

A MATURITY MODEL: DOES IT PROVIDE A PATH FOR ONLINE COURSE DESIGN?

Charlotte Neuhauser
Madonna University

Abstract

Maturity models are successfully used by organizations attempting to improve their processes, products, and delivery. As more faculty include online course design and teaching, a maturity model of online course design may serve as a tool in planning and assessing their courses for improvement based on best practices. This article presents such a maturity model.

Online education has moved to the mainstream of higher education and may surpass all other course delivery methods in quality in the near future. According to a survey of Chief Academic Officers of U.S. degree-granting institutions of higher education (Allen & Seaman, 2003),

- 81% of all institutions of higher education offer at least one fully online or blended course.
- 34% of the institutions offer complete online degree programs.
- 67% say online education is a critical long-term strategy for their institution.

This survey also suggests that academic leaders believe online education may be superior to face-to-face (F2F) education. The results show that

- 75% expect learning outcomes for online education to be equal to or better than F2F instruction within three years.
- 33% believe it will be superior to F2F instruction within three years.

Important issues are suggested by the study:

1. Online education is strategically vital to universities.
2. The quality of online education will be equal to or superior to F2F education.
3. What course design elements lead to superior online courses? What processes, not feasible in F2F instruction, are possible in online education that will enable it to be superior?
4. What might assist instructors in designing their online courses to bring about this additional level of quality?

As institutions, faculty, and programs evolve to the online structure, metrics and models for success will emerge that characterize the more effective applications and best practices of

online course design. Maturity models may be a tool that we find support effective applications and quality online course design. The model discussed in this paper attempts to build the effective use of technology and online best practices on a foundation of effective teaching principles.

Maturity Models

Maturity models in areas involving process and high-performance delivery are proving to be useful because they allow individuals and organizations to self-assess the maturity of various aspects of their processes against benchmarks. As faculty seek to improve their online courses, it is important to know the attitudes, satisfactions, and outcomes of the students; however, these alone do not always provide the guidance necessary to identify which practices or processes should be planned or improved next. In addition, as many faculty and students are new to the online community, they are not familiar with the possibilities of the technology; thus, student learning opportunities are not being expanded by exploitation of the technology. A maturity model may help faculty assess their courses in relationship to best practices and prioritize course improvement actions.

The concept of the maturity model was first developed by Watts Humphrey and his colleagues at IBM in the early 1980s. They noticed that the quality of software (conceptual, product, delivery) developed was positively correlated with the quality of the processes used to develop it. They and others found that process improvement had to come in a series of steps, rather than simultaneously. The U.S. Department of Defense became involved in the mid-1980s by funding the development of the Software Engineering Institute (SEI) at Carnegie Mellon University. Humphrey (1989) took his ideas to SEI and there the maturity model framework was formulated (SEI, 2001).

Maturity models are typically constructed with five levels. Each maturity level is a plateau in which one or more processes have been transformed from a lower level to achieve a new level of capability. Consequently, we can say that as an online course is transformed by providing learning opportunities not available at a lower level, it has then reached a new level of maturity. Each maturity level provides a new foundation of practices on which subsequent levels are built.

Online Course Design Maturity Model

The framework of the online course design maturity model (OCDMM) has been formulated from the capability maturity model for software (Paulk, Curtis, Chrissis, & Weber, 1993). Through experience and observation of others, I have found that as faculty move from F2F to online instruction, they tend to incorporate the technology slowly. As they teach online, they become enthusiastic about adding media and components and attempt to raise the quality of the course. In my experience it becomes confusing as to which process or practice should be attempted next. Using the OCDMM introduces faculty to best practices in steps, provides an integrated system that causes the course to mature in best practices as the faculty course designer increases alignment among best practices, learning principles, technologies, student and faculty objectives, performances, and changing needs.

Since the OCDMM is an evolutionary framework, it assists faculty in selecting improvement actions in course design based on their own available technology, best practice

knowledge and capability, and that of the students. The benefit of a maturity model such as this is in narrowing the scope of improvement activities for faculty to those most vital and accessible, and at the same time providing the next foundational layer of maturity. By concentrating on a focused set of practices and working toward implementing and measuring them in the course design, the faculty can continuously improve their course design and make substantial gains in student outcomes.

Since the model incorporates everything from F2F courses using little technology to courses that are entirely online with multiple technologies, it permits faculty to consciously decide the level of course maturity they wish to pursue. For those who wish to teach F2F classes with only e-mail capability, these courses would be classified at Level 1. This does not infer that the course is not a quality course, only that the best practices for online teaching are not being utilized in this course, and thus it is not a mature online course. The model does provide guidance, however, for faculty who wish to use selected best practices along with F2F instruction.

The philosophy implicit in the OCDMM can be summarized through several principles:

- A mature course design based on best practices, partnered with principles of good instruction, is likely to be positively correlated to student outcomes.
- A mature course design shifts the focus from passive to active learning on the part of the student.
- Student performance can be continuously measured and improved at multiple levels through multiple means.
- Improving student outcomes by individualization of instruction is possible through principles of online best practices and good instruction and technology.
- The improvement of student outcomes can be pursued through an integrated set of proven best practices and processes.
- The instructor is responsible for providing as many best practices as currently known and feasible, while the students are responsible for taking advantage of them.
- Since technologies evolve rapidly and best practices change as technologies evolve, the highest level of maturity will continue to ascend in quality and ultimately potential student performance.
- Institutional standards and incentives can facilitate achieving new levels of maturity in online course design.

Structure of the Maturity Levels

The OCDMM consists of five levels, moving from the initial level (Level 1) to Level 5, the integration of best practices (see Table 1). Each level has five process areas (PA), each of which identifies a series of practices that, when utilized as a group and built on the prior level, will potentially create an environment supporting increased student performance.

Table 1**Online Course Design Maturity Model**

	Key Process Areas				
	Components and Appearance	Individualized and Personal	Use of Technology	Socialization and Interactivity	Assessment
Level 5 Integrating Best Practices	<ul style="list-style-type: none"> •Develops learning objects •Engaging •Effortless navigation •Intuitive •Processes integrated and linked •Multiple sensory input 	<ul style="list-style-type: none"> •Resources supporting learning preferences •Interactive learning aids •Electronic mentors •Sensitive to cultural differences •Self-regulated learning •Learning objects matched to student needs & interests •Learning preference awareness 	<ul style="list-style-type: none"> •Extensive generation and use of Web links and resources •Choices on path, practice, community •Provides integration of processes •Blogs 	<ul style="list-style-type: none"> •Community of learners •Collaborative problem solving & critical thinking •Social presence •Alignment of learning preferences to practices 	<ul style="list-style-type: none"> •Multiple assessments for student performance and course improvement •Feedback for effective self-learning •Multiple options for expressing knowledge •Learning preference
Level 4 Strategizing	<ul style="list-style-type: none"> •Learning objects to meet course goals •Well-structured content •Audio, video and/or animation •Multimedia •Attention getting 	<ul style="list-style-type: none"> •Learner-instructor partnership •Learner-controlled links •Private e-mail faculty-student contact 	<ul style="list-style-type: none"> •Students filter, integrate, and disseminate knowledge from Web resources 	<ul style="list-style-type: none"> •Student-generated discussion •Student facilitation of task & maintenance of groups •Collaborative tools used •Sensitive to student needs 	<ul style="list-style-type: none"> •Versatility of projects •Peer review of work •Student-instructor readiness for online work
Level 3 Awakening	<ul style="list-style-type: none"> •Lectures integrated with links and discussion •PowerPoints & HTML 	<ul style="list-style-type: none"> •Primarily instructor controlled •Private e-mail with students 	<ul style="list-style-type: none"> •Discovery of Web resources •Faculty and students comfortable with use of technology 	<ul style="list-style-type: none"> •Instructor-controlled discussions •Sensitive to student participation •Frequent contact 	<ul style="list-style-type: none"> •Test pools •Papers from student to instructor •Student access to CMS
Level 2 Exploring	<ul style="list-style-type: none"> •Notes online •Blended course •Colors & fonts 	<ul style="list-style-type: none"> •Instructor controlled 	<ul style="list-style-type: none"> •Search engines, library databases •E-mail 	<ul style="list-style-type: none"> •If used, discussions are instructor-led 	<ul style="list-style-type: none"> •Papers through e-mail
Level 1 Initial	<ul style="list-style-type: none"> •Syllabus •Course information •All text 	<ul style="list-style-type: none"> •Limited access, instructor controlled 	<ul style="list-style-type: none"> •E-mail; minimal use of CMS 	<ul style="list-style-type: none"> •E-mail 	<ul style="list-style-type: none"> •None online

Key Process Areas

The key process areas in the model were identified by a literature review of best practices in online course design, which were then categorized into five process areas. Each PA for each maturity level identifies a cluster of related practices and activities that, when used collectively, may achieve an important goal for enhancing performance capability (see Figure 1).

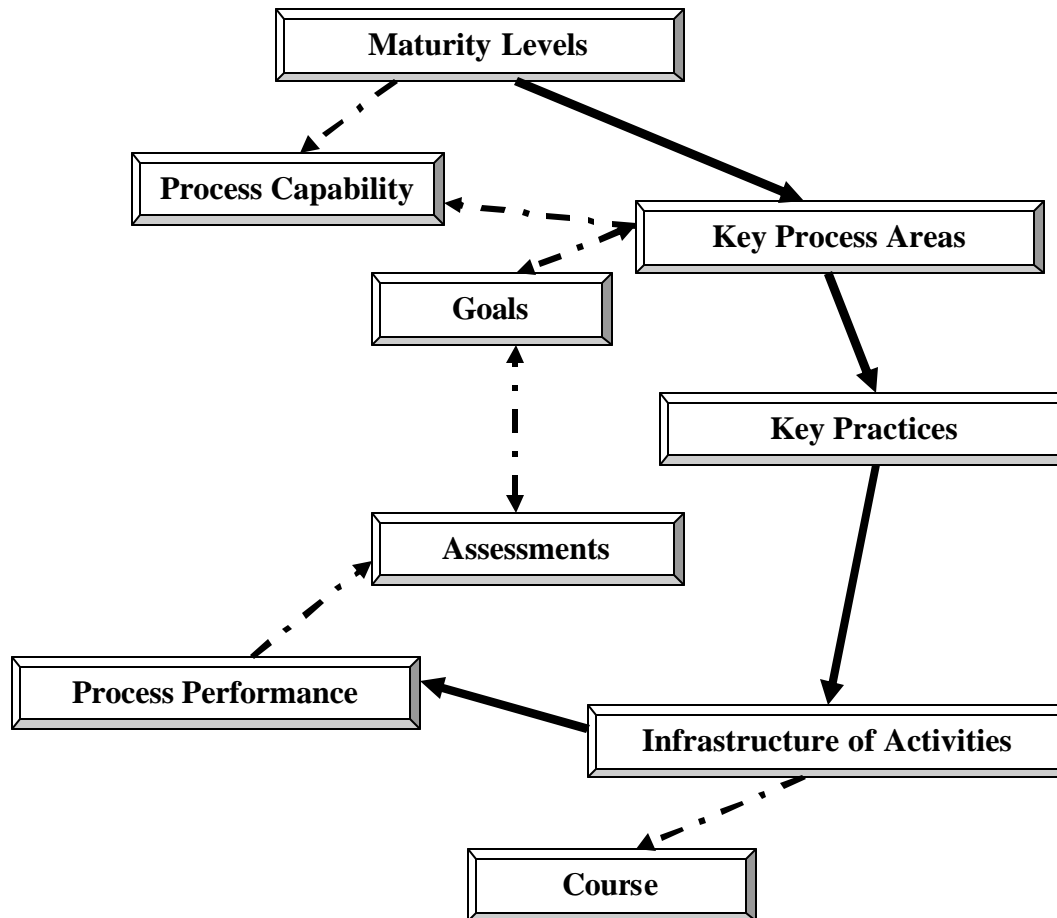


Figure 1. Relationship of OCDMM components.

The decomposition of each maturity level ranges from general guidelines to specific practices found to be successful in the literature. A process is defined as a domain with a set of activities, practices, and transformations that faculty may use to improve the quality of the course. Assuming the designer uses the principles of good teaching (Chickering & Gamson, 1987) as a foundation, the course matures in quality as additional best practices are integrated

and consistently implemented; consequently, Level 5 is the compilation of best practices currently identified in the literature.

Process Capability

The range of expected results that can be achieved by following a specific set of practices within a process can be defined as a process capability. The process capability provides the means of predicting the most likely outcome to be expected based on the literature. For example, if the literature shows that the way the screen is designed has more effect on learning than the content, then we can predict that well-designed screens will produce the potential for higher performance by students than poorly-designed screens.

Process Performance

A process performance represents the actual results achieved by following a best practices process. Process performance focuses on the results achieved, while process capability focuses on results expected. In the example above, the actual measurement of the learning outcome as a result of the well-designed screen is the process performance.

Process Maturity

A process maturity is the extent to which the practices of a specific process are designed, managed, measured, controlled, and deemed to be effective. Maturity implies a potential for growth in capability and indicates both the integration of best practices in the online course and the consistency with which they are applied throughout the course design. It may be possible for a designer to include the practices of Level 4 components and appearance process and yet not use the practices of some of the other Level 4 processes. However, since Level 5 integrates all five processes, it would not be possible to attain Level 5 course maturity without the use of all processes. Each maturity level has a general goal that relates to the purpose of that level (see Figure 2). The set of key practices for each PA reside at a single maturity level according to the level of skill, knowledge, and technology required to utilize them. All PA practices at each maturity level must be implemented in order for the course to be mature at that level.

There may be other Process Areas with additional activities that are not included because they were not as widely published in the literature, but may become part of the best practices at the fifth level as time goes on.

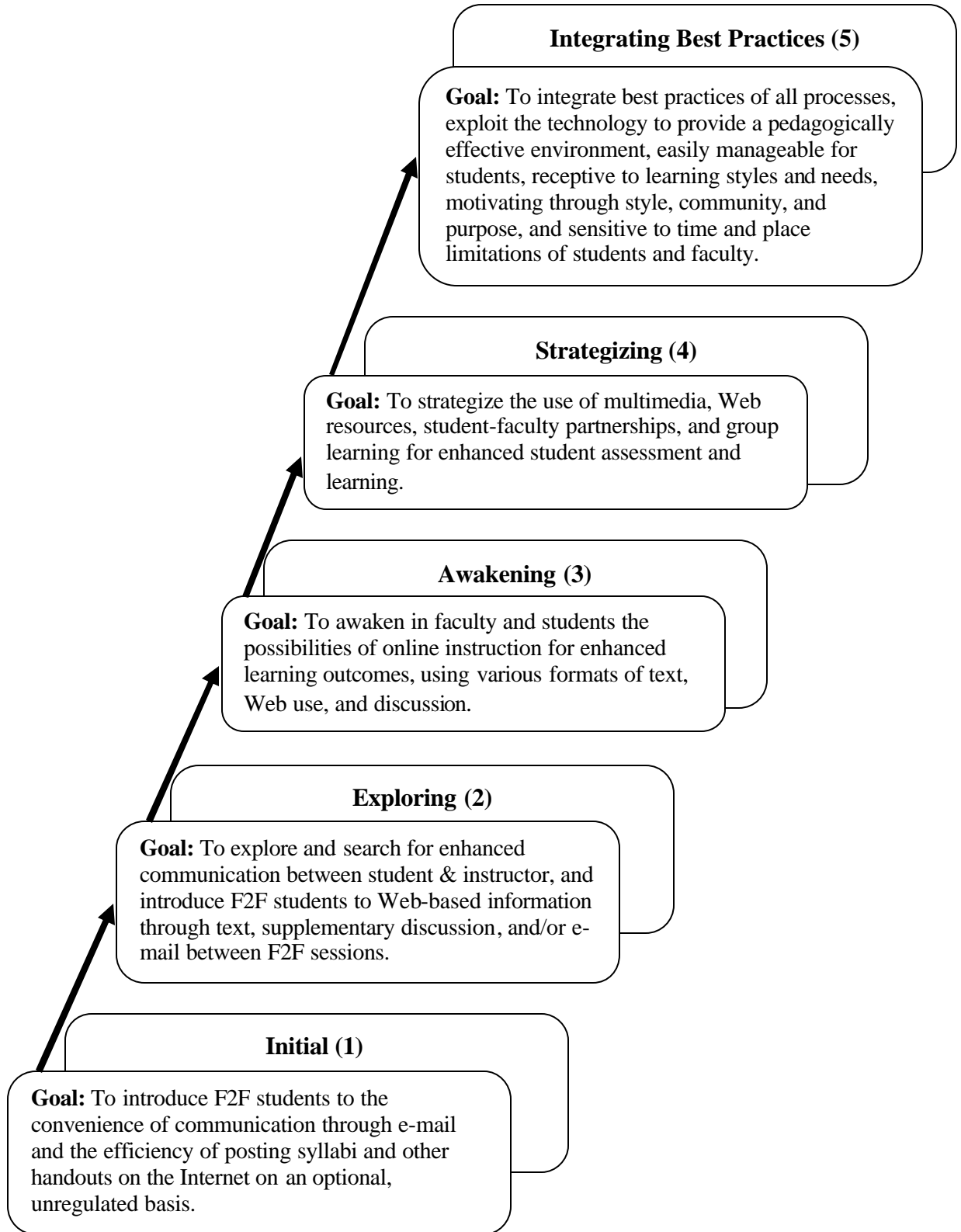


Figure 2. Key process area goals by maturity level.

Discussion of Maturity Levels and Processes

Level 1: Initial

Typically at this level, the instructor teaches an F2F course with minimal use of the Internet. The syllabus, course handouts, and a faculty profile may be available to the students through a course management system (CMS), such as Blackboard. Text-only will be used with no effort made to use graphics or HTML components. Any elective communication between students and faculty will be through e-mail. Assessment and most instruction will be F2F.

Level 2: Exploration

The course at this level may be a hybrid or blended course combining F2F and online learning. The instructor is exploring the capabilities of a CMS, and portions of lectures or lecture notes may be posted, possibly using color and font variations. Faculty will be asking themselves, “How can I transfer my face-to-face course to an online course?” A better question may be, “How can I use the technology that will provide learning activities for the students, resulting in better outcomes?”

Faculty are sometimes concerned that online learning will lose the face-to-face socialization that occurs within the classroom. However, the key in online design is applying useful concepts about learning in general with implementation of innovations that use the best of networking technologies. At this level the discussion board may be used for instructor-directed questions, but the full capability of the discussion board does not begin until Level 3. E-mail will be used more extensively for submission of papers. Students may use common library databases or search engines, such as Yahoo, but the use of the Web is limited and not especially encouraged.

Level 3: Awakening

At this level, the instructor is awakening to the vast Web resources and capability for increased learning through the use of technology. Whereas, at Level 2, the instructor is concerned with transferring F2F learning activities to online, at Level 3 there is more concern with creating an online environment that will produce more learning.

Faculty will become more comfortable with teaching online at this level. This implies that students will become more comfortable, as instructors add guidance in learning what is expected in online courses and how to think and write online, manage one’s time and, and make managing the technology easier.

Lectures will be linked with Web resources and discussion questions. PowerPoint presentations may be used along with more advanced features of HTML and audio. Evidence suggests that verbal and picture information should be presented together, as students seem to perform better when textual annotations are combined with drawings (Lehman, 2000).

Threaded discussions are initially stimulated and controlled by the instructor, but students are encouraged to discover Web resources for integration into papers or discussions. This is the level at which instructors recognize that the discussion board can reinforce the value of student writing as they reflect and share what they are learning by relating it to their experiences and their daily lives. Trinkle (1999) points out that online discussions permit learners to find greater

depth and understanding of the course content. Instructors will determine whether the interaction is meeting the needs of the students as they assess whether the students need more encouragement, chatting, networking, or assistance with the technology? The use of networking has grown in online teaching and learning as studies have shown that communication can be recorded and explored in a way that usually does not happen in F2F classes. The fact that all communication does not occur at the same time allows for more time for reflection on the messages. A large and rapidly growing body of research confirms the effectiveness of collaborative learning in higher education, and online courses accelerate and enable this (Astin, 1993; Cooper et al., 1990; Goodsell, Maher, & Tinto, 1992; McKeachie & Gibbs, 1999).

Faculty at this level encourage more student-faculty contact and interaction. Brown (2001) states that frequent student-faculty contact is the most important factor in student motivation, intellectual commitment, and personal development.

Exams, if appropriate, will be given online through the CMS, and both faculty and students are becoming more aware of the criteria for success in teaching and learning through e-learning.

Level 4: Strategizing

At this level the instructor has evolved in his or her philosophical approach to online teaching from instructor to facilitator of learning. The learning partially consists of using sharable content objects (SCOs), sometimes called learning objects. A learning object is a self-contained small chunk of learning that accompanies a specific learning objective. Each learning object will integrate text, sometimes audio and video, an activity which exemplifies the learning, and assessment. At this level the learning becomes partially learner-controlled in that the activities are descriptive enough to allow the learner to choose, depending on the needs of the learner. Students are required to access Web resources and filter, integrate, and disseminate the knowledge to others in the course. Projects are used, and may have been used at a lower level of maturity, but now they are posted for review or critique by all students.

We begin to see efforts of community-building at this level, thus threaded discussions are frequently initiated by students. Community-building is defined as creating a sense of belonging, of continuity, and of being connected to others and to ideas and values within a climate of justice, caring, and celebration (Boyer, 1995; Sergiovanni, 1994).

Learning is influenced by social interactions, interpersonal relations, and communication with others. Feelings of being alone are overcome when students join together in a community of learners who support one another (Eastmond, 1995). Building this community is vital as it can affect student satisfaction, retention, and learning as confirmed by an extensive body of research. Relative to students taught conventionally, cooperatively taught students tend to exhibit better grades on common tests, greater persistence, better analytical, creative, and critical thinking skills, deeper understanding of learned material, greater intrinsic motivation to learn and achieve, better relationships with peers, more positive attitudes toward subject areas, lower levels of anxiety and stress, and higher self-esteem (Johnson et al., 1998; McKeachie & Gibbs, 1999). To accomplish this, the instructor is using tools, such as discussion forums, team-building, and group processing through group sites for collaborative critical thinking and problem solving (Bonk & Wisner, 2000).

Level 5: Integrating Best Practices

Since Level 5 reflects the best practices of the distance learning community at this time, let us look at each process in detail. Following the process area heading are listed the major resources from which the best practices were gleaned.

Level 5 components and appearance (Bonk, 2001; Downes, 2001; Lehman, 2000; van Dam, 2002). As noted above, learning objects are chunks of learning content that can be used in multiple ways. In Level 4 the instructor uses learning objects developed by others to meet goals of the course; however, in Level 5 the instructor may be developing learning objects for use by others. In addition to designing learning objects at this level, the instructor and students will select learning objects from a variety of resources and integrate them to meet individual learning needs and learning preferences.

The use of multimedia can facilitate learning through integrating new information with prior knowledge. Research studies show that audio actually has more positive impact on learning than video. Text can communicate more information by its appearance as studies show that the look of text has as much of an impact on learning as the message (Szul & Woodland, 1998). If a program is well designed, students will want to spend time learning, scores will improve, and time on task will be reduced. It is, of course, possible to use too many bells and whistles that do not meet the objectives and actually detract from the learning.

With hypertext, learners have more control on how they access the information as they choose to follow links and navigation buttons. At Level 5 the links will be created in a logical, organized fashion to prevent the learner from getting distracted and confused. Hints or clues as to where the links will lead are given so the learner can decide which to follow.

One of the important aspects of Level 5 maturity is that the course activities are integrated and work together like a well-fitting glove. Some general criteria that have been suggested for evaluating an online course (Brandon-Hall, n.d.) include the following:

- Does the course include the right amount and quality of information? Is the course designed in such a way that learners will actually learn?
- Are learners engaged through multiple opportunities for input?
- Can learners determine their own way through the course? Is there a course map accessible?
- Is there an appropriate use of icons and clear labels so that learners do not have to read excessive documentation to determine program options?
- Does the course engage learners through novelty, humor, games, testing, adventure, unique content, surprise elements, and so forth?
- Does the course appropriately and effectively employ media production elements such as graphics, animation, music, sound, and video? Is the gratuitous use of these media avoided? Is the soundtrack annoying?
- Are there multiple types of assessment for each section before proceeding to later sections?
- Is the course attractive and appealing to the eye and ear? Does structure of screen add to the course?
- Are student performance data recorded effectively and efficiently?

At Level 5 the faculty will be increasingly cognizant of how the design of the course will motivate learners, whose creativity, higher order thinking, and natural curiosity contribute to motivation to learn. Such motivation is stimulated by tasks of optimal novelty and difficulty, is relevant to personal interests, and provides for personal choice and control (Bonk, 2001).

Level 5 individualized and personal (Gunawardena, 1997; Adler & Rae, 2002). This process area assumes that the best learning experience can be defined by the student; thus, it provides a mechanism for identifying the learning preference of the student, matching it with an appropriate reading level along with guidance for content based on abilities and knowledge. Feedback and suggestions for improvement are readily used at this level by the student. We find that students with larger quantities of learner control rate instruction more favorably (Lehman, 2000).

Various methods of feedback about learners' understanding and suggestions for improving retention or remedial materials are provided, possibly through learning objects. Reading level may also be adjusted by choosing learning objects that fit each student's needs (Adler & Rae, 2002).

Even though teaching to a student's preferred learning style may meet the student's needs, there is contradictory evidence that shows that instructors should help their students build their skills in both their preferred and less preferred modes of learning. Felder (1996) points out that learning style models that categorize these modes provide good frameworks for designing instruction with the desired breadth; therefore, the goal is to make sure that the learning preferences of students in each category are met at least part of the time.

If the class meets personal or academic needs of the students, they tend to allot more time to it. Those students who may become frustrated with the amount of time needed to input messages and with the time delays necessary for responses must be kept in mind by the instructor, and a variety of media should be used to help offset some of this frustration.

At this level, learners will have a great degree of control over the path chosen for learning. Learner control is an important aspect of effective learning, and hypertext provides that benefit. Many Web links will be provided at this level so learners may choose those which interest them or through which they may pursue a topic in depth. Web resources will be one of the methods used to link new information with existing knowledge in meaningful ways. In addition, a number of strategies will be used to achieve complex learning goals, such as scenarios, cases, games, and role-playing.

Course design is influenced by environmental factors, including culture, technology, and instructional practices; consequently, at this level the instructor will be sensitive to the differences in learning preferences between cultures.

The student may choose to have an electronic mentor that can take many forms and provide different functions, such as serving as a guide to help find the learning sought. For example, if a student has trouble with a concept, he or she can click in a Web page on the mentor, which would gather any learning objects necessary and deliver them to the student's environment, providing an immediate learning experience. To a certain extent, computer technology is capable of assessing individual learning preferences, generating learning appropriate to students' abilities and knowledge level, and providing them critical information when they need it.

Level 5 use of technology (Lehman, 2000). There is a tendency for students to not completely read textual information. They opt to quickly follow links to other material and they prefer Web sites rich in content; consequently, it is vital to provide a multitude of links that meet

this criterion. At level 5, students filter, integrate, and disseminate knowledge from Web and online databases through shared papers, projects, and discussions.

The kind of integration among text, Web links, multimedia, discussions, and simulations at this level is pushing the students towards more collaborative and team-oriented learning. Such interaction points to the growing importance of collaboration, reflection, critical thinking, evaluation, and decision-making skills, instead of low-level factual knowledge (Bonk & Kim, 1998; Wisner, 1999).

The important point to remember at Level 5 is that the Web and the technology are the means of integrating a host of learning experiences that can be stimulating and individualized, and can provide interactivity among community members and continuously assess the learning outcomes. The design, then, can use the best principles of learning, the best practices of online design, and the dynamic capabilities of the technology.

Level 5 socialization and interactivity (Brown, 2001; North Carolina Community College System, 2000; Moller, 1998; Morrison & Oblinger, 2002; Palloff & Pratt, 2001). Level 5 focuses on building a community of learners as defined above in Level 4. Whether or not a community of learners exists can affect student satisfaction, retention, and learning. An interactive environment can produce engagement, and it is probably not possible for a program to be too interactive. At this level the community of learners has been encouraged to provide positive reactions to each other's input. Receiving such messages bolsters participants' self-confidence and raises their comfort level. The course provides an environment that encourages students in supporting each other. Recent research has shown that promoting robust and usable knowledge is directly associated with engaging learners in authentic tasks and situations. In other words, it is how they feel about working online and their integration with their learning groups that is important.

Being a part of a long threaded discussion makes students feel part of a bigger whole, part of a community that together can examine or struggle with information, an issue, or an idea. There are some general question-design guidelines the Level 5 instructor will be comfortable using on the discussion board, even though some of these guidelines may actually be used at lower levels:

- Provide questions or activities that promote debate, various points of view, and sharing of past experiences.
- Avoid questions where there is one correct answer that can be garnered from the textbook.
- Plan ahead how often the instructor will intervene to drive the discussion's direction.
- Determine the management style the instructor will use to encourage and produce the desired type of discussion and outcomes.

Counter to prevailing beliefs about Web courses and the need for F2F interaction, studies show that a student's predominant learning preference and need for F2F instruction do not predict engagement. It appears that the factors that predict student engagement are the perceived helpfulness of the discussions and the student's amount of time available for online learning (Moran & Dereshiwsky, 2002). Regardless of these factors, however, online participants are more likely to become engaged by a responsive instructor. Student-generated questions and ideas are used, as well as thought-provoking questions specifically eliciting on-topic discussion and argument.

Collaborative learning groups used at Level 5 will be effective for learning as they encourage greater performance when compared to individual project performance. Learning communities are best built with ideas provided by each learner, discussion thread by discussion thread, until an environment is built where learning relationships generate knowledge and where learning is given authenticity by the learning community (Morrison & Twigg, 2001).

Level 5 assessment (Henderson, 2001; North Carolina Community College System, 2000; Steadman & Svinicki, 1998). The most important effect of assessment at this level is that the focus becomes student centered (Angelo & Cross, 1993). Assessment involves multiple levels and types, including self-assessment for readiness to learn, formative and summative assessment, learning preferences, and regular feedback for student and instructor. Before these types of assessments can occur, the instructor must provide an environment that produces multiple types of feedback and assessment. Feedback may come from alternative sources: the instructor, the student through selected readings and self-assessments, surveys on the Web, or other students.

Bonwell (1999) emphasized that effective assessments can be used to implement critical thinking, and through activity learning, improve students' metacognition skills as well (Steadman & Svinicki, 1998). Online surveys serve as flexible and useful tools for formative assessments. Accessing data from the CMS can be helpful as formative assessments. For example, Wang and Newlin (2001) found the total number of discussion postings read and written by the student during the first week is predictive of the final grade. Active participation by the students can be encouraged by private e-mails to the students the first week. This will be occurring at some lower levels as well, but the technology will be used more efficiently at this level.

As the learning progresses, the amount of guidance provided by the instructor will be reduced in order to allow the learner to explore and mature. At Level 5 the amount of guidance from the instructor has become minimal as many types of automatic, electronically generated feedback and assessment are provided for the student for self-guidance. Courses, however, will typically include instructor guidance as part of the discussion responses at the beginning of the course and will gradually diminish as the course progresses. However, more challenging types of feedback, including effective use of student partnerships and community, will be in place.

At this point the wise use of data determines effectiveness and return on investment, the latter of which includes such variables as student retention, return to other online courses, student activity throughout the term, satisfaction and effectiveness feedback surveys, and of course the standard tests and projects.

The effectiveness of the course may be determined by a variety of assessment tools, such as the following:

- Feedback surveys—Did they find the course satisfying and effective? Did the content, assessment, PowerPoints, video, and audio work well?
- Student outcomes—multiple measurements.
- Self-assessments along the way.
- Attrition rate—Did the course lose students along the way?
- Activity—Are students active on the discussion board and staying active the entire term? Is the term too long or material boring, with the same activities every week? Have students become self-motivated learners? Have they been taught how to do self-reflection and become self-regulated learners?

- Enrollment—Are students enrolling in the course? Do they return for another course?
- Did the students have many opportunities to explain, share, comment, critique, and develop course materials among themselves?
- How often and when did students access the course?

Summary of Level 5

Learning objects may be developed by faculty at this level, but will be used in more ways than at Level 4. The course is designed so that it is engaging with effortless negotiation by the student, using a rich resource of learning methodologies that support various learning preferences. The major theme of the course is community building and collaborative learning among the students and facilitator. The technology will be exploited to an extent that it may enhance the capability of the student to learn. The massive data collected and available to students and facilitator are used for feedback for student learning and course improvement. Utilizing best practices provides greater cognitive development, critical thinking skills, exploration to further professional knowledge and practice, empowerment to heighten personal responsibility toward creating change, and discovery of new knowledge (Land, Nwadei, Stufflebeam, & Olaka, 2003).

Validity of Model

The model has been presented to faculty representing universities of varying sizes and types. A questionnaire was administered to determine whether the model was a valid and useful tool for course design. The respondents (88%) suggested that they are able to place themselves in a cell within each process area and that the cells above their current level of design show the criteria adequately for moving to the next level (88%).

There appears to be some evidence that the criteria listed below their current level may cause some concern as to whether or not this presents less maturity. Fifty percent said that the cells below do show less maturity; 31% said they do not, and 19% were not sure. This interpretation may be that the word “maturity” is one that suggests incompetence or less quality on the part of faculty. There may be a misunderstanding that the respondents felt they were being judged as immature rather than the course being judged as immature in terms of its use of best practices in the process areas. Nevertheless, over two thirds of the respondents found that a tool like this can be very helpful, with one third not sure, in identifying best practices and what one needs to do to improve the quality of online courses.

Conclusion

The OCDMM represents a possible process improvement approach to online course design for faculty. The best practices incorporated in the model have been published in the literature (Morrison & Oblinger, 2002; Phipps & Merisotis, 1999). It has been found to be useful as a tool for guiding faculty in moving towards best practices in course design. Online courses must be structured to leverage and exploit technology in order for superior quality to occur. The model does not suggest that the use of these best practices will guarantee successful performance by the student; however, it does imply that if these practices are used, along with the principles

of good teaching (Chickering & Ehrmann, 2001), it is likely that the learning environment will be one in which most students will thrive and be successful.

As competition heightens among institutions, and faculty recognition and program growth are afforded to the more successful programs, the use of maturity models, such as the online course design maturity model, may be a tool that provides a basis for self-assessment and improvement planning.

References

- Adler, C., & Rae, S. (2002). Personalized learning environments: The future of e-learning is learner-centric. *E-learning*, 3(1), 22-24. Retrieved July 23, 2004, from <http://static.highbeam.com/e/elearning/january012002/personalizedlearningenvironmentsthefutureofelearni/>
- Allen, I., & Seaman, J. (2003). Sizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003. Alfred P. Sloan Foundation. Retrieved February 7, 2004, from http://www.sloan-c.org/resources/sizing_opportunity.pdf
- Angelo, T., & Cross, P. K. (1993). *Classroom assessment techniques: A handbook for college teachers* (2nd ed.). San Francisco: Jossey-Bass.
- Astin, A. (1993). *What matters in college: Four critical years revisited*. San Francisco: Jossey-Bass.
- Bonk, C. J. (2001, May). Online teaching in an online world. Bloomington, IN. Retrieved May 15, 2003, from http://www.publicationshare.com/docs/faculty_survey_report.pdf
- Bonk, C. J., & Kim, K. A. (1998). Extending sociocultural theory to adult learning. In M. C. Smith & T. Pourchot (Eds.), *Adult learning and development: Perspectives from educational psychology* (pp. 67-88). Mahwah, NJ: Erlbaum.
- Bonk, C.J., & Wisner, R. A. (2000). *Applying collaborative and e-learning tools to military distance learning: A research framework* (Technical Report No. 1107). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. Retrieved May 15, 2003, from [http://www.publicationshare.com/docs/Dist.Learn\(Wisner\).pdf](http://www.publicationshare.com/docs/Dist.Learn(Wisner).pdf)
- Bonwell, C. (1999, September 9). *Active learning in large classes*. Seminar presented at Washington State University, Pullman.
- Boyer, E. (1995). *The basic school: A community for learning* (2nd ed.). Ewing, NJ: California Princeton Fulfillment Services.
- Brandon-Hall. (n.d.). *FAQs about e-learning*. Retrieved October 22, 2002, from <http://www.brandonhall.com/public/faqs2/index.htm>
- Brown, R. E. (2001, September). The process of community-building in distance learning classes. *Journal of Asynchronous Learning Networks*, 5(2), Article 2. Retrieved October 2, 2001, from http://www.aln.org/publications/jaln/v5n2/v5n2_brown.asp
- Chickering, A., & Ehrmann, S. (2001). Implementing the seven principles: Technology as lever. Retrieved January 27, 2004, from <http://www.tltgroup.org/programs/seven.html>
- Chickering, A. & Gamson, Z. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, 39(7), 3-7.
- Cooper, J., Prescott, S., Cook, L., Smith, L., Mueck, R., & Cuseo, J. (1990). *Cooperative learning and college instruction*. Long Beach: California State University Foundation.

- Downes, S. (2001, July). Learning objects: Resources for distance education worldwide. *International Review of Research in Open and Distance Learning*, 2(1). Retrieved April 11, 2003, from <http://www.irrodl.org/content/v2.1/downes.html>
- Eastmond, D. V. (1995). *Alone but together: Adult distance study through computer conferencing*. Cresskill, NJ: Hampton Press.
- Felder, R. (1996). *Learning styles*. Retrieved April 9, 2003, from http://www.ncsu.edu/felder-public/Learning_Styles.html
- Goodsell, A., Maher, M., & Tinto, V. (1992). *Collaborative learning: A sourcebook for higher education*. University Park, PA: National Center on Postsecondary Teaching, Learning, and Assessment.
- Gunawardena, C. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *American Journal of Distance Education*, 11(3), 8-26.
- Henderson, T. (2001, September/October). Classroom assessment techniques in asynchronous learning networks. *Assessment: A Publication of the Michigan Virtual University*. Retrieved November 3, 2001, from <http://ts.mivu.org/default.asp?show=article&id=908>
- Humphrey, W. S. (1989). *Managing the software process*. Reading, MA: Addison-Wesley.
- Johnson, D. W., Johnson, R. T., & Smith, K. A. (1998). *Active learning: Cooperation in the college classroom* (2nd ed.). Edina, MN: Interaction Press.
- Land, D., Nwadei, A., Stufflebeam, S., & Olaka, C. (2003, January). Socio-technical system advancements: Making distance learning changes that count. *USDLA Journal*, 17(1). Retrieved February, 2003, from http://www.usdla.org/html/journal/JAN03_Issue/article03.html
- Lehman, D. (2000, December). Designing hypertext multimedia educational software. *Journal of Asynchronous Learning Networks*, 4(2), Article 4. Retrieved May 10, 2001, from <http://www.aln.org/publications/magazine/v4n2/lehman.asp>
- McKeachie, W., & Gibbs, G. (1999). *Teaching tips* (10th ed.). Boston: Houghton Mifflin.
- Moller, L. (1998). Designing communities of learners for asynchronous distance education. *Educational Technology Research & Development*, 46, 115-122.
- Moran, E., & Dereshiwsky, M. (2002). Identifying factors that predict student engagement in Web-based courseware. *USDLA Journal*, 16(1). Retrieved January 29, 2004, from http://www.usdla.org/html/journal/JAN02_Issue/article05.html
- Morrison, J., & Oblinger, D. (2002, March/April). Information technology and the future of education: An Interview with Diana Oblinger. *Vision: A Publication of the Michigan Virtual University*. Retrieved February 10, 2003, from <http://ts.mivu.org/default.asp?show=article&id=983>
- Morrison, J., & Twigg, C. (2001, May/June). The Pew Learning and Technology Program Initiative in Using Technology to Enhance Education: An interview with Carol Twigg. *Vision: A Publication of the Michigan Virtual University*. Retrieved February 10, 2003 from <http://ts.mivu.org/default.asp?show=article&id=859>
- North Carolina Community College System. (2000, Fall). *Online testing: Best practices from the field*. Retrieved February 10, 2003, from the North Carolina Conference of English Instructors Web site: <http://www.nccci.org/blackboard/testingadvice.html>
- Palloff, R., & Pratt, K. (2001). *Lessons from the cyberspace classroom: The realities of online teaching*. San Francisco: Jossey-Bass.

- Paulk, M., Curtis, B., Chrissis, M. B., & Weber, C. (1993, February). The capability maturity model for software, Version 1.1 (Technical Report CMU/SEI-93-TR-024, ESC-TR-93-177. Pittsburgh, PA: Carnegie Mellon University, Software Engineering Institute. Retrieved January 26, 2004, from <http://www.sei.cmu.edu/pub/documents/93.reports/pdf/tr24.93.pdf>
- Phipps, R. & Merisotis, J. (1999). *What's the difference? A review of contemporary research on the effectiveness of distance learning in higher education*. Washington, DC: Institute for Higher Education Policy.
- Sergiovanni, T. J. (1994). *Building community in schools*. San Francisco: Jossey-Bass.
- Software Engineering Institute. (2004 January 9). *People capability maturity model (P-CMM)*. Retrieved January 26, 2004, from the Carnegie Melon University Web site: <http://www.sei.cmu.edu/cmm-p/version2>
- Steadman, M., & Svinicki, M. (1998). A student's gateway to better learning. In T. Angelo (Ed.), *New directions for teaching and learning: Vol. 75. Classroom assessment and research: Uses, approaches, and research findings* (pp. 13-20). San Francisco: Jossey-Bass.
- Szul, L. F., & Woodland, D. E. (1998, February). Does the right software a great designer make? *T.H.E. Journal*, 25(7). Retrieved April 10, 2003, from <http://www.thejournal.com/magazine/vault/A2012B.cfm>
- Trinkle, D. (1999, August 6). Distance education: A means to an end, no more, no less. *The Chronicle of Higher Education*, p. A60.
- van Dam, N. (2002, January 1). E-learning by design: Can a better-designed course help you learn more? *E-Learning*. Retrieved May 17, 2003, from <http://www.elearningmag.com/ltimagazine/article/articleDetail.jsp?id=6705>
- Wang, A. Y., & Newlin, M. H. (2001). Online lectures: Benefits for the virtual classroom. *T.H.E. Journal*, 29(1). Retrieved February 6, 2004, from <http://www.thejournal.com/magazine/vault/A3562C.cfm>
- Wisher, R. A. (1999). *Training through distance learning: An assessment of research findings*. Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.