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Video instruction for teachers utilizing SchoolFusion web design software

Darlene Robin Pitman

VIDEO INSTRUCTION FOR TEACHERS

UTILIZING SCHOOLFUSION WEB DESIGN SOFTWARE

A Project

Presented to the

Faculty of

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In Partial Fulfillment

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in

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ABSTRACT

In the project described in this paper, the importance of providing effective teacher technology training was explored and the level of learner satisfaction in utilizing short, targeted video tutorials designed for new users of SchoolFusion web design software were studied. The advantages of Electronic Performance Support Systems were examined and three areas of effective instructional design are discussed including motivation, cognitive load, and user satisfaction. Finally, the effectiveness of short video tutorials and their influence on user satisfaction and improved efficacy with new software were evaluated. Findings indicate that video tutorials are effective for improving confidence and encouraging teachers to begin using the software. Video tutorials are less desirable after a teacher has gained some experience with the product.

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DEDICATION

I dedicate this effort to my husband Greg who makes all things possible, and my children Emilie and George who make all things worthwhile. Thank you for being my heroes.

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CHAPTER ONE

BACKGROUND

Introduction

Most teachers consider themselves life long learners and many want to share their enthusiasm for gaining new knowledge with their students; the reason they become teachers is to enliven the curriculum with engaging, exciting, modern content and methods. Today the world incorporates methods of learning with innovations many teachers didn't have when they were going to school: technology based tools. Current technology changes at such a rapid rate that many teachers are having trouble keeping up. Improvements to current technology are fast and frequent and old ideas quickly become obsolete. Teachers must keep up with these fast paced technological advances but to do so they need motivation and training.

The problem has long been choosing the best methods to deliver training to educators. Face-to-face, day long training, usually at the beginning of the school year has become the standard, but doesn't provide the best results often ignoring the way adults learn (Okojie, Olinkzock,

Adams, & Okojie-Boulder, 2008). Other training models have been tried (Wepner, Bowes, & Serotkin, 2007) including collaborative professional development. Of these, the concept of just in time training or Electronic Performance Support has emerged as a promising trend. The features of this training model include integrated components that are user controlled and easy to use, provides support at the moment they are needed, present relevant content-focused information for a task that the performer needs in a real work environment (Calgity, 2006).

The project goal was to provide teachers with short, organized video clips that provide visual instruction for specific online administrative tasks. Clips were no more than 3 minutes in length and each provided quick answers and training for basic skills required for managing a school web page using SchoolFusion software. By chunking the instruction into small, specific tasks, teachers could target just those areas of need without spending time viewing information that is not pertinent to the specific task at hand. Teachers were also able to work through a tutorial, easily stopping and starting again where they left off.

Statement of the Problem

The problem was to address the lack of use by teachers of the new inclusive web page software, SchoolFusion. SchoolFusion is packaged web design software that provided user templates specifically designed for K-12 education. Teachers were assigned web pages for each of the subjects they teach, and these pages were integrated with the school website. All classroom pages were similar in appearance and function providing design consistency throughout the district. The classroom web pages had selectable features such as class description, homework, class links, class files for download, class events, class contacts, and class calendar. Additional web pages could be linked to the main page showing content and pictures. There was a separate multimedia section that included a teacher message center, multimedia blog, podcast feeds and video download. Parents and students in the district could 'subscribe' to class pages and receive daily emails about homework, classroom announcements, new class files, and general school information. All classroom web pages were linked to the school's main page where additional general downloads and information could be accessed.

Teachers were strongly encouraged to use SchoolFusion software as a communication tool for parents. It was hoped that parent access to classroom information would increase student achievement and parent involvement and decrease the need to for costly paper communication. Union contract agreements made it impossible for administration to make use of the software mandatory, but it was mandated that if a teacher chose to maintain a website for classroom use it must be through SchoolFusion.

Over the course of the last year, teachers at a small suburban middle school have been asked to incorporate several new technology tools in their administrative duties. The district subscribes to 'C-Mail' a county run email program and requires staff check their work accounts daily. This mail program has been used for several years, but was retooled this year presenting a new interface. The second piece of required software is Aeries Browser Interface or ABI. ABI is a grade program, attendance recorder, and student information database. Teachers are asked to keep their grade books online and parents can access their child's records online. School attendance is recorded daily through ABI, and teachers can access student background grades and contact information. All teachers in

the district record attendance through ABI, but only the middle and high schools are asked to post grades. A third new piece of software introduced this year is the SchoolFusion web page management system. This integrated system assigns web pages to each school in the district and these are linked to individual class web pages. Calendars are synchronized and students are 'enrolled' in their class pages. Teachers can post announcements, homework, links, files, online tests, or create group emails for each class. New technology is also being gradually introduced to the class rooms including interactive white boards and web based math practice. With all this influx of new technology based tools, very little support is provided on how to use the software. Two hour after school trainings are provided at the beginning of the year and are accompanied by typewritten notes. There are no other resources provided, although you can call the district teacher-on-assignment for technical assistance. Teachers help each other.

Purpose of the Project

The purpose of the project was to develop a method of providing ongoing support and training for teachers as they

acquired the skills necessary to incorporate classroom web pages into their instruction. Training needed to address the way adults learn and provide authentic learning experiences through a series of video tutorials for teachers who are not comfortable using technology for administrative purposes and or classroom communication. It was hoped that the engaging nature and targeted instruction of the videos would increase motivation and confidence as teachers mastered a new technology. Teachers are asked to use various software interfaces in their jobs to facilitate record management, and communicate with administration and parents. Teachers are provided little training and limited references or guides to master the various software components. The expectation was that teachers would figure it out through trial and error. Many experienced and new teachers were not familiar with web based software and did not know how to complete simple tasks without help. Many teachers only employed the basic tools because they were not comfortable or motivated to spend time exploring the extras available to them. Research shows that inexperienced users can learn quickly through the use of video and audio instruction. By providing short instructional videos,

teachers can view how to perform software management tasks through just in time training and support.

Significance of the Project

The significance of the project was determined by the confusion about why teachers do not utilize web pages as a communication tool with parents and students. There is evidence that some teachers are inexperienced and perceive that the time spent learning new software as unproductive and distracting from their teaching.

A single training at the beginning of the year is not enough to master important software components. Many teachers are distracted at this time, and new teachers are often overwhelmed at the large amounts of unfamiliar information presented. While teachers are adept at reading for content, many are not motivated to find the typewritten file notes and filed somewhere and wade through instructions that may or may not be what they're looking for. Teachers who are unfamiliar with technology are not happy about deciphering new jargon along with new methods. Teachers wanted an easy visual way of asking, 'How do..." and following along. A video resource available on compact

disk and posted to a website would chunk the basic information into small, easy to follow steps. There would be no need to read through a loose papers or scribbled notes to learn simple tasks.

Limitations

During the development of the project, a number of limitations were noted. These limitations are the following:

1. The sample size was small and limited to a single middle school with fewer than 10 teachers needing assistance. New users throughout the district might have access to the videos in the future, but only a few are being examined for this study.
2. The instructional videos only applied to teachers using a particular type of software, SchoolFusion. It may not be assumed that the results would be similar for other software types.
3. The time period of the study was short, only 4-6 weeks and at the beginning of a new school year. Teachers often incorporate new ideas after the

school year has started and class routines firmly established.

4. The reasons teachers have for not using technology tools are not always related to ability, but often to motivation. The informal focus group questions at the end of the study may not provide a clear picture as to why the software was or was not accessed by teachers.

Definition of Terms

The following terms are defined as they apply to the project.

Cognitive Load Theory (CLT)

> "A theory that describes mental energy and its reaction to various loads, including intrinsic, extrinsic, and germane load." (Lohr, 2008, p. 46)

Electronic Performance Support Systems (EPSS)

> "Computerized application that provide support for the user in accomplishing specific tasks, particularly those that are difficult to memorize or are done infrequently." (Piskurich, 2006, p.393)

Multi-Channel Learning

> A system that includes several different delivery systems, some face to face, some digital, some textual, to present new information. These channels mutually reinforce each other to optimize learning. (Mukhopadhyay & Parhar, 2001)

Performance Zone

> This zone is the overlap of three critical elements required for success; information

appropriate to the task, information appropriate to the person, and information containing critical features of the environment (Maughan, 2005).

SchoolFusion web software

Web hosting and web services program specifically designed for K-12 education. Integrates and standardized web sites for administration, teachers, students and parents within a district. Provides linked web pages for administration, schools, and classrooms.

Screen capture video

Video recorded in real time from a computer screen.

Smart electronic coach

Same as 'Electronic Performance Support Systems' above.

CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

Chapter Two consists of a discussion of the relevant literature. Specifically, the current trends in teacher technology training as they relate to administrative tasks required of teachers in the workplace are examined. The ability to satisfactorily utilize technology for administrative tasks correlates directly to use of technology in curriculum. There are several barriers that are encountered before use of technology can be implemented. Some of these barriers relate to the availability of hardware and software, some to teacher motivation, and some to effective and available training methods. The use of Electronic Performance Support Systems is discussed and the ways these systems are being developed to increase efficiency. Finally, the available literature on how the design of successful training materials influences motivation by decreasing the cognitive load inherent in any new task is examined as it relates to increased use of technology.

Trends in Teacher Technology Training

Rationale for Technology Integration

Teachers need many qualities to be successful and effective educators. They should possess a life long love of learning and the desire to share their knowledge. They need a comprehensive understanding of how children learn and must be dedicated to the overall growth and development of the child. Our society is changing and it is no longer enough to prepare a student with facts and knowledge, we must prepare our students to work in a world increasingly dependent on technology for communication. If teachers are not prepared to use technology for instruction their training is incomplete (Smith, 2000). Technology offers a new way of looking at the world and the role that teaching plays in it. Studies show that for teachers to use technology in the classroom, they must believe that the technology will be an effective method of delivering information. The teacher must also trust that the students will achieve at a higher level and that using technology will not be disruptive to the classroom or the learning process. Teachers must have confidence in their own ability to use technology properly with the resources available

(Demetriadis et al, 2003). In 1994 the National Council for Accreditation of Teacher Education and the International Society for Technology in Education developed accreditation guidelines that focused more intently on integrating technology into teacher education. These associations recognized the significance and impact of technology on societal change along with the call for technology to improve professional productivity. Obstacles to increasing the use of technology in education include lack of interest, time, hardware, software, and the type of training that leads to enough expertise to utilize technology effectively (Rogers & Withrow-Thornton, 2005). In an effort to overcome these obstacles, long range programs and technology plans are often implemented with the intent of addressing the needs of teachers and their training.

Students in the modern age will rely less on the facts and figures that they are taught daily in the classroom. The importance of that information changes and grows and indeed, many of the careers that our students will have in 20 years do not exist now, just like many of today's careers did not exist a mere 20 or even 10 years ago. The training our students require relies less on data and more

on how to understand, classify, and exchange information. The internet has an ocean of data available to view and students need the skills to use this technology and sift through the information. New skills are required to be competitive in the global economy. Learning to give different examples of the same task, or view a task from various perspectives is becoming more important than factual data, and the ability to use technology to access, organize, and communicate information is not just valuable but it is essential (Baumgartner, 1999).

Teachers use technology less for curriculum integration and more for administrative tasks (McCannon & Crews, 2000). But the reality is that our students need technology integrated into their education because it will be a part of their future. Research indicates that the largest factor determining the use of technology in the classroom is the teacher's level of expertise and comfort with technology. Teacher training has often focused on using the equipment, but not integrating its use for instruction. Even when teacher training is offered, often on site technical support is not readily available. Teachers need to be proactive in their training, but sometimes additional support is necessary. Teachers are

more likely to use computers in instruction if the computers are convenient to access. In the 2000 study by McCannon and Crews, 127 elementary school teachers were surveyed about their use of technology in the classroom. 98% of the respondents had use of a working computer in the classroom. While 78% of respondents used their computers for administrative tasks, only about 30% used them to enhance classroom instruction or deliver information. 92% of teachers indicated that their computer use increased after receiving training. The largest barrier to teachers receiving training was the lack of available workshops. Recommendations include incorporating peer training and mentoring in the professional environment to encourage the use of technology integration into pedagogical skills (McCannon & Crews, 2000).

In a 2007 survey of 44 professors teaching Principles of Accounting at accredited colleges of business within the State of North Carolina (Roberts, Kelley, & Medlin, 2007) 64% used computers for professional research, 61% for email, 50% used computer and projector in classroom, and approximately 31% used technology for online hyperlinked syllabus, or personally designed web-based lectures, notes, and tutorials. The use of technology for actual classroom

instruction dropped from there to the single digits. Barriers to use of technology cited by professors included the lack of adequate equipment, and lack of personal motivation. These finding were similar an earlier SUNY Oswego Education Department (Vannatta, 2000) which showed the greatest barriers reported by professors to incorporating technology in their teaching were lack of adequate equipment and lack of training in the use of new technology, both tied at 28.9%. Interestingly, 0% of the respondents reported student ability and readiness to use technology as a factor in the absence of implementation (Vannatta, 2000). In addition to implementing a technology plan that establishes minimum levels of hardware performance standards, this survey recommends several training methods be developed to address teacher needs including group training and peer mentoring programs.

Studies show that even more than normally achieving students, at-risk students in grades K-12 are often deprived of the opportunity to use higher level thinking skills and challenges (Muir-Herzig, 2004). A study was conducted to determine if the use of computer technology in the classroom has an effect on these students' attendance and grades, and while past surveys have indicated

improvement in these areas, the Muir-Herzig survey did not. Analysis of the data led to the conclusion that although technology was available for use, teachers were not using it because of a lack of comfort and training and ability to use technology in meaningful and appropriate ways. The presence of technology caused no appreciable difference in achievement because teachers were not using the technology appropriately for instruction (Muir-Herzig, 2004).

Barriers to Implementation

The research studies discussed above indicate that technology can enhance instruction, that the ability to use technology will be critical for the careers of tomorrow, and teachers need training to implement effective and appropriate instruction in the classroom while providing universal access for all learners. Research also shows that training isn't always enough (Friedlander *et al.*, 2004). Teachers must accept the innovation, adopt its use, be confident in their ability to use it effectively, and see its value as an instructional instrument. Success or failure of implementing new technology depends on the attitude of the teacher and the support of administration. Another barrier to implementation is that precisely when teachers need help the most, they are often left on their

own. After the workshop is over and they are struggling to incorporate the new tool, no one is there to help them negotiate the inevitable challenges that arise when first using new technology. For a teacher to continue the effort to include the new idea into their practice, the teacher must believe that the benefit to instruction will compensate for the inconvenience during start up. Continuous support is essential to success. Teachers have varied reasons for the failure to use new innovations and support should be adjusted to compensate for these individual struggles. It is important to note that in the beginning teachers are reacting to the task of implementing the innovation, and not the innovation itself. Training and support needs to target the practical considerations as seen by the teachers (Bitan-Friedlander, Dreyfus, & Milgrom, 2004).

Finding the appropriate format to deliver follow up support is essential to determine whether or not a teacher will make use of the support. It should be convenient, high quality, and effective. Computer based instruction that uses video has been shown to be very effective at targeting motivation. Teachers have higher levels of satisfaction because they can manage their own learning process by

targeting their individual needs (Rodgers & Withrow-Thornton, 2005). The use of streaming video to support traditional lecture classes is increasing because of students' reported satisfaction with the ability to review material after the lecture is over, or use the video in place of a lecture that was missed (Simpson, 2006). Use of video also addresses the needs of many learners who might be termed 'visual learners' according to Gardner's ideas of multiple intelligences (Sweeder, Bednar, & Ryan, 1998). The use of several different delivery methods to support teachers' use of technology in instruction such as asynchronous video support or peer mentoring seems important to the realization of the goal to implement new methodologies.

Electronic Performance Supporting Systems

The preparation and training of educators does not end the day they step foot in the classroom. Continuing education and professional growth are important concerns for everyone involved in the teaching profession. The content background and pedagogical knowledge required for effective teaching is growing and changing. New

responsibilities require new skills and these skills usually require training. Electronic Performance Support Systems (EPSS) provide a method to deliver just in time training and information for teachers mastering new skills. EPSS can be accessed easily when and where needed to serve a variety of purposes including easing information overload, providing expertise to non-experienced users, review of prior instruction, and filling some mentoring and training needs (Chang, 2007). There is some disagreement as to the specific components of EPSS but Cagiltay defines them as a computer based system that:

- is comprised of a collection of integrated software components;
- is a part of an organization's knowledge management system;
- is user controlled and easy to use;
- provides support at the moment it is needed;
- presents relevant and context-focused information that a task performer needs in a real work environment (Cagiltay, 2006).

EPSS can not solve all training problems, and there is some concern that the skills of the veteran teacher might be

replaced by EPSS to the detriment of teachers in need of mentoring (Chiero, 1996).

In traditional training methods, only some of the material is actually remembered by the learners and some information is lost because of the delay between learning the skill and applying it on the job. That is why this type of content delivery can be so inefficient (Chang, 2004). The trend is to eliminate some of the traditional and expensive training methods utilizing mentors and replace them with a 'smart electronic coach' that individuals can instantly access to view vital support information and learn while working (Maughan, 2005). EPSS systems are not new, and people frequently utilize them without being aware of it. Applets that offer to complete forms or passwords, document wizards, searchable references, and popup windows are in common use without consciously being thought of as job aids. The degree to which the EPSS is helpful is how complex and targeted it is. The addition of visual aids is usually more helpful than a strictly text based system.

The purpose of an EPSS is to improve productivity by providing instruction at the time the user is performing the task. Teachers carry out many administrative jobs and a key activity is communication with students, parents and

administration. By analyzing the student and parent communication requirements that are part of the profession, a custom EPSS can be designed to assist in those tasks. For the EPSS to be successful, it is important to understand the work environment and the resources and events that influence that particular setting. We should provide a tool that is customized to the needs of the teachers at that particular school (Moore, 2000).

Scaffolding is often used to help learners acquire new skills and information. This can be done with the use of a mentor, but an electronic support system can also provide assistance in a cost effective and time efficient format (Cagiltay, 2006). The most effective systems are customized to the needs of the user and should satisfy the overall needs of the school or organization. People feel empowered when they can solve problems on their own and this improved attitude increases the possibility that they will utilize new technology and identify the solution to problems themselves (Chang, 2004).

Because the scaffolding tool should be designed to meet the needs of the user, the primary source of design information before, during, and after development is the user interview. This methodology mirrors the user centered

focus of EPSS. The system should function favorably from the users' point of view and should reflect an understanding of the challenges they face and the prior knowledge they bring (Cole, 1997). The interview process will improve the likelihood that the final product is targeted at the specific end user and meets the needs of the overall community. Performance specialists often refer to targeting the 'Performance Zone' when describing an effective support system. This zone is the overlap of three critical elements required for success; information appropriate to the task, information appropriate to the person, and information containing critical features of the environment (Maughan, 2005). By integrating these elements in the design, success can be optimized to realize best achievement.

A well designed system must address the dual objectives of scaffolded support: performance and learning, (Cagiltay, 2006) within the technical limitations of the environment and the abilities of the learner. Another challenge is to address the learning style of the user, what information is needed, how much information is needed, and the best method of presentation for the individual. Users should be able to move quickly through the extraneous

information that is not immediately required. The system design must provide information for cognitive tasks that are unfamiliar so they can become routine. These are the requirements of an effective EPSS.

Effective Instructional Design

Motivation

Teacher training and development is an ongoing process that continues throughout a good teacher's career. Most districts offer paid trainings and workshops in the hopes that teachers will take advantage of the growth opportunities. Colleges offer extended education courses designed to enhance teacher pedagogy and often teachers are compensated for earning additional school credits. Professional teaching associations offer conferences and workshops hoping to increase pedagogical skill and content knowledge. For the training to be effective, it must be useful in the classroom and presented in such a way that teachers are motivated to use it. Traditional workshops and seminars can sometimes be the least effective because they might have misdirected goals that do not meet the needs of the participants (Davidson-Shivers, Salazar, & Hamilton,

2005). When teachers can immediately connect what they learn to needs they have in the classroom their motivation increases and so does the sustainability of the objective.

The use of video in instructional design has the current advantage to being a novel effect, and so one of high interest. It is a passive learning tool, unless used to provide step by step instruction in which case its role is more of an active instrument. Video based instruction is also consistent in its delivery relying less on the skills of a presenter.

Multimedia content alone does not account for an increase in learner performance and satisfaction and it is expensive to design multimedia instructional materials. Also, designing media that is too visually rich can be distracting and detract from the learner's progress and enjoyment. The media must be targeted to the task, so the appropriateness of the instructional media has an impact on the satisfaction of the user (Pei-Chen, 2006). Motivation and satisfaction are difficult concepts to measure empirically and reliable data regarding satisfaction can be difficult to obtain. It is conceivable that an instructional tool can be highly motivating and yet ineffective in achieving its desired goal of acquiring new

skills. The learning tool must be engaging and appropriate to be useful.

Research into continuing motivation by John Keller (Keller, 1999) has demonstrated that a design system based on Maslow's hierarchy of needs can benefit from a seven step process that supports the human motivation dimensions of attention, relevance, confidence and satisfaction. This research demonstrates that something as variable as human motivation can be approached systematically in instructional design.

Relevance helps learners associate their prior learning experience, perhaps a traditional workshop session, with the support materials provided and enables them to apply the learned knowledge or skills toward their goal. Confidence in the validity of the tool builds the learners' positive expectation regarding success in using that new knowledge. Satisfaction comes when learners can practice their emerging skills and be successful which leads to reinforcement of the desirable outcomes (Huang, 2006). It is possible to locate both positive and negative studies on the effects of multimedia in learning. The features of multimedia design should take into account the learning styles and strengths of the user. Media is more

appealing when presented in an open style allowing users flexibility in access. Games and simulations can provide goal based challenges that stimulate motivation and interest. Video also helps hold the interest of learners with high spatial ability who can hold visual images in the visual component of working memory for longer periods of time (Muthumkumar, 2005). Many learners are self reported visual learners who benefit from learning objects that use visuals with text.

In 2005 and 2007 Choi and Davidson conducted surveys exploring the effects of context based video and problem based video respectively, on the effects of learner satisfaction and motivation. In the latter study, the satisfaction, comprehension, and learning of problem based video instruction was compared to that of problem based text instruction. Results of the study show that the video instruction had significantly higher levels of achievement and satisfaction. Students' attitudes towards the subject matter were positively changed in regards to the subject matter (Choi & Davidson, 2007). This would indicate that learners would be more likely to make use of the acquired skills because of their increased receptiveness toward the topic. In the 2005 study participants reported not only

increased motivation, but learners reported that the video based instruction was more memorable than the text based form.

Constructivists argue that learners must build their own understanding of new knowledge through experience and application to their own practice. Knowledge cannot be given from the expert to the learner because the experience of the learners is separate and unique from their tutor. Skills have relevance and meaning when they can be acquired in the context that they will be used. Video has the advantage of presenting complex material in an engaging and interesting way. Compared with text based manuals, it can also help learners conceptualize and remember the content (Choi & Davidson, 2005). Videos are particularly effective and engaging when they require participation through active learning.

Cognitive Load

Cognitive load theory (CLT) is based on the principle that most people can only hold a certain amount of information in short term or working memory. Effective instructional design seeks to reduce the amount of new information a person must manage at any given time, thereby reducing the cognitive load and allowing them to focus on a

smaller number of new ideas (Lohr, 2008). Working memory is also used to compare, contrast, and organize the information at hand and we can be more efficient with these tasks if they are kept at a manageable number, say two or three pieces of information. Once we have some efficacy with a particular type of information, we can pull it from our long term memory and use it without overburdening cognitive load. It is our experience and depth of understanding which determine how much cognitive load a particular concept places on our working memory (Kirschner, 2002). The design of instructional materials can affect cognitive load and how we learn cognitively complex new material.

Cognitive load theory has become one of the fundamental theories used to describe the cognitive processes in learning with new technologies such as multimedia environments or web based instruction. Because it provides a theory based approach to the prediction of the effectiveness of these technologies, CLT is increasingly used to inform the instructional design of such learning environments (Brunken, 2003). Using pictures and narration together lowers cognitive load because auditory and visual information can be processed using

different cognitive systems and so the load is distributed and the overall effect is a reduction in cognitive load. This is true so long as there is no requirement for split attention as occurs when the learner goes back and forth between delivery systems; for example a visual representation coupled with text that must be analyzed (Kalyuga, Chandler, & Sweller, 2000).

Interestingly, a 2000 study by Kalyuga, Chandler, and Sweller indicated that the superior learning effects of combined video and audio decrease as learners become more proficient and expert with the material. After a certain point of proficiency, the video with audio actually becomes a distraction because of the length of time it takes to deliver information and the redundancy effect. At that point, subject matter experts have more satisfaction with a diagram or text only delivery system as it allows them to quickly target specific information they need. The diagram learning method was least effective in the beginning of content acquisition, but the most effective at the end of the learning continuum (Kalyuga *et al.*, 2000). These results indicate video with audio seems appropriate for novice or beginning learners.

The utilization of both visual and audio processing channels in working memory provides the opportunity for learners to connect and create representations between each mode of information. These connections lead to deep and meaningful learning (Templeman-Kluit, 2006). Constructivists agree because cognitive capacity is limited, it is important to take into account the experience of the learner in designing learning objects. What might be appropriate for the novice is less appropriate for an expert who might find the support information extraneous. Because the information relationships possessed by the learners are different, the approach should be different also. When related information is presented together, the cognitive load to interpret those relationships is reduced. Experts would already have schema developed for relating information appropriately. In this case information that is presented using two or more forms simultaneously would be seen as redundant and less effective (Kalyuga *et al.* 1999). These CLT principles should be considered during instructional design and the experience and efficacy of the target audience should be taken into account during this phase.

Effective Instructional Design

Multimedia instructional content is shown to attract the learner's attention. Sun and Cheng (2006) showed that the use of rich media in e-Learning should take into account the experience of the learner and the objective in the design or use of video for instruction. The design of high-quality multimedia for learning necessitates designer to use accepted best practices in education and instructional technology to create a product that is useful for the learner. The development of a multimedia module consists of five phases: Understanding the learning problem and user needs, designing content using enabling technology, create materials with web style standards for human interface, user testing, and finally a structure to evaluate and improve design (Huang, 2004).

Mukhopadhyay and Parhar coined the term Multi-Channel Learning to indicate a system that includes several different delivery systems, some face to face, some digital, some textual, to present new information. These channels mutually reinforce each other to optimize learning (Mukhopadhyay & Parhar, 2001). The idea is to allow the learner the learner the freedom to choose the vehicle and depth of the learning and by offering the same content

through several forms, an increased understanding. Interactivity is included to help the promote learner initiated connections.

A major obstacle to effective learning is the learning environment. One way to eliminate this constraint involves segmenting a learning task so that it reduces cognitive load and enables the learner to manage the information. By designing short video segments addressing specific and key points, it allows the learner time to process the information at their own pace, rather than moving on to new material (Templeman-Kluit, 2006). As the learner processes and then applies their knowledge, they have time to reflect on its effectiveness and possibly transfer that knowledge to similar computer software.

Instructional methods that are effective in one media are often effective in others. The basic principles of information delivery do not change. Studies show that visual and audio presentations cause greater learning than visual and text, or text only for the new learner. This means the principles of good instructional design do not change as the media changes. Instructional methods that allow learners to hold coordinated visual and auditory input in working memory at the same time allow for greater

cognitive processing. For the experienced learner, a targeted method to access pertinent information without extraneous input is desirable (Mayer, 2003). Multimedia must stay focused on the needs of the learner to promote appropriate cognitive processing.

In the case of screen capturing software, it is one way to humanize the text and learning environment (MacDonald, 2007). By offering a visual representation of the actual screen that will be accessed, and allowing the user to access it in the environment that it will be used gives the user a sense of empowerment, ownership, and control. If they apply information that they learned in a previous workshop, the screen capture provides the familiarity of what they have seen before and an exact simulation of the actual program they are mastering. This gives added confidence and accurate support to complete the anticipated administrative tasks successfully.

Summary

The literature important to the project was presented in Chapter Two. Computers are a tool that helps us take information and communicate it to others. Information can

more easily be analyzed and disseminate it into its parts. Technology helps us reorganize and redistribute those parts into new forms. The use of technology for administrative tasks, and for presenting curriculum in the classroom is seen as important because the ability to use technology is a permanent and pervasive part of society. For all these reasons it is important for teachers who are not familiar with the use of technology to master it and utilize its effectiveness as a communication tool. Learning how to use the multitude of software programs available is not intuitive for many people. There are barriers to the use of technology that include the availability of hardware and software, the difficulty inherent in becoming skilled with a particular piece of software, and the motivation to take the time to learn and use the software. Electronic Performance Support Systems strive to improve the interface between user and software. By reducing the cognitive load required to master new technology, EPSS aims to increase its use. The effective design of instructional materials also endeavors to reduce cognitive load and thereby increase motivation to utilize the materials. Research has shown that presenting information through multi-channel learning such as the use of video with audio instruction

increases the ability of the learner to understand, retain and apply new skills. Convenient access to the video, just in time training, and clear purposeful targeting of information is important to beginners. As teachers gain efficacy with the software, video becomes less important, but the hope is that by this time the benefits of using the programs will motivate the teacher to continue using the program.

CHAPTER THREE

PROJECT DESIGN PROCESSES

Introduction

Chapter Three documents the steps used in developing the project. Specifically, an analysis of the learners within the limited environment of one middle school and the task learning analysis of creating video instruction modules have been analyzed.

Learner analysis was conducted using the Piskurich, 'Audience Analysis Template' (Piskurich, 2006). An informal survey was also conducted to determine user's preconceived ideas about using videos for training purposes. Most teachers had viewed at least one example of a video tutorial sometime in the past. Most teachers did not usually access video tutorials to learn information, most preferred demonstrations or printed materials. When asked what factors they felt would be most important the items most frequently mentioned were easy access and playability, short duration, and targeted instruction. Several teachers also mentioned providing clear descriptions of exactly what

the videos covered so they wouldn't have to search for the information they needed.

The primary design considerations for the videos were short, targeted instruction. The desired video length was no more than 2 minutes. Instructions should be clear and engaging with a minimal amount of distraction or extraneous information. The videos were created to illustrate examples of specific tasks within the software and provide clear instruction on the step required to create the same or similar results.

Two sample videos were created and distributed to 5 volunteer teachers with varying degrees of efficacy with the software. One sample provided an overview of the program, and another demonstrated how to create a class description and add a picture. Teachers provided feedback on these two videos and the remaining videos were created with those suggestions in mind. During the recording process as the developer became more experienced with the software features, improvements were made on earlier videos.

The entire beginning series was distributed to 5 teachers who were interested in learning more about using the SchoolFusion software and their input was recorded.

That feedback will be implemented as the advanced series is designed and developed.

Analysis

Learner Analysis

"The more you can find out about your target audience, the more likely it is that your training will meet its needs" (Piskurich, 2006, p. 77). Learner analysis was conducted through interviews, job education requirements, and direct observation. The Piskurich, 'Audience Analysis Template' (Piskurich, 2006, p. 80) was used to guide the analysis and is included at the end of this paper. Audience totals nineteen participants; seventeen were teachers, one counselor, plus the principal. All participants work at the same public middle school in a small suburban city.

Entry Behaviors

Entry behaviors vary. Through observation and informal conversation it is noted that some of the teachers were familiar with email and use it daily in their personal lives, some use it sporadically, and some use it rarely or not at all. All teachers used the computer in their classrooms for various administrative or teaching tasks.

Some used the computer extensively for lesson plans combining it with an LCD projector, and/or an interactive white board.

Prior Knowledge of the Topic Area

It can be assumed that all of the teachers had some experience using email because it is required by the district. According to district records, the San Bernardino county C-Mail interface has been available since 1991. The Aeries Browser Interface was adopted in 2005 at the high school, and 2007 for Canyon Middle School. The SchoolFusion web software became available January 2008. Most of the teachers had been using a grade program called 'Making the Grade' so had some experience with grading software. None of the teachers was maintaining a web site, personal or professional. An initial survey showed that six of the teachers and the principal were comfortable with technology in general and were open to the prospect of having a website for parents and students to use.

A survey of technology use as it relates specifically to this survey shows that six months ago eleven of the participants had set up a basic web page using the software. Seven teachers were maintaining and updating their websites weekly. Four had created an initial web page

but did not maintain it or use most of the features. Eight were not using the software to create any website at all.

In answer to informal focus group questions, three of the non users expressed an unwillingness to maintain a website seeing it only as additional burden to their time. The remaining five nonusers and the four minimal users expressed a desire to do more with a website but felt they needed more training to accomplish this.

Motivation

All of the teachers were required to use the email system in the performance of their job, so it might be assumed the motivation was high to understand quickly to fulfill contract obligations. Through observation and anecdotal conversations it could be hypothesized that the majority of teachers saw a benefit in parents having immediate access to their student's grades, and acknowledged the inevitability of using the computer to record grades so motivation was above average to understand the software and any extra features it might provide. The use of the webpage was encouraged but not required.

Teachers who were comfortable using technology were highly motivated and had been teaching themselves. The remaining majority would have liked to use the web page but

were not motivated to spend time learning how to use and maintain a web site. As the year progressed and all the staff had an opportunity to view the effectiveness and increase of communication between teachers, students and parents interest grew in learning how to create and maintain a website.

Ability Levels

According to NCLB all teachers were highly competent and qualified. This is a breakdown of their experience:

- Nine teachers were new to the school in the last three years
- Principal was new to the school.
- Vice principal was new to the school
- Four teachers were in their first five years of teaching.
- Eight teachers had been with the school since it opened five years ago as a temporary school.

General Learning Preferences

As a group, teachers are usually good auditory, visual, and kinesthetic learners. Most teachers had a positive experience during their education and are successful with the standard methods; they became teachers

because they were successful students. Over the years teachers have had ever increasing numbers of trainings and meetings imposed on them. Some of these trainings are worthwhile and some are not. The more experienced a teacher is, the more critical they are of yet another training workshop. Teachers are comfortable making sense of content on their own, and they want minimal interference with their adopted methods. Teachers want information delivered efficiently and effectively and it should be information in a form that can be adopted for use immediately.

Task Learning Analysis

A review of current technologies being used in this system revealed that teachers had some knowledge and experience using technology for administrative tasks in the classroom. Use of the county C-Mail program for email, and the use of the Aeries Browser Interface for attendance were mandatory. Using ABI for grades and parent communication was strongly recommended. Use of the classroom website for information about homework and class assignments was encouraged. Employees were provided software, high speed internet access, and a desktop computer in the classroom to fulfill these requirements. This project refers only to the SchoolFusion web software package.

Standards

In the school environment, a classroom web page is used for communication among professionals, parents, and community members. Used by the teaching professional it should generally be free of jargon, slang, grammatical errors, typos, and misspellings. Texting shortcuts are usually not appropriate. The information presented should be timely and represent the designer as organized and literate. Ideally, a web page should give the viewer a sense of what the classroom is like and the expectations for success. It should provide any supporting documents, assignments, and deadlines that are related to current class activities and investigations. The video tutorials will provide examples of standards that should be used and audio tips will be provided to avoid common design mistakes, or copyright infringement. One task of creating an effective web page is to choose elements that are harmonious and improve information delivery and the videos will occasionally touch on these requirements.

Outputs

When a page is successfully update, the page will reload and the new information should be readily apparent.

At this point parents and students can access the information from personal computers via the web.

Feedback

Parents and students will be able to send feedback on the website through email or assignment submissions.

Knowledge, Skills, and Abilities

Teachers must know how to write effectively and how to follow the processes to update a web page with new content. Teacher attitudes towards technology and communication should be positive and show a willingness to learn.

Summary

Potential Development

In a field of nineteen staff members, twelve needed assistance in using the district supported software. Specifically the CMail software has been available for years and yet teachers only used the basic email functions. Only one teacher had set up group mailing lists for students and parents because the setup of the task is somewhat counterintuitive to other email programs. The ABI software was fairly straightforward, but teachers still had questions about the features and what it could and couldn't

do. Because they had previous experience with a different software program they weren't sure if different features were included somewhere in this new package. Fifty percent of the teachers did not attempt the website software. All these areas needed to be addressed. An initial prototype needed to be developed and distributed for use and pre and post attitude surveys completed to see if a video program would address the problem of targeted training and increased use of software tools.

Key Factors

The key factors were the level of priority the administration placed on use of the software options. Software that is required or prioritized is in greater use than software tools that are encouraged. Another factor is the availability and quality of training. Once a year training is not necessarily timely or targeted. There had been complaints about the quality of the training and that it took too much time when sometimes all you wanted is the answer to one question. Typically individual questions were only addressed at the end of the training, requiring a teacher to stay for the entire training. Telephone help was readily available, but many teachers wanted to be able to do it on their own or found it inconvenient to wait for a

call back. Print resources, when available, were limited and difficult to use.

Measuring Success

Success would be measured by teachers increased use of the district software and increased use of the special features available. If 50% of the teachers who are currently not using the software, increase their use of the software and its special features, and attribute that increase to the use of the videos, then they are a success. This would in turn increase the level of communication with families and assist students to be successful in school.

Delivery Options

Delivery options included keeping the status quo and providing training through a district representative. Technology mentors were in place at schools and received a $2000 per annum stipend to help teachers with technology issues. A problem with this option was teachers were reluctant to ask for help, and the technology mentor usually put in many more hours than they were getting paid for. That made the position unattractive for many teachers. Teachers could be issued manuals for the software, but many teachers didn't like using software manuals and would not make use of them. The last option was the one proposed,

short 2-5 minute video tutorials targeting specific tasks and skills that included a print reference with pictures. The video can be provided in a compact disk format, or uploaded to a web site for access by teachers.

Design

Key Decisions

The design and development process took a lot of time. There were three different software interfaces that were used for communication and choosing which to develop job aides for was important. Teacher needs should be the guiding factor choosing which one was most required for use. The email program was in use by everyone for basic communication and would be replaced for bulk mailings by the SchoolFusion software. ABI was also widely in use and teachers were trained its basic features. The program that was not in wide use, possibly because it was not required was the SchoolFusion website management. To encourage teachers to use this communication tool, training had to be convenient and timely. An important consideration was that the class group email feature was addressed and simplified in the SchoolFusion package as opposed to the older mailing

list feature in Cmail. Only two of the 20 teachers were using this feature because it was difficult to set up and maintain in Cmail.

The last important decision was whether a video format was the best delivery method. Considering that the other options had not proved successful in the past it seemed this option might be effective. It was a good idea to develop a prototype of one feature such as adding a classroom description and then create a pre and post survey of teacher reactions to see if it would be well received. A mistake would have been to create the entire series only to find that the reasons for not using the software had not been addressed.

Design Process

The key element of the design process was to break down each task into its individual components. The analysis showed that the shorter and more directed the instruction the more likely it was to be used. Convenience and time management were critical. Pre and post surveys were used to guide prototype development. Surveys were used to identify key needs and requirements. Through this process videos were reviewed, revised, and resubmitted as necessary.

In a pre survey teachers indicated dissatisfaction with the current training methods. They felt trainings were haphazard and unfocused and believed the size of the classes were too big to meet their individual needs. Most expressed a desire for small group or individual instruction. A small group workshop was developed that would provide small group instruction and serve as a launch for the videos.

Design Specifications

Videos will be short and break larger tasks into subtasks. Videos will have printed support information showing critical performance steps. Videos will be assessable by compact disk and download from a district website. Videos will be recorded in a screen resolution that is viewable by a majority of pc format computers. Videos will include pop-up boxes with targeted instruction, highlights for information as it is discussed, and mouse movement indicating when and where to choose available options.

Videos were short to increase the probability that teachers will access them. Each task had one segment that showed the task in its entirety, and then shorter videos that serve as a reminder for task components. In this way

if a teacher knew the majority of the task and needed help with a specific component they didn't have to watch a longer video to get the information they needed. Videos were accompanied by a paper copy showing specific steps and salient points. The hope was that once the video had been accessed teachers could use the summary sheet if they needed reminders. Titles were descriptive and indicated exactly what task or subtask was being addressed.

Scripts were produced through trial and error. Once the author determined which task would be addressed, that task was performed in real time. Each step and mouse movement was written down in sequence. Once the entire task was complete the author returned to the notes and added rough dialogue to accompany what would happen on the screen along with any considerations that might be necessary before execution. Only after the sequence and considerations were noted would the actual task be recorded.

To keep the videos consistent, a chart of design rules was developed that included information about highlight colors, mouse movement, and timing. This chart of rules was then applied to the first draft recording to edit it for the completed final version.

The SchoolFusion software had many features and some more advanced than others. The decision was made from the survey results that since beginning users were most interested in the basic classroom web page functions; those were the functions that would be addressed by video. More videos could be added as necessary if teachers became more proficient and demanded new tutorials. The basic steps were included and more advanced features were mentioned as an option through audio, but demonstrated in a different video.

Development

Adobe Captivate software was used to record the training videos. Adobe had many pre-built effects that it provided during recording. It automatically included such features as pop-up boxes and highlighting anytime you clicked on a page element. It streamlined mouse movement and slowed it to a constant speed for the video. Adobe added typing sound effects when you were typing text if desired. Adobe used clear transitions when the background changed as when you moved from one URL to another.

It was found during recording the videos that there were additional editing features that were helpful to include after the draft or rough video was complete. Frequently the length of time that the highlight and pop up box appeared on the screen was changed to a more effective interval. Sometimes a feature would be described before selection on screen. Highlighting the object during the entire description directed the user's attention to the object being described. A pop up box could be added just before choosing the object and this reduced distraction from the audio explanation, reducing cognitive load. It was possible to take advantage of the ability to change the text that appears in the pop up box to a more descriptive name. Using the highlighting feature to emphasize changes in the webpage was desirable. As each feature on the site was modified, a highlight box called attention to the final product.

A list of features that should be edited after the initial screen capture was developed, providing a chart of design rules that were applied to each video to keep them similar and consistent. Providing continuity of this sort from video to video reduces cognitive load.

One thing learned while creating the videos is that it is difficult to time actions precisely to narrator voice. Errors of this nature include selecting the next object before the audio, or explaining a feature completely before selecting it. Fortunately, the audio editing feature was excellent, as was the mouse video overlay. Both could be shortened, lengthened, or manipulated in such a way that the mouse and audio were synchronized in the end, even if they weren't recorded that way. Early on it was obvious that the narrator needed to speak slowly and clearly. Speaking with the mouth close to the microphone was unnecessary and usually created 'breathy' sounds as the speaker tried to talk and breathe at the same time.

Most of the website elements were simple and easily communicated in a 2 minute instructional video. Once or twice there were more complicated elements such as 'Class Announcements' and the complete videos were a bit lengthy and entangled with information. One of the prototype volunteers suggested to split the topic into 'Basic Class Announcements' and 'Advanced Class Announcements' to chunk the information into more manageable segments for the intended beginner audience.

Sometimes, a slightly more complex set of instructions would end with a video with a solid beginning, a good ending and a mediocre center. Perhaps the developer fumbled the order or forgot a step. The great thing about editing using Adobe was the ability to go back and re-shoot just the sections that were unclear. It was amazing how many tries it took to get a solid presentation. It was not possible to adlib in the way teacher most do in the classroom while teaching. It was necessary to create notes to keep everything perfectly organized. The first few videos required fully written scripts to be clear. After practicing and reviewing and rerecording narration got better with multiple performances and eventually the narrator could use an outline that consisted of bullet points rather than using a complete script.

After using the Adobe software for several weeks and creating five or six videos getting better with each one, the creator had the strong urge to rerecord the first attempts because so much had been learned about the software and the design techniques that would reduce cognitive load for the learner. The first few videos were rerecorded with this additional experience applied and for the later videos it was possible to add the highlighting

and pop up box techniques as indicated in the review process acquired during the experimental process that helped direct the learner's attention to important learning elements.

Implementation

Initially a pair of introductory videos was created to get feedback about the basic concept and organization of the videos themselves. The first two topics were an overview of the software, and how to add a class description. They were distributed to 5 teachers randomly. Some of these teachers were already using the software and were not in need of instruction, and some were beginning learners. All 5 teachers provided positive feedback regarding voice modulation, pacing, graphics, and timing. Unfortunately, neither of those videos included the 'whole screen' problem that would crop up in future videos so that problem element was not discovered or addressed early.

Next, a series of eight beginning videos was created for the SchoolFusion web software adopted by the district. A one day training session was developed and offered to two groups of five participants each. The first series of basic

videos was distributed after the trainings so teachers could access them when needed. All videos were shorter than three minutes in length and covered the basic features and functions of the web design software.

Two training sessions for the software which were attended by approximately 12 teachers were coordinated and delivered. The workshops were designed to cover only the basics so the needs of experienced software users would not have been addressed. Teachers who considered themselves beginners or beginning intermediate attended the workshops as an introductory or refresher course. After the workshop, teachers were offered a copy of the introductory videos. Five teachers took the videos and agreed to view them and participate in post surveys.

The district technology coordinator heard about the instructional videos and asked if they could be provided for use on the district website and in district trainings. This was done.

Evaluation

Flow Chart

A flow chart was created to help visually illustrate the steps taken to create, edit, and revise the videos. It is included in Appendix B.

Feedback

After producing the beginning set of videos and receiving feedback it was determined that the videos were great as an 'introduction' to what is possible. Once they were more comfortable and confident with the software, teachers preferred working from a printed list of instructions. A somewhat related issue arose regarding a piece of software that was only accessed four times each year to print and record benchmark exams. This software had many unused features and teachers often forgot how to access the specific area they needed each quarter. Teachers asked for a list of steps to serve as a reminder on how to access the benchmarks and record student scores. When asked if they would like a video made the answer was no, instructions are preferable. When the subject was probed deeper it was learned that the videos are great for

information and inspiring confidence, but not as helpful when a person just wants the basics.

In the post video surveys, it was discovered that for some teachers the video did not fit completely on their screen. If the mouse movement went below their screen they would have to scroll down to see it. Most teachers could not scroll down quickly enough to catch the action and they would have to replay it. It is believed the reason for this is that the screen resolution on the computer used to record the videos is set to 1440 x 900 pixels, and several of the teachers have their screen resolutions set lower than that. A possible fix is to record the videos at a lower resolution that would fit on most screens. Another possible option is to record the videos at 1440 x 900 pixels capturing the entire screen, and then resize the final product.

Post Interviews

The five teachers who viewed the videos were interviewed individually. The original idea was to conduct a small focus group where the videos would be discussed as a team. Unfortunately, it proved increasingly difficult to arrange a time after school that was convenient for all participants. Eventually, it was decided to conduct the

interviews individually. Each teacher was asked all eight of the predetermined focus questions. The answers are as follows:

Did you find it easy to access the videos?

All the participants found the videos easy to access. The titles for each topic were clear and related directly to the software options. It was very clear which video related to each feature of the web authoring software.

Were the videos easy to follow?

All the participants indicated the videos were easy to follow and clearly indicated the steps and procedures for each option. One participant commented favorably that 'your voice was so slow and soothing' that it inspired confidence. Another participant indicated that the narration was slow and positive and made it seem like it would be 'easy' to accomplish the desired end result.

Did the videos increase your use of the web software?

Three of the participants indicated that the videos did increase their use of the software. One of the participants indicated that she was not interested in maintaining a web page although she felt more

confident now if it came about that she was required by contract to maintain a site. One participant said that she has increased her use of the web software but she didn't think the videos were the cause. She felt she got more information and guidance from the trainings, and she didn't actually view the videos until after she had already set up her new web page.

What was the most important feature of the videos?

All participants cited the some of the same features as being important. They stated that they appreciated the short, targeted topics. They liked the slow and confidence inspiring pace of the videos. One participant stated that he appreciated the convenience of being able to access the videos on his own time and when he wanted to.

What was the feature that was the least appealing, or what features would you like to see improved?

One teacher had to ask someone else how to load the compact disk in the computer, and how to open it because the 'auto play' feature did not work. Three participants stated that the video stretched below the bottom of their computer screen and they had to scroll

down if there were any motions near the foot of the video.

What benefits do you perceive in using the videos?

All the teachers indicated that if there was no one to demonstrate the software, the videos were a great way to see how it works. Three of the teachers mentioned the convenience of being able to access the video on their own time and practice privately without 'holding up' an entire class while they figured out a new feature.

Will you continue to use the videos if you have questions about the SchoolFusion software?

Three of the participants indicated that they would continue using the videos if they had more questions about the software. Two participants stated that they felt the videos introduced the basic patterns and procedures of the software and that if they had questions they would probably be of a more specific nature not covered in the basic videos. In other words, once the basic principles are mastered the videos are less helpful and informative.

Would you be interested in viewing similar videos for other software programs you might use?

Four participants said yes they would be interested in viewing similar videos for other software programs. One of these participants was particularly interested and enthusiastically stated that she had several software programs she'd love to see videos for. One participant said that she preferred to use printed resources to learn software. She stated that even though the videos were targeted and short, they were more cumbersome to use as a learning tool than simple printed instructions.

Summary

Instructional videos are a good introduction to new software, but they are less preferable than one on one instruction. The workshops combined with the videos were highly effective because they were conducted in small groups and it was easy to give personal attention to everyone and give everyone the opportunity to take whatever time they needed to master each step. That would not have been possible in the typical larger group workshops normally held for software training.

The most important design features of the videos were the targeted subject matter, short durations, highlights and pop ups for key points, and slow, deliberate pacing. Important considerations for use were easy access and timely intervention as teachers could utilize the videos at their convenience.

Teachers prefer one-on-one or small group training, but they understand that this type of training is not always possible and not always conveniently scheduled. The videos were seen more as a beginner's introduction to new software. Teachers felt that after they developed some efficacy with the software they would prefer printed materials.

The videos had the desired effect of increasing use of the web page software among the teachers who participated, but possibly served more as an inspiration rather than a source of specific information as intended.

CHAPTER FOUR

CONCLUSIONS AND RECOMMENDATIONS

Introduction

Included in Chapter Four was a presentation of the conclusions gleamed as a result of completing the project. The question of teacher motivation was addressed as well as the need for teachers to incorporate new learning, technology and methodology in their teaching to remain effective instructors. Best practice teacher training methods and preferences were analyzed as well as the need for cost effective and productive instructions. The ability of video based instruction to reduce cognitive load is asserted as well as the necessity for alternate supplementary materials. Further, the recommendations extracted from the project are presented in regards to video based instruction in an education setting and the importance of continual implementation of technology. Lastly, the Chapter concludes with a summary.

Conclusions

Teachers have some desire to follow the desires of the administration as long as those requests can be accomplished with a reasonable amount of effort. The definition of reasonable effort appears to correspond with a teacher's perception of the usefulness of the task at hand. If the task seems to yield results then the teacher is willing to put forth more personal effort than if the task seems arbitrary and ineffectual. These two variables can be considered inversely related.

Teachers must be lifelong learners to stay effective and be successful in reaching younger students. As society and technology changes teachers need to keep up with the changing face of information delivery. Using computers in their curriculum and content delivery is preceded by their ability to use technology effectively as an information management tool for record keeping and communication.

The type of training most teachers prefer is one on one with hands on practice for the task at hand. Second preference is small group instruction, and third preference is video plus printed instruction. This corresponds with a learner's need for autonomy, training on demand, and

targeted instruction. Administration needs to provide training in a cost efficient, effective manner so teachers will be able to access the training, and the training will be available as needed.

Effective instructional design must take into account the needs of the learner. Video is engaging and appealing to the users because of its ease of use and relative novelty. Video is also less dependent on the effectiveness of the trainer as it can utilize audio and visual cues. Video reduces cognitive load by providing information in several formats at once: audio, visual, and time appropriate.

Reducing cognitive load is a critical component to any training materials provided. The goal is to make the learning enjoyable and easy. Each step of the process should be highlighted and critical tasks emphasized. Through the use of highlights, pop-ups, and measured pacing, the videos are more comfortable and targeted to the beginning user.

Even the shortest videos are perceived as being longer than following a well written set of instructions, especially if you have some experience. Video is mostly effective for students who have little or no experience

with a particular software and need to begin at the basics. Video in this case can be inspiring and effective because its delivery is so private.

Recommendations

Computers have raised the bar of expectations when evaluating how much information can be processed. Administration is hungry for data so they can make better decisions about resource allocation, improving test scores and targeting student intervention. There is also a strong push to use new technology as quickly as possible. To do this, teachers must be trained in a way that they support the innovation and recognize its ability to increase their effectiveness as teachers. Teachers already give up hours of their own time to help their students, so new technology must be introduced in a non-threatening, easy access fashion to promote teacher acceptance.

Technology is an important part of modern communication, managing administrative tasks, and effective, engaging curriculum delivery. Parents increasingly demand current information about their children's grades and progress. These goals can be met

through the use of classroom web pages and email. For beginning users the gateway to technology use in the classroom is administrative record keeping and communication. Solid instruction in the basic email, grade keeping, and web authoring software is critical to achieving a level of proficiency that will promote the use of technology in the classroom. Support must be provided for these basic software tools.

Most teachers will acknowledge that the type of training they prefer is one-on-one hands on instruction. This training should be available at any time a teacher is ready to learn. This scenario is not logistically or financially possible at most institutions. The compromise is to offer small and frequent workshops targeted to teacher needs based on tech support questions and surveys. In the interim, video instruction provides an excellent support especially for new users. The videos should be available online, on demand and should be short, clear, and targeted to specific tasks. After a user gains some experience with the program, clear and concise printed instructions are preferred so the learner can proceed at their own pace.

Training through videos is effective because of the novelty and ease in utilizing videos. Videos meet learner needs by being available as needed, engaging, and they reduce cognitive load by supplying information through several learning channels, audio, visual, and text. Videos should be made readily available to learners through website download and hard copies as necessary. Videos should be provided as overviews of all required tasks, and as a supplement to face to face training. For teachers who can not attend trainings, videos should be provided as an alternative along with printed materials for reference.

Videos should be short and focused. They should be paced for the beginning learner and each step should be highlighted through the use of color and through the use of text pop-ups. Videos should address specific tasks within larger tasks and break these down to a series of manageable and reasoned steps. Care must be taken to provide clear instruction that does not distract through the use of excess noise or movement, but draws the learner attention toward important points and steps moving them through the desired process to achieve successful completion of the task.

All learners, but particularly all beginning learners should have access to instructional videos through the web and by electronic media as necessary.

Summary

Chapter Four reviewed the conclusions extracted from the project. Teachers are motivated by their own perceptions of effectiveness, perceived effort, and administrative pressure. Personal training is desirable but costly, and large group instruction is marginally effective but cheap. On demand video instruction combined with timely small group instruction is a desirable and cost effective solution. Training must be targeted, engaging and instructional videos satisfy these requirements. Successful videos reduce cognitive load while boosting confidence and increasing self sufficiency. Lastly, the recommendations derived from the project were presented including the combined use of small group training, videos, and printed resources to increase the efficacy of teachers using technology in the classroom for administrative tasks and curriculum delivery.

APPENDIX A

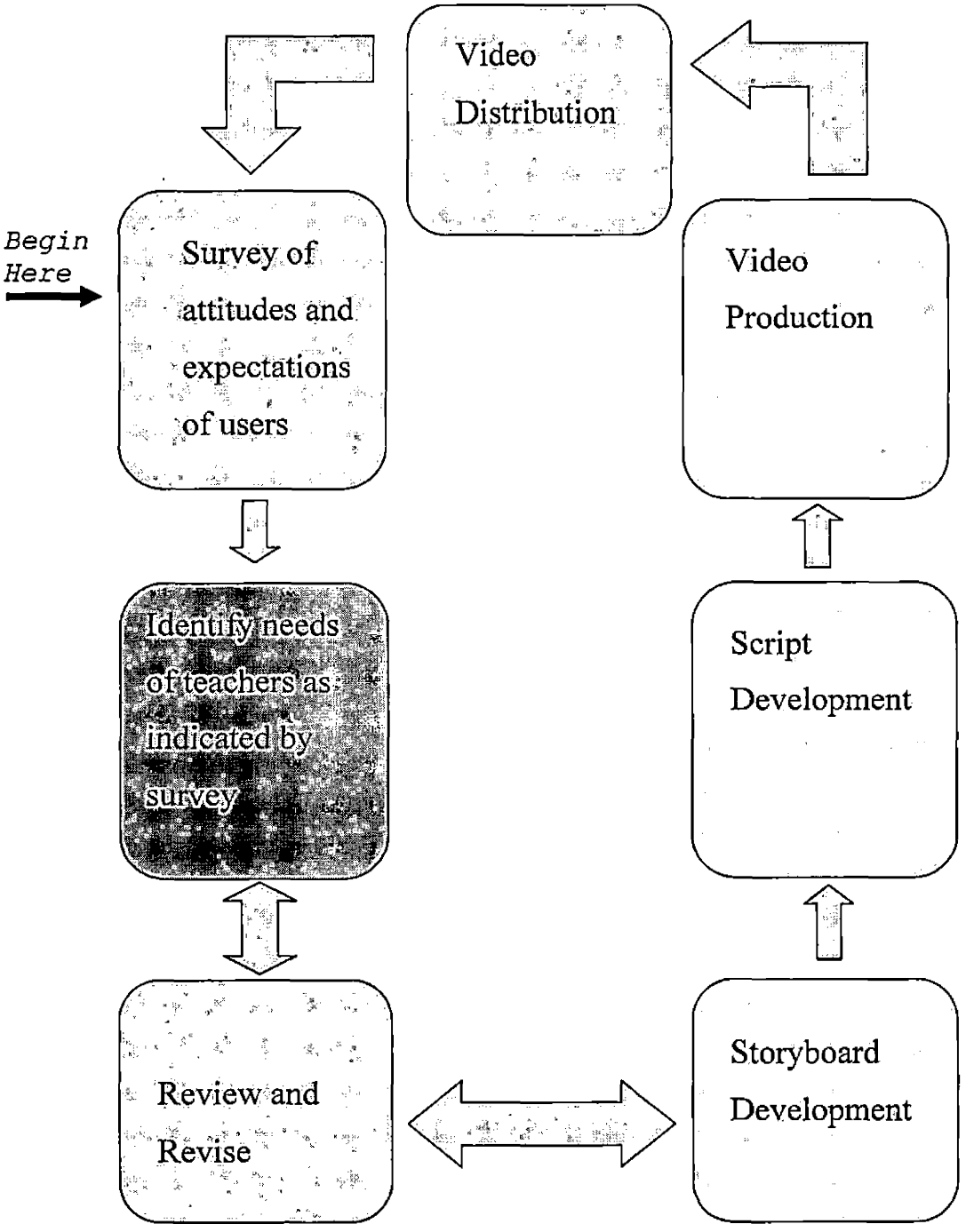
CD OF PROJECT

CD on this page

APPENDIX B

DESIGN AND DEVELOPMENT FLOW CHART

Video Design Flow Chart



APPENDIX C

AUDIENCE ANALYSIS TEMPLATE

1. *How many participants will access the materials?*
    a. Twenty: Nineteen teachers and the principal
2. *What are the job responsibilities and functions of the participants?*
    a. All participants are staff at a suburban public middle school responsible for the successful education of 450 7^{th} and 8^{th} grade students.
3. *How well do the participants know each other?*
    a. The participants know and like each other, it is a close knit community. Half the staff is new in the last two years, and the other half have professional ties going back 10 or 15 years, before the school opened.
4. *Are there specific or special potential diversity issues to be aware of within the group?*
    a. *No.*
5. *Are there key individuals within the group?*
    a. The principal is a key individual due to his authority. The technology mentor and two teachers that are highly technically oriented are good references.
6. *Is the training voluntary or mandatory? What have the participants been told?*

a. Training is voluntary. Use of the one software component is mandatory.

7. *What are the attitudes and beliefs of the participants, sponsor and managers toward the training topic?*

   a. The staff is on a wide continuum of familiarity with technology. Some are very comfortable and some do not use technology outside of the requirements personally or professionally

8. *What success and difficulties have the participants encountered with the training topic?*

   a. Success has been achieved using the basic email functions and ABI functions. Most teachers are not using the SchoolFusion website software due to unfamiliarity with the product. Few teachers are using advanced features of any of the software packages.

9. *What is the skill level of the participants in the training subject matter?*

   a. Skill levels follow a bell curve.

10. *What are the barriers the participant might encounter in applying the training back on the job?*

a. Teachers might be hesitant about using a video resource because it is a new concept. Teachers may forget they have the resource because they've never had that resource before.

11. *Have the participants taken other in-house classes?*

a. Workshops are an integral part of the teaching profession. Many staff development workshops are offered, some are mandatory, and most staff meetings involve some sort of mini training in something.

12. *Levels of evaluation to be used:*

a. 1) pre and post survey of participants

i. after six months

ii. after one school year

b. 2) Increased use of all software programs

c. 3) Increased satisfaction of parents and families in levels of communication

13. *How many participants will access the materials?*

a. Twenty: Nineteen teachers and the principal

14. *What are the job responsibilities and functions of the participants?*

a. All participants are staff at a suburban public middle school responsible for the successful education of 450 7th and 8th grade students.

15. *How well do the participants know each other?*

a. The participants know and like each other, it is a close knit community. Half the staff is new in the last two years, and the other half have professional ties going back 10 or 15 years, before the school opened.

16. *Are there specific or special potential diversity issues to be aware of within the group?*

a. *No.*

17. *Are there key individuals within the group?*

a. The principal is a key individual due to his authority. The technology mentor and two teachers that are highly technically oriented are good references.

18. *Is the training voluntary or mandatory? What have the participants been told?*

a. Training is voluntary. Use of the one software component is mandatory.

19. *What are the attitudes and beliefs of the participants, sponsor and managers toward the training topic?*

    a. The staff is on a wide continuum of familiarity with technology. Some are very comfortable and some do not use technology outside of the requirements personally or professionally

20. *What success and difficulties have the participants encountered with the training topic?*

    a. Success has been achieved using the basic email functions and ABI functions. Most teachers are not using the SchoolFusion website software due to unfamiliarity with the product. Few teachers are using advanced features of any of the software packages.

21. *What is the skill level of the participants in the training subject matter?*

    a. Skill levels follow a bell curve.

22. *What are the barriers the participant might encounter in applying the training back on the job?*

    a. Teachers might be hesitant about using a video resource because it is a new concept. Teachers

may forget they have the resource because they've never had that resource before.

23. *Have the participants taken other in-house classes?*

a. Workshops are an integral part of the teaching profession. Many staff development workshops are offered, some are mandatory, and most staff meetings involve some sort of mini training in something.

24. *Levels of evaluation to be used:*

a. 1) pre and post survey of participants

i. after six months

ii. after one school year

b. 2) Increased use of all software programs.

c. 3) Increased satisfaction of parents and families in levels of communication.

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