



## **Developing Improved Methodology for Online Delivery of Coursework Providing a Framework for Quality Online Education**

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## **Introduction**

The relative quality of online education in the United States has been in question for decades, while a higher value is placed on an education provided in a traditional classroom setting. Studies have shown that a majority of faculty members polled don't accept the value and legitimacy of online courses [1]. Still, many institutes have encouraged faculty members to pursue the development of online courses to meet the rising demand for quality online education. The key terms here are "quality" and "education". A course taught face-to-face can miss meeting expectations as easily as an online course, dependent upon the instructor's ability to create a well-planned learning environment designed to meet the students' expectations and the educational outcomes for the course. Quality assurance can be achieved in online teaching and learning, provided that approaches are employed that build on the strengths of technology and compensate for its weaknesses [2]. With the increasing trend for programs to offer some if not all course material online, developing a methodology and pedagogical strategy for online delivery of course material is critical to the success of the course and the program; affecting both the instructor and the students.

Several studies have shown that online courses take considerably more preparation to deliver the same level of learning experienced with traditional approaches because of the constant effort to revise course content, publish course materials and react to ever changing technology and supported interfaces [3]. The time needed for development of on-line courses can be significant and continuing maintenance of course content after initial implementation may also require significant faculty time [4]. Aside from the necessary course content, courses may vary drastically in a side by side comparison largely dependent upon the faculty member's investment in a course. Driving factors include compensation, available time, and familiarity with available technology and knowledge of basic principles for online course development. In addition to recognizing the effort required by faculty to develop and continuously improve quality online courses, attention must be given to how that quality is defined by students. A study of 73 different online courses revealed a significant correlation between clarity, consistency and simplicity of course design and the students' perception of learning. Consistent, transparent, and simple course structures add to such clarity as well as insure that learners only have to adapt to such structures once [5].

In an attempt to address some of the challenges faced by faculty members developing and maintaining online courses and to foster an environment of improved learning for students, a new standardized format for online delivery was developed and adopted for use in multiple courses within the Facilities Management Technology graduate program at Indiana University Purdue University Indianapolis (IUPUI), where it was evaluated. The objective of the new format, its development, implementation and evaluation are included in the following discussion.

## Background

As the director of an online graduate degree program I have received documented cases of student confusion due to inconsistencies between courses offered within the program. Many student complaints centered on basic course navigation and the ability to find the necessary resources to successfully meet the demands of the course. The majority of the program's students are non-residents, non-traditional students pursuing a graduate degree composed of completely online courses requiring a much higher level of structure built into the program. Course structure "expresses the rigidity or flexibility of the program's educational objectives, teaching strategies, and evaluation methods" and the course structure describes "the extent to which an education program can accommodate or be responsive to each learner's individual needs [6].

It is imperative to show consistency across the program and set the expectation that courses are taught at a graduate level. All courses must provide the expected rigor allowing some flexibility while maintaining the same expected level of results for the course; ensuring that student learning outcomes are met and that the student perception of learning is realized. In order to meet the growing demand for quality online education, a course development model that provides a common framework for consistency, design, pedagogy and content can be very effective. It is no longer feasible to have 18–24 months course production time, and to leave the format, navigation, and look and feel of the final course product to the discretion of each individual course developer. In a market where students expect fast service, consistency, and quality, a more streamlined production approach is now required [7]. Setting standards for instructors has become increasingly important to identify expectations for faculty members as they come and go and courses exchange hands. A way that guarantees the maintenance and quality of distance education pedagogic approaches is the development of e-learning standards. It is imperative that not only university online education policies are followed, but additional standards regarding the program be identified to encourage consistency throughout the program as well as a sense of continuity and ensured quality.

In a survey of more than 2,300 students from 31 institutions in 21 states, students indicated that except for instructor-related variables, the way the course was designed was more important than all other factors, including the learning materials [8]. Courses need to be built on a consistent platform which promotes learning, a sense of community and engagement as well as ease of updating course materials based on proven pedagogical strategies and utilizing applicable supporting technology. Though all of the program courses are delivered utilizing a Learning Management System (LMS), Canvas, not all Canvas sites are created equal. Faculty members, both full and part-time, will benefit from a consistent framework to build from that sets the expectation for course delivery and provides a means of revising content with reduced effort to promote continuous course improvement from term to term. Effort must be made to reduce the time it takes to revise course material so that it becomes a reasonable expectation based on compensation and teaching load for a faculty member to continuously update course material. Students will benefit from the consistent delivery of courses within the program, reducing any disconnect between courses, improving a sense of community among students and instructors.

## **Methodology**

The methodology used to develop a standardized format for online course delivery and evaluate the results of these efforts began with an in-depth literature review identifying best practices for online learning. The target of the study was to reveal components of course development and student learning that could be widely adopted and have an immediate impact on student success and faculty support.

Instructional design consultants from the Center for Teaching and Learning at IUPUI offered additional pedagogical insight for online learning as well as provided an account of available technology supported by the University with the ability to integrate with the existing Canvas interface. The consultants also presented functions within Canvas to support course design.

Faculty completed “Quality Matters” training for online course quality assurance. The training provided an identifiable method for assessing online courses with specific components attributing to the success of online courses and students achievement of specified learning outcomes.

Based on the completed study of “Best Practices” provided for online learning and knowledge of the available technology and LMS, an initial standard format was created and implemented in two courses contributing to the graduate program plan of study. An anonymous survey was developed in Qualtrics and distributed to a combined 17 students in the two courses to collect student feedback on the new course design in regards to improved structure, consistency, ease of navigation and online sense of community.

## **Course Design Standard Development**

Upon completion of the extensive review it became evident that improved navigation and promoting a sense of community would have the greatest immediate impact on course quality, students’ perception of learning and faculty support. Logically, if students need to spend time finding essential course components, this may result in spending less time learning the course content or engaging in peer interaction. Perhaps more notably, low findability and the frustration that accompanies it may impact not only student learning but also course attrition [9].

Highlighted in the Quality Matters Training, developing navigation that is consistent, logical and efficient is imperative; correctly naming links, files, and icons, using tables appropriately, and applying styles to improve the learner’s ability to navigate the course [10]. Navigation of an online course must begin with a starting point that provides direction for the course and sets expectations for students from the beginning and remains consistent through to completion. At the program level the presentation of the online courses that make up the plan of study become an essential part of the program branding and the consistency between courses speaks in some measure to the legitimacy of the degree being offered. There should be a consistent presentation pattern for every unit, so learners can become comfortable and develop patterns for approaching the learning activities each week [11]. The first component of the new standard format utilizing the Canvas interface begins with the home page. Figure 1 presents a view of the home page;

including course name, description, prerequisites, computer resources, instructor contact information and a link to an introduction video. This is the first page every student will see when entering the course site. The introduction video walks through key elements of the syllabus and provides student with a foundation to successfully navigate the course. The new standard also requires faculty members to schedule an orientation appointment with each student conducted by phone or through video conferencing. This is a reasonable expectation for graduate faculty teaching the online courses in the program due to the limits placed on course capacity. Online service courses with larger enrollments may need to consider video conferencing with multiple attendees. Canvas provides an intuitive menu that can be tailored to the faculty member's preferences located down the left side of the course site. To encourage consistency within the program, the new standard format requires the presence of specific tabs in each site while allowing some flexibility to include additional menu options.

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- IUPUI Academic & Student Support Services
- Campus Course Policies
- Library Research Guide

**SECTION INFORMATION:** Class#: 22539

**COURSE DESCRIPTION:** This course introduces and examines the design criteria, operation, safety, maintenance, testing and assessment of building engineering systems. The inter-relationships of fire protection, HVAC/R, electrical distribution, plumbing, lighting, acoustics, telecommunication and energy management are examined.

**PREREQUISITES:** None

**COMPUTER RESOURCES:** Canvas, Microsoft Office, Acrobat Reader

**INSTRUCTOR:**

Name:

Phone:

Email:

**START HERE:**

INTRODUCTION: select link below

[Introduction](#)

*Figure 1*


In addition to the home page and introductory material, the site provides easy access to the syllabus for the course. Figure 2 provides a look at the syllabus, which can be selected using the menu down the left side. The site allows faculty members to communicate through text, images and links among other things. In an effort to present clear instruction on the syllabus page, the outline or schedule of topics and assignments has been posted as an image while the complete syllabus can be retrieved through the available link and downloaded.

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# Course Syllabus

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COURSE OUTLINE – ART 51500 Introduction to Facilities Engineering Systems

Date	Module	Reading	Topic	Homework
Aug 23	Week 1	Chapters 2 and 3	Environmental Resources Sites and Resources	Assignment 1 Practice Quiz Due August 30
Aug 30	Week 2	Chapters 4-5 Chapter 8 (241-258)	Thermal Comfort, Indoor Air Quality Daylighting (Passive Environmental System)	Assignment 2 Due September 6
Sept 6	Week 3	Chapters 9-11	Passive Heating, Passive Cooling, Integrating Passive Systems	Quiz 1 (Week 1-2) Due September 13
Sept 13	Week 4	Chapter 12	Active Climate Control Systems	Assignment 3 Due September 20
Sept 20	Week 5	Chapter 14	Electric Light Sources	Quiz 2 (Week 3-4) Discussion Assign 1 Due September 27
Sept 27	Week 6	Chapters 16-17	Electric Lighting Design Electric Lighting Applications	Assignment 4 Due October 4

**Figure 2**

Work is posted weekly and accessed through the modules tab as shown in Figure 3 below. Each module links students to a page which provides clear instructions and the necessary resources to complete the required work for that week.

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- IUPUI Academic & Student Support Services

▸ Class Profile

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▾ Week 1 Environmental Resources and, Site and Resources

- Week 1 Environmental Resources Site and Resources

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▾ Week 2 Comfort and Design Strategies\_IAQ\_Daylight

- Week 2 Comfort and Design Strategies\_IAQ\_Daylight

**Figure 3**

Figure 4 shows the layout of a typical page that presents student work for the week. The page will provide instructions for the week including assigned reading, pre-recorded lectures and handouts due to

its asynchronous delivery, additional resources, and assigned work to be submitted. The first week's material also includes a practice assignment to ensure that students are able to submit work. The practice assignment requires students to create a video biography to share with classmates. The assignment gives students the opportunity to practice using VoiceThread for their video post as well as acts as an introduction to their cohort to be discussed in more detail. Likewise a practice quiz is included, designed to introduce students to the testing environment as well as cover key elements of the syllabus and course site to further influence the students' understanding of course expectations and site navigation. Practice assignments do not affect student grades. Once directed to the individual assignment or quiz, additional instructions can be made available.

**Week 1 Environmental Resources Site and Resources**

**Week 1 Material**

- Make sure that you have reviewed the introduction material provided on the Home Page for this course. It includes [Introduction](#)
- Read Chapters 2 and 3 in your text, Mechanical and Electrical Equipment for Buildings
- Review Lecture material for Week 1 Environmental Resources Site and Resources. A link to the recorded lecture is provided at the following links  
[Week 1 Environmental Resources Site and Resources.mp4](#)
- [Week 1 Environmental Resources Site and Resources Handout.pdf](#)
- Additional Resources  
 NA
- Submit practice homework, due August 30th @ 11:59pm  
[Assignment 1 Bio](#)
- Submit practice quiz, due August 30th @ 11:59pm  
[Practice Quiz](#)

This concludes the work for Week 1

**Figure 4**

This new format was developed to improve consistency within a course and across the program while providing ease of navigation that is consistent and logical to students. The format is also intended to provide a template for course design by faculty within the program as well as external faculty members. Faculty members are able to simply upload their course content and use the predetermined format to provide student access.



In conjunction with improved navigation, an attempt was made to create a sense of community within the online course. As mentioned earlier, one of the first steps in creating a sense of community is building the relationship with the instructor through introduction and ongoing interaction throughout the semester. Private correspondence courses or mentored relationships rely solely on the educational value of interaction with the material and interaction with the instructor. A good distance-learning class, on the other hand, broadens and enriches everyone's experience by introducing a multiplicity of opinions and personalities into the mix through the third type of relationship in the distance learning model; interaction with peers [12]. In an effort to increase student interaction, a type of discussion board was developed. Instead of a typical discussion board where students posted comments, asynchronous video posts were adopted using VoiceThread as shown in Figure 5. The video posts were presented as a means for students to communicate beyond words. The posts also presented an opportunity for students to practice expressing their opinions through speech as opposed to text alone. The initial post is a video posted by the faculty member providing the discussion topic. Students responded with their video comments which can be selected and reviewed by all participants providing the cohort with additional opinions and real world experiences beyond the instructors. The faculty member can offer additional responses as necessary to provide feedback and facilitate further discussion.



**Figure 5**

### **Data Analysis**

Upon completion of the survey, results were gathered and analyzed to determine the success of the new standard format for online course design. Thirteen of the seventeen students receiving the survey responded for a response rate of approximately 77%. The data collected was divided into two groups of responses. The first group of questions were designed to assess whether or



not the course provided clear and consistent navigation. Figure 6 shows that 92% of the students responding agreed that the course provided a clear starting point, providing evidence of the successful creation of the introductory material along with instructor orientation. Furthermore Figure 7 goes on to reveal that 92% of the students concur that course expectations were set at the onset of the class.

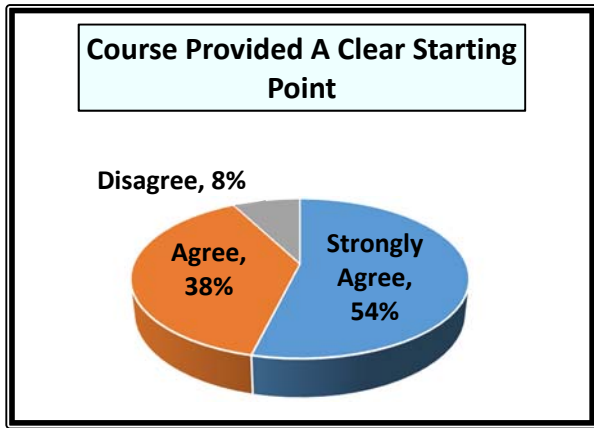


Figure 6

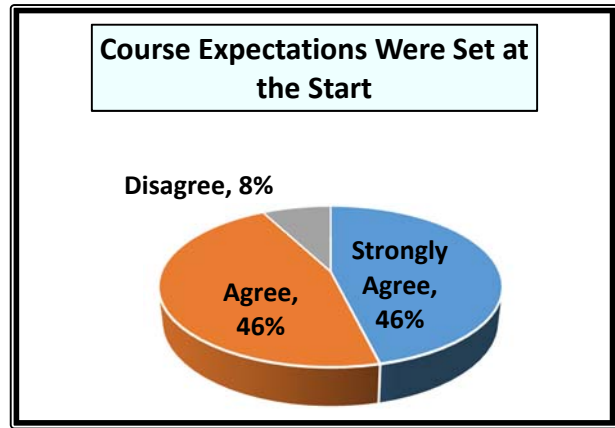


Figure 7

In addition to a clear starting point, data was collected to analyze way finding within the course site. Figure 8 discloses that 100% of the students responding agreed that the course components were identified and easy to locate; including all assignments, resources and lecture material. The same students also agreed that course material and assignments were linked and easily accessible as shown in figure 9.

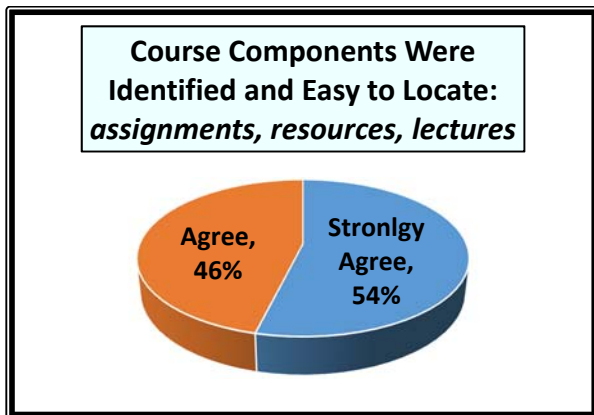


Figure 8

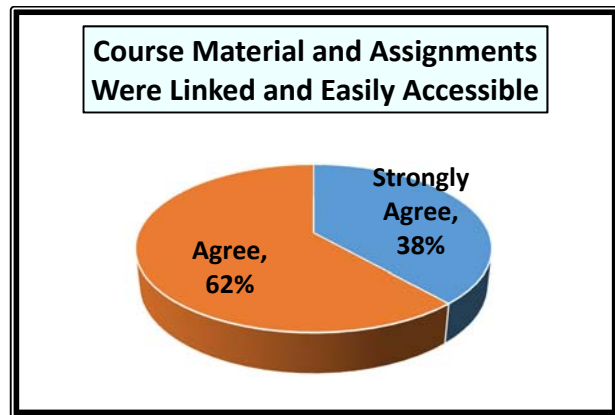


Figure 9

Furthermore, 100% of the students responding stated that the instructions made it easy to navigate the course and 92% affirmed that the material was laid out consistently from the beginning of the course through to the end as shown in Figures 10 and 11.

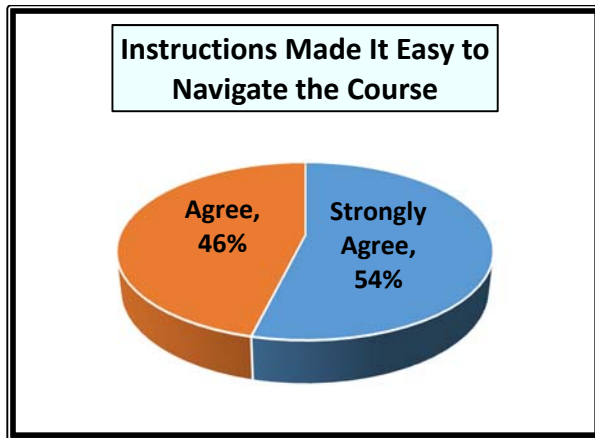


Figure 10

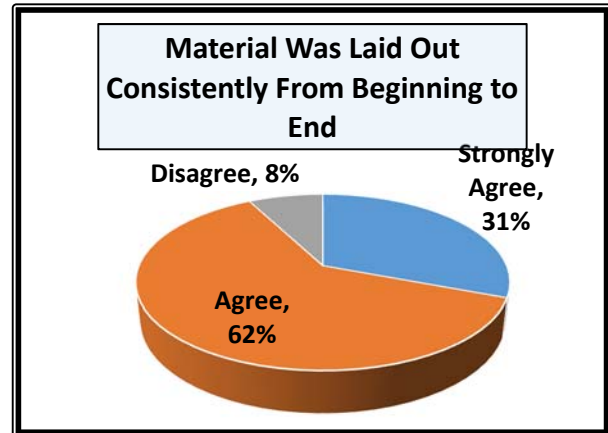


Figure 11

The other fraction of the survey was intended to collect data specific to building a sense of community within an online learning environment. A sense of community should include both instructor to student interaction and student to student. Figure 12 shows that 92% of the students responding agreed that the instructor providing a personal introduction made it easier for students to reach out to the instructor throughout the course. When asked, the 92% of the same students responded stating that personal introductions made by students increased student interaction in the course as seen in Figure 13.

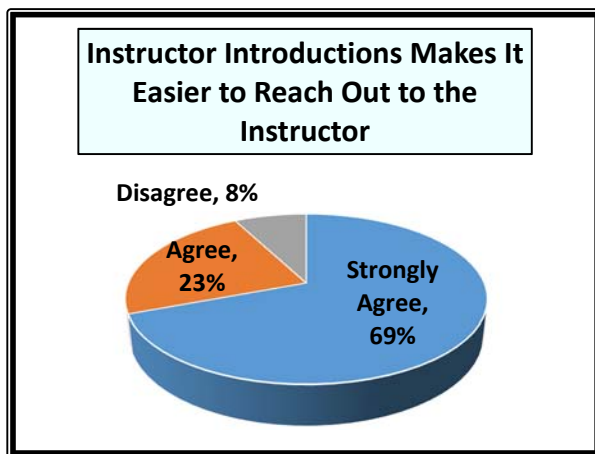


Figure 12

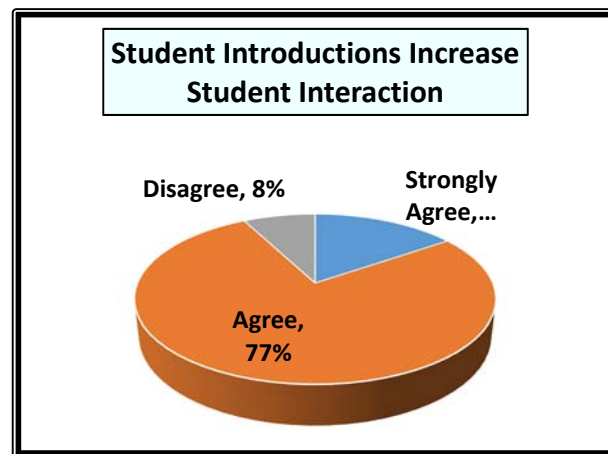
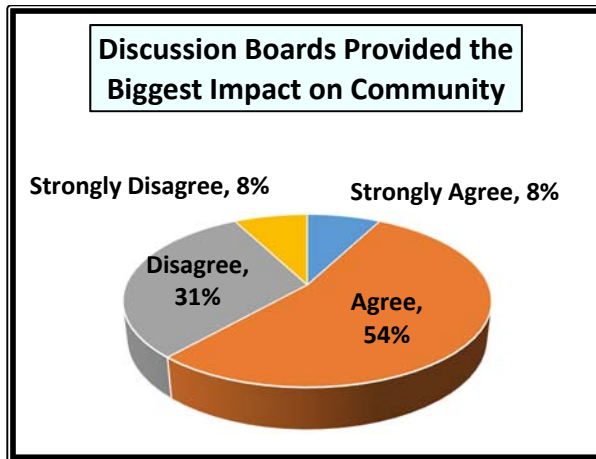
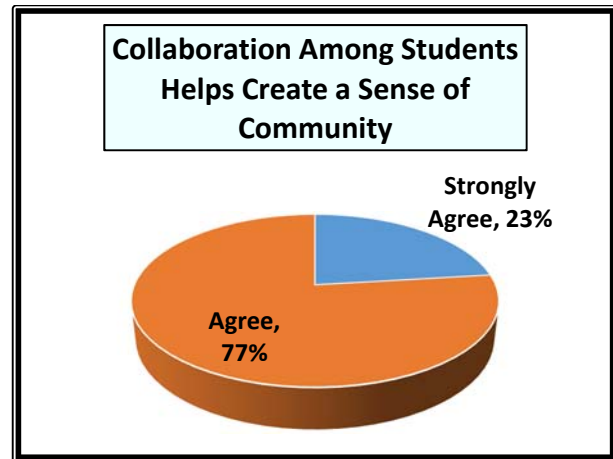


Figure 13

In addition to requiring introductions at the onset of the course, student interaction was also bolstered through discussion board posts and student collaboration. Figure 14 reveals that only 62% of the students felt that discussion boards provided the biggest impact on community. Many students added that discussion boards, specifically the video post was added work in the course. Surprisingly, 92% of the students perceived the discussion board to be an added value for the course. Figure 15 goes on to show that 100% of the students agree that collaboration among students helps to create a sense of community.



*Figure 14*



*Figure 15*

### **Recommendations and Conclusion**

The objective of this study was to create a standard online course design format that would support student learning and provide faculty members with a template to reduce design efforts and allow faculty members to focus on content as well as student interaction. Based on the results of this study and the student survey, the course structure proved to be easily navigated by students ensuring that time was not wasted looking for required resources and assignments. Providing a defined starting point for students with set expectations using introductory material and live orientation in addition to a standard syllabus is imperative if faculty members are to lay a foundation for students to successfully navigate the course.

Furthermore, providing a sense of community in an online setting has proven to be more difficult than in a traditional classroom environment, especially for students earning degrees completely online. The survey revealed that, though possibly not the most important element, discussion posts can add to student interaction contributing to a sense of community. Video posts provided some additional benefits over traditional posts, but also added technical difficulties and a learning curve that had to be overcome by students and faculty members. Allowing practice assignments helped to reduce pressures associated with delivering assignments using new technology. The survey results also suggest that increased collaboration among students would also help build a sense of community among online students. Ultimately the findings revealed that multiple methods need to be employed within an online course to help ensure interactions between students and with the instructor.

The study would have benefited from a larger population of students to survey. The enrollment size for the online graduate courses was limited, while a study performed on online undergraduate service courses could produce greater responses. Faculty look to continue improving course quality. Future studies will include reviewing best practices for creating interactive lectures for asynchronous online courses including a review of technology.

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