Students' Perception of Course Quality across Course Development Models

Abstract: Through a unique combination of events, a large research institution used four course development approaches in a relative short period of time. Courses were developed by faculty using a training course, instructional designer supported, QM training course, and no training or support used. Distance learning courses taught online were grouped based upon the development model. Students from randomly selected courses received a survey based on the QM criteria asking their perception of the course elements and their opinion of the quality of the course. Students' perceived course quality were compared given four course development models. Significant results were found across the 8 QM general standards for instructional designer supported (DS) online courses designed using QM criteria as compared to the other course design models.

Introduction

With projected declines in freshman enrollment into post-secondary institutions (Selingo, 2012), institutions are exploring different approaches for reaching non-traditional students. Traditional freshman students are also changing as tuition cost increases, many are choosing to work full or part-time jobs as they attend classes. As a consequence, many post-secondary students are handling a different set of pressures as they attempt to complete degree programs. Post-secondary institutions are responding to the changing needs of students by providing distance learning options for their students resulting in 70.7% of higher education institutions offering online courses (Allen & Seaman, 2014). Distance learning classes enable these students to take courses on a flexible schedule as they work or care for children. From this perspective, distance learning contributes to students successfully progressing and completing their degrees.

Migrating courses from traditional course formats to distance learning requires faculty to shift their pedagogical beliefs, improve technical skills, and adopt different classroom management skills (Allen & Seaman, 2013; González-Sanmamed, Muñoz-Carril, & Sangrà, 2014; Neban, 2014). Faculty continue to have a negative perception about the quality of online education primarily based on the belief that their instructional content is incompatible with online instruction (Neban, 2014). Teaching styles are often developed very early in a career making it difficult to change mid-career to a different style. When teaching online, faculty are often challenged in learning both the technology and a different pedagogy creating a degree of discomfort as they convert their courses to the distance learning formats (Osika, Johnson, & Buteau, 2009). Contributing to the pedagogical challenges in transitioning to online is the perception the online courses are impersonal with no discussion, which leads to the faculty member missing the student-teacher interaction (Neban, 2014; Osika, Johnson, & Buteau, 2009).

To assist faculty in overcoming concerns while migrating online and to enhance their skills to become effective distance educators, professional development is considered a valuable tool. In a survey of 48 institutions with membership or representation in either SloanC or WICHE, 90% use a variety of professional development options including 2-5 hour workshops, 2 hour 1-on-1 training, hands-on training, creating an online course, or one-time sessions to provide training and support to their faculty members (Meyer & Murrell, 2014). Community of practice was another professional development option used by 57% of those institutions. Of the course training options, faculty placed higher value on pedagogical training than tool trainings; while webinars were valued the least by faculty members (Meyer & Murrell, 2014).

One approach to increasing the number of online courses delivered is to teach the faculty how to design a course and the skills required to facilitate that course. Training young adults typically focuses on foundational knowledge to prepare them for future careers. As an adult matures, training options change to reflect their increased capacity for reasoning and desire to work better. Training becomes more about problem solving and application of knowledge. Training older adults to use technology is counterintuitive as they often need extensive learning experience to acquire foundational technical skills (Schenck, 2015). Based upon the perception that faculty need extensive training to learn the technology, professional development for faculty teaching online is often a training course offered over several weeks or an intensive week long experience (Meyer & Murrell, 2014). These professional development opportunities often focus on foundational technical skills and the principles of instructional design.

Training courses have mixed results. The typical training model is cost effective in that groups of faculty are trained to design their own courses. However, the training course must be carefully designed with the faculty members' expectations in mind. Faculty often have high expectations as instructors. For the best results, the instructors of the training course must be prepared, the technology skills should be limited to a few necessary skills, and the guest speakers selected to represent different vantage points (Terantino & Agbehonou, 2012). The additional time requirements to fully participate in the training courses can lead to low rates of participation in the course. To mitigate the lack of participation, communicating the expectations to the faculty members is important so they understand the extent of the work required to participate in the course (Cho & Rathbun, 2013). After participating in a training course, however, the faculty members often report lack of confidence in their use of the online technology (Kerrick, Miller, & Ziegler, 2015).

Within many training courses, faculty may be taught the instructional design process using the Quality Matters (QM) rubric. The QM rubric was a federally funded project by MarylandOnline (Shattuck, 2012). Two components drive the success of the rubric. The rubric describes the best practices and serves as a checklist for those needing guidance in development. Faculty are often included in the evaluation process as they review and certify courses meeting the rubric standards. The QM rubric also serves to guide the development of online courses. The rubric includes standards describing content, how to write objectives, develop assessments, create instructional materials, instruction on the learning management system, and technology tools that are available for instruction and assessment. Training courses developed using the QM rubric results in improved confidence in the use of the technology by the faculty (Hixon, Barczyk, Buckenmayer, & Feldman, 2011). The rubric apparently promotes confidence through the structure and the assurance of the research used to develop the rubric.

To address the concern about the time commitment required by faculty in completing the course work needed to participate in instructional activities, the training course is often online. The advantage of a self-paced online course provides flexibility to match faculty members' variable schedules and to build the instruction, which accommodates a range of teaching styles and levels of technology expertise (Rhode & Krishnamurthi, 2016). The development of the faculty development online course takes extra time compared to a face-to-face training. However, once developed the implementation is scalable (Rhode & Krishnamurthi, 2016).

Another course development approach is to collaboratively build courses with the faculty member. The advantage to this approach is the immediate applicability of the training to an actual situation. The training in this case is individual based upon the skills of the faculty member. This model can be successful if course development guidelines are pre-established. The guidelines clarify what is required for a successful course, creates consistency across the courses, and promotes a collaborative working relationship between an Instructional designer and the faculty member (Chao, Sau, & Hamilton, 2010). Faculty can feel overwhelmed when all of the guidelines are presented at one time. Presenting the different criteria at the different stages of development seems to eliminate that feeling (Chao, Sau, & Hamilton, 2010).

The most extensive methodology for the development of high quality courses is a multiple strategies approach. This approach uses a training course, taught by Instructional designers, to orientate the faculty members to the instructional design process. The training course is followed by support through the instructional design process by experienced online instructors acting as mentors. The instructional design staff follows-up with the faculty member to ensure their online classes are working well as the semester begins. Faculty, who have participated in this process, felt they were prepared to teach their newly designed course (Vaill & Testori, 2012).

With so many different combinations of course development models to select from, knowing which of the models is the most effective is difficult to determine. The studies often measure the results of one model or examine one aspect of the model. Rarely are the studies focused on student perceptions of quality. With student success becoming an important focus in funding models for post-secondary state institutions, ensuring the courses developed are meeting the students' needs and perceptions of quality is important to institutions.

Case Study of Course Development Models

The university in which this study was conducted is a large research institution with over 30,000 students attending undergraduate and graduate programs. The University has 2000 faculty in both tenure track and non-tenure track positions, with another 500 adjunct instructors. Approximately, 50% of those faculty participated in

professional development offered by the Center of eLearning in the past 16 months. Currently, 17% of the 15,000 courses offered by the University are offered through some form of distance learning format with 5% through video streaming and 12% online.

When the university was founded in the 1960s, the goal was for the university to be an innovative distance learning institution within the state. The first distance learning efforts were recordings of video in which students would check out the reels for viewing to obtain the course material. With the deep history of the university in distance learning, many faculty felt they had expertise that could transfer to an online environment. With state pressure to have the state universities developing online courses, the institution developed a Center for eLearning (CEL) to develop online courses. Within a three-year period of time, four different course development models were used allowing the evaluation of students' perception of the quality of the courses.

Training Course Model (CT)

To facilitate the development of online courses, the staff at the CEL implemented a required course for online educators. Content included writing of behavioral objectives, assessments, best practices in the how to use the learning management system, delivery of instruction, building community, and accommodations. The faculty members were given a sandbox, which was an empty course shell that could be used to practice developing a course. The culminating activity was developing an online lesson that could be shared with the class. Each week had assignments that were graded by an instructional designer. Designers were also available for advice on course development. Faculty were given a stipend of $3500 for finishing the course. Then paid $6000 every time classes were taught as an overload. With budget drawbacks occurring resulting in no pay increases, faculty were willing to participate in the program. In two years, 210 faculty enrolled in the course. The course was offered in 10 face-to-face sessions with online components.

The course was effective in bringing faculty to the CEL for training and increased the number of classes taught by the faculty online. However, the faculty expressed concerns over the time commitment in completing the course and about the relevance of the content taught in the course. Many felt they had online teaching experience and already had basic knowledge about teaching online. Department chairs were concerned about the quality of the courses developed through the process. Due to time challenges by faculty, some courses were very basic. Other courses were well developed, rich in content and interactive experiences. Based upon the concerns, the team at the CEL decided to change the professional development approach to be faculty friendly.

Instructional Designer Supported (DS)

The new model created a partnership between the faculty member and the instructional designer. The online courses are developed using the QM rubric criteria with several refinements. Each course has a navigational video to give the student guidance in how to access the course materials. A second welcome video is developed by the faculty describing what the course is about, the faculty member's expectations, and the relevance of the courses. The courses have a start here module which contains the class schedule, assignment list, and syllabus. Accessibility/ADA standards are required for all instructional materials. Finally, some form of synchronous communication tools are encouraged.

The design partners used rapid prototyping tools to facilitate quick development of online classes. One rapid development tool was a course template. The template had the basic navigational design and support services essential for student success. The template was designed to be attractive. The template was flexible to accommodate the course organization the faculty wanted with images and multimedia relevant to their courses. The second tool developed was a course blueprint in a matrix format. The matrix promoted the course planning and communication about the course content assessments and strategies. The last tool was a syllabus template, which contains the elements of best practice for online delivery. The second component was development of a collaborative partnership with the faculty member and instructional designer. The faculty content expertise was complemented by the designers' knowledge of course design processes and technical knowledge. The instructional designers provide as much support and assistance in the development of the content as possible. Courses were created to meet QM standards. Faculty are paid $3500 for completing a course. A second payment of $1000 is given when they receive QM certification for the course. They can bring multiple courses through the process. At this point in time, no courses using the instructional design support (DS) have been submitted for QM review.

Designed with No Support (NTS)

In this model the faculty member designs their own course without support or training. Many of the courses offered were developed by innovative faculty who were leaders in distance learning. Those faculty developed courses before professional development was available. Other faculty choose this method because they are concern about the intellectual property rights of their course materials. Faculty developing courses in this group use pedagogical knowledge created through their own learning and teaching experiences.

Within a short period of time, courses were developed using the four different models. This unique situation allowed for the comparison of four course development models by the design team: (a) training course (CT), instructional designer support (DS), (c) Quality Matters course training (QM), (d) designed with no support (NTS). The motivation for the evaluation was to ensure that dollars spent on the new development model resulted in a better quality of online classes. The second motivation was to evaluate the quality of the courses from a student perspective as part of a broader evaluation of the student perceptions about quality within the online classes and the students felt the classes were effective in supporting their learning. If classes developed using the CT or the DS models were determined to not be of high quality, then courses would be redesigned based on the students' feedback. Therefore, the following research questions guided this study: (1) Are students' perceptions of course quality equivalent across all development models? (2) Which faculty development model provides courses which are perceived as higher quality by learners? (3)Which professional development model rated higher by students based on general QM standards?

QM Developed Courses (QM)

Online classes developed to meet QM Standards were revised courses using the NTS or CT course development models. The instructor taught these classes at least once. An Instructional designer reviewed the course as the faculty member participated in an online training course which described the QM criteria. The instructor would then modify the class based on their experiences in teaching the course, the suggestions for improvement provided by the instructional designer, and the QM standards. All courses developed using this model were then submitted for outside review by Quality Matters.

Research Design

This study surveyed student perceptions of course quality given four course development models: training course model (CT), Instructional Designer Supported (DS), Designed with No Support (NTS), QM Developed Courses (QM). Survey questions were based on the 43 review standards of the 5th Edition 2014 Quality Matters Rubric (QM, 2014). These review standards are grouped under 8 General standards (Course overview, Learning objectives, Assessment, Instructional Materials, Learner Interaction, Course Technology, Learner Support, Accessibility). The review standards are used to evaluate various qualities of online courses. The survey was developed by modifying the QM standard into a Likert scale survey item. For example, QM Standard 2.3 (all learning objectives or competencies are stated clearly and written from the learner's perspective) became a statement they could respond to (all learning objectives or competencies are stated clearly and written from the student's perspective) and students rated their class using a Likert scale type items ranging from a "1" signifying strongly disagree to a "5" signifying strongly agree. In addition, the survey included two quality items: (1) I feel that the course was structured in a way I could learn; and (2) This course is a high quality course.

"The QM Student survey," was delivered in a web-based development tool called Typeform (Typeform.com).. A cluster sampling method was used to recruit the participants. Courses using each development model were randomly selected from all the distance learning courses offered at the university and the surveys were sent to all the students enrolled in those courses via email.

Several forms of analysis were used to analyze the data received from the surveys. Student responses were categorized by course and grouped according to the faculty development model used in the development of that course. Participants answered questions describing their perceptions of the difficulty, or helpfulness of the material. Student responses to survey questions were gathered and categorized by group data across faculty development models. An ANOVA was conducted on the data obtained. In addition, responses to review questions were compiled by QM General Standard and compared across faculty development models. Means for the quality questions were also compared. Finally a grand mean of all survey responses were averaged and compared across course development models.

Results

A total of 108 (n = 108) responded to the survey: 20 from the QM group (n = 20), 37 from the CT group (n= 37), 44 from the DS group (n = 44), and 17 from the NTS group (n = 17). Participants answered questions describing their perceptions of the difficulty, or helpfulness of the instruction. To address question 1 and test the hypothesis of mean differences among the four groups, an analysis of variance (ANOVA) was conducted on the data obtained. In addition, pairwise comparisons were conducted using post-hoc t-tests to address questions 2 and 3 to determine whether the difference between each pair of groups was statistically significant.

The ANOVA method is predicated on the assumption that the data is normally distributed. The data from each group was tested for normality using SPSS. The results of the Shapiro-Wilk tests indicated that the assumption of normality cannot be rejected for the QM, CT, and NTS groups *(p>.05)*. However, the assumption of normality must be rejected for the DS group *(p<0.05)* (Shapiro & Wilk, 1965; Razali & Wah, 2011). However, when the sample size is large enough, the ANOVA procedure is robust against departures from normality (Triola, XXXX).

From the ANOVA analysis (see Table 1), interesting patterns in the responses were noted. The DS group was observed to have the highest mean M=203.48 and the lowest standard deviation (SD = 4.13), and the lowest margin of error. These results suggest that students' overall satisfaction was highest in this group and that they felt this lesson design most closely met the quality matters QM standards. Regarding question 1, the ANOVA reveals that the hypothesis of equal means among all the groups must be rejected *F(3,114) = 6.62, (p = .00037)*. CT was the group with the next highest mean M = 174.97; however, the standard deviation for this group (SD = 42.19) was much higher than the standard deviation for the QM group (SD = 36.77). This suggests that the participants' answers were more consistent for the QM group (M = 172.30) than the CT group. The NTS group had the lowest mean (M= 169.06) and the highest standard deviation suggesting that participants in this group were the least satisfied and there were greater variations among the participant's answers in the NTS group (SD = 42.30).

Table 1. Descriptive Statistics

		Mean	Std Deviation	Std Error	95% confidence Interval for mean
	N	*M*	*SD*	*E*	*CI*
QM	20	172.30	36.77	8.22	(155.09, 189.51)
CT	37	174.97	42.19	6.94	(160.90, 189.04)
DS	44	203.48	27.37	4.13	(195.16, 211.80)
NTS	17	169.06	42.30	10.26	(147.31, 190.81)

*QM = Quality Matters Approved
*CT = Course Training
*DS = Designer Supported
*NTS = No Training, No Support

Post hoc analyses, using the Bonferroni correction at the 0.05 significance level revealed that the mean overall satisfaction score for the DS group was statistically significantly higher than that of the other three groups. To address question 2, independent sample t-tests were conducted between the groups. The results confirm what is apparent in the table above. The differences between the QM, CT and NTS group means are not statistically significant *(p > 0.05)*. The 95% confidence interval (CI) for the mean of the groups confirms the results of the post-tests as the CI for the DS group does not overlap with the CI of any of the other three groups and the CI for the QM, CT, and NTS groups do overlap (table 1).

To answer question 3 an ANOVA was conducted for each standard. Standard 1 referred to course overview and introduction and standard 2 referred to learning objectives. The results revealed that there is was a statistically significant difference in students' perception of the effectiveness of the course overview and introduction as well as clear descriptions of the learning objectives. Within the models a difference was perceived for Standard 1 *F(3,114) = 5.14, (p = .002)* and the learning objectives standard *F(3,114) = 4.77, (p = .004)*. Post hoc analyses reveal that the mean satisfaction score for the DS group was statistically significantly higher than the CT and NTS groups ($p<0.05$). Given standard 2, the mean satisfaction scores for the DS group were higher than the QM group, however the difference was not statistically significant. The difference between the QM, CT, and NTS groups were not statistically significant ($p>0.05$).

Standard 3 alluded to assessment and measurement and standard 4 instructional materials. A statistically significant difference exists among the four groups with respect to their perception of the quality of the assessments and instructional materials. For standard 3 *F(3,114) = 5.39, (p = .002)* Follow up pairwise comparisons between the groups also reveal that the difference between the DS and QM group was not statistically significant, but the DS group had statistically significantly higher mean than the CT and NTS groups. No statistically significant difference was observed between the QM, CT, and NTS groups. When it comes to standard 4, *F(3,114) = 4.62, (p = .004)*. The DS group had statistically significantly higher mean than both the QM and CT groups, but not the NTS group ($p>0.05$).

Standard 5 referred to learner activities and interactions and standard 6 referred to course technology. Students' perceptions of learners activities and interactions were not the same among the four groups *F(3,114) = 8.43, (p < .05)*. The same holds true for course technology *F(3,114) = 4.81, (p = .003)*. For both standards, the DS group had statistically significantly higher mean than the QM and CT groups but not the NTS group *(p > .05)*. The difference among the QM, CT, and NTS groups were not statistically significant *(p > .05)*.

Standard 7 inquired about learner support, and standard 8 course accessibility and usability. A statistically significant difference among the groups for standard 7, *F(3,114) = 3.99, (p = .01)* and standard 8, *F(3,114) = 5.88, (p = .001)*. Post hoc tests reveal that for standard 7 the DS group had higher mean than the NTS group only. The mean differences among the DS, QM, and CT groups were not statistically significant and the mean differences among QM, CT, and NTS groups were not statistically significant *(p > .05)*. For standard 8 the DS group had statistically significantly higher mean than the QM group and the NTS group but not the CT group *(p > .05)*. The means of the QM, CT, and NTS groups were statistically equivalent *(p > .05)*.

In addition, the survey included two additional Likert scale items that are not part of the QM rubric. There two items measured the students' perception of the quality and structure of the course. The ANOVA revealed a statistically significant discrepancy in students' perception of course quality and structure based on the course development model *F(3,114) = 5.60, (p = .001)*. Pairwise comparisons of the groups revealed that the subjects ranked the DS group highest in course quality and structure. The DS group scored statistically significantly higher than both the QM and the NTS groups *(p < .05)*; but not the CT group *(p > .05)*. The mean scores for the QM, CT, and NTS groups were not statistically different.

Discussion and Conclusions

Shattuck (2007) proposed future research consider the faculty professional development relative to the QM process. The current study was conducted in an effort to continuously improve our processes for implementing the Quality Matters rubric in our course design model. The results show satisfaction level was consistently higher for

the Instructional Designer Supported (DS) group across multiple standards. The DS instructional materials were based upon the Quality Matter rubric but some enhancements (described above) were made which altered student perceptions. Notable amongst these enhancements was that faculty were paid an additional stipend which more than likely encouraged their active involvement with the Instructional designers. These results suggest that the QM standards are more effective when courses are developed with the assistance of an Instructional designer. Faculty working together with Instructional designers seem to yield better student satisfaction. The partnership of a faculty member's content knowledge and the Instructional designer's course development expertise suggests a better course development model. Further, the DS group ranked higher across all 8 standards. Concurrently, the NTS group ranked lower in most of the standards suggesting that students perceived courses developed by faculty who did not receiving training or received support from instructional designers as low quality.

Contrary to the researchers' expectations, the DS group outranked the QM group on every standard. Many of the differences were significant. Given this sample, students felt courses developed with QM standards without training or designer support do not yield the best possible experiences in online courses. Instructional design support provides additional course development expertise to faculty, but more importantly an Instructional Designer's guidance may lead to a greater level of pedagogical soundness.

The demand for online courses is rapidly rising. This paper adds to the growing body of knowledge on course development models. It suggests that students' experiences are significantly enhanced when online courses are designed in partnership with instructional designers. Instructional designers can provide pedagogical knowledge and match the content needs to the best practices for the delivery of the instruction. The technology is constantly changing. These changes are difficult for a faculty member, who is focused on the expansion and gathering the latest knowledge in their content areas, to monitor. The instructional designer is keeping updated on the best technology to use for course deliver. Merging the knowledge combined with the refinements included in the courses over and beyond the QM criteria identified in the rubric contributed to the students' at this institution rating the instructor supported online classes higher than courses developed using the other models.

Limitations

The results may not be generalizable to all students as the data was collected at one single institution. Although the different course development strategies are defined in this paper, each institution course development components have similarities and differences with what is offered. To fully, understand the student needs those difference need to be defined to arrive at the best combination of factors to impact the perceptions of quality by the students. Further, the participants represented a wide range of colleges. An unmeasured variable is the effectiveness of the training models in relation to subject matter content. It is possible some subject matter content may be easier to teach in an online environment.

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