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ABSTRACT

Instructional design is a critical factor in a successful distance education environment. An efficient design analyzes audience and needs, creates learning goals/objectives, develops materials, methods and media for content delivery, and plans for evaluation and feedback. Design implementation requires certain instructional criteria: (1) competent, skilled faculty; (2) meaningful interaction among instructors, staff, and students; (3) well-organized and accessible support materials; (4) effective collaboration among instructors, program planners, and instructional designers; (5) multimedia integration with lessons; and (6) instructor responsiveness to student needs. Through question/answer strategies, group work, familiarity with the technological environment, and portfolio assessment, a design can combine content, interaction, and student evaluation, effectively achieving the educational goals of distance learning. (Contains 24 references.) (YKH)

Instructional Design:
A Critical Ingredient in the Distance Education Soup

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Instructional design is a critical component for success in the distance education environment. This paper provides a conceptual framework for a workshop on modifying the teaching and learning context for distance education "classrooms." Understanding the differences between distance and traditional teaching, learning systematic instructional design principles, and applying effective teaching and learning strategies are emphasized.

Need some spice in your life? How about trying a new dish? If you gently stir technology with instructional design, the recipe for delicious distance education can feed many minds. This paper will serve as the backbone for the workshop being delivered during the conference. After lots of time in the kitchen, the ingredients for successful teaching at a distance include:

1 cup	How distance education differs from traditional teaching/training
2 T	Instructional design components (audience, objectives, methods, evaluation)
3 t	Elements of effective distance education instruction
¼ t	Role of the instructor, site facilitators, media specialists, students
½ cup	Content, presentation skills and multimedia
¼ cup	Interaction between content, students, instructor, interface
2 T	Immediacy techniques (humanizing, building rapport)
½ cup	Alternative assessment and competency-based evaluation
2 t	Additional logistical considerations for dispersed students.

The second part of the workshop will be dedicated to the development of an instructional strategy with the presenters acting as facilitators. Although there are some guiding principles for instructional design for distance education, there are significant differences depending upon the audience, content, media, etc. Therefore, somewhat homogenous groups will form (K-12, higher education, adult education) to apply the conceptual framework into a working model.

How Distance Education Differs From Traditional Teaching and Training

Before noting differences between traditional and distance teaching, it is important to have a working definition and historical perspective to set the stage. "Distance education is planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements" (Moore & Kearsley, 1996, p. 2) It has become a strategic means for providing training, education, and new communication channels to business, educational institutions, government, and other public and private agencies. Distance

education is critical to our geo-political status as a means to disseminate and assimilate information on a global basis. It is often referred to as "mediated," "distributed," or "virtual" instruction because a medium is used to overcome this separation, to span time and space (Dooley & Gruele, 1995).

Distance education is not new. It dates back to the 1800's when correspondence courses were delivered by mail. The technology has evolved from radio broadcasts to Sesame Street on the Public Broadcasting Channels, making television an education distributor. The evolution of compressed digital video technology, a cost-effective solution for providing two-way audio/video communications through high speed telephone lines, has made it possible for educators to reach students anywhere in the world (Edmundson, 1997).

Now, as a comparison, think about your ordinary, every-day soup. Traditional teaching can be like pre-packaged, off-the-shelf soup. Instructors have pre-planned lectures or activities (just open the can) to fit their particular classroom (Chicken Noodle or Cream of Mushroom today?). Because there is face-to-face contact and non-verbal cues (Mmm, Mmm Good), then the instructor continues to serve more. It is convenient, "comfort" food and fairly consistent.

Today's distance education, although based upon the successful ingredients of traditional education, has become a Julia Child's special recipe. You work a lot harder and sometimes things don't taste so great the first time you make it! Some of us are natural chefs and others have to practice. Materials have to be converted for a computer monitor or TV display; more active teaching strategies are needed so distant students don't become isolated and bored; instructors need access to students through electronic mail or other means; schedules have to be coordinated and on-site personnel/site coordinators alerted of activities....wait a minute! This recipe is just too difficult! Who has time for all that?

You often hear the saying that "too many chefs spoil the soup." Well, in the distance education context, the instructor is but one of a team to complete this meal! Although the instructor serves as the content specialist (soup stock), additional expertise is provided by instructional designers, media specialists, support staff, site facilitators and producers. Moore (1987) emphasizes that distance education requires not only a content specialist, but also "experts in the various media to be used, [and] educational technologists to see the media are integrated in the most effective way" (p. 14). Instructors need to be comfortable with the technology, yet able to focus on the educational opportunities, rather than technical capabilities.

Another key difference between traditional and distance teaching is the concept of a classroom. Distance education is not confined between walls of mortar! It *can* be a classroom equipped with microphones and monitors, or it can be a television studio with a satellite downlink, or individualized, self-paced instruction via the World Wide Web, desk-top videoconferencing, or CD-ROM. Our traditional ideas about student-contact hours, learning activities, teaching strategies, and student evaluation now have new meaning. In distance education, a great deal of attention must be given to the nature of the learning environment. Distance education should be learner-focused, with instructors creating an environment for active learning.

There seems to always be a question of "quality." Can distance education reach more people, save time and money, and also provide effective learning experiences for students? A recent research study indicated that:

> "...students learn equally well from lessons delivered with any medium, face-to-face or at a distance...[H]undreds of media comparison studies indicated, unequivocally, that there is no inherent significant difference in the educational effectiveness of media...The specific medium does not matter...Students learning at a distance have the potential to learn just as much and as well as students taught traditionally" (Schlosser, 1994).

What *does* make a difference is the detail given to instructional planning and design (Box, 1993; Lacy & Wolcott, 1988; Price & Repman, 1995; Schrum, 1996; Telg, 1996). "Creating lessons and courses for distance learning is not a trivial activity, and it is not merely a matter of applying distance learning technologies to a successful traditional classroom lesson" (Schrum, 1996, p. 31).

Instructional Design Components

Instructional design has been defined as "the systematic process of translating principles of learning and instruction into plans for instructional materials and activities" (Smith & Ragan, 1993, p. 2). Like a master chef, instructional design requires a basic recipe (audience, content, etc.), mixed with the appropriate ingredients (methods, materials, media, etc.), the skills to prepare the meal (presentation style, humanizing/rapport, etc.) and the final taste test (student evaluation/assessment). "The effectiveness of courses delivered over a distance, like face-to-face instruction, depends on the planning of the course, class activities and the instructional materials used. The use of systematic instructional design in course planning can help to make any instruction more successful in promoting learning" (Price & Repman, 1995, p. 251).

Let's look at a few instructional design models. In the book, *Instructional Technology for Teaching and Learning*, there are six major areas to help instructors plan for effective teaching using technology. They include:

- the overall instructional plan—what should be included and how the components should be arranged
- various analysis techniques and methods that help determine both the current skill level of the learner and the level needed to accomplish the task
- analysis techniques to determine what the information to be learned is and what should receive the focus of the instruction
- a repertoire of strategies, tactics, and techniques, based on principles of learning and communication, that can be used to increase learning by the student
- strategies for sequencing instructional materials so that the learner gets the proper amount of information when needed and
- an emphasis on evaluation to ensure that what was completed and accomplished was attributable to the instructional materials (Newby, Stephich, Lehman, & Russell, 1996).

Dick and Carey describe an instructional design model with nine stages:

- identify instructional goals
- conduct an instructional analysis
- identify entry behaviors and learner characteristics
- write performance objectives
- develop criterion-referenced test items
- develop an instructional strategy
- develop and select instructional materials
- design and conduct a formative evaluation with possible need for revision and
- design and conduct a summative evaluation (Dick & Carey, 1985).

Heinich, Molenda, and Russell provide the ASSURE model for instructional design with six steps:

- analyze learners
- state objectives
- select media and materials
- utilize materials
- require learner performance and
- evaluate and revise (Heinich, Molenda & Russell, 1989).

And we could go on and on--the basic components of instructional design for traditional teaching apply well for distance teaching (audience/needs analysis; developing learning goals/objectives; developing materials, methods and media for content delivery; and planning for evaluation and feedback). This may seem like an oversimplification, as if it is a linear process, but this is intended to serve only as a guide (Dooley, 1995). Many instructional designers believe that designers should be guided by *principles* rather than *procedures*, and that design approaches should be tailored to the needs and constraints of the specific learning situation (Tessmer & Wedman, 1990). But, most of us would agree that there is a planning, implementation and evaluation stage as a part of the process.

What *is* different in mediated delivery is not the basic instructional design principles, but the differences in the teaching and learning context. Monson (1990) noted four critical elements to consider for distance instructional design: *humanizing, participation, message style, and feedback.* It is acknowledged that one goal or impetus for distance education is to teach more students and to teach more students where they are. And it becomes increasingly apparent that, as part of the teaching/learning process, it is necessary to attend to or accommodate those students or learners, that they become a focus for instructors and instructional designers of distance learning programs. One of the key principles associated with distance education is that *it* must be interactive and that our students' participation is desirable. Interaction can take many forms, and we must consider ways in which students can become involved or engaged. Successful distance educators encourage us to engage our students early and often. How do we plan for that?

Elements of Effective Distance Education Instruction

Dillon and Walsh (1992) suggest that teaching at a distance requires different skills and behaviors of instructors. Faculties need to learn how to make the best use of the technologies available in order to personalize their instruction and actively involve students in the learning experience. Important instructor skills and behaviors for successful implementation of distance technologies include:

- competent faculty skilled in their subject area and in presentation skills
- meaningful interactions that occur between and among instructor, site facilitators and students
- well organized and readily available support materials
- effective collaboration between instructors, program planners, instructional designers
- integration of multimedia and
- instruction that is responsive to student learning needs (Egan & Sebastian, 1993).

Design factors correlated with student satisfaction also include:

- feelings of rapport and the absence of feelings of isolation or separation and
- immediacy behaviors, such as specific feedback on individual work through comments on papers, oral discussion, solicited phone calls, etc. (Hackman & Walker, 1990).

The key is to design teaching strategies/lessons that seamlessly combine content, interaction and student assessment. The assumption is made that the instructor should know the content. But how do you combine content with interaction? Moore (1989) suggests that there are three primary avenues for interaction: student and content, student and instructor, and student and other students. With regard to the interaction of the student and content, all manner of sensory input may be involved. Students may read materials given to them, or they may view on screen information while listening to an instructor present subject matter. Students may have written assignments or activities requiring discussion of course content as well.

The primary interaction between students and the instructor may include question and answer strategies. For many instructors in a traditional, face-to-face classroom, spontaneous questioning may be a natural part of teaching style. Good use of questions may be even more important in the distance environment and should be part of the planning or design process. Considerations include when to use questions, the intent or purpose of the question, type of question, phrasing of the question, distribution of questions among sites, as well as responses to questions. Additionally, the student - instructor interaction may involve such issues as instructor immediacy and rapport, message style, presentation techniques, learning styles of students and so forth. Monson (1990) coined humanizing as the "process of creating an atmosphere which focuses on the importance of the individual and overcomes distance by generating group rapport" (p. 2). This, too, becomes another planning or design consideration.

Planning for student or group involvement may include many of the activities that have been used successfully in traditional settings -- group projects, brainstorming, study groups, teams, role plays, case studies, panels, interviews, debates, peer teaching, or other group activities (Dooley & Greule, 1995; Monson, 1994). The challenge is to creatively re-think those activities for a different setting, the distance environment.

Although we insist that the content or subject matter is still the most important aspect of our classes, and it is what drives the design of our courses, the reality is that the technology, equipment, and hardware that connect the students and the instructor represent a huge factor in the design and delivery of distance education. Hillman, Willis, and Gunawardena (1994) have designated a fourth interaction: learner-interface. How the student relates to the technology or interface may well determine the success of the distance learning effort. Students, as well as the instructors, must become comfortable in the environment. This will require orientation and planned activities which provide practice using the technology.

This approach to designing, developing, and implementing courses based on types of student/learner interactions provides the design team another tool for the planning of effective learning experiences for the distance learner. But, how do you know if students actually learn the content? One final consideration is assessment.

Most people think of standardized, formal testing when assessment comes to mind; however, several forms of alternative assessment (portfolio assessment or competency-based) are ways of documenting the learning process. This type of assessment is particularly powerful for teachers and students at a distance.

A portfolio is a purposeful collection of student work that exhibits the student's efforts, progress, and achievements in one or more areas. The collection must include student participation in selecting contents, the criteria for selection, the criteria for judging merit, and evidence of student self-reflection (Paulson, Paulson & Meyer, 1991). The real power of portfolio assessment is that it gives students an opportunity to *learn about learning* through engaged self-reflection. A portfolio should be done *by* the student, not *to* the student, offering them a concrete way to value their own work. The portfolio should include the rationale, goals, contents, standards, and judgments. This will be particularly important to the instructor for providing feedback to the student, to show growth and problem areas that need to be addressed. By way of support, students need models of portfolios, as well as examples of how others develop and reflect upon portfolios.

So why use portfolios in conjunction with testing? Standardized testing may distort the educational process, because instruction is often driven by the testing process. Portfolios can help students to understand the link between what they study in school and their future successes on the job through integrating student learning and assessment. By this method, the portfolio complements traditional tests, and provide educators with new understandings of how students learn and succeed. They also assist by showing progress over time in a more natural way and aid in the development of curriculum to guide future educational decisions. Students may also benefit by fostering personal responsibility, improving self-esteem, developing critical thinking skills and gaining a sense of pride and ownership of their work.

Portfolios often use competencies to document student learning, measured by a set of criteria. Often these criteria are associated with a number so that instructors can better manage the evaluation of students. This type of evaluation allows for an instructor to maintain information about a student's performance without losing the qualitative information which is important in assessing a student's growth.

In distance education, we can provide an environment where students may be evaluated through alternative assessment. Some examples of portfolios that might be used in the distance education arena include:

- setting up a World Wide Web site
- electronic presentations
- producing an electronic game with authoring software (i.e. Authorware, HyperCard)
- a student prepared videotape or
- developing an e-mail discussion group (listserv) to document growth over time.

This type of assessment is particularly powerful when using computer technology and telecommunications.

Conclusions

In distance education there are many considerations for effective instructional delivery: systematic instructional design, effective teaching techniques, building interaction, assessing learning, etc. There are also a variety of roles: instructional, social, and technological. The charge is to design instructional goals and activities that will be meaningful to a variety of students at different locations. Faculty who teach at a distance must spend more time in planning and preparation for delivery. Typical transparencies and chalk-board techniques must be modified into computer graphics; access to resources such as library references, textbooks, laboratories or computer facilities must be considered. It becomes easy to see why a team approach becomes so important for this medium.

While delivery approaches differ, instructional strategies that facilitate learning are the goal:

- providing clear and understandable instruction (using relevant examples, asking questions to check for student understanding, well-planned review of information of ideas, well-sequenced presentations, etc.)
- supplying meaningful and informal interactions among and between students, facilitators, and instructors (telephone office hours, using electronic mail, computer discussion groups, etc.)
- using appropriate teaching immediacy behaviors (calling students by name, eye contact, personalized feedback, etc.) (Egan & Sebastian, 1996).

Understanding the teaching and learning context for the distance education environment, remembering the importance of sound instructional design principles, and packaging it all with the elements of effective distance education instruction make for a successful teaching and learning experience. Is it soup yet?

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