



## **Teaching Tip**

# **Strategy for Assessment of Online Course Discussions**

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### **ABSTRACT**

The online teaching environment is a powerful interactive medium for promoting higher order thinking skills in students. Faculty have to adapt to this new medium by using components in online course tools (such as discussion boards) to create assignments that incorporate cooperative and collaborative learning. Assessment of this type of learning activity is different from tests used in traditional courses. This article discusses the role of discussions in online courses, provides a case for effective assessment needs, and using a sample case study discussion offers a strategy that can be used by faculty to assess online discussions.

**Keywords:** Web Course Tools, Online Discussions, Assessment, Management Education

### **1. INTRODUCTION**

The Internet has become especially popular among educators because of its ubiquitous, global, platform independent nature that supports education through the creation, sharing and distribution of online course materials. Business schools have been under constant pressure to provide students the skills and experience needed to effectively use emerging technologies (Alavi et al., 1995; Hilldebrand, 1995) that are being used by businesses to gain competitive advantage (Leidner and Jarvenpaa, 1993). Webster and Hackley (1997) have identified previous studies of business schools adopting computer-mediated distance learning for business cases and simulations. With the acceptance of business models that integrate online technologies for business-to-business and business- to-consumer transactions as well as the exponential growth of e-commerce, it becomes imperative to prepare students to be proficient in using interactive web based applications. An online environment provides opportunities for students to work in teams to accomplish tasks and projects using collaborative software that has built-in tools to facilitate content creation and document sharing.

Many business faculty have realized advantages of using online technology to supplement face-to-face instruction because of the benefits offered by this medium. The Internet has quickly evolved from being merely a distribution channel to an interactive environment for

collaborative learning. In what can be considered a partial response to Frost and Fukami's (1997) challenge to the profession to think in deep ways about management education and teaching, faculty have realized the tremendous potential of actively engaging students in the online environment. Students have also appreciated the benefits and convenience of accessing course materials online. The technology component is now being integrated with almost every functional area of management education.

Since the Web is a different medium, teaching styles have to be adapted to this environment. Many faculty who have not used technology in the past to facilitate learning in classroom, now have to reengineer their thinking to teach with technology using a different medium. Faculty have to adjust to the new pedagogy that uses technology as an integral component in teaching. In this mode, faculty have to relinquish control and adapt to a new way of teaching that encourages cooperative and collaborative learning in students. Faculty pioneers have offered online web courses that simulate traditional (face-to-face) classroom environment by using online syllabus, schedule, course notes, assignments, and discussion boards. In addition, students are also provided the opportunity to communicate with the instructor or other students by using e-mail, bulletin/discussion boards, live chat rooms. Capabilities such as online assessment, simulations, multimedia, course delivery, and access to external resources provide potential advantages over lecture-only classes. Effectiveness of

these experiential type learning has been supported by researchers. Vygotsky (1986) recognized the use of social dialog and interaction to be an essential part of the learning process. Assessment represents a cognitive behavior modification technique designed to help students develop goal setting behavior, planning, and self-monitoring (Good & Brophy, 1995) and provides opportunity for students to master the concepts (Bloom, 1956).

This article explores the assessment of interactive discussions in the online environment, more specifically the online discussion boards (sometimes also called Bulletin Boards). Using excerpts of an Information Technology and Network Management case study, this article presents a rubric for assessment and shows how interaction can be graded based on that rubric.

## **2. ONLINE COURSE DISCUSSIONS**

In traditional as well as online environments, instructional design principles must be applied to develop pedagogically effective learning materials. Ritchie and Hoffman (1997) emphasize that well designed courses include elements that motivate the learner, specify what is to be learned, prompt the learner to recall and apply previous knowledge, provide new information, offer guidance and feedback, test comprehension, and supply enrichment or remediation. Web-based instruction in particular should be designed to accommodate individual learning styles. However, this does not imply using all available technology components but instead using only those appropriate ones that will directly contribute to enhanced learning in students. Traditional classrooms have used objectivist model of learning, which is based on Skinner's theory of transfer of knowledge from teacher to the learner. In this model, the instructor controls the material and pace of learning. Describing this model, Cuban (1993) mentions that instruction is directed to the whole class as a large group, the pace of learning is controlled by the teacher, and curricular and instructional decision making is guided by the textbook as the primary medium. On the other hand, constructivist model is student-centered (Hofstetter, 1998). Here the instructor acts as a moderator primarily responsible for facilitating learning. In this model, most instruction occurs in small groups, students help choose the content to be organized and learned, teachers permit students to determine the rules of behavior, classroom rewards, and punishment (Cuban, 1993). Because of the capability of Internet to use discussion groups and text, graphics, audio, video, file transfers over electronic mail in asynchronous (not real time) format; and also videoconferencing, whiteboards, chat in synchronous (real time) modes, a different learning medium has evolved that is closely based on constructivist approach to learning. Bloom's (1956) taxonomy of learning lists six levels of cognitive skills: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. Effective discussions address higher order skills in Bloom's hierarchy by engaging students in applying theories, examples, distinguishing between facts, evaluating responses of other

students, providing opposing viewpoints as well as feedback on other discussion posts. Discussion groups provide a platform to debate issues. A variety of activities can be used with online discussions, including case studies, brainstorming, role-playing, critiques, and reaction/position papers. Another important aspect of online learning is collaborative learning which depends strongly upon interactive communication.

It was noted by Hall (2002) that demonstration of 'deep level' student learning is critical in assessment. Hall described deep level student learning by listing several verbs including hypothesize, generalize, reflect, apply, integrate, analyze, and explain. In order to achieve deep level understanding, an online learning environment needs to be created where the student is motivated and proactive in the learning process. As compared to the lecture method, small group discussion learning offers students better opportunities to acquire critical thinking skills and metacognitive learning strategies (McKeachie, 1986). Interacting with other students forces participants in discussion groups to explore different perspectives that lead to greater understanding of material to be learned. The struggle to resolve potential conflicts brought forth also results in development of higher levels of understanding (Slavin, 1990).

## **3. ASSESSMENT OF DISCUSSIONS**

The goal of assessment is to determine if learning objectives have been accomplished. Formative evaluation using online testing helps students assess their level of knowledge of the course material. In addition, it gives the instructor a better idea of what students are understanding as well as the concepts that still need clarification (Hazari, 2003). Graham et. al. (2001) have listed seven principles for effective use of online discussions. These principles are: 1) Instructors should provide clear guidelines for interaction with students, 2) Well-designed discussion assignments facilitate meaningful cooperation among students, 3) Students should present course projects, 4) Instructors need to provide two types of feedback: information feedback and acknowledgment feedback, 5) Online courses need deadlines, 6) Challenging tasks, sample cases, and praise for quality work communicate high expectations, 7) Allowing students to choose project topics incorporates diverse views into online courses. Within discussion groups, faculty have to adapt to a different medium that is used to provide instruction and communication. The primary approach used in discussions taps into experience that students bring to the classroom. Students use past experience as anchors for new learning by using the Socratic method along with cooperative learning. In this environment, the instructor provides structure to the course environment by handling administrative issues, initiating a topic for discussion, providing discussion points to help students get started, and providing clarification if needed. The main responsibility of learning by taking initiative and doing research is shifted to the student. Malone et. al (1997) call

for a research-based criteria to assist faculty in determining effectiveness of their online materials. Popham (2002) recommends two approaches for assessing constructed-response material (such as online discussions). These two approaches are Holistic and Analytic scoring. In holistic scoring strategy, the student response is scored as a whole and is sometimes referred to as "impressionistic" scoring. Discussion posts of a student are collected and assigned a single score. According to Terry (1989), in holistic scoring, initial criteria is established prior to scoring, and these criteria are then taken as a whole (without assigning points to each criterion element) to assign scores based on tone, structure, and comprehensibility of the writing. Analytic scoring is more detailed in which individual criterion are established using a point-allocation method and using a scoring matrix, points are allocated to each student's discussion for the criteria. The sum of score gives the students overall score. The main advantage of this scoring method is that it helps identify the students' strengths and weaknesses. It is however time consuming and focuses on different aspects which may result in overlooking the overall quality of discussion posts and communication of ideas, as well as responses evoked from other students. A hybrid approach that combines the advantages of different methods can also be used. One such evaluation

rubric for assessing weekly online discussions that was developed based on review of literature and peer input from other faculty teaching in the online environment is shown below in Figure 1. The rubric awards a range of 1.0-5.0 points (in increments of 0.5) for weekly discussions based on several criteria such as research depth, feedback to other students, regular input, citing examples from professional practice, and demonstrating leadership qualities.

As can be seen from the Figure 1 rubric, set criteria have been established for achieving point scores. At the end of the week, discussions of each student are collected and analyzed using criteria mentioned above. Although scores are not assigned to each criterion individually, student response as a whole using collective criteria in the rubric is evaluated. Regularity of posting can usually be determined by sorting discussion posts according to dates (a feature usually available in most web course tools such as WebCT and Blackboard). An overall score is then assigned to the student. For a large class, analytic scoring using individual scoring matrix each week would be time-prohibitive for the instructor, therefore a hybrid approach offers the opportunity to evaluate the discussions and provide feedback to students for continuous improvement.

**1.0 – 2.0 points:**

- Posted main topic information.
  - Replied to one other student posting.
  - No depth of presentation, no research base, opinion only.
  - Information posted only one time or several posts at one time.
  - Comments were barely related to main discussion question and/or other student posting.
  - No constructive comments to help class discussion.
  - All posts made within 24 hours of assignment due date
- 

**3.0 – 4.0 points:**

- Posted main topic information and one response on same day.
  - Several posts, but all on same day
  - Time between posting indicated student had read and considered substantial number of student postings before responding.
  - Replied to other student postings and provided relevant responses and constructive feedback to the student.
  - Enhanced quality of discussion (i.e. illustrated a point with examples, suggested new perspectives on issues, asked questions that helped further discussion, cited current news events etc).
  - Time between posting indicated student had read and considered substantial number of student postings before responding.
  - Referenced other research, gave examples, and evoked follow-up responses from other students.
- 

**5.0 Points:**

- Demonstrated leadership in discussions.
- Posted regularly during the week.
- Replied to main topic. Substantially enhanced quality of discussion (i.e. illustrated a point with examples, suggested new perspectives on issues, asked questions that helped further discussion, cited current news events etc.)
- Replied to several other student postings on a regular basis and provided relevant responses and constructive feedback to the student posting.
- Time between posting indicated student had read and considered substantial number of student postings before responding.
- Referenced other research, gave examples, and evoked follow-up responses from other students.

**Figure 1: Rubric for assessing online discussions**

#### 4. SAMPLE CASE STUDY

In most web course tools, discussion posts are 'threaded'. This means that within a discussion there can be several topics being debated simultaneously and when students make their initial post, other students can reply to a post by having the discussion appear indented under the main post thus making it possible to reference original responses. Instructors and students also have an option of sorting discussions by Author, Date, and Subject. An excerpt of exemplary student discussions on a case study is shown in Figure 2. In Figure 2, three student discussions are shown. The discussions are based on an Information Technology and Network Management Case study "Cookies R Us" (Fitzgerald & Dennis, 2002), in which the company has a need for transmitting sales and inventory data to headquarters. Students are asked to recommend a type of WAN architecture and service for the company's network. (Note: Names/e-mails of students have been changed to protect their privacy). Instead of presenting the case and submitting it directly to the instructor for a grade, discussion groups provide the opportunity for debate.

Referring to the above transcript, the qualities attributed to students are as follows:

Michael: Reply to other students in context of an earlier post presenting counter argument based on research. Professional practice example.

Roger: Counter argument, respectfully disagreeing and providing basis for disagreement (goes to show effective communication skills).

Leslie: Rebuttal, justification of original recommendation, real life example of current

practice by large corporation applied to case being discussed.

Instructor: Compare/contrast and synthesize information, facilitate discussion by asking additional questions.

Examination of students discussions as a whole show that they have referenced external resources, actively engaged in debate, included professional experience, have compared/contrasted discussions with other students' responses, given examples, and introduced new perspectives that evoke follow-up responses from other students. Based on rubric given in Figure 1 and using the transcript shown in Figure 2 as well as additional posts during the week, the above students would be candidates for high scores.

#### 5. CONCLUSION

The online learning environment where students are motivated and proactive greatly enhances deeper level of understanding. Angelo and Cross (1993) have observed that by providing proper assessment, students reinforce their grasp of course content and strengthen their own skills at self-assessment. Furthermore, student motivation is increased when they realize that faculty are interested in their success as learners. To achieve pedagogical improvements in interactive web environments for assisting teaching and promoting learning, faculty can empower themselves by effectively using components such as discussion forums in web course tools, and utilize sound assessment techniques that provide meaningful feedback to students to help develop their communication and higher order thinking skills.

Date: Fri Feb 6 2004 8:08 am  
Author: P, Michael  
<michael@waldenu.edu>  
Subject: Re: Subject: Mini-Case: Cookies Are Us, Ch. 8, p. 265

Rob,

I concur with your recommendation of a VPN network for Cookies Are Us. A secondary consideration seemed to be leased Fractional T1 lines offering a bandwidth of 64 kbps. However, upon researching costs, one estimate quoted \$ 1,000 for the install, and then about \$ 100 per year (State of Hawaii, 2004), Paracon requires \$ 1,300. for the installation equipment (2004). Multiplying those costs by 100 stores, the numbers seem quite large for a Cookie operation. VPN offer a cost effective and flexible solution.

Michael

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<http://www2.hawaii.gov/spo/pricefiles/00-16R8.pdf>

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Date: Sat Feb 7 2004 8:25 am

Author: K, Roger <roger@waldenu.edu>

Subject: Re: LSS - Subject: Mini-Case: Cookie Are Us, Ch. 8, p. 265

Leslie, I usually like what you have to say and I like it now but I disagree with you on this one. You said so yourself, "To determine the WAN architecture for Cookies Are Us I first looked at the overall company requirements. FIRST, THE COMPANY APPEARS TO ONLY REQUIRE DATA TRANSFER AT THE END OF THE DAY. Secondly, there are multiple stores over a reasonably large geographic location. While the large geographic location does influence the overall architecture, the amount of data and the current company architecture influenced my decision.

The infrequent transmittal of data and access to the home network would make one question why a dedicated circuit when a dialup may suffice. If it was a dedicated circuit, how about ISDN as a low cost measure. ISDN and a VPN portal would produce the desired results you are looking for and they would be perceived as Extranet users on the company intranet. Data could be transmitted whenever, corporate could view store inventories and send emails to managers and associate sales personnel. Your case shows some merit and I have always liked your opinions. So, I do not mean sound so callous in my statement.

Roger

=====  
Current Forum: Week 4, Day 7 Read 17 times

Date: Sat Feb 7 2004 9:20 am

Author: S, Leslie <leslie@waldenu.edu>

Subject: Re: LSS - Subject: Mini-Case: Cookie Are Us, Ch. 8, p. 265

LOL Roger, no offense taken. My reason here is why limit the architecture to the current business requirement. Granted, they currently only send data once a day, but what if they start real-time transfers? One reason Wal-Mart has been so successful in the industry has been their ability to quickly replenish stock. This is done during the purchase process, which automatically sends information about products and purchases from the register. Why delay sending this information till the end of the day? I see this as a potential competitive advantage.

Leslie

=====  
Current Forum: Week 4, Day 7 Read 13 times

Date: Sat Feb 7 2004 10:43 am

Author: Instructor <instructor@waldenu.edu>

Subject: Re: LSS - Subject: Mini-Case: Cookie Are Us, Ch. 8, p. 265

Leslie and Roger,

I read your exchanges and feel both offer interesting perspectives. In reading your response Leslie, you use Walmart to support your position for eliminating a VPN as a solution. My only question is whether Walmart can be equated with Cookies Are Us? Granted, there are some similarities but, the inventory processes and the demands for products differ enormously between the two companies. You're certainly right about the competitive advantage Walmart gains as a result of its system. Do you think a similar set-up is necessary for Cookies Are Us? Thanks.

(Instructor)

=====  
Date: Sun Feb 8 2004 11:40 am

Author: P, Michael <michael@waldenu.edu>

Subject: Re: LSS - Subject: Mini-Case: Cookie Are Us, Ch. 8, p. 265

To All,

This thread of conversation has been extremely interesting and thought provoking. Having spend a few months within the last year at Wal\*Mart corporate offices (data center), I feel compelled to participate in this conversation. Of course, I'll stay clear of confidential and non-compete information.

As Leslie clearly articulates, it is important to consider growth and direction when making decisions based on network infrastructure. Tactical solutions are best when strategic ramifications and vision have been considered.

When looking at the application ramifications of changing the process from a daily data transfers i.e., disk at the end of the day, to file transfer at the end of the day, there is not a huge process change occurring here. However, to imply that the disk at the end of the day is going to be transformed into an on-line transaction processing system transferring transactions as they occur simply because the network infrastructure is in place, I would argue, is a bit much. Modifying a batch application into an on-line transaction processing application is, at minimal, a big deal. So big, that normally and application rewrite occurs.

Therefore, since no application rewrite was alluded to in the case study, I would argue that the disk transfer simply becomes the file transfer requiring a transmission of around a one-megabyte file from each store once a day. The one-megabyte is based on a one to two disk transfers with a disk capable of containing 720k of data.

That said, Cookies Are Us, business requirements, as interpreted by me, call for a minimal bandwidth requirements.

Michael

Figure 2: Excerpts of Case Study student discussions

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