

Instructional Design Best Practices and Guidelines for College Online Learning Developers

Introduction

Background

In a recent paper, we reviewed the explosive growth of the Internet as the vehicle by which college instruction is delivered: college courses are currently estimated as growing at 33% annually nationally (Tallent-Runnels et al., 2006); while at the University of Central Florida (UCF), Web-only courses (W) have grown at an annual average of 67% over the last three years and Mixed-mode (M, also referred to as “blended” courses) grew at an annual average of 54%. By contrast, traditional face-to-face (f2f) courses at UCF grew at an annual average of 26% for the same period (Center for Distributed Learning, University of Central Florida, 2007).

Pervasive in the literature, there are three distinct areas that can influence the degree of success college faculty might enjoy as a result of efforts to design and deliver their courses into a format for delivery through the Internet (such courses are also called “online” courses). The terminology for these areas varies, but here we combine some of the other terms parenthetically to demonstrate the variety: technical skills (computer literacy, Web skills, media production skills, Internet savvy, technical readiness), instructional design knowledge and practice (instructional systems design skills – ISD, pedagogical knowledge, instructional strategies, design competency, organization design), and institutional support (departmental, college, or university readiness, institution technical infrastructure, technology help desks) (Arabasz & Baker, 2003; Lee & Hirumi, 2004; Meloncon, 2007).

For more than a decade there has been a debate whether it is the use of media or the design of instruction that leads to learning (Clark, 2001; Kozma, 2001). While Clark (Clark, 1983) has argued that technology can be likened to vehicles that deliver instruction, but that do not

themselves influence student achievement, he has also argued that benefits found resulting from instruction are not due to the medium used for the delivery of instruction, but rather that those benefits come from the instructional strategies built into the learning materials. Gordon (1994) states that “most serious designers who have studied training and instructional design have concluded that it is *not technology* that really determines the effectiveness of a training program, but rather the soundness of the *instructional design process* itself” (p 19). If Kozma (1991) recognized that the construction of knowledge takes place when the learner actively collaborates with the medium, then he must agree that the choice of medium and how it is integrated within the instructional program (two decisions which are usually made by an instructional designer) are usually important for successful learning outcomes. Stated in this way, Kozma would agree with Gordon and Clark and recognize the important role instructional design plays in the design and delivery of training or educational content.

With the rush to place instructional materials online to meet increasing demand for the flexible learning framework afforded by Internet-based education, there is concern that the quality of such instruction is being ignored (Bangert, 2006, p 228), is in need of published guidelines and benchmarks of quality (McKnight, 2004, p 5), is unapparent due to flawed research methodologies (Schweizer, Whipp, & Hayslett, 2002, p 144), or is being taught by adjuncts or faculty without doctoral degrees (Y. Yang & Cornelious, 2005, p 2). Faculty who would create and teach online courses must address the issue of quality and how to best ensure that quality is considered during the development and delivery of those courses.

Earlier in this article we derived that media or technology choices are not as important as is the instructional design process. So what is “instructional design”? Reigeluth (1999) differentiates instructional design process from that of instructional design theories whereby theories will be used in a design process where a designer will plan and prepare for instruction (p 13). Gordon (1994), in summarizing the concept of *Systematic Training Program Design* integrates an ergonomic approach to a systemized process to guide program development that will meet the needs of an organization and its employees while being consistent with the precepts of Total

Quality Management (p 10). Gordon saw the systematic training program design as being a model with three primary phases: front-end analysis, design and development, and system evaluation. The front-end analysis will have the designer conducting a needs assessment that includes data gathering from the organization, the tasks (or skills) to learn, and the trainees themselves. The front-end will also include a training need and resource analysis, as well as writing functional specifications. The design and development phase will have the designer developing the concepts, doing initial system development and prototyping, conducting formative evaluations and user testing, doing full-scale development, as well as final user testing. The system evaluation phase will have the designer finalizing evaluation criteria, designing the evaluation program, and collecting and analyzing data.

Gordon's model is essentially the same as a more popular model that has the acronym ADDIE, which stands for Analyze, Design, Develop, Implement, and Evaluate. It is unknown when and by whom the ADDIE model originated, but it is safe to state that it likely developed somewhere in the period of the 1950s (B.F. Skinner's Programmed Instruction Movement and Task Analysis being used by the US Air Force, and Bloom's Taxonomy of Educational Objectives for the Cognitive Domain) and the 1960s (Mager publishes *Preparing Instructional Objectives*, Glaser employs the term *instructional system*, Gagne publishes *The Conditions of Learning*, and the systemized approach for designing instruction is introduced by James Finn).

Liu et al. (Liu, Gibby, Quiros, & Demps, 2002) quote Smith and Ragan (1992) with a description of *instructional design* as "the systematic process of translating principles of learning and instruction into plans for instructional materials and activities." Liu et al. further describe the work of instructional designers as the planning of instruction in such a way to permit students to employ cognitive strategies to actively learn the material. They include a list of common job titles instructional designers have been known to hold, and by which we can glimpse the multitude of skills and the phases of the process instructional designers are involved: industrial designer, curriculum developer, learning specialist, instructional technologist, project manager, multimedia producer, webmaster, or developer of online learning. If this is not enough, Liu et al. further

capture the all important role the instructional designer carries as a strategic partner in instructional development projects as they are required to “understand the needs and wants of the client, the objective and the audience of the finished project, the capabilities of the programmer, graphic artist, and available tools,” as well as have “design and project management skills” (p 2).

Connections

I have spent most of the last twenty years working in different capacities where people are challenged by their environment or the tools of their profession. In most cases, they either required new tools or training. I have designed and delivered instruction to adults who required training in language arts and a great many different technologies, most of which were computer-based. I have designed instructional guides, online help systems, tutorials, and job-aids. Some solutions were simple paper-based bi- or tri-folds, some were high-end online performance support solutions that cost the customer nearly a half million dollars and five months of work. I have delivered instruction as a stand-up teacher in front of the class, and I have designed and delivered instruction in scenarios that literally spanned the globe and reached into every continent (except the Antarctic), and I don't know how many countries. From these experiences, I have experienced first hand how important instructional design is, and how a systemized approach for developing and delivering instructional content is critical. At my current job, I provide support to seven other instructional designers who support UCF college faculty in their efforts to learn how to develop quality instructional content that will be delivered via the Internet. I have a passion to know and understand how to design successful instructional materials.

This brings us to ask the primary question that seeks to address the issues of quality in online instructional content development and delivery: “What do experts in the field say are best practices, important guidelines, or skills as regards instructional design for college faculty, who would create and deliver educational content that will be delivered through the Internet?”

In the course of researching work on this topic, a paper presented by Lee and Hirumi at the 27th conference of the Association for Educational Communications and Technology (AECT) in Chicago in 2004 surfaced (Lee & Hirumi, 2004). In their paper, titled *Analysis of essential skills and knowledge for teaching online*, Lee and Hirumi employed a research technique described by Cooper in his book *Synthesizing Research, Third Edition: A Guide for Literature Reviews* (Cooper & Cooper, 1998). Lee and Hirumi followed Cooper's research methodology to search for relevant work and encode the findings across the literature base to find common themes that would support answers to their central question on essential skills for teaching online. This article seeks similar answers as those sought by Lee and Hirumi, but the aim is lower. Lee and Hirumi approached the situation online developers and instructors face as described in the background section of this introduction: they researched for the skills and competencies to support the three primary areas (they identified six areas) that influence successful online instructional design and development. The scope of this article is less and seeks to find the best practices, guidelines, or skills and competency details of practicing instructional designers or college faculty who will design online courses. Lee and Hirumi's approach is perfect to research this lower target of what experts would identify as supporting instructional designers in their work to place college courses online.

Method

Overview

Using Cooper's definitions (the approach Lee and Hirumi used), the methodology for this article is called a research synthesis, alternatively named *integrative research review*, or just *research review*. In Cooper's words, "research syntheses focus on empirical studies and seek to summarize past research by drawing overall conclusions from many separate investigations that address related or identical hypotheses" (Cooper & Cooper, 1998, p 3). The aim of this article is to use Cooper's methodology to perform a narrow search of the literature to derive expert directives on the employment of successful instructional design practices for college faculty seeking to develop and deliver online courses. To keep the quality of articles that will be used in

this study high, and thereby satisfy the requirement that only expert opinions or experience will be used, we limit the search for material to only include articles published through peer-reviewed journals. From this point forward, the methodology is specifically described in the steps taken to find material to answer the primary question.

Before describing the specific steps, we must take note of Cooper's advice and cautions. Cooper describes the process of research synthesis as consisting of five stages:

- 1) Problem formulation
- 2) Data collection or the literature search
- 3) Data evaluation, or the assessment on the quality of the literature search
- 4) Analysis and interpretation
- 5) Presentation of results

Cooper notes that "Synthesists... can make different choices about how to carry out their inquiries. Differences in methodologies will create differences in conclusions" (p 5). He then warns us that "...each methodological decision at each stage of a synthesis may enhance or undermine the trustworthiness of its conclusion or, in more scientific terms, create a threat to its validity" (p 5). In an effort to mitigate threats to the validity of findings that can arise through the process, appropriate steps in the methodology used herein are identified together with Cooper's general suggestions he outlines in the context of the stages of the research process.

Stage 1: Problem Formulation

The issue is the threat of declining quality of college courses being placed and delivered through online formats. The threat may be due to a number of factors; however, the identified concern here is the instructional design skills of the faculty member as they construct and deliver courses online. The primary question for this article is to derive through a literature search for the opinions, guidelines, or best practices from experts in the field which exemplify quality instructional design practices. Cooper's suggestion is that "the researcher must decide what

distinguishes relevant from irrelevant material” (p 5). For this project, a search was initially made using the search terms “college” AND “instructional design” AND “faculty e-learning” as key words in the Wilson Web database.

Stage 2: The Literature Search

Cooper’s advice here is that since this stage involves “making a choice about the population of elements that will be the target of the study.” And that “identifying target populations is complicated...” as researchers will want to “make inferences about two targets. First they want the cumulative result to reflect the results of all previous research on the problem. Second it is hoped that the included studies will allow generalizations to the individuals or groups that are the focus of the topic area” (p 8). To meet this requirement, this study narrows the targeted articles in ways detailed below.

The first check on relevancy will be that any resulting article leads must be no older than a published date of 1998 (i.e., all relevant articles will be published from 1998 forward). This date is not completely random. It was selected because it was the first year that multimedia literacy for PC users began to become mainstream with Windows 98 starting its push into the marketplace – Windows 98 represented a significant improvement over ease-of-use and integration of audio and access to a wider variety of media forms, and the Internet. Also after 1998, there began a subtle shift on how the Internet would eventually figure as a major resource and change the personal computer Operating System – Applications and Programs model. Bill Gates introduced Internet Explorer 4.0 that integrated with the Operating System in Windows 98 and touched off the lawsuit initiated by Netscape in the well known case of *United States v. Microsoft*. With this we saw new tools, such as an “Active Desktop” – whereby the PC’s desktop metaphor could be a page from the World-Wide-Web (WWW), Cascading Style Sheets, and much more that helped people become WWW authors. It’s almost from this point that WWW growth becomes nearly exponential. Before 1998, online authorship was not yet mainstream. The search for relevant material on expertise of online course design must include best practices or research findings as regards *instructional design* as it applies to *online course design* for *college faculty*: while it’s

possible to find and fulfill the first two important criteria with research articles authored before 1998, it was determined that the work would not reflect current practice with the current crop of technology tools and Operating System environments; further, the material would not be plentiful. Articles published therefore before 1998 were ignored. To summarize, the articles must be from Peer-Reviewed Journals, be no older than 1998, and must address *instructional design* practices by *college faculty* in their efforts to develop and or deliver courses for the Internet (i.e., “e-learning” or “online”).

Stage 3: Data Evaluation

Cooper states that “after data are collected, the researcher makes critical judgments about the quality of data” (p 8). The first search yielded very few potential articles. It was found that the combination term *faculty e-learning* was not used by many authors. Therefore the strategy was modified: the term *e-learning* was removed, and instead a visual scan of resulting abstracts was used to find articles that reported on work with *online* course development or delivery. This yielded a more healthy number of potential articles. From a full list of nearly 100 articles, 24 articles were identified as containing all the appropriate search terms, as well as met the other criteria of published date and published through a peer-reviewed journal. Finally, from the 24 articles, eight were found to be the most promising in that besides meeting all the search criteria, they all were authored to address instructional design needs of faculty seeking to place or deliver their courses online. The important and subtle point here (that is not yet possible with automated computer searches) is that the context of applying instructional design methodologies, or best practices was retained in the articles dealing with college faculty seeking to put courses online. From the eight, six of the articles were actually used. While the two were still appropriate articles, the authors did not highlight any specific guidelines or instructional design best practices.

Stage 4: Analysis and Interpretation

Cooper states that “during analysis and interpretation, the separate data points collected by the researcher are synthesized into a unified statement about the problem” (p 8). Also, Cooper

considers that interpretation requires that researcher distinguish systematic data patterns. To meet this need, a three step process was developed.

1) *Create a coding sheet by which all the studies can be reviewed.*

Since the focus is to cover the skills or practices employed within the *instructional design process*, a table with the process stages of the instructional design methodology was made into a coding sheet. Then the coding sheet was used to capture the article's key skills or best practice applications of the instructional design process. Part of the data capture process was to look for and include any conceptual definitions and operational definitions and place these into the general coding sheet. Also, included with the data capture process were details of the selected article (i.e., title, author(s), journal name, published date, issue, page numbers, and journal type). If the skill item was not worded in a way to fit as a skill (i.e., appropriate verb + predicate), then the process included adding appropriate wording but clearly identifying any changes added by this author: all of the table data are the original words and form from the author; words or phrases enclosed in brackets were added by the author to improve readability and to standardize the language structure.

2) *Fit the identified skills or instructional design process best practices into a structured results table, such that it fits within the sequence of the systems approach to instructional design.*

If there was no fit for the identified item within a general topic category, then it was determined that the general *instructional systems design process* was inadequate for the work of college faculty developing and delivering online instructional content. To meet this circumstance, the process was to add a new column to include a new general topic for the item and to place the specific item from the article within the row reflecting the article being reviewed. Each row included a reference to the originating article and its publishing details.

3) *Copy in sequence the fitted skills or instructional design process best practices and paste them in sequence into the details table.*

Each skill was cross-referenced with the original item number on the initial (general coding sheet) table, so that conceptual and operational definitions come forth on the final table.

In step two above, an accommodation for change is made to the coding sheet for situations where the derived data does not fit the initial or current model. Cooper makes note of such circumstances: "A research synthesist may discover unanticipated elements of the domain along the way" (p 14). He goes on to explain that sometimes the concept structures may be too narrow or too broad in definition and require an adjustment to the coding process. Even if this amounts to a redefinition of the problem as the process runs, Cooper advises that such adjustment may be necessary and beneficial.

Stage 5: Public Presentation

For this stage, Cooper recognizes that the final stage is the creation of the reporting document that describes the investigation and completes the project. In this stage, he details the format and scope of the final document's specific sections. This article follows those guidelines.

Results

Source Materials

A list of the articles used in this study follows. The order in which each article appears is the order that will be used for all subsequent tables.

Table 1: Journal Articles Used to Derive Instructional Design Best Practices or Guidelines

Count	Art. No.	Title	Author(s)	Pub. Date	Journal	Publication Format
1	1	So you are going to be an online writing instructor: Issues in designing, developing, and delivering an online course	Savenye, W. C.; Olina, Z.; Niemczyk, M.	2001	Computers and Composition 18 (2001) 371-385	Peer Review
2	2	The Development of an Instrument for Assessing Online Teaching Effectiveness	Bangert, A. W.	2006	Journal Educational Computing Research 35(3) 227-244	Peer Review
3	3	Blended learning: understanding the middle ground between traditional classroom and fully online instruction	Welker, J.; Berardino, L.	2005- 2006	Journal Educational Technology Systems 34(1) 33-55	Peer Review
4	5	Quality control in online courses: using a social constructivist framework	Schweizer, H.; Whipp, J.; Hayslett, C.	2002	Computer in the Schools 19(3/4) 143-158	Peer Review
5	6	Online collaborative learning: relating theory to practice	Fisher, M.	2002- 2003	Journal Educational Technology Systems 31(3) 227-249	Peer Review
6	7	Faculty Development and Universal Instructional Design	Ouellett, M.	2004	Equity & Excellence in Education 37(2) 135-144	Peer Review

The instructional systems design (ISD) process (e.g., ADDIE) consists of five phases, wherein each phase includes multiple sections of instructional designer (ID) work. In several instances,

the research process forced the table to expand to permit entries where an author presented more instances of instructional design best practices than the original table had room; additionally, there were several instances when an author presented an item for which there was no column: this is to say, that what the author presented was not part of the original ISD process as envisioned by Gordon in 1994. Since the technology has evolved considerably since 1994, it makes perfect sense to add a new column title to capture a new work section. In both instances, the table was adjusted or expanded to accommodate the data.

The following data represent the derived instructional design best practices or guidelines from the reviewed articles. In a couple of places where there is a clear need for best practices or guidelines, there was nothing found. In such instances where they are missing, the author inserted "<Empty>." The main headers are the ISD process phase, the sub-headers represent the nature of the ID work, and the bullets represent the associated best practices or guidelines.

Graphics of tables that depict the structuring of the best practices into an instructional systems design process model are presented over several pages in Appendix A.

Using Cooper's terminology, each best practice or guideline in this study is a *conceptual definition*. While instructional designers can find these definitions useful, their full potential is unrealized without associated *operational definitions*. The literature review derived many of the operational definitions for these conceptual definitions (i.e., best practices or guidelines), and they are fully listed in Appendix B.

Analysis Phase

Organizational Analysis

- <Empty>

Task Analysis

- <Empty>

Audience Analysis

- Analyze the learners

- [Consider] what information about learning goals or prior experiences [should be gathered] from students at the beginning of the course

Needs Assessment

- Determine the need for the course

Resource Analysis

- Determine what technical resources are needed and available

[Course Appropriate for Online]

- Determine whether the course is appropriate for online delivery

[Other Resource Issues]

- Consider other resource issues

Functional Specifications

- Determine the projects and requirements

Design Phase

Design Concept Development

- [Design for] diverse talents and ways of learning
- [Avoid "course killer" teaching tactics or situations]
- [Design for complex environments with authentic learning tasks]
- [Design such that the] learning model [is] collaborative and approached as a team effort

[Instructional Objectives]

- Determine your instructional goals and student-learning objectives
- Be specific with course requirements and instructions
- [Determine what] students are expected to know, do, or value at the completion of [the] course

[Terminal Objectives]

- Develop assessments to monitor student progress
- [Determine what] the core outcome goals [are] for all students
- [Consider if there are] alternative outcomes that could be offered to all students

[Instructional Strategies]

- Determine the overall course methods and strategies
- [Design for] cooperation among students
- [Set minimum classroom meeting requirements for first time blended learning course participants]
- [Employ] social negotiation of meaning
- [Challenge students] to apply new knowledge and share what happen[s] as a result
- Encourage cooperation among students
- [Create an environment to support] active learning
- [Sequence skill development with consideration of novice to experienced]
- [Build] intentional learning communities
- Include [communication] learning technologies
- Encourage active learning
- Decide on activities/projects
- Emphasize time on task
- Make projects and assignments open-ended
- Communicate high expectations
- [Make use of interactive communication techniques available through the Web]
- [Consider how] strategies for assessment reflect key learning goals
- Limit group sizes
- [Consider how to] factor in individual differences

[Media Selection]

- [Consider varying] the use of course management technology to student level
- Select tools for both synchronous and asynchronous communication

[Identify Instructor Role]

- Try new approaches and be ready for shifting roles
- [Facilitate the course such that] professors act as guides, mentor[s], and even co-learners

[Communication Strategies]

- Support the students in using computer-mediated communication
- [Support] student-faculty contact Establish a communication plan
- [Ensure that] student opinion and experience is valued by professors and peers
- Encourage student-faculty contact
- Determine how to provide feedback
- [Determine how] class standards [will] be communicated to students

[Content Development Issues]

- Consider how information will be made available to students
- [Consider] time on task [for the course design]
- Use blended learning course as an addition but not replacement for classroom meetings
- [Include] assistance for learners at varying zones of proximal development
- Set a schedule for synchronous meetings
- Respect diverse talents and ways of learning
- [Set] high expectations
- [Apply course management technology choices consistently among faculty]
- Set expectations for asynchronous discussions
- [Decide how to] prepare students to meet the assignment expectations
- Provide orientation if required

Prototyping

- Pilot the blended learning program

Formative Evaluation

- Conduct formative evaluations and revisions of the course
- Create online course readiness assessments
- Determine how work will be evaluated and communicate [this] to students
- [Consider whether] the methods of instruction are negotiable

Develop Phase

Full Scale Development

- Develop the course web site in well-organized modules or "chunks"
- Prepare the blended learning course fully before class start

[Media Production]

- Develop high-quality, highly visual web-based materials

User Testing

- <Empty>

Implement Phase

[Provide Appropriate Level Support]

- Provide students with support necessary to achieve their individual learning goals and satisfy their individual [instructional] needs
- [Provide] prompt feedback

[Communicate Access Requirements]

- Ensure access to appropriate technology

[Provide Support for New Student Roles]

- Support students in new roles

[Provide Time Management Structure]

- Help students understand how to employ a wide range of studying and learning strategies

[Provide Students with Meta-Strategies]

- Make explicit the knowledge and ways of thinking that constitute their disciplines

Evaluate Phase

Finalize Evaluation Criteria

- [Determine how] variable outcomes (excellent to poor) [will] be assessed
- [Consider] what evaluations [should be collected] at the end of the course

- [Consider] what feedback [to] gather as the course progresses

Design Evaluation Program

- [Determine whether] variable outcome measurements [are] negotiable

Collect and Analyze Data

- <Empty>

Discussion

Areas of Strength

There is some utility in deriving a list of instructional design best practices or guidelines for college faculty who must develop and/or deliver their courses in an online format. It provides a place to start for the uninitiated, as well as directions to grow and improve. The author attempted to provide further structure by incorporating the best practices or guidelines into an evolved instructional systems design process model. Since this overall structure is based on process models, such as ADDIE (which has been used extensively for nearly four decades) that are well proven, using this additional structure should ameliorate the end product by ensuring that it will serve the purpose for which it was designed. Additionally, this list can be used as a project management outline:

- Resources necessary for each best practice that a college faculty might use to develop an online course can be identified, and, if necessary, priced
- Levels of effort can be calculated and set to a schedule
- Overall project requirements can be communicated to department chairs and deans as appropriate

As stated in the Results section, some very useful details, the operational definitions, can be found in Appendix B. From these, college faculty or instructional designers will have additional guidelines for those instances that such were found in the literature review.

For departments or institutions planning on having their faculty develop and deliver courses online, this list will provide them with some structure for the nature of the work into which they are embarking. This list does not intend to cover all of the very important aspects about placing courses online. The reader will recall that there are at least two other very important aspects that influence the success of online courses: technical skills and institutional support. However, this list does start a process to uncover the all-important middle-ground that is instructional design skills and best practice guidelines for online college course development and delivery.

Areas to Improve

This author is certain that there are elements to this study that can be improved. For instance, some readers might not agree with the placement of certain best practice guidelines into the instructional design process model. There are important areas in the process model that are seriously lacking best practice items. The presentation of the results into graphic models can be made to better depict the idea that the best process model is iterative and not linear as the table structure might suggest. Behind the scenes, the coding process and tools have some weaknesses that can create misapplication of the findings into the wrong phases if not carefully attended (or left out of the findings altogether).

As regards placement choices of the derived best practices into the structure of an instructional systems design process model, the choices here were personal, but based on nearly 20 years of experience designing and developing instructional content. The experience mentioned is, however, no real qualifier. Conducting such work in a production environment where competing assignments and attention (and too little time or resources) is the natural state of most of us, sometimes decisions are made on the fly. It is the intent of this author to have the readers who wish to use the list and the tools in the appendices to modify them as necessary. The goal is, and always will be, to be successful in the development and delivery of online courses. The results from this study are a step towards that goal.

Areas within the structure of the instructional systems design process model that do not have any best practices or guidelines needs attention. A somewhat glaring omission is any reference to Bloom's taxonomy of the cognitive and affective domains (Bloom et al., 1956), or Anderson's (1999), Anderson's and Krathwohl's (2001) revision of the same – these tools are very useful in support of design phase activities. To manage the missing or lean areas, this author notes two general strategies:

- Review additional articles to see if they may fill out the empty or lean areas
- Change the search terms to find a different set of articles

The latter strategy may be the best choice. Early in the study process, the search terms included the word “design” in the string “instructional design.” The intent with the search string was to find articles that were related to the *instructional systems design process*. The problem is that the process name and a phase of the process use the same word: “design.” This might account for the heavy findings of best practices within the design phase. Therefore, a search should be conducted to see if “analysis,” “develop,” “implement,” and “evaluate” or “assess” might bring forth additional material to fill out the list.

As regards different graphics, or table structures, there are likely better approaches that can be used to convey the where and the how the particular best practice or guideline can or should be implemented within the overall process. This author will be looking for better ways to capture and depict these best practices, and it is hoped that the readers will do the same.

As regards the tools that were used in the background, “incremental improvement” is the strategy. As this author continues to work with these ideas, these tools will evolve to ease the burden of analysis and improve the quality of the data results.

An Important Area of Focus

Much of the practiced educational philosophy found with this study, if the evidence from the review of the literature is any indication, is bound to constructivism. The works reviewed showed that major areas of focus include active learning, collaborative and cooperative strategies, strong

on communicative approaches, authentic learning tasks, and an overall sensitivity towards developing interactions between faculty and student, as well as between students: these areas are key indicators of constructivist-compatible online teaching practices (Bangert, 2006). The role of these areas of focus is to take advantage of the social nature of learning, which is important in constructivist learning designs (Mayer, 1999). Mayer notes that “many of the popular instructional methods for promoting constructivist learning depend on interpersonal learning environments that enable discussion, modeling, guided discovery, and scaffolding” (p 152). This concept is important for those who will design and deliver online courses since an area of concern with online learning is the loss of personal, face-to-face interactions with the instructor: this is identified as an important limitation (Z. Yang & Liu, 2007). It should be no surprise after these last considerations that to offset a potential sense of isolation that can result from participating in online courses, faculty should pay special attention to create and maintain social interactivity and other constructivist strategies.

Whenever a person throws him or herself into a challenge with passion and honesty, then it is not so much the product that is important as is the journey itself. I find that this particular journey demanded a lot of time, and an attempt to think, in a minor way, a little differently than others in this field. I am rewarded by what I learned about this type of study (the research synthesis), as well as the data the methodology revealed. I intend to repeat this approach on a couple of similar topics until sets of tools and understandings might be derived to better prepare those who would learn to develop and deliver courses through the Internet. An obvious application of this work is that I will apply what I have learned through my work as an instructional designer for UCF faculty. The work is interesting and infinitely variable – mostly because the topics and their owners are so.

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Appendix A: Structured Results Tables

These graphics represent the MS Excel tables used with the structured part of the coding work, where best practices were fitted into an instructional design process model. These graphics should provide the reader with the sense of areas well covered and the areas that require additional attention.

Table 2: ISD Process Model, Analysis Phase Results

Nr.	Article No.	General Skill Type	Analysis							
			Organizational Analysis	Task Analysis	Audience Analysis	Needs Assessment	Resource Analysis	[Course Appropriate for Online]	[Other Resource Issues]	Functional Specifications
1		Detail Skill 1 Specification			Analyze the learners	Determine the need for the course	Determine what technical resources are needed and available	Determine whether the course is appropriate for online delivery	Consider other resource issues	Determine the projects and requirements
2										
3										
4										
5										⚠
6					[Consider] what information about learning goals or prior experiences [should be gathered] from students at the beginning of the course					
7										

Table 3: ISD Process Model, Design Phase, Part 1 Results

Mr.	Article No.	General Skill Type	Design Concept Development	[Instructional Objectives]	[Terminal Objectives]	[Terminal Objectives]	[Instructional Strategies]	[Instructional Strategies]	[Instructional Strategies]	[Instructional Strategies]
1	1	Detail Skill Specification	[Design for] diverse talents and ways of learning	Determine your instructional goals and student-learning objectives	Develop assessments to monitor student progress		Determine the overall course methods and strategies			
2	2						[Create an environment to support] active learning			
3	3		[Avoid "course killer" teaching tactics or situations]	Be specific with course requirements and instructions			[Set minimum classroom meeting requirements for first time blended learning course participants]	[Sequence skill development with consideration of novice to experienced]		
4	5		[Design for complex environments with authentic learning tasks]				[Employ] social negotiation of meaning	[Build] intentional learning communities		
5	6		[Design such that the] learning model [is] collaborative and approached as a team effort				[Challenge students] to apply new knowledge and share what happen[s] as a result	Include [communication] technologies	Decide on activities/projects	Make projects and assignments open-ended
6	7			[Determine what] students are expected to know, do, or value at the completion of [the] course	[Determine what] the core outcome goals [are] for all students	[Consider if there are] alternative outcomes that could be offered to all students	Encourage cooperation among students	Encourage active learning	Emphasize time on task	Communicate high expectations

Table 4: ISD Process Model, Design Phase, Part 2 Results

		Design								
Mr. No.	Article No. Type	General Skill	Continued	[Instructional Strategies]	[Instructional Strategies]	[Media Selection]	[Identify Instructor Role]	[Communication Strategies]	[Communication Strategies]	[Content Development Issues]
1	1	Detail Skill					Try new approaches and be ready for shifting roles	Support the students in using computer-mediated communication		Consider how information will be made available to students
2	2						[Support] student-faculty contact			[Consider] time on task [for the course design]
3	3					[Consider varying] the use of course management technology to student level	Establish a communication plan			Use blended learning course as an addition but not replacement for classroom meetings
4	5									[Include] assistance for learners at varying zones of proximal development
5	6			[Make use of interactive communication techniques available through the Web]		Select tools for both synchronous and asynchronous communication	[Facilitate the course such that] professors act as guides, mentor(s), and even co-learners	[Ensure that] student opinion and experience is valued by professors and peers		Set a schedule for synchronous meetings
6	7			[Consider how] strategies for assessment reflect key learning goals	Limit group sizes [Consider how to] factor in individual differences				Determine how to provide feedback	Respect diverse talents and ways of learning

Table 5: ISD Process Model, Design Phase, Part 3, Development Phase

Mr.	Article No.	General Skill Type	Design			Development				
			[Content Development Issues]	[Content Development Issues]	Prototyping	Formative Evaluation	Full Scale Development	[Media Production]	User Testing	
1		Detail Skill								
2		1 Specification								
3			[Set] high expectations				Conduct formative evaluations and revisions of the course	Develop the course web site in well-organized modules or "chunks"	Develop high-quality, highly visual web-based materials	
4			[Apply course management technology choices consistently among faculty]				Create online course readiness assessments	Prepare the blended learning course fully before class start		
5							Pilot the blended learning program			
6			Set expectations for asynchronous discussions				Determine how work will be evaluated and communicate [this] to students			
7			[Decide how to] prepare students to meet the assignment expectations				[Consider whether] the methods of instruction are negotiable			

Table 6: ISD Process Model, Implement and Evaluate Phases

		[Implement]			[Provide Support]			[Provide Support for New Student Roles]			[Provide Time Management Structure]			[Provide Students with Meta-Strategies]			Evaluation		
Article No.	General Skill Type	[Provide Appropriate Level Support]	[Communicate Access Requirements]	[Provide Support for New Student Roles]	[Provide Time Management Structure]	[Provide Students with Meta-Strategies]	[Provide Appropriate Level Support]	[Communicate Access Requirements]	[Provide Support for New Student Roles]	[Provide Time Management Structure]	[Provide Students with Meta-Strategies]	Finalize Evaluation Criteria	Finalize Evaluation Criteria	Finalize Evaluation Criteria	Finalize Evaluation Criteria	Finalize Evaluation Criteria	Finalize Evaluation Criteria	Design Evaluation Program	
1	Detail Skill 1	Provide students with support necessary to achieve their individual learning goals and satisfy their individual [instructional] needs	Ensure access to appropriate technology	Support students in new roles	Help students understand how to employ a wide range of studying and learning strategies	Make explicit the knowledge and ways of thinking that constitute their disciplines													
2	2	[Provide] prompt feedback																	
3	3																		
4	5																		
5	6																		
6	7	Give prompt feedback										[Determine how] variable outcomes (excellent to poor) [will] be assessed	[Consider] what evaluations [should be collected] at the end of the course	[Consider] what feedback [to] gather as the course progresses	[Determine whether] variable outcome measurements [are] negotiable				

Appendix B: Detail Results Tables

The following data represent the instructional design best practices or guidelines together with their representative operational definitions (see bullets).

ISD Phase: Analysis

Analyze

Analyze the learners

- what are the characteristics, needs, motivations, and capabilities of the students
- what are required knowledge and skills of learners
- what is motivation of learners: can they choose any other delivery strategy? Are they motivated to learn in general? Are they willing to work independently?

[Consider] what information about learning goals or prior experiences [that should be gathered] from students at the beginning of the course

Determine the need for the course

- ensure the course will have sufficient enrollment to justify development
- recommend developing online courses for which there is a ready audience
- students who wish the convenience of taking the course online

Determine what technical resources are needed and available

- will you use an integrated courseware system or what will you use to develop and deliver online courseware

Determine whether the course is appropriate for online delivery

- course content may or may not be easily adaptable for online delivery
- text-based materials, threaded discussions, quizzes, chatting, peer review of papers work well online
- "hands-on" projects can be problematic

Consider other resource issues

- development of materials for online delivery takes longer, often twice as much time
- take a team approach for developing web-based courses

Determine the projects and requirements

- determine available options and needed flexibility in your course
- conduct a formative evaluation or a pilot test to determine what works and what doesn't

ISD Phase: Design

[Design for] diverse talents and ways of learning

- The instructor was respectful of student's ideas and views.
- The course was designed so that technology would minimally interfere with learning.
- Flexibility was permitted when completing course assignments.
- This course used a variety of assignments and activities that allowed students to demonstrate understanding of critical course concepts.
- I was given choices about the types of activities or assignments that I would complete to demonstrate learning of important course concepts.

[Avoid "course killer" teaching tactics or situations]

- [Faculty should not be] slow to respond to online [student inquires or be] slow to grade assignments.
- [Faculty should be aware of conditions that support] students who do not help fellow students.
- [Faculty should be aware of the challenges with too large class sizes: ideal size is 20.] Student teams should be used if the size is 35 or more.

[Design for complex environments with authentic learning tasks]

- Learning must take place in rich environments that engage learners in real-world problems and activities rather than artificial exercises.
- Students need to look at problems in complex ways and use a variety of means to represent their understanding.

[Design such that the] learning model [is] collaborative and approached as a team effort

Determine your instructional goals and student-learning objectives

- describe in detail what students can expect to be able to know or do after the course
- include a statement of the desired learning outcome in measurable terms, include a description of any materials or conditions, and perhaps a statement of standards of acceptable performance

Be specific with course requirements and instructions

- Faculty should be just as specific with course requirements and instructions as with fully online distance learning courses.

[Determine what] students are expected to know, do, or value at the completion of [the] course

Develop assessments to monitor student progress

- what will you use to determine student learning or progress
- Develop projects - individually or in groups, do weekly summaries, use built in system multiple choice testing tools, guided peer reviews

[Determine what] the core outcome goals [are] for all students

[Consider if there are] alternative outcomes that could be offered to all students

Determine the overall course methods and strategies

- consider the methods, models, and analogies to be used in the course
- computer-mediated communication, multimedia, face-to-face with web supplements, fully web-based
- use constructivist approach with open-ended learning environments

[Design for] cooperation among students

- The course was structured so that I could discuss assignments with other students.
- I felt comfortable interacting with the instructor and other students.
- This course included activities and assignments that provided students with opportunities to interact with one another.

[Set minimum classroom meeting requirements for first time blended learning course participants]

- [First time blended learning course participants] should attend some minimum portion

of classroom meetings.

- [First time blended learning course undergraduate participants should attend all classroom meetings until such time class participation or grades or a combination of these and other criteria warrant otherwise.

[Employ] social negotiation of meaning

- [Faculty should make use of that] what counts as knowledge and how one thinks about and expresses ideas about that knowledge come from interactions with others in a variety of learning communities, both formal and informal.
- Through extended dialogue and collective problem solving with others who have both greater and lesser expertise than they do, learners move from what they currently know to more complex understandings.

[Challenge students] to apply new knowledge and share what happen[s] as a result

Encourage cooperation among students

[Create an environment to support] active learning

- This course included interactive assignments and links to examples from the Web that directly involved me in the learning process.
- This course used realistic assignments and problem-solving activities that were interesting and motivated me to do my best work.
- The course allowed me to take responsibility for my own learning.
- The course was used to stimulate thoughtful discussions.

[Sequence skill development with consideration of novice to experienced]

- [Faculty developing online courses for the first time] should develop skills in fully online courses for distance learners before venturing into a blended learning course environment.

[Build] intentional learning communities

- [Faculty should build] an intentional learning community where there is a shared sense of purpose around the generation and sharing of new knowledge.

- [Faculty should support a design where] the learners are in control, continually diagnosing their own learning needs and identifying what they will do next.
- [Faculty should create and support designs whereby] learning is collective as students jointly create a product rather than simply summarize their individual understandings.

Include [communication] learning technologies

- [Faculty should include] chat rooms, threaded discussions, video streaming, audio streaming, simulations, and laboratories.

Encourage active learning

Decide on activities/projects

- [Faculty should decide in advance] what to do where.

Emphasize time on task

Make projects and assignments open-ended

- [Faculty should] include project-based assignments, both synch and asynchronous.
- [Faculty should design such that] interactive set-up includes distributed collaborators, Web-based inquiry application, rich media, and public demonstration of learning.

Communicate high expectations

[Make use of interactive communication techniques available through the Web]

- [Faculty might consider using Web Partners or Peer Editing, Student or Guest Interviews, Alter Egos, Brainstorm Sessions, Buzz Sessions, or Panel Discussions.]
- [Faculty might also consider using Small Group Projects, Role Plays, Case Studies, Simulations, Values Clarification, Demonstrations, Critical Incidents, Theatrics, Incomplete Statements, or "In a Fishbowl."]
- [Faculty might further consider using Ranking or Reporting, Jigsaw, Mnemonics, Personal Vignette, Pyramid or Snowballing, or Character Dialogue.]

[Consider how] strategies for assessment reflect key learning goals

Limit group sizes

- [Faculty should consider] 20-25 for newsgroups and 3-5 for group projects.

[Consider how to] factor in individual differences

[Consider varying] the use of course management technology to student level

- Faculty [should consider varying] the use of course management technology for blended learning for undergraduates compared to the scope of use for graduates.
- (e.g., syllabus and a place to post assignments for undergraduates versus group work, discussions, and tests for graduates)

Select tools for both synchronous and asynchronous communication

Try new approaches and be ready for shifting roles

- advise that developing an Internet course should be considered an adventure
- instructor roles change considerably when teaching via distance learning

[Facilitate the course such that] professors act as guides, mentor[s], and even co-learners

Support the students in using computer-mediated communication

- decide what types of computer-mediated communication will be used and the technical details for how to share information
- plan how to use discussion forums or threaded discussions and when discussions will be required or optional.
- consider the role and function of moderators
- consider using live chat for open office hours, group work, or other communications

[Support] student-faculty contact

- The instructor communicated effectively
- The instructor was enthusiastic about online learning.
- The instructor was accessible to me outside of this online course.
- The amount of contact with the instructor was satisfactory.

Establish a communication plan

- Faculty should establish at the beginning of the semester a plan for when the professor will be available to students online.

[Ensure that] student opinion and experience is valued by professors and peers

Encourage student-faculty contact

Determine how to provide feedback

- [Faculty might use] e-mails [and then determine the] privacy and frequency [of these communications].

[Determine how] class standards [will] be communicated to students

Consider how information will be made available to students

- where will you locate information and how will students access it
- will all the information be read from computer screens? Can books still be used? Do articles need to be scanned to be placed online? Will you use sound or video?
- Consider copy right laws for content you post to the online system

[Consider] time on task [for the course design]

- The course was structured to be user friendly.
- The course was structured to provide an efficient learning environment.
- The course allowed me to complete assignments across a variety of learning environments

Use blended learning course as an addition but not replacement for classroom meetings

- Faculty should use the blended learning course as an addition to but not as a replacement for classroom meetings.

[Include] assistance for learners at varying zones of proximal development

- [Faculty should design and support] an environment where teachers and learners can jointly construct knowledge and become more self-aware and self-directed in their learning process.
- [Faculty should consider that] through modeling and feedback, both teachers and learners nudge each other to higher levels of understanding.

Set a schedule for synchronous meetings

- [Faculty might] consider student input [for schedule synchronous meetings].

Respect diverse talents and ways of learning

[Set] high expectations

- This course used examples that clearly communicated expectations for completing course assignments.
- This course provided good examples and links to other examples published on the Web that helped to explain concepts and skills.
- The assignments for this course were of appropriate difficulty level.
- This course used realistic assignments and problem-solving activities related to situations that I am likely to encounter outside of this course or in a future job situation.

[Apply course management technology choices consistently among faculty]

- The current varied use of ... technology frustrates students, as they are required to travel a steep learning curve for each blended learning course.
- Faculty within a program or school could agree on the same minimum set of requirements for electronically submitted writing assignments.
- [Faculty could agree on the following:] the proportion of instruction online (e.g., two-thirds in class and one-third online); log in requirements; attendance requirements;
- [Continued:] use of public message board format, shared reference area, course schedule, and private folders for secure and documented student communication; [determine what] will be considered quality postings;
- [Continued: should] a student who is actively engaged in class meetings [be] exempt from participating in online discussions; determine where assignments should be posted.

Set expectations for asynchronous discussions

[Decide how to] prepare students to meet the assignment expectations

Provide orientation if required

- [Faculty might find resources or support a] Tech Camp, tech remediation, [or]

community help.

Pilot the blended learning program

- Faculty should pilot the blended learning program, establish a committee on course delivery, develop a phased implementation, designate a core set of skills for faculty and establish criteria for success.
- Examples include ease of use, a match between technology and values held by faculty, and a view of technology as a vehicle for new approaches rather than an aid to current teaching strategies.

Conduct formative evaluations and revisions of the course

- most instructional design models have iterative stages of evaluation and revision
- Ginger Pisik (1997), Tom Creed and Hal Schlais (1997), Porter (1997) are several examples of authors who have posted evaluation tools for distance-learning courses

Create online course readiness assessments

- [Faculty might consider creating] exercises in the first module of a blended learning course that represent the different requirements of the course.
- [The results of the assessment should] clearly demonstrate that the student has not taken advantage of an online orientation to course management technology.
- The criteria [in the assessment] address the ability to concentrate, ability to understand and remember reading material, level of self-discipline, knowledge of time management, reading skills, writing skills, and technical skills.
- [e.g., University of Maryland Student Online Readiness Assessment:
http://www.elearners.com/advisor/index.asp?cm_sp=test_-_advisor_-_tab_-_n%20fa]

Determine how work will be evaluated and communicate [this] to students

- [Faculty might use] peer review [or] percent on collaboration.

[Consider whether] the methods of instruction are negotiable

ISD Phase: Development

Develop the course web site in well-organized modules or "chunks"

- nature of the web dictates developing course materials into easily accessible and viewable chunks of information
- organization is critical
- instructions must be more clear than those used with face-to-face course delivery

Prepare the blended learning course fully before class start

- Faculty should fully prepare the blended learning course at the beginning of the semester since building the course as the class progresses creates confusion for students.

Develop high-quality, highly visual web-based materials

- placing learning materials on the web requires a variety of highly visual materials to teach some objectives
- use good screen design for web page design

ISD Phase: Implement

Provide students with support necessary to achieve their individual learning goals and satisfy their individual [instructional] needs

- "Although technology is an integral part of distance education, any successful program must focus on the instructional needs of the students, rather than on the technology itself" (Sherry, 1996).

[Provide] prompt feedback

- My questions about WebCT were responded to promptly.
- My questions about course assignments were responded to promptly.
- I was provided with supportive feedback related to course assignments.

Give prompt feedback

Ensure access to appropriate technology

- Communicate whether students need particular technical skills and indicate where they might go or do to get those skills

Support students in new roles

- Help the students adapt to the new roles they will have when taking an online course
 - they must be active and more responsible for their learning

Help students understand how to employ a wide range of studying and learning strategies

- Support students in improving their study skills, time management, and materials organization, as well as estimating time for task completion, delayed gratification, and scheduled self-reinforcement

Make explicit the knowledge and ways of thinking that constitute their disciplines

- share thoughts about disciplinary content knowledge and their strategies for learning so students know what is expected of them and ideally become self-regulating learners

ISD Phase: Evaluate

[Determine how] variable outcomes (excellent to poor) [will] be assessed

[Consider] what evaluations [should be collected] at the end of the course

[Consider] what feedback [to] gather as the course progresses

[Determine whether] variable outcome measurements [are] negotiable