Supporting student comments & Probing further: I agree with you that story-telling is a good way to begin a presentation. Are there other strategies that would work equally well? If you had a choice, how would you open your speech?

Eliciting comments: In story-telling, do you think it's appropriate to begin with an entertaining story even if it has no relevance to the topic of your presentation?

Refuting student comments: Perhaps keeping the audience in suspense is a good way to engage them. I wouldn't say that his story is irrelevant to the topic of discussion, considering the product is meant for "thirsty" dogs!

Closing

Thread: Activity 1 – Summary of discussion

Post: Activity 1 – Summary of discussion

Author: Tutor

Well, it's time to summarize now:

- Some of you felt that story-telling is a good way to begin but the speaker should pitch his story at the right level of audience and formality.
- Others suggested that there are other more interesting ways of opening presentations by means of anecdotes and rhetorical questions.
- Apart from the opening, you felt that the speaker did a good job of giving background information, stating the objectives and giving an overview of the presentation.
- As for tone, you felt that his tone was engaging and quite dramatic.
- On the topic of visual aids, you felt that he had done an excellent job of presenting information in his slides.

Time's up so let's move on to the next activity.

A post-mortem of the e-learning session was conducted in the tutorial that followed to ensure that there were no gaps in the students' understanding of the e-learning tasks. For blended e-learning to be successful, the tutor should be prepared to provide students with all the support they need before, during and after the e-learning session. In addition, the tutor is responsible for preparing relevant e-learning activities that enhance the curriculum of a course. This often involves creating the activity as well as providing input in the form of handouts and PowerPoint slides so that students have the relevant background knowledge to enable them to participate in the activity as well as the technical knowledge required to handle the new learning tools.

The Learning Community

It is worthwhile to revisit three elements of the e-learning community: the learner's cognitive development, the social interaction among students and the role of the teacher as facilitator.

Although the analysis in this paper focuses on the cognitive aspect of learning, it is apparent that all three elements play a crucial role and need to be considered holistically to ensure the success of any e-learning activity. The analysis of the discussion board showed that the online e-learning environment was conducive to learning. Students of different abilities had an opportunity to participate in the discussions, exhibiting a hierarchy of thinking skills in their analysis of the oral presentation videos. The social aspect of the learning was evident in the sensitivity that students showed towards each other and in their own learning, triggered by interaction with others. Finally, teachers provided the glue that held the entire e-learning experience together, providing support when required and withholding it when the student discussions were proceeding smoothly.

Students' Views on E-learning

The final aim of this study was to collect views of the students on the e-learning experience. Students were specifically asked to indicate whether they thought their e-learning experience was a good way of learning and to offer reasons for their positions. As shown in the table below, the findings were mixed:

Table 1: Students' Responses to E-learning

Groups	Responses	For	Against	Neutral	Blended
TC08	14	-	11	1	2
CV3	30	16	8	3	3
B22	19	5	9	3	2
Total	63	21	28	7	7
%	100%	33%	44%	11%	11%

Out of the 63 students who responded to this question, 44% were against e-learning but an equal number were for it, with 33% indicating their support for e-learning and a further 11% specifically recommending blended e-learning as the best approach. As is expected in such surveys, 11% took a neutral stance being neither in support of it nor against it. The student comments below are representative of those for e-learning, those against it and those in favour of blended e-learning:

For e-learning: This e-learning is definitely unique and much more interesting than in-class learning. Students are allowed to proceed with the class according to their own pace. And through the discussion board, I am able to view ideas from other classmates that I have never heard from before. This form of discussion is more comprehensive and wide-ranged, rather than just sharing our views within our own groups. Two thumbs to e-learning!

Against e-learning: I feel tutorial classes are still the way to go. The e-learning touch sorely lacks the human touch which I feel contributes to an overall more holistic experience. It also teaches us to learn to speak up in front of a group of audience instead of just typing in front of the screen. In the real world, you can't possibly hide behind the screen forever when trying to engage your superiors/clients/colleagues, can you? Let's not be fooled into believing that we could always retreat into our comfortable virtual world when confronted with the harsh reality of life. Therefore, I still strongly believe that hands on tutorial classes will prove to be a better choice in the long run. Thank you.

For blended e-learning: I agree with the comments that e-learning helps students to learn at their own pace and also the active discussions. With the videos, we're able to pause it, rewind it whenever we want. The discussion board also makes it a tool for those shy to speak up. However, I believe this would be a better tool to use as an "after-class" kind of thing, for people to review what has been taught, and understand better, rather than using it as a primary way to teach. With the human touch taken away, there isn't much moderation to whatever we have to comment. Some may rush through the videos, leave comments and log off early, without seeing through other's comments. Invalid [comments] or comments which are out of line may not be vetted if the pace is not regulated. Also isn't this a "communication" subject, where we should improve our interaction with people, and not just behind computer screens? (We got lots of that practice through msn already) =p All in all, e-learning is a good tool to use for teaching. However, it shouldn't replace face-to-face lectures/tutorials.

Students' comments revealed that they were against e-learning due to lack of readiness for it, especially with respect to equipment and the method used for the current e-learning session. Students were particularly frustrated with the discussion board due to the many message threads that made it difficult to keep track of all the student contributions, the slow speed and

poor error recovery which resulted in typed messages and the entire screen disappearing during the session. Their frustration is evident in the comments below:

> **Logistical Problems**: I think this e-learning initiative is revolutionary. However, there was a lot of hassle in trying to get a computer. Even if we got a computer, there were no headphones to enable us to listen to the lectures. On the other hand, classroom tutorials are much more convenient as adequate facilities are already provided. I guess e-learning just needs some time to mature and fully develop before it becomes an effective teaching tool. One good thing about this was that e-learning managed to get the whole class to participate. That's something face-to-face tutorial would never be able to achieve in Singapore. =) Maybe, in the future, we would be able to speak to each other face-to-face via online conferences that simulate a real classroom setting. Think Star Wars and all the futuristic stuff …

> **Discussion Board Problems**: An instant messaging client would have sufficed. Also, message threads should have been limited as well to reduce 'cognitive dissonance'. The school should do away with the Java client as an intermediary for e-Learning as it is slow (especially when we have to cycle through the message threads and video clips), unwieldy, has poor error recovery and compatibility, and a potential source of security exploits. They should have specialized stand-alone software to handle e-learning.

From their responses, it appears that students are not ready for a complete transformation from the face-to-face classroom to an e-learning environment, especially in the context of skill-based communication skills courses. It is apparent from student feedback that the on-line technology used for e-learning needs improvement for the successful simulation of real-life classrooms where students have the benefit of verbal and non-verbal communication cues for a holistic experience.

There is no doubt that e-learning adds extra dimensions to learning (Clarke, 2004): it fosters integration of different spaces so students can learn at the university, at home or on the move; it offers flexibility in terms of time as students can revisit and review the discussion forum at any time; and it opens up a range of media resources in the form of PowerPoint slides, videos and online discussions in real time. However, e-learning brings into question some of the

traditional values of education regarding who owns, creates and controls knowledge. It also challenges our thinking by creating new etiquettes of learning and teaching as well as shifting the locus of control from the teachers in the learning community.

Conclusion

To gauge the effectiveness of the new medium of e-learning, an attempt has been made in this study to examine online discussions of students from the point of view of Bloom's taxonomy of thinking skills (Anderson & Krathwohl, 2001) as well as an online survey of student views. Anderson and Krahtwohl's adaptation of Bloom's taxonomy proved to be valuable in the analysis of the online discussions as it provided different potential pathways to learning through a hierarchy of cognitive levels (ibid.). The online discussion forum encouraged learning through active interaction among students of different abilities. However, through the e-learning activity prepared for the present course, it became apparent that tutors cannot plunge students into an e-leaning environment and expect learning to happen without giving them proper guidance. To make online learning beneficial and lasting, tutors need to design and facilitate online discussions to accomplish educationally meaningful learning outcomes, preferably through blended e-learning tasks that can be integrated into the curriculum in such a way that students are guided through the process via pre and post face-to-face tutorial sessions. In conclusion, e-learning is here to stay and the onus is upon educators not only to embrace this technology but also to ensure that it is blended into traditional modes of teaching in a seamless manner.

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About the Author

Dr Sujata Kathpalia is a lecturer at the Language and Communication Centre in the School of Humanities and Social Sciences at the Nanyang Technological University, Singapore. She teaches communication skills and academic writing courses. Her research interest is in the areas of discourse analysis, academic writing and second language teaching.