DESIGNING ONLINE AND ON-GROUND COURSES TO ENSURE COMPARABILITY AND CONSISTENCY IN MEETING LEARNING OUTCOMES

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This article examines the issues and barriers to effective online course design, recent research concerning guidelines for designing effective online courses (Bannan-Ritlan, 2002; Hirumi, 2005; Koszalka & Ganesan, 2004; Northrup, 2001), and research-based instructional design guidelines for course design (Kemp, Morrison, & Ross, 1998). It then raises the question of how to design comparable online and on-ground courses in order to ensure the goals, objectives, and learning outcomes are met in both delivery modes. A design process and matrix provide guidelines for mapping consistency and congruency across course delivery methods.

Research indicates traditional classroom courses are often retooled for the online learning environment (Koszalka & Ganesan, 2004) and this process often fails when the linear-designed instructional framework (Simonson, Smaldino, Albright, & Zvacek, 2003) is followed. When professors are asked to design online courses using packaged course management systems (CMS), such as BlackBoard or eCollege, with little training on the features and how these features impact learning, the results produce courses that do not align well with learning outcomes. However, according to Koszalka and Bianco (2001) when instructional purposes are kept in mind and guidelines for the effective design of online courses are followed, the results are well-designed online courses that successfully engage learners and provide multiple opportunities for learning and interaction (as cited in Koszalka & Ganesan, 2004). Snelbacker, Miller, and Zheng (2005) suggest that while distance education does have unique characteristics, the well-defined research-based principles and guidelines for the design and development of traditional courses can be modified for use in e-learning environments. The question that then needs to be addressed for those concurrently designing online and on ground courses is, what are the guidelines for ensuring that learning outcomes are met in both delivery modes?

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PROBLEM AND PURPOSE OF THE RESEARCH

Koszalka and Ganesan (2004) presented a taxonomy for designing online courses that are developed in CMS environment. This taxonomy provides useful guidelines to those tasked with designing and developing new distance education courses. It describes common CMS features and categorizes them into information, instruction, and learning elements with examples of their value for teaching and learning. Their intent was to "provide guidelines that prompt developers to think strategically about their use of CMS features and make appropriate decisions that will support and enhance course teaching and learning goals" (p. 248).

What happens, then, when the online and on-ground courses are concurrently designed and developed? What guidelines are available to those tasked with producing a course that aligns the informational, instructional, and learning elements for both delivery modes? At this point, research does not provide us with effective strategies and guidelines in this area. We can, however, extrapolate guidelines from the research to-date on systematic instructional design and effective online course design.

The goal of this research is to present course design guidelines and a matrix which guide the concurrent design and development of an online course with an on-ground course. These guidelines and matrix will provide comparability in meeting the learning outcomes for students in both learning environments, while retaining the effective instructional strategies for each.

BACKGROUND

Issues in Designing Online Courses

Challenges in designing effective online courses include a lack of knowledge of the features and tools available in CMSs and a need for faculty to understand the role of student-centered learning to increase student learning.

Koszalka and Ganesan (2004) acknowledged that CMSs used in the development of online classes can distract the developer from aligning information, instruction, and learning to the course goals and objectives. The multiple features and tools are enticing to use, but they do not equate to good design. The automation of easy-to-populate templates appears to be an efficient method to build a course, but frequently online courses suffer due to an ill-informed selection of features that are not aligned to course learning objectives (Gilbert & Moore, 1998; Kidney & Puckett, 2003). The developer, whether a professor or a subject-matter expert, is often confused or uneducated about the features in the CMS and how these tools can best be used to create learning opportunities. The reality is that the misalignment of CMS features to learning outcomes can, and often does, cause the learner frustration (Moore & Kearsley, 2005).

Another concern in creating quality online learning is that faculty in the e-learning environment still teach using a teacher-centered pedagogy where lectures constitute the delivery method for presenting information to the learners (Barret, Bower, & Donovan, 2007; Zemsky & Massey 2004). These researchers suggest that instructors must change their pedagogy to a learner-centered teaching style in this medium where students can play an active role in their learning process when the technology tools are utilized for maximum effectiveness. Miller (2007) reported that students in learner-centered online courses master concepts better and produce higher quality projects than those in non-learner-centered online courses. Chou (2001) reported that learner-centered instructional design, along with constructivist approaches, enhanced student learning.

Shifting from traditional to online teaching requires a thoughtful consideration of how best to use a learner-centered approach in the delivery of online instruction to optimize instructor-learner interaction (Brown, 2004). In general, navigating through course material that has not been carefully designed can be frustrating and

challenging for students. For distance education, learner-centeredness is the focus and is strongly associated with student satisfaction (Fulford & Zhang, 1993; Gunawardena & Duphorne, 2001; Swan, 2001). Course developers, then, need to address the issues of effectively utilizing the CMS features and tools in order to create a student-centered learning environment that optimizes interactivity.

Guidelines for Designing Effective Online Courses

Current research on the effective design of online courses is abundant (Collis, 1999; Hirumi, 2005; Koszalka & Ganesan, 2004; Miller & Miller, 2000; Snelbecker, Miller, & Zheng, 2005; Zhang, 2004). The research, in general, however, cautions that with the rapid proliferation of course offerings, many are not instructionally sound (Hirumi, 2005; Morrison & Anglin, 2006). In order to create instructionally sound courses, research-based principles need to be applied.

There are, however, various opinions concerning how design in distance education is viewed. Some feel that the design principles developed over the years for use in creating traditional classroom instruction can be applied to the e-learning environment. Others feel that technology presents such unique challenges, that distinct principles need to be devised (Snelbacker, Miller, & Zheng, 2005). The research suggests that a blending of the principles may serve to provide useful guidelines.

The American Distance Education Council (ADEC) published the *ADEC Guiding Principles for Distance Learning* (n.d.) after evaluating web-based learning environments and concluded that the principles for distance education design are foundational to high-quality learning, no matter where the learner is located and may be applied to distance and face-to-face learning. These guidelines state that distance learning designs consider design for active learning outcomes, appropriate instructional strategies and technologies, needs, learning goals, and learning styles of the students, and the nature of the content.

Collis (1999) suggested that well-designed online instruction needed to afford learners the opportunity to select from a variety of resources created to address individual learning styles and to utilize the varied communications tools that support instructor-learner, learner-learner, and learner-content interactions. McCombs and Vakili (2005) defined 14 learner-centered principles that they felt should be integrated into curriculum design.

Hirumi (2005) analyzed six sets of e-learning guidelines and concluded that certain elements need to be specified in order to produce high-quality learning environments. These elements had not been addressed by published guidelines he reviewed (Table 1). Hirumi was particularly concerned with the lack of guidelines concerning learner-centered practice.

Research-based principles for the design and development of online courses exist, as well, as research that calls for more granular guidelines. More traditional instructional design models can also provide significant information to guide course development.

TABLE 1
Hirumi's Guidelines for Producing High-quality Learning Environments

1. Align learning objectives with assessment criteria.

2. Design learning events that are based on and aligned to the learning outcomes.

3. Specify expectations for timely and appropriate feedback to ensure optimal instructor-learner interaction.

4. Design and sequence instructor-learner, learner-learner, and learner-content interactions for effective learning opportunities.

5. Use research-based motivational design theory such as Keller's ARCS Model to motivate students to learn.

Morrison, Kemp, and Ross (1998) presented an eclectic instructional design model that is both flexible and adaptable (Table 2). They acknowledged the role of technology in both the design and delivery of knowledge and instruction and supported the alignment of learning outcomes to materials and assessments.

Connecting Design to Pedagogy

In 1987, Chickering and Gamson distilled extensive research on effective classroom pedagogy. This substantive body of evidence produced what is referred to as the seven principles. They are:

1. encourages contacts between student and faculty,
2. develops reciprocity and cooperation among students,
3. uses active learning techniques,
4. gives prompt feedback,
5. emphasizes time on task,
6. communicates high expectations, and
7. respects diverse talents and ways of learning.

In 2006, Chickering and Ehrmann (1996) connected the seven principles to technology use. They concluded that the integration of new technologies should be consistent with the seven principles. The power of the technology is in the tools and their multiple capabilities and how the instructor implements them to support student learning. For example, princi-

ple one states that good practice encourages contacts between the instructor and the learner. When this principle is applied to the communication tools in distance education, features such as announcements, e-mail, chat sessions, assignment feedback, and document sharing provide incredibly powerful opportunities for communication and interaction to support student learning.

Designers need, then, to consider how to adapt instruction to fit with the characteristics of a particular learning situation. However, when the course is delivered utilizing multiple delivery methods, the characteristics of each environment need to be identified and the selection of information, instruction, and learning opportunities should be aligned in order to meet the goals and objectives of the course. Curriculum and instruction should drive the selection of resources and activities to support teaching and learning.

Creating a Blended Process to Ensure Comparability

After synthesizing the research on effective design principles in distance learning, instructional design, and pedagogy, the author developed a process for designing online and on-ground courses that blended the research findings in effective online course development and instructional design models (Table 3). This process keeps the learning objectives in focus while attending to the need for optimal interaction, which research shows is critical to student success.

TABLE 2
Morrison, Kemp, and Ross Instructional Design Model

1. State instructional objectives for the learner
2. Sequence content within each instructional unit for logical learning
3. Design instructional strategies so that each learner can master the objectives
4. Plan the instructional message and delivery
5. Develop evaluation instruments to assess objectives
6. Select resources to support instruction and learning activities

TABLE 3
Frequencies of Visual Cue Types

1. Clearly state the learning objectives.

2. Design and sequence a variety of learning events/content/resources that are aligned to the learning objectives and that support instruction and individual learning styles.

3. Specify expectations for timely and appropriate feedback to ensure optimal instructor-learner interaction.

4. Design and sequence instructor-learner, learner-learner, and learner-content interactions for effective learning opportunities.

5. Design and align formative and summative evaluations that align with learning objectives.

6. Use research-based motivational design theory to support a student-centered learning environment.

An Example of Applying the Process

This process was applied to the concurrent design and development of an online and on-ground course at a university in southern California. In 2007, a team of lead faculty members was tasked with conducting a review of the six core courses in a Masters of Arts in Teaching program. The results of the review indicated that one of the core courses was poorly aligned to both the internal and external criteria. The course lead then analyzed multiple data to begin a course revision. The challenge presented was to design both the online and on-ground course to provide comparability in meeting learning outcomes and providing consistent learning experiences.

The course lead began the course design process by conducting a needs analysis via the evaluation student and instructor course content feedback for a 1-year time period. This data clearly showed a course that was outdated. Further research provided information concerning how the course could be revised. A new approach to the content was selected, followed by a new textbook. Learning objectives, also termed learning outcomes, were written and the process presented in Table 3 was followed to design the online course first. After writing a course syllabus and more detailed course outline, the next task was to apply the blended process to the online course design.

Each of the features and tools available in the CMS was analyzed to determine the opportunity for interaction. Column A in Table 4 indicates the type of interaction opportunity that each tool provided. Learning events were designed and sequenced to provide learners with multiple opportunities to obtain, practice, and apply new knowledge. Assignments and assessments were aligned to the learning outcomes and grading rubrics for each assignment were created. After the initial design was completed, two instructors who would be teaching the new course reviewed the online course design using the internal and external criteria to determine alignment to course learning outcomes. Adjustments were made and the first version of the course was completed.

The next task was to design the on-ground course. The course lead analyzed each of the required readings, course materials, assignments, and assessments to determine if the event could be used as it was designed for the online learning environment or if it needed to be adapted.

One example of this was the online discussion threads. The question arose of how to create a peer-interaction exchange so important in the development of critical thinking skills. This element appeared to be missing in the on-ground component. It was determined that the prompts for the online threaded discussions could be used as the prompts for the reflective journal assignments in the on-ground course. This meant that students were having comparable assignments and would be able to apply what they had learned in their readings. The missing learning element of peer input and feedback in the on-ground course was resolved by having discussion time during class to

explore the prompts in greater depth. This type of analysis was conducted for each learning event in the online course presented in Table 4 Column A. At this point of the design process, the online and on-ground courses had assignments, assessments, and materials that were correlated.

An additional tool, the online supplement, became available during the design and development of the courses, which added a new element in the course design. Specifically, in a CMS, an online supplement can be made available to on-ground instructors and students. This online supplement contains all lectures, assignments, and additional support materials contained in the online course. The benefits of this supplement to the on ground instructor are: (a) information and instructional opportunities are consistent for all students (b) course materials are readily available (c) students are responsible for printing out materials needed for each session, (d) any student missing a class has access to the course lecture, assignments, and other information, (e) communication via e-mail can be sent to individual students, groups, or the entire class as needed, (f) the automated grade book records and communicates grades in an ongoing basis, (g) students can submit assignments electronically via the DropBox feature which has a time stamp, (h) DocSharing provides an area where both the instructor and student can post papers, articles, and presentations for sharing, and (i) the Webliography for the entire course can be built by the entire class.

This new element provided the designer with a tool to bridge the online and on-ground instruction and learning. The matrix in Table 4 provides information on how the delivery methods are related. It compares the online and course supplement features with the on-ground corresponding activity. Using this matrix allowed the designer to create and/or select content, resources, and learning events that were comparable across both delivery methods. For example, returning to the Threaded Discussion example. In Row 1c—Threaded Discussions, the prompts were written for the

online course aligned to the learning outcomes. The online student responded to the prompt in the Threaded Discussion area where students posted their response and then engaged in interaction with their peers and the instructors. The on-ground instructor introduced the prompt via the online supplement in class and facilitated small group discussion of the issue. The on-ground students then accessed the online supplement during the week to post and discuss the prompt. The addition of the online supplement provided the on-ground instructor and the students with a powerful tool that has the potential to increase communication and learning.

The combination of the blended design process and the matrix provided the course designer with two tools to ensure comparability in the design and development of course content, learning events, and assessments. A final review of the courses was completed and the course was taken to the Graduate Council for approval.

Challenges, Problems, and Concerns

This course design received the full support of administration, instructors who had taught the course, and students who participated in focus groups. One of the challenges in taking on such a large design task is to ensure that opinions and voices are heard. This was a collaborative effort that involved several levels of stakeholders at the university. Given that, the concerns moving forward include faculty attitude toward the quality of online courses, the availability of ongoing training, and the need for follow-up research.

"Faculty attitude toward the quality of online education and its ability to equal the traditional face-to-face instruction is still conservative" (Allen & Seaman, 2003, para. 4). Faculty response to the idea that online and on-ground courses need to be designed to deliver comparable learning experiences ranged from agreement to dismay. Those who agreed with the design philosophy were intrigued and were willing to learn how to develop their own

TABLE 4
Matrix for Creating Comparability

A. ONLINE: Course Management Feature	B. ON GROUND: Course Supplement	C. ON GROUND: Course
I. Communication	*I. Communication*	*I. Communication*
a. Announcements [Instructor-learner interaction]	a. Announcements [Instructor-learner interaction]	a. Verbal or written memos [Instructor-learner interaction; learner-instructor]
b. E-mail [Instructor-learner; learner-instructor; learner-learner]	b. E-mail [Instructor-learner; learner-instructor; learner-learner]	b. Face-to-face [Instructor-learner; learner-instructor; learner-learner]
c. Threaded Discussions (Asynchronous) [Learner-learner; instructor-learner; learner-instructor]	c. Threaded Discussions (Asynchronous) [Learner-learner; instructor-learner; learner-instructor]	c. In-class discussion and/or reflective journals [Learner-learner; instructor-learner; learner-instructor]
d. Chat (Synchronous) [Learner-learner; instructor-learner; learner-instructor]	d. Chat (Synchronous) [Learner-learner; instructor-learner; learner-instructor]	d. In-class discussion [Learner-learner; instructor-learner; learner-instructor]
e. Feedback via assignments and electronic gradebook [Instructor-learner; learner-instructor]	e. Feedback via assignments and electronic gradebook [Instructor-learner; learner-instructor]	e. Written and/or verbal feedback [Instructor-learner; learner-instructor]
f. Virtual Office Hours [Instructor-learner; learner-instructor]	f. Virtual Office Hours [Instructor-learner; learner-instructor]	f. Face-to-face office hours [Instructor-learner; learner-instructor]
II. Information	*II. Information*	*II. Information*
a. Lectures (PowerPoint, videos, print-based) [Instructor-learner]	a. Lectures (PowerPoint, videos, print-based) [Instructor-learner]	a. Face-to-face, PowerPoint, Video [Instructor-learner; learner-instructor]
b. Readings: Textbook, posted or linked articles, Web sites [Instructor-learner]	b. Readings: Textbook, posted or linked articles, Web sites [Instructor-learner]	b. Textbook, hand-outs of articles [Instructor-learner]
c. Interactive Learning Activities (Game-like experiences to reinforce skills) [Learner-self]	c. Interactive Learning Activities (Game-like experiences to reinforce skills) [Learner-self]	Not Available
III. Instruction	*III. Instruction*	*III. Instruction*
a. Advanced Organizers: graphic organizers, pretests, quizzes, interactive 'games' [Instructor-learner]	a. Advanced Organizers: graphic organizers, pretests, quizzes, interactive 'games' [Instructor-learner]	a. Advanced Organizers: graphic organizers, pretests, quizzes, [Instructor-learner; learner-instructor]
b. Assignments [Instructor-learner]	b. Assignments [Instructor-learner]	b. Assignments [Instructor-learner]
c. Doc Sharing [Instructor-learner; learner-learner]	c. Doc Sharing [Instructor-learner; learner-learner]	Not available
IV. Learning	*IV. Learning*	*IV. Learning*
a. Readings, assignments, discussion threads, group work, feedback, presentations, DocSharing, Webliography, assessments [Learner-self; learner-learner; learner-instructor]	a. Readings, assignments, discussion threads, group work, feedback, presentations, DocSharing, Webliography, assessments [Learner-self; learner-learner; learner-instructor]	a. Readings, assignments, group work, class discussions [Learner-self; learner-learner; learner-instructor]

courses. Those who were dismayed raised valid questions. Some of those questions included: How much time does this process take? Who is going to teach me how to do this? Do we know if this works?

Administrative support will be required to make this process an integral part of design and development. Faculty training and ongoing support will be needed to help instructors move from teacher-centered to learner-centered pedagogy. Further research is needed to determine if students do, indeed, receive comparable learning experiences when online and on ground courses are designed to deliver the same content in different delivery modes.

SUMMARY

The online learning environment affords educators the unprecedented opportunity to reach students anytime and anywhere. It affords the learner the opportunity to take advantage of higher education due to convenience and accessibility. While this new landscape provides unlimited teaching and learning options, we need to be cognizant of the challenges that arise when designing and developing courses.

Not everyone wants to participate in distance education; that includes instructors and learners. As we design courses, one issue we do need to consider is this: are we providing learners with comparable learning experiences regardless of the delivery method?

This design research looks at the issues concerning designing and developing courses for the online and on-ground learning environments in order to ensure that learning outcomes are met via the design process. The concern of equality in learning is at the heart of this design process.

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