

red in the U.S. as they have been in Japan and Europe. This will require WBI/T elopers and coordinators to carefully consider the implications of this technology for their programs, especially in light of compatibility, content, and communication issues. The authors believe that ultimately WBI/T will be positively isformed as a result of anytime/anywhere educational opportunities that are le possible by this emerging communications and computing infrastructure.

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G. Shotsberger is Associate Professor, Department of Mathematics and Statistics, University of North Carolina at Wilmington (e-mail: shotsbergerp@uncwil.edu).

ild Vetter is Professor, Computer Science Department, University of North Carolina at Wilmington (e-mail: vettterr@uncwil.edu).



Designing Discussion Questions for Online, Adult Learning

Zane L. Berge and Lin Muilenburg

In online discussions, whether in workplace training and higher education, can serve as a catalyst, helping participants to better understand. But to be most effective, facilitators must plan their questions. This article offers excellent advice for asking questions, preparing participants, and managing discussions.

Increasingly, educators and trainers are asked to design and deliver training for online classrooms. What teaching methods work best? Is discussion the same online as in-person? What questions are most effective for the instructional goals of the course?

Much of what goes on in training within organizations in the workplace and in higher education takes the form of students hearing, seeing, or reading content that was structured by the instructor, followed by the instructor asking a question of the student(s) about that content, with the instructor then reacting to each student's response. In traditional classrooms that are instructor-centered, with lectures and a focus on content, the pattern described above occupies up to 80 percent of the classroom time, with up to 100 questions per classroom hour being asked (Brown & Edmondson, 1984; Gall, 1984). But a higher frequency of instructors soliciting response from students is not necessarily what leads to more effective learning. This may be especially true if the goal is to foster discussion (Dillon, 1985).

Even in classrooms that do not use such teacher-centered approaches, question-asking is at the heart of understanding. Online learning environments, Web-

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based or otherwise, are often more learner-centered than traditional, brick-and-mortar classrooms. Online classrooms that use computer conferencing are characterized as being discussion-oriented; authentic, problem- and project-based; inquiry-focused; and collaborative (Berge, 1997). In this type of learning environment, it is usually more important for the instructor to ask the "right questions" than to give the "right answers."

The Right Questions

The right questions depend greatly on what the instructional goals and objectives are for the training, development, or education that is to take place. The right questions are those that foster learner engagement in the learning process. The emphasis in the workplace is shifting from training to a focus on the learning organization. In a lot of ways, the move to the learning organization is a philosophical shift in which organizations are recognizing that a well-trained and well-educated workforce is an important area in which they must build competitive advantage.

It is also a recognition that learning is not finished after a particular degree or certificate is achieved. Rather, education is life-long and necessary for individuals to gain the competencies needed on the job and in the complex problems of adult life. Questions that simply ask learners to recall facts are not going to be very effective in helping learners solve authentic problems, in their jobs, or in advanced studies. Such problems as found in adult life require higher-level thinking, such as clarifying, expanding, generalizing, making inferences, analysis, synthesis, and evaluating.

Levels of Questions

The difference between low-level thinking and higher-level thinking has to do with the cognitive complexity for the learner. One of the better-known taxonomies for framing a discussion of cognitive complexity was presented by Bloom and his colleagues (1984). It involves six levels, from simple to more complex: knowledge, comprehension, application, analysis, synthesis, and evaluation. Following are example questions for each level, along with the instructional processes and keywords often used with each category:

Knowledge (remembering). The instructional processes are commonly repetition and memorization, with keywords within such questions as *define, list, name, recite, describe, and identify*. "What is the definition of constructivism?"

Comprehension (understanding). Instructional processes are usually explanation and illustration, with keywords such as *summarize, paraphrase, convert, explain, extend, and rephrase*. "Can you tell me, in your own words, what Martin Luther King Jr. said in his 'I have a dream' speech?"

Application (transferring). Processes are usually practice and transfer, and keywords are *apply, use, demonstrate, operate, solve, and employ*. "Can you post a lesson plan using the criteria listed on page 45 of your textbook?"

Analysis (relating). Processes are most often induction and deduction, with keyword indicators including *relate, distinguish, point out, break down, support, and differentiate*. "What factors distinguish communism from socialism?"

Synthesis (creating). Instructional processes involve divergence and generalization, with keywords such as *formulate, compare, create, predict, devise, and produce*. "What would an economic system be like that combines the salient characteristics of capitalism and socialism?"

Evaluation (judging). Processes involve discrimination and inference, with keywords being *appraise, decide, assess, defend, judge, and justify*. "Using evidence that you select, take a position and defend it regarding whether capitalist or socialist countries have a higher standard of living."

This and what follows are true of adult online learning, whether in higher education or in the workplace classroom.

There are other taxonomies for categorizing cognitive complexity. Most are structured along the lines of "knowing about something," versus "knowing how to use or apply something," versus "evaluating or synthesizing something." Regardless of the taxonomy used, designing questions for the desired cognitive level is a significant design element, as demonstrated in the types of sample questions above.

Purposes of Questions

In addition to helping learners engage in higher-order thinking, question-askers have many other purposes for asking their questions. Borich (1996, pp. 343-344) lists the following purposes for questions:

- To arouse interest and curiosity.
- To focus attention on an issue.
- To stimulate learners to ask questions.
- To diagnose specific learning difficulties.
- To encourage reflection and self-evaluation.
- To promote thought and the understanding of ideas.
- To review content already learned.
- To help recall specific information.
- To reinforce recently learned material.
- To manage or remind students of a procedure.
- To teach via student answers.
- To probe deeper after an answer is given.



While there may be some additional purposes for questions, in general, questions for instructional purposes can be grouped into the following categories (with examples):

Interest-getting and attention-getting. "If you awakened in the year 2399, what is the first thing you would notice?"

Diagnosing and checking. "Does anyone know Senge's five principles of a learning organization?"

Recall of specific facts or information. "Who can name the main characters in *Moby Dick*?"

Managerial. "Did you request an extension on the assignment due date?"

Encourage higher-level thought processes. "Considering what you have read, and what was discussed in the posts this past week, can you summarize all the ways there are to overcome obstacles to effective teamwork?"

Structure and redirect learning. "Now that we have discussed the advantages and limitations to formative evaluation, who can do the same for summative evaluation?"

Allow expression of affect. "How did you feel about our online guest's list of ten things trainers do to shoot themselves in the foot?"

As you can see, each of these types of questions can be used in designing online instruction, depending upon the instructional purposes(s), goals, or objectives for the course or program.

Tips for Online Questions

Here are several tips, based on our experience, that may help in designing questions for online discussion:

- Essentially, online questions are the same as offline. However, you must take care in making sure the question is clearly stated. Questions, and just about everything else done online, are more easily misunderstood. Currently, Web-based and computer-based conferencing use text, with little video or audio. Until this changes, question-askers have at their discretion word choice, word emphasis, and the context in which it is raised, but not voice inflection. Voice inflection carries a lot of meaning in in-person classrooms.
- One of the easiest ways to *stifle* discussion is for the instructor to post a long, well-articulated post on the subject at hand. Our experience is that learners tend to think, "that's the last word," and end their contributions to that topic after that, even when topic closure is not the instructor's intent.



- The more diverse the group of learners, and the more complex and divergent the question, the more diverse the responses may be. You should expect unusual answers, either correct or incorrect, and make sure that the instructor or other participants respond in an appropriate and reasoned, ethical manner that matches the cultural norms or expectations for each of the participants.
- Humor and sarcasm often are mistaken online. Similarly, learners should not be embarrassed or punished through the use of questions, or any other methods, for that matter.

Principles for Designing an Online Discussion

There are several guiding principles for effective online instructional discussions that are germane to this article: (1) design the discussion ahead of time, (2) prepare the learners for the discussion, (3) manage the discussion in process (Eisley, 1999), and (4) summarize the discussion. Eisley recommends that you:

- Tie the discussion to your objectives.
- Make sure the most salient points get made. This helps to guide learners and allows you to efficiently manage the discussion, and you will know the right time to wrap up discussion.
- Structure the discussion (focus the content, specify the format, avoid questions which invite non-responsive communication or redundancy).

Consider the paths of thinking that may be activated by the questions asked to facilitate discussion. Consider the divergent directions that questions might take the discussion and possible learner responses to each question. What follow-up questions should be asked? This is different from an outline of content to be covered. It is not creating a rigid plan. Instead, various possible outcomes are being considered. By taking the time to prepare these follow-up questions ahead of time, the instructor (or designated learners) can be ready with questions that will draw out the discussion and lead to constructive thinking within each participant, while the discussion stays generally focused on the content and goals.

Prepare Learners for Discussions

We cannot expect learners to automatically know how to constructively participate in an online discussion. Participants must be taught such things as "netiquette," how to write effective e-mail, and how to compose a response, and they must be made aware of the instructor's expectations early in the process.

Nadine Burke (1999) provides a wealth of information on her Web site to teach learners how to respond to her questions and the comments in classmates' posts.

- If a classmate has a lengthy response, cut the parts that are not important to your reply and leave only the part to which you wish to reply.

- If you are going to respond to a number of paragraphs in the original post, consider spacing down to under the paragraph you wish to comment on and type your response there. Placing the comments between paragraphs helps your reader know what you are referring to.
- If you just want to say, "I agree," that does not add anything of real value to the conversation. Instead, try to figure out why you agree, how you can expand upon the point you agree with, or what new information can you add to that to continue the conversation.
- Feel free to disagree with your classmates' opinions, but do so with respect. Cite evidence to be able to support your dissenting opinion.
- Never resort to name-calling or obscenity.

Manage the Discussion in Process

discussion has started and participants are beginning to post responses to the question provided. What should be done to facilitate this discussion? Feedback is important, especially individually given feedback. Private e-mail to encourage newcomers to the discussion and to welcome participants is also useful. You may also send private notes explaining how individual participants may be able to respond in a clearer manner, if they need to spell-check, or if they need to watch their tone or attitude (Burke, 1999).

What kinds of questions should you ask to promote ongoing discussion and constructive thinking? Savage (1998) suggests probing question such as:

- What reasons do you have for saying that?
- Why do you agree (or disagree) on that point?
- How are you defining the term that you just used?
- What do you mean by that expression?
- Is what you are saying consistent with what you said before?
- Could you clarify that remark?
- When you said that, just what is implied by your remarks?
- What follows from what you just said?
- Is it possible you and he are contradicting each other?
- Are you sure you're not contradicting yourself?
- What alternatives are there to such a formulation?

How do you know when to jump into the public forum with comments? If things are going well, do not interfere. Resist the temptation, if it exists, to post a public reply until the conversation is waning.

Summarization. At the day/time that has been designated, or when the discussion has covered the salient points designed in the instruction, close out the discussion with a summary. A more in-depth analysis would be too long and not within the

scope of this article. But suffice it to say that the instructor or designated student(s) should summarize the essential points that have occurred during the online discussion or ask some prompting questions to redirect and recharge a somewhat different discussion.

Conclusions

Questions, designed to generate and facilitate discussion online for instructional purposes, need to be planned. Since much of online teaching is learner-centered, the methods used emphasize discussion, inquiry, authentic projects or problem-solving, and collaboration. Effective questions, as part and parcel of online discussion, can serve as a catalyst for increased adult learner understanding and meeting the instructional goals in both workplace training and higher education.

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Zane L. Berge is a Contributing Editor of Educational Technology and Director of Graduate Training Systems programs, University of Maryland Baltimore County, Baltimore (e-mail: berge@umbc.edu).

Lin Muilenburg is a doctoral candidate in the Department of Behavioral Studies and Educational Technology, University of South Alabama, Mobile (e-mail: LinM@zebra.net).