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ABSTRACT

This paper examines how the use of video has inspired and altered the implementation of teaching and learning in the delivery of a master's program offered in a distance learning format. In the process of this examination, technical issues concerning video production techniques, distribution, and utilization are also analyzed. The paper focuses on the Educational Technology Leadership master's program at George Washington University (District of Columbia), which has been delivered entirely at a distance since 1989. Throughout the history of the program, the role of educational video has changed progressively; this analysis was performed to examine whether technology used to deliver distance education affects the conceptual development of instruction for academic programs. For comparison purposes, characteristics of each of the four historical phases are discussed in the following areas: (1) "Students, Organization and Technology" summarizes the general state of the program; (2) "Video Concept" describes the basic ideas guiding the use of video and its intended effects; (3) "Production Techniques" addresses the approaches taken to create video products consistent with the video concept and the general program parameters; and (4) "Outcomes" reports the effects that specific approaches to video use had on students. (Author/DLS)

Communications Technology and Video Production: An Evolutionary Study of Their Effects On a Distance Learning Program

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Abstract: The purpose of this paper is to examine how the use of video has inspired and altered the implementation of teaching and learning in the delivery of a master's program offered in a distance learning format. In the process of this examination, technical issues concerning video production techniques, distribution, and utilization are also analyzed.

Introduction:

The Educational Technology Leadership program is a master's degree curriculum, which has been delivered entirely at a distance since 1989. Although the program was designed with distance education in mind, it has evolved substantially in form, substance, and philosophy since its inception. Challenged to utilize current distance learning delivery methods for academic and market reasons, options were continually evaluated in terms of accessibility, affordability, and curricular effectiveness. It appeared to be true, however, that as the technological applications evolved to accommodate market conditions, programmatic shifts also occurred. The current project explored the possibility that technical decisions, seemingly unrelated to curricular decision making, were, in fact, directly related to curricular changes.

Background of the Problem:

The Educational Technology Leadership program is aimed at adult students seeking career advancement or reorientation in the area of educational technologies for a wide array of professional settings. An examination of the student profiles reveals that they each bring a relatively unique set of backgrounds and expectations to the educational environment. The richness of this diversity is desirable, but it can also generate conflicting visions for the educational experience itself. It can also generate conflicting valuing for the instructional approach. Some students desire a straight forward 'give it to me and I'll learn it approach' while others want validation through extensive feedback, while still others enjoy the discovery oriented problem solving approach. One of the challenges confronting the program, therefore, is to provide an educational experience which meets a variety of learning styles and preferences, but does so in a way that is fundamentally oriented to a basic philosophy and theory of learning.

The ETL program basically pursues a constructivist approach to learning, utilizing a wide array of techniques to deliver the basic information and intellectual tools that can be used in building new understandings and meaning. Despite some general evidence to the contrary, the experience of the ETL staff is that the techniques of instruction do make a difference in how well this occurs. Over the years, improvements in the technical delivery of the program have led to improvements in learning. In other words, the conception and use of a particular technological form (e.g. video) can change the nature of the information that is delivered and the manner in which information is perceived and valued. Content is not all that matters, the style of instruction is also important.

During the history of the ETL program the role of educational video has changed progressively. In the early years, video was supplementary to computer use in the program, but as the technology, student audience, and style of instruction changed so did the role of video. As the role of video changed, the concept of learning became more flexible. In the ETL program's present configuration, computer based video in the form of web

based streaming video, digitized audio/video files, real time video conferencing, streaming animations and traditional video tape are each utilized in unique ways that shape as well as deliver the program content.

The ETL program was originally designed using multiple media for delivery. The basic media elements have always included video with audio (for demonstrations, interviews, illustrations), the bbs / Internet / web (for interaction), and print materials (for basic information and original source material). The ETL program staff has consistently viewed these media as different channels of information operating at different levels of effectiveness for variety of learners. The simplicity of the model and its appropriateness has been repeatedly challenged by several factors over time: 1) the student population's skills and needs changed, 2) the available communications technology changed, and 3) an interest in a more streamlined efficient method of course production emerged. It is the position of this paper that changes in the instructional methodology of the ETL program can be directly understood as a function of the changes in students needs, available technology, and desired efficiency. This reality alone would not be significant were it not for the additional contention that by changing the technology to adapt to changing needs and possibilities, the program consistently reinvented itself in a systematic fashion. The following research question was pursued to determine if, in fact, the technology did have a substantive impact on the conceptual development of the program from an instructional perspective.

The Question

Does technology used to deliver education at a distance affect the conceptual development of instruction for academic programs?

Methods

Although many technologies are utilized in the delivery and support of distance learning and the ETL program specifically, none was more pervasive or more strongly associated with this program that the various video technologies that have been implemented. For the purposes of this study, therefore, a study of the role of video was selected to determine what effects were present in the orientation of the students to the program materials

The form and use of video in the ETL program was determined by analyzing video products utilized over the past eight years. This preliminary analysis resulted in four categories:

1) the technology used to deliver video resources,
2) the style of video production for each technological form,
3) the type of content delivered, and
4) curricular outcomes of each video form.

In each of these categories data was collected from the eight years of the program's history. Instructors were interviewed and shown the outcome of the video analysis to validate the categories and conclusions drawn. In such cases, where there was disagreement by more than one subject, the conclusion was either withdrawn or corrected. Only instructors who had taught in the ETL program for more than 3 years were included in these interviews. As a result of the preliminary analysis, four categories emerged for comparison and presentation purposes. These categories and the results are described in the next section "Conceptions of Teaching with Video.

Conceptions of Teaching with Video

For comparison purposes, characteristics of each of four historical phases of the program are summarized in four parts. Part one, "Students, Organization and Technology," summarizes the general state of the program. Part two, "Video Concept," describes the basic ideas guiding the use of video and its intended effects. Part three, "Production Techniques," concerns the approaches taken to create video products consistent with the "video concept" and the general program parameters. Part four, "Outcomes," reports the effects that specific approaches to video use had on students.

Phase I

Students, Organization and Technology

Starting in 1989, the ETL program was marketed exclusively to suburban Washington, DC. An ITFS transmitting system was used to send a line of sight signal to two large county school systems. The school systems in turn redistributed the signal on the education channel of their respective cable systems. The idea was to provide in-school and in-home access to educational programming for teachers from The George Washington University. This was the first National Capital area delivery of graduate education into student's homes where it could viewed live and/or recorded it for later use. Transmission of the live classes lasted for two hours and included two-way audio connections for up to twenty-five phone callers. For the first year of the program students could opt to take the courses on-campus in the production studios.

Video Concept

The use of video in this initial context was conceived as the primary instructional vehicle. The basic content of classes was instructor led lecture, group exercises, and special content guest presenters. The instructors were responsible for the development of material and organization of classes. Video was viewed a powerful and almost exclusive replacement for the traditional class meeting, although the ETL program staff made a persistent effort to recognize telecast video as only one part of a three part system. In additional to telecast video, the ETL program also used a computer based electronic bulletin board system, and a printed materials sent by mail.

Production Techniques

Whiteboard graphics, props and printed materials, an overhead camera, and a three-camera production crew supported live production video. Computer generated text slides were integrated into the instruction through the use of video switcher and a scan converter. Instructors typically pre-planned the production with the director a week or even a few days ahead, arrived fifteen minutes before airtime, received make-up and a microphone. A director managed camera switching, while instructors taught to both the studio class and those at a distance simultaneously.

Outcomes

Skills developed by instructors included keeping the distance students feeling part of the class through realistic question and answer management. Live broadcasts with telephone call-ins provided opportunity for student interaction, personal attention, and fun. The camera movements, however, distracted students in the studio, and accommodations to the distance students; while distance students sometimes felt excluded when instructors spoke exclusively to the studio students. In addition, less than 10% of the distance students actually spoke during the live interaction (about the same for the studio students), the value of the totally live format was brought into question.

Phase II

Students, Organization and Technology

In 1992 international satellite and cable distribution of the video began in cooperation with Mind Extension University (now Jones Education Network: College Connection). The two-hour video format was retained, but live productions with real-time audio (telephone call-in) interaction were reduced to four per semester. The numbers of students enrolled increased dramatically; the audience was broadened to include educators other than schoolteachers. The on-campus studio audience was eliminated and the program became dedicated to distance education delivery.

Video Concept

The use of video in this second context was conceived as context setting, intellectually and emotionally motivational, and informational. Stylistically, the video followed either a news talk show format or a technology variety approach. Production standards were increased significantly including a professionally designed set and props.

Production Techniques

Production was accomplished through a team development model including television production staff, content experts (course instructor), and the program director. Production techniques were elaborated including the addition of pre-produced video segments including field shoots, text and graphic slides with some animations, software and hardware demonstrations, interviews, live games and simulations. Emphasis was placed on good lighting, lighting effects, frequent scene changes, semi-scripted events, three camera selection of shots including pans, zooms, and moving camera work. The primary goal was to achieve high quality instruction, but contextual motivations such as the training and values of the television staff, the standards of the distribution company, and the program staff's interest in appearing more professional, led to an upward scaling of production values to approach commercial quality production outcomes.

Outcomes

High quality video productions had a strong appeal to those looking for video quality and added prestige to the program overall. Some students, however, complained that the high production value made the instructors feel more distant and less real. In addition, the production rigor, however, caused instructors to experience time / work overload and video productions became more expensive. Coordination of efforts consumed too much time and energy. The two hour production time frame was tyrannical often leading to production segments that were included simply because "five more minutes' were needed. Production staff had greater control over the instructional product than the instructional staff during this time and small problems became big ones working against production deadlines. The project had begun to place too much emphasis on the quality of the production, following television production principles; rather than an emphasis on instruction, following instructional design principles. A more streamlined approach was needed.

Phase III

Students, Organization and Technology

In 1995 several changes were introduced to streamline production and improve the efficiency of information delivery. Live video was eliminated based on low usage, expense, and limited interactivity on the part of the students and the instructors. Consequently, prime time televised delivery was reduced and telecasts were moved to marginal viewing hours. In addition, video production was reduced to one hour segments. Since most students were either purchasing videotapes or recording off-air for delayed viewing, this did not have a serious impact on enrollments or student satisfaction. Audio interactivity was transformed into a greater emphasis on email interaction and asynchronous conferencing. Perhaps most dramatic was the shift to the World Wide Web and web pages as the primary focal point for course delivery, thus altering the significance, if not the role, of video.

Video Concept

Video was now conceived as a specialized information source. As more emphasis was placed on the development and utilization of the web as an analog for the classroom, video was re-conceptualized as a data source rather than a communications channel.

Production Techniques

Reducing two hours video "shows" to a one hour format forced a new strategy for production. One principle was to compress presentations to a more efficient communications format. An interview that would have formally taken twenty to thirty minutes would now be produced in a 10-15 minute segment. Chattiness and congeniality would be replaced by efficiency and focus. Demonstrations would be pre-produced, and often edited, segments were designed to show the highlights of software and hardware performance without the usual wait time of live productions. This strategy helped in circumstances where the instructor was not very interested in or suitable for TV teaching. In addition, classic materials such as interviews with policy makers, futurists, and educational philosophers were reedited from previous courses for reuse. In some cases, videos were produced as supplementary materials to pages and topics on the course web pages.

Outcomes

Placing less emphasis on the video as classroom analog created a subtle shift away from student identification with instructors and a sense of place which video tended to create, even if it was only in two dimensions. On the other hand, focus on the web site created a better integrated instructional experience where students moved seamlessly from one information source to another including interaction. The exception to the seamless transitions was tape-based videos. For example, when developing the web site, instructors tend to think less about the necessity and value of the video relying instead on the primacy of the web site and the greater flexibility for materials production that the web provides. Some students seem to think all the information should be in either the video or the website, but not in a combination of the two.

Phase IV

Students, Organization and Technology

Seeking to achieve the goal of seamless information channels on the web, experiments with digitized audio and video were executed using very brief segments (2-5 minutes). Content was drawn from previous classes plus new material acquired via digital tools. Team development involving multimedia and web developers provided an well-integrated design, but even small file sizes created wait times beyond acceptable levels. While some downloadable files continue to be used for specialized purposes, streaming audio and video has been pursued actively. These audio and video resources can not only be integrated seamlessly into the web based course design, but they provide access to virtually unlimited amounts of instructional and informational audio/video resources in either a pre-recorded or live format through a link on the website.

Video Concept

Video is now conceived as an information destination, a place, among other places, where students can go to experience multi-sensory learning synchronously or asynchronously. The role of video as a destination, a place, has begun to transform the analog of website as classroom to website as learning community. Perhaps this is a subtle distinction, but one which is highly significant, because in a learning community people meet other people in information rich environments, they interact with one another and with the information itself.

Production Techniques

Digital video should produced with reasonably high production values emphasizing lighting and sound quality. Traditional television production techniques often have negative results. Fast pans, zooms, special effects and other techniques which change the screen information quickly; work against sending a high quality signal over the web. Camera work should be simple and oriented to delivering important information through both audio and video. Temptations to pursue the fun, but frivolous should be discouraged. Also, since the digitization and compression processes lose information by their very nature, it is best to start with a high grade of video source material. Typically, this means utilizing Beta format videotape or at least Hi-8. At present, the size of the playback area of a computer screen is typically small. Wide shots reveal very little detail, so close-

ups or medium close shots work best. Emphasis should be on video production that conveys important information; even a single headshot can convey authority and credibility if it is the right head. Poor quality video, which doesn't transmit well, actually reduces the information that students can obtain, by distracting their attention from the audio channel. Even more important than the technical camera issues is the goal of producing video that really matters. The concept of video as information destination, as opposed to information vehicle, frees the producer to create video of any appropriate length necessary to communicate the desired information. Couple this with the ability to index and contextualize the video and the educational experience is moved from a teacher-scripted experience to a student centered one.

Outcomes

While this is the most recent of the historical phases for the use of video in the ETL program, it is without question the most exciting. The current use of digital streaming video and audio, coupled with real-time video conferencing, animations and more traditional video tapes has created a well-spring of creativity on the part of instructors and students alike. For the first time students are not only engaging learning opportunities in an authentic collaborative style, they are engaging the materials in the style of researchers. Students are no longer simply consumers of knowledge, they are producers. Instructors are no longer simply providers of knowledge, they are validators. The distinction between students and instructors is blurring as they engage one another in learning communities. The shift to the idea of learning communities is just beginning; it is expensive in terms of support, and it is imperfect, but it is growing idea. To date, the biggest problem is providing everyone in the program access to the learning community. Those students with the fastest computers and fastest Internet connections encounter a system which works well, those with less able systems and connections are frustrated by erratic performance and information transfer loss. Since this was and continues to be a predictable characteristic of our current technological reality, the ETL program continues to support more traditional video sources such as tape. The program's leading edge technologies are currently "added value."

Conclusion

Studying the development of video resources and their implementation in the ETL program has provided a useful focal point to begin understanding the dynamics of program evolution. As a result of the study, it is clear that the format of the video, the delivery system, and the production techniques were altered by the dynamic needs of the students and the program designers; but in turn, these changes brought about conceptual changes in the instructional methods and goals of the program.

Whether this kind of dynamic affects other programs is unknown, as is the question as to whether other technologies had similar effects in the ETL program. What is valuable to understand is that communications tools do have the power to redefine our intentions and our behavior through their actual use. Even the most careful plans are likely to give rise to the creation of meaning and behavior well beyond the original intentions of their designers.

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