Online learning strategies: Interaction examples that work

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Background

A growing body of literature describes the potential benefits that eLearning can bring to learning and teaching. Hatzipanagos (2005), for example, talks about the use of the web as an important resource-based learning (RBL) tool that promotes student-centred learning. Laurillard (2001) and Wenger (1998) talk about social learning through the building of 'communities of practice' using the web technology, making it possible for learners to learn through discussion and collaboration. Similarly, Preece (2000) suggests that the web has allowed learners to form into 'online communities' which enable interactions in an 'anytime, anywhere' format and support the autonomy of learners. Northover (2005) describes changes in the university student population to accommodate a growing number of mature students who have family and job commitments. Increased learning flexibility made possible by web-assisted teaching has growing importance for this changing population.

As the trend towards the growing importance of technology in teaching and learning is clear, the relevant question is not _whether_ eLearning should be used, but rather _how_ technology can most appropriately be used.

Simple and Enriched Interactions

The present paper presents a perspective on this _'how'_ question by looking at web uses by the type of interaction they are able to enact. Swan (2003) explains interaction as the "reciprocal events involving at least two actors and/or objects and at least two actions in which the actors, objects, and events mutually influence each other" (p. 4), and that interaction is central to learning. eLearning is able to facilitate at least three main kinds of learning-enhancing interaction: _interaction with content_, _with instructors_, and _with peers_.

Figure 1 below illustrates how, using this model, a student can act on and get responses in the three areas. Online quizzes, for example, involve learners through interacting with content. Forum discussions, used as a form of group-learning tool, involve interactions with classmates. Online assignment submissions are one way to use the web for assessments in which learners and the instructors interact.

The present paper suggests that these interactions can range from simple to highly enriched. Simple interactions are one-directional or with limited feedback and exchanges. Enriched interactions are two-directional and negotiation of meanings is possible. Figure 1 shows the two types of interactions with thin single-directional arrows and bold two-directional arrows respectively.

With this in mind, an investigation was carried out to look at the interaction natures of the eLearning experiences supported by the e3Learning Project with the aim of identifying the ways enriched interactions can be achieved. e3Learning is a Hong Kong government funded "Teaching Development Grant"(TDG) project. It operates across three universities, the Hong Kong Polytechnic University

Figure 1: Simple and Enriched Interactions

(PolyU), the City University of Hong Kong (CityU) and The Chinese University of Hong Kong (CUHK). The project has been involved in the building of over 130 websites in the twenty-six-month period from October 2002 to December 2004. Details of the project can be found at http://e3learning.edc.polyu.edu.hk .
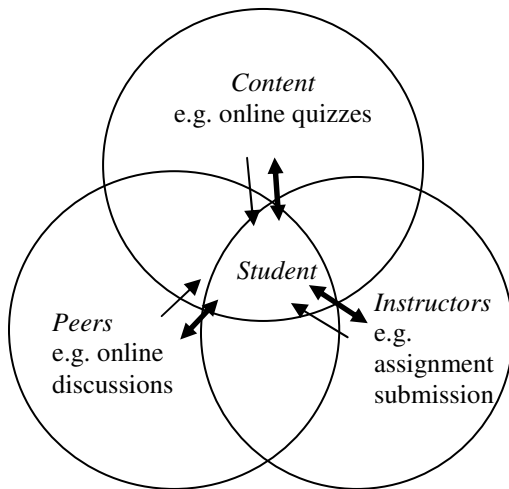
The investigation involved an analysis of web materials drawn from the purpose-built websites and learning objects from a variety of disciplines utilizing many different web tools and methods (such as animations, simulations, quizzes, and peer critiques). They were also judged according to their ability to generate enriched interactions. The result of the investigation, displayed in Table 1, is the list of eLearning strategies which range from simple to interaction-rich.

Interaction with content
- Just-in-time information through **online references**   - Better explanation of dynamic concepts through **animation** and **simulation**   - Application of concepts through **online cases**   - Improvement of procedural knowledge through **videos**   - Consolidation of knowledge and skills through **self-assessment with feedback**   - Learning through playing **educational games**   - Increasing assessibility through **mobile-learning**
Interaction with instructors
- Clarification of ideas with teachers through **chat-rooms** and **discussion forums**   - Extended discussion on **news** and **controversial ideas**   - Answering students' questions about the course using forum & **FAQ**   - Sharing expertise through **video conferencing**
Interaction with peers
- Building an **online learning community**   - Peer learning through **online group work**   - Challenging each other's ideas through **peer commenting and discussion**   - Reflective learning through **peer critiques** and **revision of assignments**   - Building a larger learning community through **inter-cultural exchanges**   - Better understanding through synthesis and creation by doing **multimedia projects**

Table 1: eLearning Strategies Arranged by Interaction Type

In the next section, selected strategies are presented for each of the three interaction types; i.e. content, instructors, and peers. For the full list and to view working examples / self-explanatory demonstrations, please refer to the site at http://e3learning.edc.polyu.edu.hk/Disted05 .

eLearning Strategies with Enriched Interactions

Below are a few sample strategies that involve students interacting with **content**.

- *Consolidation of knowledge and skills through **self-assessment with feedback***: The example is an online quiz which takes the form of a 'slot machine'. The teacher requesting this learning object wanted to get students to test their knowledge of grammar in an interesting way. Students choose the answer and pull the handle for answer checking. The correct answer will be provided to the students and points will be awarded. Immediate feedback is provided from the computer to the students, taking interaction from single direction to a simpler form of enriched interaction.

- *Better explanation of dynamic concepts through **animation** and **simulation***: An example is found in a virtual simulation for Optometry students. The teacher developed a web-based simulation to let the students practise objective refraction using a professional tool (retinoscope) in different scenarios. Multiple attempts are allowed and results are emailed to students and teachers. A virtual machine has been developed to resemble the real machine as much as possible. Students learn through trial and error. The online programme behaves according to students' input, and thus facilitates enriched interaction for the students.

- *Learning through playing **educational games***: Games are thought to be an effective way to engage students in learning activities (James, et. al. 2003). The teacher of a course on molecular biology has developed a role-play game to let students act as a researcher to gather required materials like enzymes, substracts and DNA fragments by completing different learning-related tasks. The final mission is to handle a PCR (polymerase chain reaction) experiment. The teacher wants to develop students' problem-solving skills related to the profession. The game facilitates interaction by responding to students' actions, thus allowing two-way and very rich interactions.

Here are some strategies that involve students interacting with **instructors**.

- *Clarification of ideas with teachers through **chat-rooms** and **discussion forums***: A teacher of radiography has made use of a chat-room activity to facilitate idea exchanges. The teacher lists out discussion topics and assigns the time to have an online tutorial. At the appointed time, the teacher facilitates discussion so that students are not passively sitting in front of the computers but have two-way idea exchanges with their instructor. Peer to peer communication is also possible using this strategy, but focus tends to remain on the teacher as expert.

- *Extended discussion on **news** and **controversial ideas***: A teacher set up an assignment which required students to post and discuss the latest news as forum discussion topics in a business course. The teacher spends a great deal of time commenting on students' postings. Students also show high involvement and participation in the conversation with the teacher as well as each other. Student growth in sensitivity to events happening around them is observed through this design which achieves rich interactions.

- *Sharing expertise through **video conferencing***: Group projects are completed by design school students in HK and design students from schools in other countries. The final presentation is carried out using video conferencing in which students can simultaneously see and hear each other and the

teachers and view the project work . Teachers from the schools in both countries gave feedback to students, providing an interaction-rich context for students to learn.

Lastly, here are some strategies that involve students interacting with their **peers**.

- *Building an **online learning community***: This is a 100% online programme teaching Pragmatics in the English language. Students have to submit group assignments weekly. The discussion forum becomes an important channel of both instructor-to-student and student-to-student communication. Though the teacher also participates, students are encouraged to discuss their assignments and weekly tutorials among each other.

- *Challenging each other's ideas through **peer commenting and discussion***: During this course in Nursing, students are out in clinics and hospitals for placement. They are encouraged to share their working experience in a forum. This virtual community not only provides a chance for them to express their happiness and difficulties, but also provides a way to give comments and support to each other, ensuring rich interactions.

- *Reflective learning through **peer critiques** and **revision of assignments***: The teacher divides her students in a Nursing course about Home Care into groups and defines a debate topic in the forum. Pairs or small groups have to debate and feedback on alternate weeks. Each group has 3 chances to post on their debate topic. It takes 6 weeks to complete a debate, but the interactions observed are extremely rich.

- *Building a larger learning community through **inter-cultural exchanges***: By using the forum as the common platform, Masters' degree students learning Design from Korea share and discuss "customer behaviour" with sub-degree students in Hong Kong. The context of this interaction-rich 'Learning Community' has moved from 'local' to 'global'.

Conclusion

Web-based learning strategies can be classified according to the type of interaction they foster: with content, with instructors, or with peers. The paper highlights that interactions range from simple to very enriched. There are strategies that tend to generate the enriched type of interactions and the paper has exemplified the strategies with real cases. It is hoped that these strategies can guide future eLearning planning and practice, as it is reasonable to assume that for more effective learning to take place, eLearning experiences should be able to provide enriched interactions. For further exploration of these interaction types including a rubric for selecting appropriate strategies, please refer to another paper presented at this conference titled "Online learning strategies that work: real examples (with an emphasis on strategy planning)" by the same authors.

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