Online Courses: Models and Strategies for Increasing Interaction

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Abstract

Online courses may appear to be similar to one another because they use a common set of tools to present material in web pages and provide facilities for discussion. However, the ways in which the tools are used can result in quite different experiences for course participants. This session will draw on experiences from the Master of Education program at the University of Southern Queensland and the Education Technology graduate program at Purdue University. Examples of different course models - print plus, substantive conversation, performance coaching, virtual seminar, online conference and simulation - that can be created using the common tools will be presented and discussed. Strategies for initiating, sustaining and concluding meaningful online discussions in the contexts of these models will also be presented.

Introduction

Regardless of which learning theory we subscribe to (e.g., behaviorism, constructivism, social cognitivism), interaction, in some form or other, is believed to be critical to the learning process (Ertmer and Newby, 1993). Similarly, "interaction is widely cited as the defining characteristic of computing media" (Swan, 2002, p. 4). For example, Arbaugh (2000) investigated five Internet-based MBA courses and found that students' perceptions of learning were most closely associated with the instructor's emphasis on interaction within the course, ease of interaction, and classroom dynamics. Cunningham (1992) also emphasized the importance of this interaction, noting that it was the *dialog* among online community members that promoted learning. According to Palloff and Pratt (1999): "The learning community is the vehicle through which learning occurs online. … Without the support and participation of a learning community, there is no online course" (p. 29).

In general, there are three types of interaction that occur within online courses: interaction with content, interaction with instructors, and interaction among peers (Moore, 1989). Interaction with content refers to learners' engagement with instructional information; interaction with instructors refers to the methods by which instructors teach, guide, assess, and support students' learning; and interaction with peers refers to the multiple ways students communicate with each other and support each other's learning.

While interactions with instructors and peers have, historically, been problematic for students enrolled in distance education courses, the relatively recent availability of interactive computer-based communication technologies (Bernard, Rojo de Rubalcava, and St-Pierre, 2000) has substantially ameliorated this issue. Students are able to engage in timely interactions with instructors and peers using asynchronous (e-mail and discussion boards) or synchronous (text chat) tools. These tools offer some advantages, such as easily searchable records of exchanges, over face-to-face interaction but lack some of the subtlety achievable through non-verbal communication. The use of voice and video for communication is currently restricted by bandwidth limitations but future advances in network capacity and compression techniques can be expected to enable more widespread access.

In place of the inherent difficulty of interaction at a distance, however, a new challenge has arisen. That is, how to use these new interactive technologies in ways that support student learning. According to Bonk, Malikwoski, Angeli, and Supplee (2001), "There is minimal guidance as to their pedagogical significance and scant research to make firm claims as to how educators might use such technology" (p. 1). In this article, we attempt to fill that gap by providing guidance at two levels, that is, the macro (course design) and micro (discussion strategy) levels. We begin by describing various models of online course design, each with its own pattern of interactivity, in order to help instructors choose a model that supports their teaching style, their students' needs, and the particular demands of their content. Following that, we describe effective strategies for facilitating student-student interaction, via asynchronous discussions, within any online course.

Models of Online Course Design

Despite the relatively short history of online education, there is a substantial body of literature offering suggestions for effective design and implementation. However, most of these suggestions are based upon the experiences of practitioners and, as yet, few are backed by authoritative research. Some are distillations of experience into practical advice about the conduct of online discussions (Salmon, 2000) or the promotion of active online learning (Salmon, 2002). Others are attempts to provide a broader theoretical framework to guide design of online environments that promote constructivist learning. For example, Schneiderman (1998) proposed a three component philosophy which he characterised as "Relate-Create-Donate." In this model, students work in collaborative teams (relate) to develop ambitious projects (create) with results that have value outside the classroom (donate). A focus on authentic, knowledge building activity is a common theme in descriptions of online learning whether the activity has a real purpose as promoted by Schneiderman or is conducted in some form of simulation. In the latter case, recent work has suggested that engagement by the learners depends on a "willing suspension of disbelief" similar to that experienced in response to various art forms (Herrington, Oliver, and Reeves, 2003).

Print plus

In the earliest days of online education at the University of Southern Queensland (USQ) it was thought that being an established provider of distance education would confer an advantage because so much prepared instructional material was already available. A substantial number of print-based packages were converted for online offering by rendering the selected readings as scanned images in PDF and the locally written material as HTML. The content of these converted courses remained essentially unchanged from that designed for print distribution. Whether offered in print or online, the major type of interaction in these courses was with the content. There was limited interaction with the instructor, mostly in association with assessment, and very little opportunity for direct interaction among peers.

While computer mediated communication (CMC) facilities were made available for all courses, online and print, because the courses had been developed originally for print they did not typically include activities that made effective use of the CMC. A few courses

were modified to include activities that encouraged students to engage with each other and/or the teaching staff using CMC but many students studying in print-based mode had limited or no access to CMC and it remained an optional component.

There is nothing inherently wrong with distributing course materials in the form of atoms (in print or CD-ROM) rather than as bits (online) (Negroponte, 1995). For certain content, such as video, where network capacity may present challenges or where student access is limited, postal distribution of the core materials may be the most appropriate solution. However, even when the bulk of course content is provided in this way, the addition of appropriately designed and implemented online activities (Salmon, 2000, 2002) supports more collaborative learning than would otherwise be possible. The addition of such activities reduces the reliance upon interaction with content, and the attendant difficulties experienced by some students, and increases the opportunity for interaction with instructor and peers in ways that enhance learning through more responsive feedback.

Substantive conversation

Substantive conversation has been identified as a key standard of authentic instruction (Newmann and Wehlage, 1993) and as one of the productive pedagogies that promotes "coherent shared understanding" (Education Queensland, 2001). It is characterised by sustained dialogue about matters of intellectual substance that is not scripted or directed by the teacher.

In stark contrast to conventional face-to-face teaching, traditional print-based distance education offers little or no opportunity for such interaction. Online education can provide a variety of different communication methods that might support substantive conversation as a pedagogical form. Asynchronous communication by email or discussion forums can work well for some purposes and may encourage more thoughtful contributions because responses do not have to be generated in real time. Particular efforts may be required to encourage participation by establishing social presence (Gunawardena and Zittle, 1997). Synchronous communication using text chat, shared workspaces, or audio/video offers greater spontaneity, which may assist with creating group cohesion. Most online environments, including BlackBoard and WebCT Vista as used at USQ, support both asynchronous and synchronous communication. Although students in such courses interact with content, the emphasis is on interaction with other participants in the conversation, the instructor and peers.

Several of the wholly online courses offered at USQ have developed teaching approaches around the use of online discussions to build shared understanding through substantive conversations. Students are invited (or required) to respond to some stimulus which may be a reading, website, or their own experience in the form of a "reflection" posted in the discussion area. Skilled moderation (Salmon, 2000) may be required to sustain and develop the ensuing conversation in ways that encourage further contributions to building understanding of the course topic.Strategies for initiating and sustaining these conversations are discussed later.

Performance coaching

Another affordance of face-to-face teaching that has typically not been available through print-based distance education is timely feedback on student performances. Structured activities embedded in the materials and the ready availability of teachers by telephone have helped but are seldom as responsive or effective as a teacher in a classroom for shaping performance.

For many purposes, the asynchronous communications methods available in online courses can provide prompt and effective feedback without the difficulty of getting both parties to a telephone simultaneously. Synchronous communications can support "virtual office hours" for more interactive feedback. In addition, it is possible to embed interactive activities, or COOLTools (USQ, 2003), into a course in ways that can provide immediate feedback to support student understanding and may return information about student progress to the teacher.

One USQ course that adopts a performance coaching approach teaches skills for creating simple multimedia through a series of carefully sequenced exercises based on examples provided in the materials (Fisher, 2000). This approach was adopted to ensure that, so far as possible, all students would gain a similar range of basic skills in multimedia creation and to provide clear models for development of those skills. In one example of an activity sequence, students write a haiku, set it as text in a font they select, and convert the text to an image for display in a web page. They subsequently embellish the image, animate it and record their own voice reading the haiku mixed with music or sound effects. The sound and image(s) are then presented, first as a QuickTime movie, and later using Macromedia Flash. This process affords students opportunities to practise a variety of skills on the same content and to compare the capabilities of various multimedia tools.

At each step students are encouraged to share their creations with their peers by publishing them on a web page and posting the URL to the course discussion area. Students are able to ask other students for information about how they achieved particular effects. They are also able to seek direct support from course staff when they experience difficulties. In a course of this type, interaction with content is clearly important but, provided appropriate steps are taken to build a sense of community among participants, interaction with peers can contribute significantly to motivation and consequent learning.

Virtual seminar

Another standard of authentic instruction is "connectedness to the world beyond the classroom" (Newmann and Wehlage, 1993). The same concept is included in both the productive pedagogies (Education Queensland, 2001) and the "relate-create-donate" approach (Schneiderman, 1998). Print-based distance education courses have applied these ideas through appropriately designed embedded activities and authentic assessment which has allowed students to gain course credit while completing activities that can be usefully applied in their own contexts.

Online education offers additional options for collaborative work with connections to the real world. Compared to face-to-face classes, in print-based courses, long communication times can restrict the opportunities of students to confer with the teacher, peers, or others beyond their local contexts. In online courses these restrictions are relaxed or removed permitting a wider variety of interaction with instructor and peers.

One successful online course model at USQ operates along the lines of a graduate seminar. Rather than provide students with large amounts of prepared content, the seminar course presents a series of related modules, each with a short stimulus paper, pointers to selected readings and structured activities, which may require students to conduct a short survey in their local contexts or collect other forms of information. The products of student work are then shared through the discussion forum and used to develop the course themes. The activities may contribute towards course assessment as well as to increased understanding of the

student's own context with a potential to inform future work.

Experiential learning

The concept of applying instruction to one's own context is also embedded within an experiential learning approach. Broadly defined, experiential learning involves the acquisition of knowledge through personal involvement in activities or events.Similar to both action learning and action research, experiential learning is a cyclic process, with action and reflection occurring alternately (Dick, 1997). The reflection stage is used to both critically review the previous action and to plan the next one. While action research projects are typically completed by individual teachers in their own classrooms, simultaneous participation in an online course can broaden the experience and thus, increase the learning that occurs.

For example, teachers in a school district in Indiana participated in an online community while simultaneously designing and implementing action research projects within their own classrooms. Course content revolved around ideas of authentic instruction and self-directed learning; teachers designed action research questions that explored strategies for improving students' self-directed learning skills within their own classrooms. Whereas individual reflection might suffer from a lack of *critical* review, online discussions provide opportunities for teachers to give and receive feedback from others, thereby enriching the reflection stage of the learning process. Additionally, by making their reflections public, participants are forced to explicate the implicit theories that underlie their decisions and actions. This, then, enables them to more effectively translate these intuitive theories into action.

Online professional development

Until recently, professional development efforts, related to increasing technology skills, have generally focused on the needs of the classroom teacher, with little attention paid to administrators' needs.Yet many of our administrators are novice technology-users and have little experience or training in the knowledge and skills needed to be effective technology leaders. Furthermore, due to full and unpredictable schedules, administrators typically find it impossible to attend ongoing or weekly training sessions. Moving to an online environment can counter some of these difficulties.

As an example, an online professional development course [HREF3] was designed to help administrators gain both the competence and confidence needed to facilitate and support effective learning environments supported by technology. Participation in the course comprised a variety of virtual interactions and discussions and incorporated three primary strategies (modeling, reflecting, and collaborating) that, based on previous research (Ertmer, 1999; 2003), were judged to be effective in supporting teacher and school change. For example, participants observed (via the Web and CD-ROM) a number of model teachers; engaged in ongoing reflective conversations via asynchronous bulletin board discussions, as well as synchronous chat sessions; and collaborated with each other for the completion of various course activities. By requiring administrators to *use* technology to *examine issues* of technology leadership, the course was able to support the development of administrators' ideas related to technology leadership, while simultaneously building their confidence and competence related to technology skills.

Online conference

Many print-based courses require students to prepare substantial papers. The reading and preparation of the paper is a significant learning activity and the paper provides a basis for assessment of student performance. Constraints on time and communication methods typically do not allow for the exchange of papers among students, effectively restricting interaction to that with content and the instructor. However, online courses need not be subject to the same restrictions since files and messages can be exchanged relatively easily and quickly, allowing significant additional interaction with peers.

One USQ online course is built around an online conference about multimedia applications in education. Students are provided with a small collection of stimulus readings in a broad topic area and are asked to prepare a proposal for a paper to be delivered in the online conference. The proposals are graded and students each prepare anonymous peer reviews of two proposals. The reviews are also graded. Using the grading and reviews for guidance, students complete their papers, which are presented online and used as the basis for discussions hosted by the authors of the papers over a three-week conference period. As a final activity students are required to select a small number of papers from the conference and write an introduction to their collection. The design affords students opportunity to pursue a topic of individual interest in depth as well as to gain broad familiarity with the field.

Simulation

Despite the evident value of learning in real contexts it is sometimes preferable to work with a simulation than with the real world. Classic examples include the use of simulators for flight training but computer-based and online simulations have proved useful in fields such as nursing practice (Naidu, Oliver, and Koronios, 1999) and a variety of other vocational training applications (Oliver, 2001). A strong base of theory relevant to the design and implementation of such environments is developing (Jonassen and Hernandez-Serrano, 2002; Oliver, Harper, Hedberg, Wills, and Agostinho, 2002).

One existing course in the Master of Education program at USQ has made limited use of a multimedia simulation constructed with problem-based learning as the underlying design framework (Albion and Gibson, 1998; Gibson and Albion, 1999). The materials are presented for use in an HTML browser, either direct from CD-ROM or from a web server. They incorporate numerous images, over 100 QuickTime video clips comprising more than an hour of video content, and a small number of interactive components. Interaction in this course has been primarily with the content but variations are possible which promote significant interaction with peers working together on a simulation.

Scenarios and cases presented with little or no media content can also be effective. The key to their success is providing authentic stimulus material that promotes student engagement with the issues (Herrington et al., 2003). This strategy has been used effectively for many years at Purdue University. For example, students in an advanced instructional design (ID) course read selected print-based cases from *The ID CaseBook* (Ertmer and Quinn, 2003), and then discuss them, asynchronously, via a course discussion board. While students tend to be enthusiastic about the use of cases (citing their authenticity and relevance to professional practice), several weaknesses have been noted, particularly during initial attempts. In general, early discussions revolved around surface details rather than underlying issues. Students seemed to engage in a type of "group-think" and appeared unwilling to voice opposing perspectives or alternative solutions. In an effort to solve this problem, we combined students from two universities in our online discussions. This, then, extended the range of perspectives and increased the variety of background

experiences brought to the table. As such, this provided the type of authentic experience advocated by Newmann and Wehlage (1993): students were intellectually engaged with diverse others in discussions about relevant content.

Coaching Online Discussions

While the specific course design will *allow* students to interact, to varying degrees, with content, instructor, and peers, it does not necessarily *encourage* or *promote* interaction. Rather, specific care must be given to how these interactions are initiated, sustained, and concluded. In this section we describe strategies for facilitating meaningful discussions.

Initiating online discussions

Good discussions, whether in a face-to-face or an online environment, are not automatic. They require both careful planning and facilitation. If either of these is inadequate, the discussion is likely to wander. According to Eisley (1995), structuring an online discussion involves three main activities: 1) limiting the content focus, 2) selecting a structure that invites responsive interaction and avoids redundancy, and 3) communicating the discussion format. In order to limit the focus, an instructor needs to provide specific directions that establish the rules for discussion. Content boundaries need to be fairly narrow. For example, rather than ask students to "share your thoughts about self-esteem," a more focused opening might be, "What role does self-esteem play in the success of incentive systems? Please give examples." *Responsive communication* refers to interactions in which participants comment and build on each other's contributions, which has the effect of creating a conversation among participants. Asking each student to "give an example of a poor feedback system you have experienced" is likely to lead to unresponsive communication, whereas asking students to "work together to propose a group recommendation on how to improve the feedback system in XYZ Corporation" almost demands that learners respond to one another. Redundancy is avoided by explicitly asking students to build on each other's ideas, rather than propose his/her independent ideas. Finally, instructors can use a variety of discussion formats (e.g., role play, debate, twenty questions, hot seat) to keep discussions interesting, focused, and productive. The introductory statement is the key mechanism for clearly communicating the specific format to the participants.

Initially, students may be hesitant to participate in online discussions. Fostering a sense of community through informal forums dedicated to social interactions (introductions, personal interests), humor, and/or technical support, can alleviate some of these concerns. In addition, instructors can use the formal forums to set a positive tone, establish clear expectations, provide model responses, and add personal examples. These strategies can foster a greater sense of community among the participants and, according to the literature, lead to greater learning (Cunningham, 1992; Palloff and Pratt, 1999)

Sustaining online discussions

Roblyer and Ekhaml (2000) noted that "with proper instructional design, distance courses actually can be more interactive than traditional ones, providing more personal and timely feedback to meet students' needs than is possible in large face-to-face courses." Still, it is typically the instructor's responsibility to create and implement the "proper instructional design." That is, once the discussion has begun, the instructor plays a key role in *managing* the discussion: keeping the conversation focused while also moving it forward. Instructors must constantly be on guard for topic drift. Strategies for keeping the discussion *focused* include 1) acknowledging posts that have focused on the key issue, 2) asking students to expand on their comments, 3) contrasting comments made by different students, and 4) asking students for examples or supporting evidence to clarify a comment. In maintaining the flow of the discussion, it is important to remember that we want our students to do more than just talk; the primary goal is to maintain a focused discussion that addresses relevant issues.

To move the conversations forward, instructors need to be careful not to revert to a traditional teacher's role and provide "answers" to students' questions or concerns. Instructors' comments often have the unwanted effect of ending the dialog prematurely, due to students' perception that the 'expert" has spoken (Ertmer, Stepich, and Lane, 2001). The use of "discussion tags" can ameliorate this to some degree. For example, at the end of a message, consider adding comments that invite students to post other perspectives: "Just my thoughts. I'm sure there are other perspectives. What do you all think?"

The use of wait time is essential to allow students to respond to each other. If students don't respond in a reasonable amount of time, instructors might try a more subtle approach to prompt interaction: "Sam posed an interesting question. What do the rest of you think?" One of the most effective strategies instructors can use to guide and sustain online discussions is questioning. Questions should be clear, specific, and open-ended. In addition, questions that are somewhat controversial and are likely to produce different opinions can provide a powerful tool for initiating and sustaining meaningful dialogue. Finally, consider using any of the following types of questions: 1) clarifying (How does this example relate to the theory being discussed?), 2) probing (Could you tell us a little more about that point?), 3) focusing (Could you narrow that down and give us a specific example?), 4) summarizing (What's the bottom line of all this discussion?), and 5) evaluating (When you add this all up, what conclusions do you draw?). Instructors establish the level of thinking in their discussions, and thus their classrooms, by the level of questioning they maintain.

Concluding online discussions

When it's time for a discussion to end, how can it be concluded effectively? One of the most useful strategies involves the use of *weaving* comments. That is, the instructor or moderator looks for similarities and differences across the postings and synthesizes them in a way that leaves the door open for further exploration. Whereas summarizing can actually curtail a discussion (Haavind, 2000), weaving comments present a *landscape* of the multiple perspectives offered. By juxtaposing participants' comments, there is opportunity for further reflection. Other strategies for concluding a discussion include describing the issues that still need to be resolved, reviewing unexpected developments or findings, and asking students to share "lessons learned" and/or to reflect on the "best ideas" that resulted from the discussion. Each of these strategies brings *closure* to a discussion without *closing off* additional ideas or insights.

Given the amount of emphasis placed on participation in an online course, it is important that students receive timely feedback. Decisions must be made regarding what will be evaluated: number of responses, length of responses, number of messages read by the participants, or some combination. Providing a checklist or rubric ahead of time assures that students know what they should emphasize in their postings. Instructors have also found it useful to ask participants to rate each other on their contributions although students are fairly reluctant to do this.

According to Haavind (1999), the quality of learning that takes place in an online course is highly dependent on the skills of the discussion moderator, who must make "effective but restrained interventions to steer a groups' learning process in the right direction." Thus, instructors must be able to provide both the structure and freedom needed to intellectually engage students with the content through their engagement with each other. Carefully planning how these interactions will occur, monitoring them while they occur, and providing closure and feedback when they are completed, can assure that these goals are met.

Conclusion

Print-based distance education has served the USQ Master of Education program and similar programs well. The materials and methods developed for that purpose may still have a role to play in delivery of education but they cannot provide a complete response to the emerging needs of many learners.

A contemporary educational program requires an increased focus on building and applying knowledge rather than transmitting and storing it. It needs to promote authentic learning that relates more directly to the professional contexts in which students find themselves. It needs to promote "engaged professionalism" in which educators develop dispositions and capabilities for sharing knowledge with colleagues. Online education supports approaches to teaching and learning that increase the likelihood that courses will be able to achieve these goals. These approaches are based on opportunities for learning through a wide variety of interaction techniques in courses that reflect different design models depending upon the characteristics of learners, instructors, and learning goals.

As described above, there is no single approach to using online tools that works best in every educational situation. There are multiple possible approaches, more than enumerated above, that may be used individually or in combination. Developing faculty capacity to expand the use of online approaches will require that we take a dose of our own medicine, working collaboratively to build knowledge about teaching and learning in the twenty-first century.

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