Television Show Format for Presentation of Engineering Management Theories

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I. Introduction

For about fifteen years, a degree called a Master’s of Science in Engineering Management (MSEM) has been offered by the Industrial and Management Systems Engineering Department at the University of South Florida (Callahan and McCright, 1994). This degree is offered through traditional on-campus instruction and, through the studios of the Florida Engineering Education Delivery System (FEEDS), it is also offered via live closed-circuit television broadcasts and via tape-delayed instruction. The first and second authors have collectively taught over forty courses via FEEDS. This extensive experience with televised courses has led to the understanding that the learning process in such an environment may be somewhat more delicate than in a traditional classroom environment.

II. Background

Experts have long noted that individuals may have several ways of learning, but that in most cases one style predominates for a given person. Agogino and Hsi (1995), for example, suggest that instructors should use a variety of teaching materials (from lectures to experiments to demonstrations to case studies, etc.) in order to meet the needs of individual students who may have differing preferences for how they learn. Schroeder (1996) points out that the range of learning styles on campuses is expanding. This is likely due to a combination of influences including increasing diversity, increasing exposure to different people, places, and cultures, and increasing experience with new technologies.

Collegiate instruction (especially at the master’s and doctoral levels) falls into the realm of adult education. Cantor (1992) notes that adult learners have different characteristics from youthful learners. Adult learners tend to be autonomous and self-directed, rather than passive and submissive. Adult learners are generally goal oriented and seeking the relevancy of new knowledge. Adult learners have accumulated life experiences that strongly influence their beliefs, ideas, and interests. Adult learners generally want to be able to apply
the knowledge they learn to solving some sort of practical real-world problems they face or anticipate facing in the future.

Litzinger and Osif (1992) note that learning style preferences are influenced by three primary factors:

1. Cognition, which is the process or processes by which the individual acquires knowledge from the surrounding environment. Different cognition processes may derive different knowledge from the same environment. Individuals will prefer some processes to others. Thus, for example, some learners prefer a visual medium to an aural medium for the transference of knowledge.

2. Conceptualization, which is the mechanism used by the individual to process the information gleaned from the environment. Some learners may tend to focus on the specifics of the situation while others may tend to look for the broader meaning in the facts. Thus some learners are specifists while others are generalists; some are more oriented toward qualitative information while others prefer quantitative information; some are detail oriented and others strive to understand the full meaning.

3. Affective characteristics, which include individual beliefs and behaviors such as motivation levels, decision-making styles, personal values, emotional preferences, and so on. Individuals with different upbringings, cultural heritages, educational and professional experiences, goals, desires, and objectives may respond very differently to the same environmental stimulus.

When these three factors are combined, different individuals may learn best in very different ways. Through experience most people develop skills in adapting their own learning to the style which is presented to them, but they will always find learning easier in situations in which their own preferred learning styles are prevalent.

Kolb developed a related grouping of learning styles, which is explained by Litzinger and Osif (1992). Kolb suggests that individuals may vary along two dimensions called the processing continuum and the perception continuum. By combining these individual variations, Kolb identified four types of learners as shown in Figure 1 below.

This figure shows that individuals in different quadrants might certainly prefer different styles of learning. People who are very comfortable learning from their own concrete experiences may find abstract conceptualizations confusing and impractical, for example. Kearsley (1996) goes so far as to say that instruction geared towards adults should focus more on the learning process than on the content of the instruction. For adult learners, he recommends the use of case studies, role playing exercises, organizational simulations, and self-evaluations rather than lectures and demonstrations. These more involving learning situations appeal to persons who prefer concrete experiences as well as to those who prefer abstract conceptualizations. Involving situations also appeal to those who prefer active experimentation while still providing the stimuli necessary for reflective observation. Thus learners who fall into each of Kolb’s learning styles are likely to respond positively to these active and involving learning situations.
O’Connor observes that technology can be adapted in order to fit different learning styles to the demands of higher education. Technology may be extremely useful as instructors seek to explore more learning styles through new approaches to teaching.

III. The Objective of the Study

The authors of this paper believe that course instruction presented through a televised medium has a natural tendency to be less involving than course instruction presented in live face-to-face classroom encounters between instructors and students. While this disadvantage of distance learning is true for courses presented on FEEDS, advantages also exist within this system. The authors are seeking ways of improving the students’ learning experiences within the constraints of the system. In the past several years, increasing use of technological innovations has permitted a number of course enhancements such as the use of the Internet for two-way communications with students, presentation of handouts and assignments, and submittal of student work (McCright and Callahan, 1999).

Over a six year period, a series of dramatic skits have been developed as a way of taking lecture-type material and creating a more involving, humorous, and memorable learning experience in one MSEM course. Student reaction to these skits has been extremely positive and anecdotal evidence of effective long-term retention of the material presented in these
skits is plentiful. During 1999, the authors decided to revamp and strengthen each of the skits previously developed and put them into videotaped segments for use in future offerings of the course. While the skits will no longer be live in the classroom, they will be of considerably higher quality when viewed in the on-campus classroom or in any off-campus site in the future.

The objective of this experiment is to determine if student learning in both traditional classroom settings and distance-learning environments can be enhanced through significant use of high-quality dramatic presentations of course materials in a televised medium.

Such dramatic presentations are hypothesized to enhance learning for individuals fitting into all four quadrants of Kolb’s learning matrix. This hypothesis is based on the idea that theoretical material can be presented in a way that allows abstract conceptualization while at the same time providing a more concrete experience to learners. Concreteness will occur because students will “meet” theorists and experimental subjects (played by knowledgeable assistants) and hear thoughtful and humorous discussions about the theories and experiments. Likewise, both active experimentation and reflective observation will be enhanced through the dramatic nature of the on-camera interactions between theorists and instructors.

IV. The Project


The underlying framework used for the development of the videotaped course segments was a television talk show in which the first and second author served as co-hosts of the “show”. A set was designed and built by FEEDS staff members to resemble a network talk show set. Guests (mostly PhD students) were invited to the show and introduced as the actual theorists or persons familiar with their theories. Discussions between the guests and the hosts permitted significant exploration of the content of the theories, how they were developed, and how they were related to earlier theories.

Significant effort was devoted to simulating the ambience of a televised talk show. Each segment (episode) of the series was approximately thirty minutes long with two short breaks. A series introductory segment was developed and used to begin each episode. The three portions of each episode were approximately ten minutes long and were concluded at a natural break in the material. This allowed students to break their concentration at regular intervals without losing important information. Each portion was concluded with a commercial break to enhance face validity of the television show framework. Usually two
short commercials were shown during each break with the first commercial containing actual content about other MSEM courses, on-campus activities such as National Engineers’ Week events, and information of importance about the Work Design and Productivity course. The second commercial was a parody commercial and was intended for comic relief to precede the next portion of the show. Each episode also contained a commercial for the next week’s show.

Style of the episodes was varied somewhat as material requirements permitted. Several episodes involved the appearance of an assistant who portrayed the actual theorist of interest. These guests included Karl Marx, Len Greenhalgh, and J. R. Hackman and Greg Oldham. Other assistants portrayed “Schmidt” who was a subject in one of F. W. Taylor’s early studies and “Ms. Jones” who was one of the wiring bank workers from Elton Mayo’s famous Hawthorne Studies. A game show venue was used to present Herzberg’s Motivation-Hygiene Theory with two student volunteers as the contestants. McGregor’s Theory X and Theory Y were presented by assistants who debated the relative merits of the two theories. Two working managers discussed Mintzberg’s study of what managers actually do. Perhaps the most memorable of all the episodes was one in which a homeless man was seen in various situations (begging, working as a laborer, becoming a manager, etc.) in which he became motivated to meet the various needs hypothesized by Abraham Maslow. The relevant portions of Maslow’s theory were presented between each segment with the guest.

V. Lessons Learned

Several important lessons were learned through this project. Some involved practical aspects of developing and taping the various episodes of the show. Other lessons involved the development of the content of the episodes. Still other lessons involved the effectiveness of the effort.

1. Practical Aspects of Production

A significant investment of time and resources was necessary to produce a semester’s worth of videotaped episodes. First, the individual episodes had to be concepted by the instructors with a significant interaction with FEEDS staff directors. The input from directors was necessary to assure that the ideas developed by the instructors were feasible with the equipment, time, personnel, and financial resources available. In order to keep the episodes fresh and unpredictable, innovative concepts were required. This taxed the creativity of the team to the maximum. The episodes were not scripted, but detailed outlines were developed in order to assure that the necessary information was presented. This required several hours of effort for each episode. Guests had to be scheduled, briefed about the concept, and prepped for their roles. This sometimes required several hours for an episode. Other materials (such as graphics for use in explaining theories) had to be developed. The studio had to be scheduled around on-going class schedules. In order to reduce scheduling problems, many of the episodes were filmed during summer and Christmas holidays. Last, but not least, considerable FEEDS staff time had to be devoted to the project.
Approximately three hours of filming was required for each episode. With four to five staff members involved in each filming, the total staff time for the project approached 300 hours. This also includes staff time spent in off-site filming, editing, sound editing, creation of graphics, and various other pre- and post-production activities. Without a superb production staff and strong support from FEEDS management, the project would simply not have been feasible.

2. Content of the Episodes

The entire content of the course could not be presented through the episodes of the talk show. The episodes were only intended to provide the essence of the primary theory to be discussed during each week’s class. Thus, the content of each episode was determined largely by the course outline and by what theories were scheduled for each week. In some cases two or more theories were scheduled for the same class meeting. In these cases, the instructors selected one of the theories as the more important one and developed an episode around that theory. Other theories were presented in a more traditional lecture and discussion format. As a result, F. W. Taylor’s theory was selected for an episode, but Max Weber’s theory was presented directly in the class. Likewise, Maslow’s theory was presented through an episode and Chester Barnard’s theory was presented in the class.

Presenting each theory within the thirty-minute framework of the episodes was somewhat challenging because the instructors desired detailed graduate-level presentations which would be thought-provoking and which would stimulate the interest of the students. In the end, the content of the episodes was not always the complete presentation of the relevant facts about the theories. Often, class time was used to augment the material after the episode was shown.

Typically, the episodes were shown as each theory was being introduced. Following the showing of the episode, the class then generally entered into a real-time discussion of the theory as presented and as it could be applied to modern engineering management situations. Using the episodes as springboards to classroom discussion often resulted in lively and insightful exchanges between students and instructors.

3. Effectiveness of the Series

Measuring the true effectiveness of an innovation in instruction methodology is a rather complex process. To determine long-term effectiveness, a researcher needs to show that long-term retention of the material is improved with the new method when compared with long-term retention using standard teaching methods. Such measures would usually involve the use of a control group receiving traditional instruction compared with a treatment group receiving the innovative instruction. The performance of members of these groups on objective pre- and post-tests would then be compared over a period of time, say six months or a year. Such a large, longitudinal study is considerably beyond the scope of this project.
Instead of using objective longitudinal measures of the effectiveness of the project, we rely on more subjective measures to show effectiveness. Students enrolled in the Spring 2000 course in which the episodes are shown will be given an evaluation questionnaire in which they will be asked their opinions regarding the quality of each episode, its memorability, and their affective response to the episode. The results of these evaluations will allow us a reasonable short-term measure of effectiveness. Approximately fifty subjects are expected to experience this innovation in instruction. The authors anticipate reasonable statistical significance from the aggregated information obtained from the evaluation questionnaires. The statistical results will be presented at the national conference.

VI. Conclusions

Conclusions regarding the effectiveness of the talk show episodes will not be available until the summer of 2000. However, some conclusions from the project are already available. They are:

1. A significant commitment of resources (staff time, studio time, equipment time) are required to transfer course materials to professional-quality dramatic videotaped presentations.
2. Creativity and the ability to innovate methods of presenting information are necessary for the successful development of such a series of presentations.
3. Students have a high degree of appreciation for efforts to improve the interest level of their courses. They were unanimously excited about the talk show concept and were enthusiastic about the episodes themselves. Students discussed the episodes and the material presented in them outside of class.
4. By creating archival versions of the episodes, the University can reuse the professional quality presentations in future semesters with little additional effort.

Additional conclusions regarding statistical results of student evaluations will be provided during the presentation at the ASEE conference in the Summer of 2000.

Bibliography
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