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Carol L. Considine

Old Dominion University, cconsidi@odu.edu

Michael W. Seek

Old Dominion University, mseek@odu.edu

Jon Lester

Old Dominion University, jmlester@odu.edu

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Strategies for Effective Online Course Development

Ms. Carol L Considine, Old Dominion University

Carol Considine is an Associate Professor of Engineering Technology at Old Dominion University. She has a Bachelor of Science in Civil Engineering from Virginia Tech and a Master of Science in Civil Engineering from University of California, Berkeley. She has fifteen years of industrial experience and is a LEED AP BD+C. Her area of specialization is construction. She has been teaching using distance learning technologies for fourteen years

Dr. Michael W. Seek, Old Dominion University

Dr. Jon Lester, Old Dominion University

Jonathan M. Lester is recognized regionally for his excellent reputation as both an educator and consulting Professional Engineer. He has served as a Lecturer for three years and as an Adjunct Professor for five previous semesters. His teaching contributions span a wide range of subjects from introductory courses, to required intermediate and upper level design electives. He has brought practical applications from consulting design and construction to the classroom that students' have found invaluable upon graduating. Serving as Experiential Learning Option advisor for multiple students' portfolios, Dr. Lester has successfully evaluated proposals from past work experience to grant course credit for distance students. He has served as the Civil-Site design option evaluator for Senior Design projects each semester as part of his normal teaching responsibilities. Dr. Lester has developed new courses in Civil Engineering Technology to better distribute the student load in Fluid Mechanics and the accompanying laboratory. Dr. Lester has also taught the Professional Engineering preparation courses through the ODU Business Gateway. Dr. Lester has embarked upon the initial asynchronous modality course development and was instrumental in promoting the program forward with this initiative with the Center for Learning and Teaching. He has developed an asynchronous course for Fundamentals of Building Construction and will develop several other courses in the future. Dr. Lester has over ten years' experience in the design and construction of general civil engineering projects in the Hampton Roads area. Consulting assignments have included wastewater collection projects as well as potable water distribution, utility rehabilitation and relocation projects, and storm water projects. He specifically has experience with sewer pumping stations; gravity sewer interceptors; water and wastewater treatment plants. Among his past project assignments are annual engineering services contracts with the cities of Norfolk, Virginia Beach, Suffolk, Radford, and Salem, VA. He is a Professional Engineer in the Commonwealth of Virginia and serves on the Virginia Water Environment Federation Stormwater Committee. He embodies the 'Citizen Soldier' concept that was instilled during his undergraduate studies at Virginia Military Institute, having served as a Marine Corps Reserve officer in addition to both his academic and professional endeavors for over twenty years.

Strategies for Effective Online Course Development

Old Dominion University's Civil Engineering Technology (CET) program has a successful history of distance education, with more than half of the student population comprised of distance learners. Distance learning delivery has traditionally been via satellite and video-streaming with students having the choice of asynchronous or synchronous options. The university is in the process of updating their distance learning technologies and has encouraged programs to migrate to an online modality of distance learning. Developing and delivering online courses requires different competencies and facilitation skills than video streamed synchronous delivery or face to face instruction. A course delivered online changes the teaching and learning dynamics. Courses must be learner-centered with a learning environment that addresses the new roles of the student and instructor. The instructor needs to get to know the students, and empower students to manage their learning experience while creating an online community among the students. The instructor takes on the role of a facilitator of learning, and students must take a more active role in the learning process. Students must be self-motivated, self-disciplined and willing to take ownership of their learning. The course content and layout are critical to successful student engagement and interaction with the instructor, the material, and with other students. Online courses must be developed for longevity, separated from a text that can be revised soon after the online course is launched. Course modules, focused on course topics, should use multiple resources, readings, mini-lectures, assignments, online quizzes, discussion boards, web links, and others, to achieve learning outcomes. As more programs move to online courses, understanding effective strategies for planning, designing and facilitating these courses becomes critical to success.

Background

Old Dominion University has been delivering distance learning programs since 1994 and has awarded 3000 baccalaureate and master's degrees since the inception of its distance learning programs.¹ Their engineering technology programs were one of the first degree programs at the university to embrace distance education. There are three programs in the Engineering Technology Department at Old Dominion University: CET, Electrical Engineering Technology (EET) and Mechanical Engineering Technology (MET). Distance education offerings in the Engineering Technology Department are restricted to junior and senior level courses and were originally scheduled so that a student would have access to courses on a four year rotating basis. Because the distance learning programs were so successful, frequency of course offerings have been increased in all programs. Students entering the CET program with completed lower division coursework can complete their degree program in 2 years. In the fall of 2013, the Engineering Technology Department had a total of 587 full time equivalent headcounts of which 29 percent are CET, 32 percent are EET and 39 percent are MET.² The CET distance learning program has been extremely successful with regard to participation levels, with approximately 50 percent of the student population comprised of distance learners.

Distance learning courses were originally offered asynchronously via satellite. As technology changed, students were provided an opportunity to video stream courses either synchronously or asynchronously. Currently the University is transitioning distance learning programs to online

asynchronous programs. CET will be the first degree program in the Engineering Technology department to transition to this delivery method.

Changing roles of faculty and students in on-line course delivery

One of the challenges of an online asynchronously delivered course is the changing roles of both faculty and student. Faculty members who are successful in distance education understand the change in their role and are willing to transition to a “learner centered teaching” methodology, becoming a facilitator of learning. Faculty need to be content experts, but must also have an understanding of instructional design, student learning styles, and the needs of online learners. In addition they must have an ability to facilitate collaboration and community in a web based environment. Faculty must continue their efforts of quality improvement and assessment. Keeping teaching journals to record problems with and successes of course delivery can play an important role in quality improvement in subsequent course offerings. Faculty need to have an aptitude for or experience with teaching online. They need to have flexibility related to design of content, adapting approaches to delivery of material, and a willingness to learn new ways to transfer knowledge. They have to have a tolerance for failure and be flexible enough to make changes when an instructional methodology is not working, or students are not responding to content as expected.³

Faculty essentially take on four roles and competencies in the delivery of on-line classes:

- Pedagogical - encompassing content preparation, interaction, collaboration and assessment skills and competencies
- Managerial – encompassing logistics and readiness issues
- Social – encompassing community building, interaction and collaboration
- Technical – encompassing proficiency in computer use and course management⁴

At Old Dominion University, the distance learning student population tends to be older adults, between 25 and 50 years of age, working full time, and in school to pursue opportunities for advancement. Many have families and they cannot relocate to attend a campus based university program. Additionally, these students may not be able to attend class during the working day, due to time conflicts with their employment. A distinct advantage of these students is that they bring a wealth of knowledge from their professional lives into the classroom and many times can be some of the best students because of their experience and maturity levels.

To be successful, on-line students need to be open-minded about sharing their life, work and educational experiences. Visual barriers that hinder some students are eliminated, and students have time to reflect in preparation of written responses. Since most course correspondence is by writing, students must be able to communicate clearly through writing. Students need to be self-motivated and self-disciplined to stay on schedule with the course materials and assignments. When they have problems with the course content or assignments, they need to speak up. Instructors are not able to recognize student problems from visual interactions and cannot help if they are not notified of problems. Students need to recognize that they are responsible for their learning and need to be proactive. On-line courses can be time consuming; students need to be able to commit 10 to 15 hours of work each week per course, recognizing that the on-line course may be more time consuming than a traditional course. Students need to have the minimum

technical requirements for the course of study. As in the traditional classroom, they need to have a proper foundation and course pre-requisites. At Old Dominion University, students are expected to meet lower division pre-requisite course requirements through education in the community college system. Critical thinking, reflection, and decision making should be recognized by students as part of the online learning process. They need access to reliable broad band internet so that they can freely access course materials, and they need to believe that high quality learning can take place outside of the traditional classroom.⁵

Effective strategies for planning, designing and facilitating on-line courses

In preparation for development of an on-line course, faculty can benefit from professional development to acquire skills in the areas of online teaching fundamentals and pedagogy. These skills include computer and information literacy skills which will aid them in the use of course management systems and videoconferencing applications. At Old Dominion University, the Center for Learning and Teaching (CLT) offers a six week online course that requires faculty participants to use the proprietary course management system as well as video conferencing applications. As faculty use the various teaching and learning technologies, they become familiar with their capabilities and limitations which aid in the future planning of the on-line course. The course also covers knowledge of copyright, fair use, privacy and intellectual property issues as well as a basic understanding of the characteristics of different types of learners and their needs (technical, content, affective and cognitive).⁵

Transitioning over forty hours of classroom instruction into words, videos, examples and learning activities provides a challenge for faculty members in balancing providing sufficient meaningful content and holding the students' attention. In the planning stage, development of a course design matrix provides for the alignment of course objectives and assessment strategies with module objectives and learning activities.⁶ This course design matrix provides the organizational structure of the course. Weekly modules, based on course topics, replace text chapters in the course design. The modules, focused on course topics, guide the student learning and are supported with use of a reference text. The text is as a course resource, similar to its use in a traditional class lecture, but module content is developed independent of the text to avoid copyright issues. At Old Dominion University, the online courses are developed with the goal of a five year life. Textbook revisions are usually on a shorter time frame and if the online modules are tied to text chapters and pages, every time the course text is revised, the online course requires major revision. The use of modules provides autonomy for the online course materials. A detailed learner-centered syllabus is also developed to structure the course, and provide a schedule for the course development. It serves as the roadmap for course materials that need to be obtained and developed.

During the course design phase, faculty at Old Dominion University are engaged with, and work closely with an instructional designer and instructional technologists to ensure that the final course design is rich, challenging, and provides an effective learning experience for students. The overall course design aligns course and module objectives to content. Engaging and diversified learning activities are used to achieve learning objectives. The advantage of working with instructional designers and instructional technologists is that they have a broader knowledge of instructional techniques and technologies that can be applied to any type of educational

material. For example, a vocabulary worksheet becomes an exercise for students using a drop down menu to match the vocabulary word with the definition and animations are created to demonstrate tectonic plates shifting after glacial retreat. Combining their instructional techniques expertise with the instructor's content expertise allows for new approaches for content delivery. Part of the course design includes developing opportunities for interaction and collaboration within the course, and meaningful assessment and feedback.⁴

Each module may include multiple learning activities and assessment opportunities. Learning activities may include readings, mini-lectures, problem solving, web links, writing assignments (low and high stakes), quizzes, and discussion boards. Using different applications like word clouds, slide share, wikis, voice threads, Prezi, maps and timelines can enhance student learning, and provide opportunities for creativity. Including technologies such as Skype, Audacity, Adobe Connect, and YouTube can provide opportunities for co-construction of knowledge and meaning.⁷ All technologies that will be used during the semester should be used early in the semester in a trial run so that students can use it when needed. Assessment should be aligned with the learning objectives and teaching methods of the course.⁸ Formative and summative assessment strategies should be included to provide opportunities for the student and faculty to gauge the students' understanding and learning of the materials. Formative assessment strategies may include reading worksheets, with students summarizing key points, vocabulary matching exercises in drop down menus, written reflection on course, assignments, or learning objectives, journals, and portfolios. Summative assessments may include homework assignments, group projects, peer-assessment of group work, quizzes, critical evaluation of contributions to the discussions and traditional exams.

Research in distance learning continues to emphasize the importance of interaction for effective teaching.³ Faculty must be clear about the amount of time the course will require of the students and themselves to eliminate potential misunderstandings about course demands. In the role of facilitator, faculty must address issues of community building, interaction, and collaboration. It is important to teach students about online learning since they may not understand the responsibility they have for their own learning, the importance of the online community, or how to build an online community. Faculty should model participation behavior by logging on often and contributing to discussion and community formation in the course website. Students are likely to participate in community formation if the instructor models the behavior and encourages their participation. Faculty should monitor participation, and set limits on participation when needed. When participation wanes, interactions are headed in the wrong direction or if one student is dominating the conversation faculty need to step in and redirect the discussions. Faculty should contact students who are not active in the online environment and encourage them to participate.⁸

Community building establishes rapport between faculty and students and between students and students. Strategies to draw students out and help them establish an online community where they know the people they are learning with include a social space on the course site, posting of introductions and biographies, encouraging judicious use of chat for socializing, and modeling openness and humor. Also, virtual office hours for synchronous chats with students can be effective. Research in distance learning emphasizes the importance of the online community. When students are engaged in the online community the results are increased retention,

decreased feelings of isolation, student co-construction of knowledge, increased interactivity, high achievement of learning objectives, a sense of satisfaction for all involved, and learners are empowered to take responsibility for their learning.⁸

Creating opportunities for interaction between students and between students and faculty in course modules can be accomplished by using some of the following learning activities:

- Collaborative problem solving – establish an online meeting room where students can log on and solve problems
- Small group work - use a “process monitor” to comment on group process or progress and rotate the role of group leader and “process monitor” through the group.
- Online discussion threads - establish minimum posting requirements, post rubric and grade on participation and monitor for compliance.
- Distributed facilitation – rotate or share facilitation roles with students. Ask them to take charge of the discussion thread for a short period of time. They can choose a topic or post their understanding of a topic with discussion questions.
- Debates can be set up by the instructor or encouraged if the issues emerge spontaneously on the discussion board
- Simulations – students can work through a real or hypothetical situation provided by the instructor in small groups to explore issues and develop skills
- Role plays – the instructor can assign roles or students can choose them in order to play out a case or situation assigned by the instructor or spontaneously, in response to a situation presented by a student
- Case studies – cases can be presented by the instructor for student response or students can be asked to generate cases from their work or lives for peer comments
- Collaborative group projects – research projects, discussion of cases, simulation or role plays
- Brainstorming sessions – students are given a situation and asked to respond quickly with their ideas, either synchronously or over a period of a day or so on the asynchronous discussion board

Conclusion

Developing an online course requires consideration of the role that interactivity and the online community play in student learning and achievement of learning outcomes. It is necessary to take this into account when planning, designing and facilitating online courses. The content expertise of faculty can be transformed into engaging and varied learning activities within course modules, with the expertise and assistance of instructional designers and instructional technologists. Both learning and assessment activities provide excellent opportunities to expand course interactivity. While the planning and design phases of online course development are important to the success of a course, the facilitation phase is crucial to the overall success of the online course offering. Creating the social connections, establishing a positive rapport, and creating opportunities for students to interact with the material and each other, and co-construct knowledge, can lead to the best learning outcomes and course satisfaction.

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