ASSESSMENT OF AN ASYNCHRONOUS LEADERSHIP LEARNING ACTIVITY FROM THE PERSPECTIVE OF STUDENTS

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Abstract

The purpose of this study was to determine characteristics of an asynchronously delivered activity that could guide future development efforts to create learning activities that meet the needs of students. Technology continues to provide tools for developing new ideas, pushing the boundaries of techniques, and allowing one to create new and inventive methods of helping students learn. With change as a constant, it is imperative that we remember that underneath the technology, fundamental concepts, such as instructional design and understanding the learner, have not changed. Development of quality instructional materials requires purposeful time, effort, and expense. Thus, as individuals use technology to create instructional materials it is important that they address the question of whether or not development efforts are creating materials needed by the population being served. Demand for particular courses, specifically "Professional Leadership Development," repeatedly surpasses the capacity within the Department of Agricultural Education at Texas A&M University to teach these courses.

The researchers believe that alternative methods of delivering leadership education to meet demand is accompanied by the responsibility to assess student interest in these methods and consideration of preferred instructional design strategies. In a prior study conducted by the researchers, students enrolled in "Professional Leadership Development" indicated a preference for audio and graphics in the presentation of materials (Boyd & Murphrey, 2001). In response to these findings, an activity was designed and developed to address one unit, "Ethics and Leadership Styles," within the course. Based on student reaction to the activity, the researchers have identified elements to guide future development and creation efforts.

Introduction and Theoretical Framework

Leadership skills are an important aspect of student development and thus institutions of higher education strive to meet this need by developing courses to assist students in acquiring these skills. Green (1992) found that while some learn leadership in unplanned ways, it is not always possible for all students to have the opportunity to learn. Demand for particular courses, specifically "Professional Leadership Development," repeatedly surpasses the capacity within some departments to teach these courses.

Technology is creating alternative methods for delivering leadership education to meet demand by generating opportunities for educators to design computer-based activities.

"While the challenges are significant, harnessing multimedia is increasingly seen as essential for training departments of the 21st century" (Barron, 1999). The exploration of how technology can be used to teach specific subjects for specific learners is a constant process. As computers and the Internet become increasingly available, the promise of educational benefit by using computers to

teach also accelerates (Hokanson & Hooper, 2000). Thus, it is important to seek understanding of the mechanisms that will allow the promise of educational benefit to be realized. As cost-effective technologies facilitate the development of educational activities (Tian, 2001), instructors look for effective ways to utilize these technologies.

Technology can be used in different ways to address different educational goals (Niederhauser & Stoddart, 2001). Designing effective learning activities requires careful consideration of the learner and the subject matter. "Instructional designers need a dynamic view of how documents and tools are modified, reinterpreted, and used to create and understand systems in the world" (Bloom & Loftin, 1998, p. 10). Excellent instructional design provides an environment that feels natural and comfortable to its users, excites and challenges its users, is functional and fulfills its purpose (Troupin, 2000). "One of the most powerful uses of multimedia is to immerse the user in a learning environment" (Boyle, 1997, p. 35). Choices in instructional methods are needed to maintain motivation and attention and to address different learning styles (Miller, 1997). Alessi & Trollip (1991) provide five major types of computer-based instruction programs: tutorials, drills, simulations, instructional games, and tests.

Simulations have been found to be an effective teaching tool. Simulations often enhance motivation, encourage transfer of learning, and are efficient in regard to the length of time required by the student (Alessi & Trollip, 1991). Situational simulations deal with attitudes and behaviors in various situations and allow the student to learn by actually performing activities in a context similar to real life. A study of engineering students using a computer simulation in conjunction with classroom instruction indicated that a substantial gain in the retention of the subject matter was obtained compared to students using only conventional teaching methods (Firth, 1972). Simulations provide educators direct opportunities to include Gagne's nine levels of learning into instruction (Gagne, 1985) and allow the learner to explore a topic and receive feedback without public humiliation. "Computer simulation affords teachers and instructional designers a powerful tool for sustaining knowledge retention and transfer" (Bill, 1997, p. 5) by encouraging exploration and case-based learning while relating the abstract to the concrete. In fact, teaching effectiveness can be improved through the use of technology (Seal & Przasnyski, 2001).

However, Born and Miller noted that faculty are concerned about the quality of web-based degrees (1999). The units of instruction utilized for courses to satisfy these degrees require close monitoring to ensure quality. Studying instructional methods used to facilitate learning in distance education is a plausible line of inquiry (Lockee, Burton, & Cross, 1999). While it is believed that a simulation is a positive addition to the instructional design used in teaching ethics and leadership styles, Boyle indicates the need to "fully evaluate their strengths and limitations" (p. 43).

Design is a process that takes place before, during, and after the development of educational materials. "The design process proceeds in a cycle of analysis, design, build, and test" (Horton, 2000). One element of testing relates to understanding student perspective. Discovering student reaction to the simulation approach used will provide insight for the researchers and other educators to assist in future development and evaluation initiatives for the class described and for courses in related fields.

Purpose and Research Questions

The purpose of this study was to determine characteristics of an educational activity delivered asynchronously that could guide future development efforts to create learning activities that meet the needs of students. The study sought to describe student reaction to the activity. A separate study, reported elsewhere, evaluated whether or not students learned from the activity and revealed that the activity did enhance learning.

Research questions developed to guide the study focused on three primary areas: reaction to the approach used for the activity (i.e., Did you find any part of the simulation offensive? Did you enjoy the simulation?), presentation issues such as color and fonts (i.e., Are the colors easy for you to read on the screen?), and issues related to use (i.e., Did you incur any difficulty viewing the simulation?).

Methodology

Research Design

A mixed method approach was utilized in the study to provide triangulation and clarification of results. The study consisted of two parts: qualitative analysis and quantitative analysis. Qualitative analysis was utilized to provide a valid glimpse into the reality (Warwick, 1973) of how the students reacted to the activity while quantitative analysis was used to measure student response deductively. The qualitative analysis preceded the quantitative analysis to avoid influencing the researchers.

A data collection instrument containing three sections was developed by the researchers. The qualitative section consisted of seven open-ended essay questions providing an opportunity for the students to express their thoughts. The quantitative section consisted of seven multiple-choice questions. A third section included four questions to allow identification of the respondents. The instrument was assessed for readability and face validity by faculty and graduate students in the Department of Agricultural Education. The instrument was placed on the Internet and students entered their responses directly online. A randomly assigned number was generated by the computer and assigned to each respondent to ensure confidentiality. Personal identification questions were used only to verify that the students received appropriate credit for completing the activity. CD-ROMs containing the activity were distributed to all 120 students enrolled in the course during their assigned labs. How to use the CD-ROM was explained and an instruction sheet detailing the tasks to be completed to receive credit and asking whether or not he/she would be willing to be interviewed was distributed. An informed consent form was also distributed. Eighty-three students self-selected to complete the activity and instrument. Of those students, more than ninety percent of the students commented in the qualitative section of the instrument. An interview protocol was developed and interviews were conducted with students who had provided vague responses. Eleven students were contacted for interview: six students were interviewed and five students failed to respond to persistent correspondence. Member checking was done throughout each interview to clarify information. Triangulation was used to verify the data. The students interviewed were representative of the on and off campus and like and dislike groups in proportion to the overall group. In addition, comments were compared based on responses to specific questions to further clarify themes in the data.

The results from the qualitative questions were compiled and grouped by question. Computer-generated codes were used to identify comments related to each student. The constant-comparative method was employed to evaluate the data (Lincoln & Guba, 1985). Initially, each idea was listed separately without categorization. Colored markers were used to identify themes and to provide visual indication of emerging categories. Once initial categories were established, the second stage of the constant comparative method consisted of a peer debriefing that was conducted in April 2001 with the Distance Education Workgroup within the Department of Agricultural Education. This workgroup included researchers familiar with technology and instructional design and allowed emerging themes to be further interpreted. As the data analysis progressed, the researchers were able to define specific categories based on overlying themes in the data. Each incident was integrated into their properties and then the construction was delimited and written.

The results from the quantitative questions were compiled and analyzed using the Statistical Package for the Social Sciences (SPSS) computer program. Descriptive statistics consisting of counts and percentages were used to describe responses from the sample.

Development of Activity

The learning activity entitled "AGED 340: Project Interaction" was designed based on findings from a previous study that indicated a preference for audio and graphics (Boyd & Murphrey, 2001). Creativity was used to generate a unique approach to the topic covering one unit within the course focused on "Ethics and Leadership Styles." The activity was designed during Fall 1999 and developed the following year. Design of the activity followed recommendations provided in *Computer-based Instruction: Methods and Development* (Alessi & Trollip, 1991). The asynchronous learning activity was designed as a simulation and created with the computer program, Macromedia Flash. The simulation includes the following components: objectives, directions, an opening, the body (presentations and student actions), and conclusions. The activity is comprised of narrated audio clips, sound effects, text, and graphics. Throughout the activity, the learner is presented with an animated clip and then asked to respond to the scenario by answering a question based on what they learned. The learner is then presented with another animated clip that resulted because of his/her response. This process continues for multiple levels. See Figure 1 for screen capture example of the activity. At the conclusion of the activity, the learner is presented with a unique summary based on earlier choices. There are eighteen possible routes within the program. See Figure 2 for a flowchart diagram illustrating a portion of the program. At the end of each route, following the unique summary, students are provided an opportunity to go through the simulation again or to proceed to a self-test quiz. The self-test quiz combines both content and questions to create an interactive learning experience. The purpose of the learning activity was to encourage retention of the primary principles covered in the units. The asynchronous approach was selected to allow students to learn at their own pace; however, the activities could be used in a traditional classroom setting.

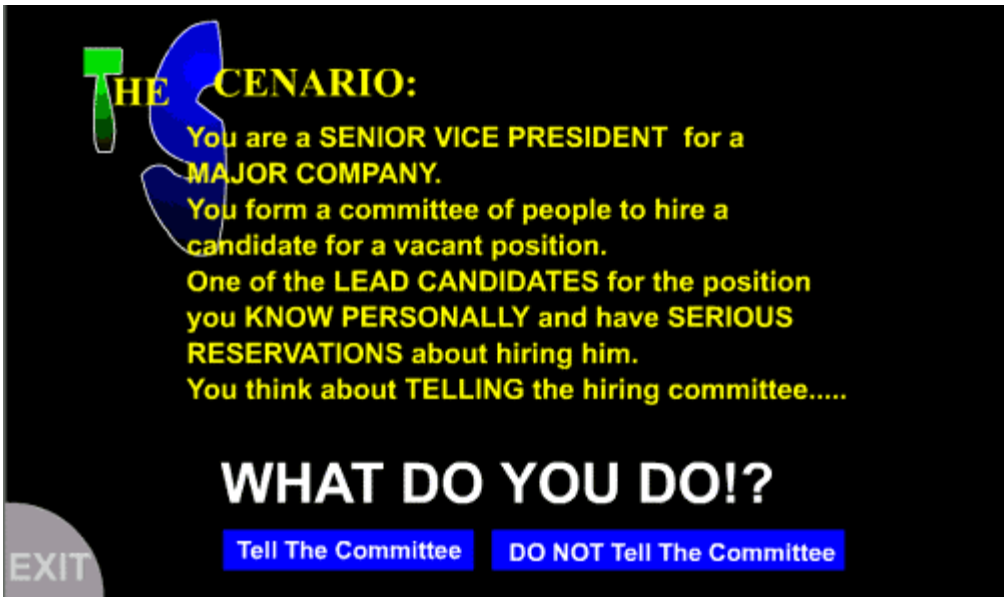

Figure 1. Screen capture of activity entitled "AGED 340: Project Interaction" used in "Professional Leadership Development" course during Spring 2001, Texas A&M University.

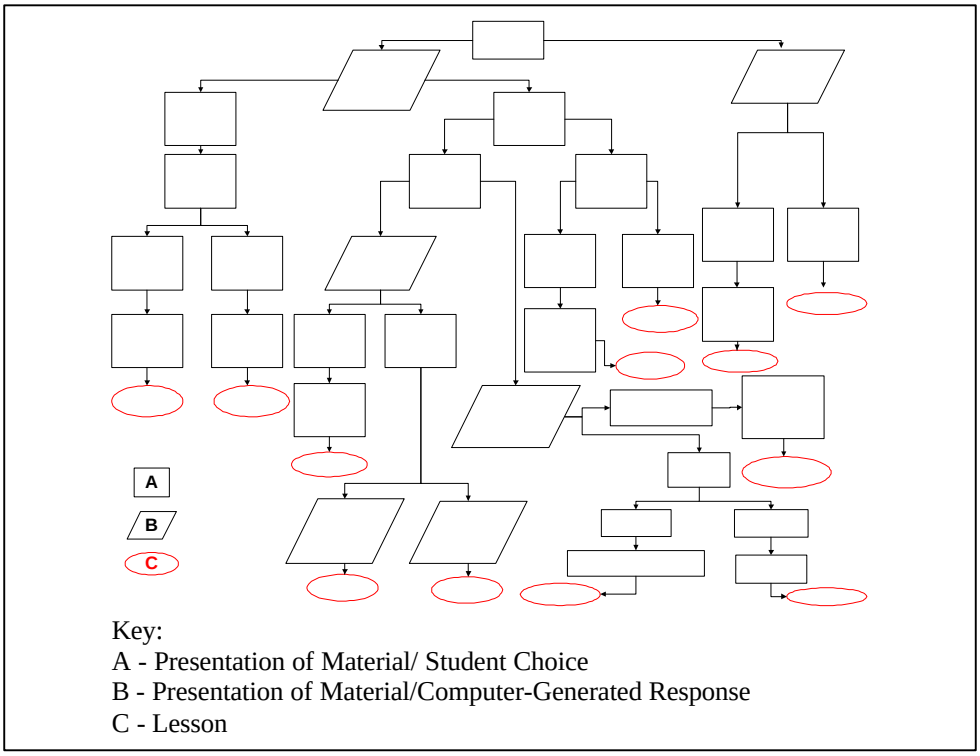

Figure 2. Portion of the flowchart for "AGED 340: Project Interaction" used in "Professional Leadership Development" course during Spring 2001, Texas A&M University.

Findings

Qualitative Findings

Evaluation and synthesis of the responses revealed two discerning and contrasting reactions to the activity. The predominant reaction to the learning activity was positive. Students indicated that "*it helped me understand* " (481), was "*informative*" (574) and that "*it made me laugh and I learned*" (507). Several students noted that they liked the way the activity displayed *ramifications of your choices* (471, 485, 521, 533, 547, 550, 552, 587) noting that it was a *good practice tool* (471, 536, 589). At the other end of the spectrum, some students indicated that the comical approach was *annoying* (505, 537, 554) and that "*it took too long*" (460, 487, 508, 527, 532, 543, 558, 562). Two activities within the program were noted as having *unclear instructions* (499, 500, 523, 546, 552, 557, 560). Eighteen students indicated that there was nothing they disliked about the simulation. Of those students that indicated they did not enjoy the activity, both on and off campus viewing was represented. Within the context of instructional design and development, three categories influencing student reaction to the activity surfaced out of the comments: *Interface, Approach, and Technology-related Issues*.

Interface is the means by which the student interacts with the computer. This involves images, text, and buttons that appear on the computer screen. Several students indicated that the program was *easy to use* (476, 479, 521, 530, 544, 545), *understand* (476, 488, 523) and *follow* (498, 510, 558). However, comments related to interface predominantly focused on the display of text and graphics.

Based on the comments, students preference varied; most students indicated *preference for the bright colors* used in the activity and felt the colors helped them focus on important aspects of the content (475, 488, 499, 515, 519, 529, 541, 564). On the other hand, a few students indicated that the bright colors were hard to read (502, 530, 547). One student stated that the colors "Hurt my eyes" (530) while another stated, "Colors chosen yielded …fast focus on the most important concepts" (574). While there were very few comments regarding specific colors, one student indicated that *greens and purples were hard to read* (543), one student noted that *blue was the easiest color to read* (565), and one student stated, "The *green and red were great* for telling whether or not I had gotten the answer right or wrong" (546).

Only a limited number of students responded regarding the fonts used in the activity and all comments were *positive regarding font size and display*. Students stated that "the different sizes kept the eyes moving, catching all of the [information]" (564, 496) and that the size of the fonts were good (529, 539, 548). One student commented that the font showed the *prioritization* of important words (574).

Approach relates to the creative design of the activity. Reaction to the approach of the activity was varied. Some of the students indicated that the activity was *too long* (488, 507, 532, 535, 587), that it should be to be "more to the point" (475), and that it was "a bit over done" (567) while another student indicated that it "wasn't time consuming" (546). Only one student indicated that portions of the activity could be offensive to others (478). Negative comments related to the approach consisted of: *annoying audio* (476, 505, 513, 523, 537, 554, 558, 582), *poor jokes* (481, 558), *too many bonus questions* (496, 502, 521, 566), and the *animation* (558).

Many of the students indicated that they liked the *humor* (472, 485, 494, 501, 507, 513, 525, 529, 535, 538, 539) and found the activity *helpful* in encouraging

understanding (478, 481, 483, 504, 528, 489). Students expressed that they liked the *ramifications of choices* (471, 485, 521, 533, 547, 550, 552, 587) and seeing the theories learned in class applied (541). One student commented, "I found it to be a great compliment to lecture and it added another style of learning that you cannot get from lecture and reading" (587). Another commented regarding style, "I liked that it talked to me like a person instead of just giving me directions" (502).

The *audio* (i.e., sound effects and voices) was well received by many students (478, 526, 540, 543, 549). Students indicated that the activity "clarified certain topics" (504) through the *examples* presented (480, 498, 508, 541) and they liked the "game show feel" (539, 556). Words to describe the activity included, "fun" (534, 548), "humorous" (539, 568), "entertaining" (538, 553), "interesting" (544, 552, 568), and "neat way to learn" (559, 565).

Technology-related Issues include aspects regarding the actual running of the computer program. Some of the students who indicated that they did not enjoy the activity revealed issues related to the failure of technology. Students indicated the *inability to hear audio* (496, 529, 545) and *slow load time* (479, 519, 541, 544, 562, 568). Several students indicated that the activity "*moved too slow*" (472, 510, 525, 528, 533, 544, 559, 562, 564). Follow-up interviews revealed that this was related to *computer technical issues* and that the statement "moved too slow" referred to the amount of time it took the computer to reveal the next screen. Students who indicated that they had computer speed problems primarily viewed the CD-ROM using their home computer. On-campus students did not indicate problems.

Quantitative Findings

As revealed in Table 1, 98.8% of the students indicated that the approach used in the activity helped them to understand the topic. A lower percentage (86.7%) of the students indicated that they enjoyed the activity. In regard to whether or not the colors and fonts used in the activity were easy to read on the screen, the majority (87.7% and 97.6%, respectively) of the students indicated that they were easy to read. More than half of the students viewed the activity off campus and the majority (85.2%) of the students did not incur difficulty viewing the activity.

Conclusions

While the findings cannot be generalized to the broad population, this study provides timely information for educators considering the development of computer-based activities. Reflection on the findings from both the qualitative and quantitative phases of the study leads one to conclude that there are specific elements of design that should be considered for the audience being studied.

Designers must resist special effects yet use creative and innovative approaches (Reiber, 2000). In general, the students that indicated that they did not enjoy the simulation – did not comment on why. However, those same individuals when asked, "What did you like" – responded with positive statements – this leads one to conclude that while he/she "personally" did not desire to learn using the approach studied – he/she acknowledged the benefit to others. In fact, one student who indicated that he/she did not enjoy the simulation stating to "keep it simple", stated, "It was an effective learning tool" (532) and another student (513) that indicated that the audio was "lame" also indicated that he/she liked the humor.

Table 1. Student Response to a Simulation Activity, Texas A&M University, Spring 2001

Question	*Response*	*n*	*%*
Did the approach used help you to understand the topic? (N = 83)	Yes	52	62.7
	Somewhat	30	36.1
	No	1	1.2
Were the colors used easy for you to read on the screen? (N = 81)	Yes	71	87.7
	Somewhat	7	8.6
	No	3	3.7
Were the fonts used easy for you to read on the screen? (N = 83)	Yes	81	97.6
	Somewhat	1	1.2
	No	1	1.2
Where did you view the simulation? (N = 83)	On Campus	24	28.9
	Off Campus	59	71.1
Did you incur any difficulty viewing the simulation? (N = 81)	Yes	12	14.8
	No	69	85.2
Did you enjoy the simulation? (N = 83)	Yes	72	86.7
	No	11	13.3

Given the finding that the majority of the students (85.2 %) did not incur difficulty viewing the activity, one can conclude that the design of the activity was effective and easy to follow. However, based on comments regarding two activities within the program, it can be concluded that the instructions related to those activities are unclear.

The interface was well received by most students. Color can be used to gain attention, direct focus, or motivate (Reiber, 2000). The finding that color and fonts were well received is not surprising given the fact that the researchers followed instructional design principles in the design and development of the activity. However, one can conclude that students perceived bright colors as a good attribute and that the interface met the needs of the students.

The majority (86.7%) of the students indicated that they enjoyed the simulation. In fact, students noted that they "enjoyed the humor" (529), "liked the sound effects" (526), and found the activity "informative" (574). However, some students noted that "the voices got on my nerves" (505), it was "time-consuming" (527), and it was "too cutsey" (560). These diverse comments lead one to conclude that not all students desired the approach used and thus there is a need to provide students with two distinctly different versions of the same activity. The development resources required to develop the highly animated version of the activity evaluated were much more than would be the development of a streamlined text-based simulation presented in a non-humorous manner. Thus, one can conclude that because of varying style preferences, it would be beneficial to offer different approaches.

Given the fact that several students indicated that the program seemed to move

slowly, one can conclude that when used with a less-than-desirable computer (computers with specifications other than those recommended by the researchers) the activity does not function as well. This finding leads one to conclude that educators should take into consideration the varying degree of computer access. The finding that students who utilized home computers experienced technology failure more frequently than those students accessing the program on-campus leads one to conclude that computers used at home may not be up to the standards required by new educational programs. It can be concluded that researchers should ask the question, "What kind of computer do you have at home?" instead of "Do you have a computer at home?" and when expecting students to access materials online, "What is your connection speed to the Internet?"

Implications and Recommendations

Implications exist for both the activity under evaluation and for others seeking to develop quality instructional materials. In relation to the activity itself, the approach used was found to be effective and useful by many of the students. Thus, the implication exists that similarly designed activities could be created for the population focused on different topics. In relation to the activity itself, the following recommendations are provided:

- Introductions to each question should be edited to provide a more direct path within the activity.
- An option to turn the sound off should be added.
- A distinctive warning should be added to the program explaining the importance of using a computer with certain specifications to avoid delayed load time.
- An activity with the exact content should be designed and developed without animations and audio in a straightforward and serious nature. Text should be revised to reflect this approach.

Implications for others relate to the fact that the approach studied could be used in other settings taking into consideration the elements identified. "Regardless of their effectiveness, graphics (and other visuals) are an integral part of most teaching strategies" (Rieber, 2000, p. 33). The three categories that surfaced (interface, approach, and technology-related issues) signal those areas to which students are most attuned. This study focused on perceptions and "smile sheet" evaluation. Understanding what the students like and dislike will enable educators to design instruction that can achieve one noted benefit of computer-based instruction, which is to engage the student. The fundamental fact that poor teaching is a result of poor planning holds true for activities created with technology. We must continue to revisit design elements to ensure that the instruction created meets the needs of the learners being served. Engagement directly impacts retention and completion of activities. It is important to note that while we often assume that creativity will engage students, based on the findings in this study, this is not always the fact.

As stated by Roger Shank, technology has created the possibility of one-on-one for every learner, the ability to stimulate, and the chance to try stuff out and fail in private (Galagan, 2000). "Clearly, how computers are used is the key to their effective use and exploitation of their vast capabilities" (Hokanson & Hooper, 2000, p.

550). While instructional design and graphic design books provide guidelines for the development of computer-based materials, this study has identified the following key elements that should be considered for individuals interested in utilizing the approach evaluated:

- Interface design issues should address font and color issues and follow guidelines available.
- Multiple design approaches should be made available to satisfy different learning preferences.
- Activities should be designed with an understanding of the computer specifications required to ensure that they match that of student access.

Based on findings reported, it is recommended that additional research be conducted to determine whether or not learning styles influence like or dislike of the activity under evaluation. In addition, based on the different responses received in regard to the questions that used the words "like" and "enjoy," the possibility exists that these words conjure up two different concepts and should be researched further. This study sought to describe the reaction of students to a simulation delivered asynchronously and identify elements of design to guide future development efforts in creating computer-based activities that meet the needs of the learners in order to allow the best utilization of resources in the development of these activities.

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