Using Pilot Projects to Train Staff in Instructional Development Agencies: A Videotex Example

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Abstract: The proliferation of high technology that can be used in instruction places new burdens on instructional development agencies and their staffs. In order to function efficiently in their professional capacities, what should development personnel know about high technology and how should they find out? Pilot projects provide one approach to answering these questions. Recently, staff of the Center for Instructional Development at Syracuse University embarked on a pilot project intended to explore the instructional potential of videotex — a delivery system new to the agency. The project provided staff members with an opportunity for professional growth, helped answer important questions about the available videotex system, and suggested general benefits to the agency of this and other pilot projects.

Today's new technologies offer an exciting and welcome chance to recast education and training. Options for individualizing instruction or providing distance education on a real-time interactive basis are increasingly more powerful. Keeping up with each new technology that has potential educational use imposes a special burden on instructional development agencies whose developers must become familiar enough with the technology to make decisions about its suitable educational application. Because of their higher relative costs and complexity, however, the use of the new CD, video, and telecommunication technologies imposes special burdens on the budgets and human resources of instructional development agencies.

Pilot projects are one means for addressing the staff development problem. For the purpose of this paper, the term "pilot project" refers to a project whose scale is reduced in some aspect: breadth, or depth, or implementation, or some combination of these. The particular project described here was limited mostly in implementation in that the final product was not used by students.

This paper uses a videotex-based project as a vehicle for discussing the staff development potential and subsequent agency benefits of pilot projects. Videotex is a computer-based, two-way communication system capable of sending print and graphic information over telephone or cable lines. Although the focus of the paper is on using pilot projects for staff development,

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the paper also provides some appraisal of videotex as an instructional delivery system.

This paper begins by elaborating on the concern about staff development in today's high technology environment and the role that pilot projects can play in addressing this concern. Next, the paper outlines the process followed in this particular project, describes the videotex pilot, and discusses what we learned through the project. The paper concludes with a discussion of the costs and benefits of the pilot project approach.

THE BURDEN ON AGENCY AND STAFF

Financial costs associated with newer technologies like computers, interactive video, and telecommunications often make access to them very difficult. The initial costs of equipment and essential support items are expensive, and maintenance costs use a high share of budget dollars. The dollar cost is, however, only part of the burden new technologies impose on instructional development agencies.

Human resource costs also run high. Instructional development and training staffs need to become familiar with the new technologies in order to make intelligent decisions regarding their appropriate application. Developers have always had to keep abreast of new technology. The introduction of programmed instruction and educational television are just two examples of once new technologies with which instructional developers and trainers had to become familiar.

Because of their complexity, the costs in time and effort in learning to use and appropriately apply the new technologies are now higher than they were in earlier eras. Moreover, the new technologies can be variously combined to form additional kinds of instructional delivery systems. For example, a computer plus a video disc system provides computer-assisted interactive video; a video system combined with telecommunications enables video conferencing; a computer joined with telecommunications forms a videotex system. This combining factor compounds the learning costs.

What Must Developers Know

Undoubtedly, the new technologies offer very powerful instructional delivery systems, but their appropriate use demands new understanding and new skills on the part of the staffs of instructional development agencies. In addition to acquisition, support, and maintenance costs, therefore, agencies are faced with time and effort costs as staff skills are upgraded while the customary level of agency services is sustained.

One significant question is, "How much technological expertise must an instructional development staff acquire in order to function effectively as proactive professionals on high-tech projects?" Some may reply, "None," since a clear characteristic of high-tech projects is the need for a team of specialists

consisting of content experts, instructional developers, and people whose skills are relevant for the technology being used. Can professionals afford to be passengers? It is unlikely. Shatzer and Callan (1986) found it necessary to create a special training program for course developers designing instruction for computer-based training. Personal experience in creating video and computer- assisted interactive lessons also indicated the need for some knowledge about these delivery systems on the part of instructional developers. But how much knowledge is needed to work effectively with a new technology?

In working on any project, instructional developers must be able to communicate effectively, exercise judgment, and make decisions about all aspects of the project. It seems, therefore, that the development staff at least needs a working knowledge of the basic vocabulary used to talk about thr; technology. The staff also needs an understanding of the new system's capabilities and limitations, especially as they relate to instructional design principles and practices. Lack of vocabulary inhibits meaningful communication. Lack of knowledge about the technology's capabilities and limitations precludes being able to judge its suitability for delivering instruction in a given situation. For example, if high quality graphics are critical for instruction, then a microcomputer system capable of displaying only stair-step graphics would not be the delivery system of choice.

Beyond this rather obvious level of familiarity, however, what ought instructional developers know about a particular technology with which they need to work? Key variables likely include the economies of the system, user appeal, the steps for implementing instruction on the system, ease of updating, maintenance factors, and the time required to design and produce lessons for the system.

A companion question as to how much developers need to know about a new technology is, "How can the needed knowledge be acquired?" Some useful information can be gained through reading, personal communication, and attending conferences and workshops. Helpful as these approaches are, the full reality of all that is involved in working with a new technology does not become apparent through them. Pilot projects, whose benefits are widely recognized in many fields, expose developers to the specific requirements of a new instructional delivery system (Florini, Craig, Hugo & Spuches, 1987; Moore, 1986).

The Value of Pilot Projects for Instructional Development Agencies

Pilot projects help reveal how much instructional developers must know about a technology in order to use it effectively. Specifically, a pilot offers five distinct advantages for instructional development agencies:

1) it allows assessment of the strengths and weaknesses of the tech nology without committing substantial staff time and other resources;

2) it avoids involving clients in a project before the development staff is comfortable with the new medium;

3) it helps illuminate any special demands the medium might make on the development process;

4) it minimizes the use of expensive outside experts; and

5) the pilot provides an opportunity to identify critical logistical concerns relevant to the particular technology. A previous pilot project enabled our development staff to identify important factors related to computer-assisted interactive video instruction.

Thus, when an opportunity came to explore the instructional potential of videotex, a pilot project seemed the best means for doing so. A discussion of the benefits and costs of the videotex project follows the description of the pilot.

THE VIDEOTEX PILOT

Videotex services first appeared in 1976. Application of the technology has grown steadily, with much of the development work occurring in Britain, Canada, France, and Sweden. Although some educational uses have been made of videotex in the United States, more extensive application has been made elsewhere. For example, twelve Canadian universities are using Tendon" — a system noted for high quality graphics — to deliver courses in physics, biology, language arts and journalism (Olson & Minor, 1987; Pfaehler 1985). Issing (1986) suggests a variety of other educational uses for videotex.

Syracuse University acquired a videotex system through a grant from A.T.&T. At the present time, the system is primarily used by students to retrieve information of interest to the campus community (Hezel & Miller 1986). The presence of a videotex system on campus provided the staff of the University's Center for Instructional Development with an opportunity to investigate the use of videotex as an instructional tool. Having seen the high-quality graphics, the richness of color, the easy combination of text and visuals, and the interactive potential of the system, videotex looked like a promising instructional delivery system. A pilot project seemed the best way to explore its potential.

At the time of this project, our agency consisted of two professional instructional developers and three graduate interns. With our other project commitments, the staff felt we could not afford to have everyone actively participate in the videotex project. We decided to directly involve two staff members. The others would benefit through staff reports and demonstrations.

In selecting the subject matter for the pilot, we felt it important that the videotex pilot reflect an appropriate use of the technology. After some discussion, we chose to design a short unit on applying additive color theory in black and white photography, a content area familiar to one of us. We believed that the lesson represented an appropriate use of the technology in three ways.

First, the effects of using different color filters to enhance black and white photographs could be demonstrated easily. Second, the high resolution color graphics of the videotex system readily permitted illustrating the relationship between complementary and primary colors. Third, students could practice applying the principle of additive color theory within the instructional unit.

The project team designed the lesson, following the instructional development model used at CID (Diamond, Eickmann, Kelly, Halloway, Vicker & Pascarella, 1975). To gain proficiency with the videotex system, one member of the staff swapped services with an experienced videotex programmer, also called a frame creation artist, who produced material for the campus videotex information service. In return for being taught how to program the videotex system, the staff member created some materials for use on an informatior system.

The final design document consisted of a detailed storyboard of the complete lesson. In order to transfer the lesson to the videotex system, our now-trained staff programmer had to create a series of videotex frames on the system. We chose to produce representative portions of the storyboard. This maximized our resources while giving us experience with as many unique message design problems as possible.

We then asked the more experienced frame creation programmers to evaluate the completed segments. Suggested improvements were incorporated into revisions of the lesson. Next, the completed lesson was shown to a content specialist in black and white photography who checked the accuracy of the lesson and gave additional insights into how the videotex medium might be exploited. Finally, we met with the rest of the development staff to diffuse what we had learned and to discuss its implications.

What We Learned about Videotex from the Pilot

The experience of designing and producing the pilot unit provided a clearer understanding of the potential of the University's videotex system for delivering instruction. The experience also helped illustrate what developers should know about videotex in order to design effective instruction for the system. In addition, we were reinforced in our belief in the value of pilot studies as a means of exploring the instructional potential of new technologies.

The decision to have a development staff member acquire sufficient programming expertise to create all the needed on-screen frames let us make our own judgements about the capabilities and limitations of the videotex authoring language, also called the frame creation software. It is possible to do simple things quickly with the A.T.&T. software. On the other hand, it requires substantial time to learn the language well enough to produce an instructional unit requiring certain types of graphics and branching options. About 60 hours were needed by the staff member, who had prior computer programming experience, to become proficient enough with the system to create the photography lesson. Because of its nature, the lesson included many graphics. It became obvious that creating good videotex lessons requires more than

proficiency with the frame creation software. Creating graphic frames requires many of the skills of a graphic artist in terms of choosing colors, placement of objects and text, and construction of objects.

Acquiring the level of software and graphic expertise needed for a major videotex instructional project does not represent a good investment of the time of the development staff. Their time should be used employing their special professional skills. At the same time, some degree of proficiency with the software facilitates communication with the frame creation specialists. Software proficiency also enables the development staff to form reasonable expectations for the quality of the frames, the amount of time needed to create good frames, the speed with which actions can occur, and the extent of the branching capabilities the system offers. Being able to produce a small instructional unit of about 20 frames on the videotex system would strengthen developers' ability to communicate and to make more sophisticated judgements regarding use of the system.

Producing the photography lesson also helped us identify some of the idiosyncrasies and limitations of the available videotex system for delivering instruction. These include the piecemeal appearance of individual frame components, branching restrictions imposed by the software, and limited animation possibilities. The pilot also suggested strategies for working with the system more effectively. For example, it is possible to take advantage of the piecemeal appearance of frame components to focus learner attention by having certain image components appear first or last. Also, if a series of frames shares a number of image components, the common elements need not be redrawn with each new frame. The result is a faster presentation.

The staff also identified important questions that would have to be answered were the videotex system to be used for real instructional purposes. These include questions as to how many people could use the system at one time, its security features, the transmitting costs, system maintenance factors, and how much down time might be expected. Finally, the pilot helped us to evaluate videotex as an instructional delivery system.

Some Conclusions about Videotex as a Delivery System

Videotex is a suitable means for delivering instruction under some circumstances, but the systems are very expensive, and telecommunication charges are high. Because of this and the availability of other technologies than can function rather similarly, we would not invest in a videotex system just to deliver instruction. (In fact, given the continuous development in computers, software, and telecommunications, it will be interesting to see if videotex retains a separate identity.) As a delivery medium, videotex has attributes similar to those of computer-assisted instruction, with its associated strengths and weaknesses. That is, a videotex system is costly in terms of hardware, software, and the human resources needed to design and implement the instruction. Also like computers, the power of videotex permits the inclusion of design features not readily available in noncomputer-based instructional delivery systems.

Although we would not purchase a videotex system to deliver instruction, using an existing in-house system for training and instruction is another matter. In addition to use by colleges and universities, agencies like hotels, convention centers, transportation centers, and corporations might find it cost-effective to use their videotex systems for some kinds of staff training. Few agencies, however, seem to use their videotex systems for this (Bacsich, 1984). Why they are not used may be an interesting avenue for future exploration.

THE PILOT PROJECT'S BENEFITS AND COSTS

The primary purpose of the videotex pilot was to foster staff development and in this, the project was successful. The project team gained a considerable measure of confidence working with videotex, acquired a working vocabulary of the technology, developed skills in using it, and formed a richer concept of videotex. The pilot helped clarify the capabilities and limitations of the available system and set a level of expectations regarding the appropriate use, function, and appearance of any future instructional products for the videotex system. Other staff members benefited from the pilot through staff reports and demonstrations.

From a management perspective, the pilot project resulted in some general benefits for our agency. These include:

1) being able to make more knowledgeable judgements about the appropriate use of the videotex technology and the costs of using it;

2) having credibility with clients when discussing the system;

3) being better able to manage future videotex projects;

4) having some basis for estimating project costs; and

5) increasing the value of our agency to the university because of enhanced staff capabilities.

The biggest cost of the project was the increased work, which was undertaken without a reduction in other responsibilities. But there was another cost. Because this particular pilot was intended solely for in-house staff development, it was difficult to sustain motivation and to meet self-imposed deadlines. This motivational problem was not a factor in an earlier pilot project where the resulting product was used immediately in a classroom. Although acknowledging the motivational issue, we feel that the general benefits of pilot projects justify the effort expended on them even when the product has no immediate use.

CONCLUSIONS

In order to make appropriate use of videotex and other new technologies, it is important that instructional developers have some knowledge about the individual technology and some skill in using it. Pilot projects are an excellent way to gain a reasonable degree of knowledge about and skill in evaluating, using, and managing new technologies, thus helping instructional development agencies cope with the burden of keeping up with them. The experience also builds staff confidence regarding the use of new technologies — an important asset in a rapidly changing field. In general, pilots should be low risk, provide maximum hands-on experience, and be related to realistic instructional problems.

We will continue to see the rapid emergence of new technologies; many will have educational potential. Pilot projects offer instructional development agencies and staffs a powerful staff development vehicle and an evaluation tool for assessing the reality of that potential.

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