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Engineering Technology Management Graduate Student Online Learning Preferences

Dr. A. Mark Doggett, Western Kentucky University

A. Mark Doggett is an Associate Professor and the Coordinator for the Master of Science Degree in Engineering Technology Management at Western Kentucky University. His interests are in the area of technology management practices, lean, theory of constraints, quality, and systems thinking. His research includes various decision-making and problem-solving strategies, and the development of distance learning approaches.

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Abstract

As online graduate programs continue to grow, so does the availability of learning media and delivery tools. Faculty and students are increasingly using web-based means of communication such as blogs, wikis, discussion boards, and collaborative tools in addition to assigning traditional readings, lecture notes, homework, writing exercises, and examinations. There have always been multiple choices available to instructors for the delivery of content and the assessment of learning, but now there are more varieties of instructional technologies from which to choose. Given the choice, are there certain online approaches that engineering technology management graduate students prefer? Qualitative and quantitative data was gathered from current students and alumni of an online master's program in this discipline. The questions assessed student preferences for instructional technology media for delivery of content and the means of communication.

Engineering Technology Management Graduate Student Online Learning Preferences

The continuing growth and acceptance of online distance education for graduate degree programs has resulted in faculty increasingly being asked to design and deliver courses using computer-mediated systems. These distance delivered degrees come in many forms with some faculty simply posting notes while others make use of text, PowerPoint™ slides, hyperlinks, or video.[1,2] With the development of greater bandwidths and familiarity with technology, faculty can now utilize more complex and interactive ways of delivering course material, both synchronous and asynchronous. However, asynchronous delivery of coursework still offers the greatest degree of flexibility for both the instructor and student.

The access, flexibility, and convenience benefits of distance learning, particularly for adult learners, are well documented. However, educational distance programs tend to suffer a higher drop-out rate due to a variety of issues such as student feelings of isolation, cost of technology, and lack of student support services.[3,4] It is imperative that distance-learning faculty know the learning preferences of their students and their familiarity with various instructional methods so that curricula can be designed effectively. Effective online courses are those that engage the learner while reflecting the instructor's personality through the content.[5] The intent being to utilize the appropriate method and format for instruction provided the instructional goal facilitates its use.

The design of an online course greatly affects its quality. In addition, the role of an online faculty member changes from lecturer to facilitator. Proper media selection for the content of an online course can either help or hinder the facilitation process, particularly the critical student-to-student and student-to-instructor interactions.[6-9] For distance courses, these interactions take place primarily through chat rooms, discussion boards, or e-mail. The degree of interactivity in a given course is a strength along with the amount of asynchronous material, which promotes

flexibility and a self-directed pace. Furthermore, publishers are now offering customized e-books and tailored course cartridges, providing a cheaper alternative to hard copy books with unassigned chapters. Reading and writing cater best to visual learners, but other activities may benefit kinesthetic and tactile learners.[10] Hogan found that the most common Myers-Briggs type personality of a technology graduate student at a NAIT accredited Midwestern university was ESTJ while the dominant group personality was ENTJ.[11] These personalities both exhibit extraverted thinking and a preference for preplanning. The primary difference between the two is that ENTJs are abstract perceivers of information whereas the ESTJs are concrete. Both types of learners would prefer the structured sequence of online courses and working interactively with others in the class.

With regard to exams, Gehringer[12] found that student satisfaction for open-book, open Web exams was high, even though they create a number of administrative issues due to the technology. A material advantage of open-book, open Web exams is that they provide a more authentic type of assessment, examining students using the types of questions they would be asked on the job. It also prevents the use of simple recall-type questions. Another advantage is the ease of reading student responses that are typewritten rather than handwritten. Conversely, online exams cannot automatically distinguish between minor answer variations, but they can automatically grade other types, such as multiple choice and true-false. Online exams can be created using text banks and questions can be randomized. However, academic integrity remains an issue even though students cannot cheat using unauthorized materials because all materials are authorized. If this is an issue, then the best defense is to proctor the exam.

Instructional Methods for Online Graduate Programs

The purpose of the study was to assess student preferences regarding instructional technology media for delivery of course content and the means of communication. The scope of the study was limited to an online graduate program in Engineering Technology Management at a comprehensive pubic university with asynchronous distance learning instructional technologies. Students were asked their preferences and perceptions regarding online course content and the various communication modes within the degree coursework. Using 10 questions, both qualitative and quantitative data was gathered from the study. Forty-five students and alumni were sent an e-mail and invited to participate in a survey using Easy Survey Package (ESP), an institutionally supported on-line software package. Twenty-five responded for a response rate of 55%.

The quantitative findings were compiled and are shown following. In the first question, subjects were asked to check the online or web-based items where they had the most experience. Of the responses, 100% has experience with online discussion boards or forums and 76% used social media such as Facebook or My Space. A majority utilized online presentations, U-tube videos, and Google docs. Almost half of the respondents had experience with blogs and online projects. See Table 1.

Table 1.

Question 1: Of the following, check the items that you have used or with which you have the most experience.

Discussion Board/Forums	100%	25
Facebook/MySpace	76%	19
Online Presentations	64%	16
U-tube videos	52%	13
Google docs	52%	13
Blogs	48%	12
Online Projects	48%	12
Web page creation	40%	10
Tegrity/Captivate	36%	9
Wikis	28%	7
Podcasts	28%	7
Twitter	20%	5
RSS	20%	5
Online Collaboration Tools	20%	5
Other: gotomeeting.com	4%	1
Other: Research Papers	4%	1
Other: webinars	4%	1

For the second question, subjects were asked to rate the online or web-based items for assignments in terms of preferences. The respondents were instructed to check between 1 and 5 with 1 being the most preferred and 5 the least preferred. The results are shown in Table 2. The most preferred mode for assignments was the discussion board/forum followed by research papers. Web pages and homework assignments were also slightly preferred with the rest being preferred about the same. Least preferred items for assignments were wikis, blogs, and Tegrity or Captivate video/audio, but these were not strong. Question 3 asked the following: Do you have other preferences for assigned work that are not listed above? If yes, please describe. Other stated preferences listed by respondents included assignments using AutoCad, Adobe, Java, TopCat, Visio, and Visual Basic.

Table 2.

Question 2: From the following, select your preferences for online assignments. On the Likert scale, indicate your preferences using 1 as the most preferred to 5 representing your least preferred.

	Average rank
Discussion Board/Forum	1.6
Research paper	2.3
Homework	2.5
External Web page	2.5
Google doc	2.7
Project	2.7
Presentations	2.8
Podcasts or U-tube	2.9
Blog	3
Tegrity/Captivate	3
Wiki	3.1
Portfolio	3.1

Question 4 asked subjects their preferences regarding group or individual assignments. See Table 3. The majority strongly or moderately preferred individual work with approximately one-quarter neutral on the question. Question 5 asked subjects if they preferred sharing their completed assignments with the rest of the class or just submitting the work directly to the instructor. See Table 4. The responses to this question were mixed with a slight majority preferring to submit directly to the instructor. Again, approximately one-quarter of the respondents were neutral on the question.

Table 3.

Question 4: In general, do you prefer to work on assignments in a small group or individually? Select the one answer that best represents your preference.

Strongly prefer Individual work	56%	14
Moderately prefer Individual work	16%	4
Neutral	24%	6
Moderately prefer group work	4%	1
Strongly prefer group work		0
TOTAL	100%	25

Table 4.

Question 5: In general, do you prefer to share your completed assignments with the rest of the class or just submit the work directly to the instructor? Select the one answer that best describes your preference.

Strongly prefer submit to instructor	20%	5
Moderately prefer submit to instructor	32%	8
Neutral	24%	6
Moderately prefer share with class	16%	4
Strongly prefer share with class	8%	2
TOTAL	100%	25

For question 6, subjects were asked their preferences regarding online exams on a scale of between 1 and 5 using 1 as the most preferred to 5 representing the least preferred. See Table 5. The least preferred online exam was a timed exam with forced completion. The most preferred exam type was one that allows multiple attempts. The other types of exams were similar in terms of a slight preference. Question 7 asked: Are there other types of examination methods that you would prefer? If so, please describe. Other suggested examination methods included research papers, essay questions, oral, and practice exams. One comment was that exams are not appropriate for graduate classes.

Table 5.

Question 6: From the following, select your preferences for online exams. On the Likert scale, indicate your preferences using 1 as the most preferred to 5 representing your least preferred.

	Average rank
Exams that allow multiple attempts	2
Essay exams (open-ended questions)	2.3
Multiple choice/true-false exams (closed ended questions)	2.4
Short answer or single sentence response exams	2.6
Timed exams (forced completion)	3.7

On question 8, subjects were asked to select their preferences for viewing course content in an online class using 1 as the most preferred to 5 representing the least preferred. Most preferred a web-based or electronic form of a textbook followed closely by pictures/graphics, and video. A hard copy textbook or podcast was least preferred, but not strongly. See Table 6. Question 9 asked: Are there other course content delivery methods that you would prefer? If yes, please describe. Other course content delivery methods suggested were audio clips, Kindle, Adobe PDF, and video teleconferencing. In addition, respondents provided a few interesting comments.

- "I really do not like materials that must be printed in order to get an online class completed."
- "Video, graphics, and podcasts are helpful sometimes, but also require heavy internet connections."

- "If there were enough interest, classroom."

For question 10, subjects were asked: From the following, select your preferred online resource. On the Likert scale, indicate your preferences using 1 as the most preferred to 5 representing your least preferred. In terms of preferred assignment resources, responses were all very similar with a slight preference for assignment checklists. See Table 7. Other assignment resources suggested were online textbooks in PDF format.

Table 6.

Question 8: From the following, select your preferences for viewing course content in an online class. On the Likert scale, indicate your preferences using 1 as the most preferred to 5 representing your least preferred.

	Average rank
Text (soft copy, e.g., web)	2.2
Pictures/graphics	2.4
Video	2.4
Text (hard copy, e.g., book)	2.5
Podcast or U-tube	2.7

Table 7.

Question 10: From the following, select your preferred online resource. On the Likert scale, indicate your preferences using 1 as the most preferred to 5 representing your least preferred.

	Average rank
Assignment checklists	1.7
Posted grading rubrics/criteria	1.8
Assignment templates provided	1.8
Examples of student work (both good and bad)	1.9

Summary and Conclusions

The students surveyed have used and are familiar with online media such as blogs, projects, presentations, U-tube, or Google docs. There was heavy use of social media. Students preferred and heavily used online discussion or forums. Most preferred individual work submitted solely to the instructor. Students liked exams that allow multiple attempts, but disliked timed exams with forced completion. The results above are not surprising given the nature of adult learning and the current generation of graduate students. It also supports the statement that exams may not be appropriate for graduate school. There was a slight preference for the use of electronic or web-based textbooks, if available. Students indicated a slight preference for checklists as an assignment resource, but all resources seemed to be appreciated. It is interesting to note that only 4% of students had experience in research papers, but ranked them highly in assignment

preference. This may indicate confusion regarding the question as they are used extensively in the program as an assessment method.

The continued use of discussion boards and forums in the delivery of distance courses was supported and would be preferred by this group of students. Discussion boards are also supported in the literature as a method to engage students. Instructors may want to consider assigning individual versus group work, but only if congruent with the goals of the course. However, this finding is also in conflict with the literature regarding student-to-student interaction. The case cited by Woolsey and Roschua[9] received similar responses regarding group work and interaction. An alternative explanation might be that it is more characteristic of the self-directed, self-motivated adult learner whose time is precious and must be managed well.[9,13]

It is debatable whether extensive use exams at the graduate level are valuable, but the type of exam, other than a timed one, does not appear to be of great concern to students. As the survey was regarding online exams rather than paper exams, this finding is congruent with the literature. Students appreciate additional resources, which can also potentially enhance course design and interactivity. In terms of future opportunities, the use of social media may have potential, but at present seems to be geared more towards the marketing of degree programs rather than instruction. While blogs, podcasts and U-tube videos were not highly preferred as a means of submitting assignments or viewing course content, they do have validity as an additional way to engage students. Instructors should definitely explore and be encouraged to adopt electronic versions of textbooks or customizable course cartridges as they become available.

In terms of effectiveness, it appears the discussion board or discussion forum is a preferred instructional media for engaging students by providing a degree of instructor-student interaction when the instructor is actively moderating the discussion. The amount and frequency of online group work and exams continue to generate the most controversy due to conflicting research findings. This may be alleviated in the future as the technology improves. The majority of the effectiveness of online programs is still dependent on the instructor and the design of the course content.

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