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Faculty development in the use of multimedia

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Abstract

Falk and Carlson (1992) observed that educators have, in the last 15 years, witnessed a phenomenal growth in the variety and capability of tools available to them. In 1977, teachers were using traditional teaching aids such as chalkboards, slides, overhead projectors, audio cassettes, and films. In 1992, new and powerful tools such as videotapes, personal computers, interactive video, multimedia, networks, distance learning, and a whole spectrum of possibilities in the form of CAI, CD-ROM, DVI and CD-I become available to them. Hence, teachers today are faced with the challenge to move beyond teaching the way they themselves have been taught, and to integrate in their curriculum these new instructional tools.

Faculty Development in the Use of Multimedia

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SECTION 1

INTRODUCTION

Falk and Carlson (1992) observed that educators have, in the last 15 years, witnessed a phenomenal growth in the variety and capability of tools available to them. In 1977, teachers were using traditional teaching aids such as chalkboards, slides, overhead projectors, audio cassettes, and films. In 1992, new and powerful tools such as videotapes, personal computers, interactive video, multimedia, networks, distance learning, and a whole spectrum of possibilities in the form of CAI, CD-ROM, DVI and CD-I become available to them. Hence, teachers today are faced with the challenge to move beyond teaching the way they themselves have been taught, and to integrate in their curriculum these new instructional tools.

One of such new tools that is generating immense interest these days in educational institutions throughout the country is interactive multimedia. Lynch (1991) wrote that multimedia implies "multiple forms of communications media, controlled, coordinated, and integrated by the microcomputer" (p. 2). It is interactive because the computer allows the individual user to "interact with and control the flow of information" (p. 2).

Lynch (1991) also aptly described multimedia's appropriateness to the way we learn in a world that is rich in sensory experience. He

reiterated the fact that we daily encounter information from a wide variety of formats: sound, images, and text. As educators interact informally with students and colleagues, they are able to use gestures, sketches, and impromptu demonstrations to help convey their verbal explanations. But in their formal teaching, they often have to adhere to text and still illustrations, however unsuitable they may be, to convey the total meaning of their subject matter to students or peers. Multimedia offers educators "a way to regain some of the explanatory power of audio, video, animations, and interactive simulations, and to build those features into educational materials that actively engage students by giving them the best possible explanations they can, with whatever media are most suitable to the task" (preface).

It is not surprising, therefore, to find an increasing number of educational institutions today that are committed to integrating multimedia in their curriculum. Some are already developing multimedia presentations while others are in their implementation process.

The University of Northern Iowa is one such institution that is committed to multimedia development and usage in its various academic colleges. Recently, the College of Education (COE) has secured IBM-based and Macintosh-based multimedia platforms for the purpose of developing such interactive applications for its curriculum. These technology services are coordinated by the

Instructional Resources and Technology Services (IRTS). One of IRTS's responsibilities includes the Faculty Development Center, whose mission is to assist COE faculty members with getting started in technology-related projects for instruction, professional activities, or research.

Since, according to a recent survey, many COE faculty members are unfamiliar with multimedia equipment and software, there is an urgent need to introduce this upcoming technology to them. The purpose of my research project is to develop a workshop that will contribute to faculty development in the use of multimedia.

SECTION 2

NEEDS STATEMENT

Since Nasbitt's best-seller, Megatrends came out in 1982, See (1991) observed that the predicted direction in which we are moving toward an information-based society is gradually becoming a reality. This dramatic change in our world is being brought by new information technology such as CD-ROMs, modems, VCRs, video disc players, and fiber optics. Power On!, published by the United States Office of Technology Assessment in 1988 (cited in See, 1991) reported substantial increases in the number and type of information technology in American schools. In the same year, the Electronic Learning's Eighth Annual Survey of information technology in the nation's schools was published, and it supported the findings of Power On! (Bruder, 1988)

In light of these technological changes, the University of Northern Iowa (UNI) recognizes the importance of equipping its faculty and students with the skills needed to meet the demands of our rapidly changing world.

Faculty Development Need in Multimedia

One tool that is currently of widespread interest in educational circles today is multimedia. The College of Education (COE) at the University of Northern Iowa, for example, has set several multimedia

technology goals, one of which is to train its faculty on the appropriate utilization of multimedia in classroom settings.

With help from the Instructional Resources and Technology Services (IRTS), the COE Technology Committee has recently completed a survey (see Appendix A) among its faculty members to determine their degree of familiarity with various technologies. The survey revealed, among other things, that respondents were most familiar with traditional technologies such as overhead and slide projectors, and also evidenced more expertise in microcomputers than with mainframe computers. Within the area of microcomputers, respondents showed most familiarity with word processing, spreadsheets, computer-assisted instruction, and databases. They were, however, only at a minimal comfort when it came to dealing with artificial intelligence, interactive video and multimedia. At the same time, they expressed a strong interest in professional development in interactive video and multimedia technology.

One major underlying motivation for COE faculty to learn about multimedia is the desire to integrate multimedia into their instruction. There seems to be general sense of excitement among the faculty to know more about this upcoming technology. But at this stage, the majority of them have very little knowledge as to how it works. Since the College of Education has only recently procured the development stations and software needed to do multimedia, there has

been no previous training offered within the College to its faculty in this area. Hence, it appears that one of the first things they need is an introduction to multimedia in a workshop environment.

Obstacles to the Workshop's Success

The likely obstacles that could affect the success of this workshop are lack of administrative support, inadequate financial support, lack of space, lack of computer workstations, lack of access to the production equipment and software needed to produce multimedia materials, malfunction of the computer hardware, and lack of technical resource support.

Of the above obstacles, the three most likely to affect the success of this workshop are lack of space, lack of computer workstations, and failure of the computer hardware to function properly. The setting is crucial to the success of the workshop. The ideal room for conducting the workshop is one that allows proper set-up of the computer workstations, and also gives all participants sufficient space to interact comfortably with each other and the workshop leader. The availability of computer workstations where participants can be involved in the activities of using multimedia equipment and software would determine the size of the room needed as well as the maximum number of participants that could attend the workshop. At times, no matter how much planning may have taken place, classroom space and computer workstations are at a premium, and a right size classroom

and a right number of workstations may not be available. Although every effort would be made to ensure that the computer hardware run smoothly, there always looms a chance, as in every technology, that something may break down that would curtail the computer's proper functioning as and when one needs it. Many a time, this is beyond one's control.

The other four factors - administrative support, financial support, and access to production equipment and softwares, and technical resource support should not pose any threat to the class's success. Since this class is part of the Instructional Resources and Technology Services' (IRTS) faculty development program which is wholeheartedly endorsed by the College of Education, the workshop is completely supported to ensure the overall program's success. This implies that funds necessary to support the needs of the workshop have been budgeted for. Finally, since one of IRTS's objectives is to help faculty members to get started in technology-related projects for their instruction, it would provide the adequate access to the production equipment and software necessary to produce multimedia materials. As far as technical resource support is concerned, IRTS has recently recruited a technical person to help with the set-up of the computer stations as well as provide multimedia support.

To recap, the purpose of this project is to develop a workshop that would help contribute to faculty development in the use of

multimedia. Presently, the multimedia training that has been identified to be contributing to faculty development is an introduction to QuickTime and Adobe Premiere.

SECTION 3

REVIEW OF LITERATURE

Purpose

The purpose of this literature review is to discover why multimedia appeals to educators, and what is happening to help teachers use this new technology.

Multimedia: Why it appeals to educators?

Computer vendors and magazine publishers have stimulated so much publicity and interest in the power of multimedia technology these days that it could, at times, overwhelm a newcomer. The educational arena is not exempt from this influx of multimedia information. Innovative teachers, aware of this new wave of technology, are excited about its vast possibilities.

In order to appreciate multimedia's appeal to educators, it is perhaps helpful to first understand some of the major instructional problems that teachers face, and then see the role that multimedia plays in meeting these instructional needs. Lewis (1985), in a study focusing on the role of information technologies in academic instruction, identified four major instructional problem areas that teachers encounter. These problem areas included the abstract/ concrete, motivation/active learning, individual learner differences, and generic skill development.

In the abstract/concrete area, the instructional tasks that ranked most troublesome were conveying the relationship between theory and practice as well as abstract concepts. In the category of motivation/ active learning, motivating students to learn in unstructured settings is most challenging. Teaching a class of students with a wide variety of learning abilities and learning styles is most trying in the area of individual learner differences. In the generic skill development area, encouraging students to develop abilities such as problem solving, analysis, writing, listening, visualization, and social interaction was most difficult. Incidentally, Wilson (1991) supported the need for interpretive skills such as problem solving, creative thinking, a sense of open inquiry, coping with multiple points of view, working with others and resolving conflicts as becoming more crucial than ever in order to succeed in our information age.

In light of these challenges in the teaching/learning process, it is easier to see why multimedia is so appealing. Multimedia allows the students to learn in a non-linear, non-sequential setting, and places information (words, still and moving images, sound) at their disposal to produce creative projects. Because multimedia is capable of providing this view of information that better reflects the interconnectedness of knowledge, the learning experience becomes interactive and enhanced (Campoy, 1992). This capability of

interconnecting knowledge can help the teacher bridge the chasm between theory and practice and clarify the abstract since it focuses "attention on the relationships between ideas" (Kearsley, 1988, p. 23).

In contrast to the traditional classroom where lectures and the chalkboard are used to stimulate students, multimedia allows a teacher or student to begin the activity by browsing through a variety of visual images, text, and audio sounds that may sparkle some ideas for a project. Multimedia hence acts as a great motivator for learning even in unstructured settings. Judy Gibbons of Apple UK added that "by integrating text, graphics, sound, animation and video, it [multimedia] addresses different learning styles, providing a truly interactive learning environment that students can explore, add to and compose in, enabling them to become actively engaged in the learning process" (Ambron, 1990, p. 21).

The claims to the potential of multimedia are continually made. Based on interviews with dozens of educators and industry people, Bruder (1991) gathered several reasons why multimedia makes a difference in the classroom. Five of the benefits cited were that multimedia: (a) reaches all the senses which enhances learning, and can be tailored to the learning styles of individuals, whether they are visual, verbal, auditory, or physical learners; (b) encourages and validates self-expression by allowing students to decide how they

want to create a project, whether through words, images, sound, etc.; (c) gives a sense of ownership to the user since students actually create what they learn, and there is often physical evidence, such as a portfolio of work, of that learning; (d) creates an active rather than passive atmosphere because it forces the student to participate and think about what they are learning; and (e) fosters communication in that its use starts conversations between the students and teachers and allows ideas to flow in ways that may not always be possible through words alone. No wonder educators were excited about multimedia. Although there is no conclusive research yet that multimedia improves instruction, its capabilities, nevertheless, could not be ignored.

Today, almost everyone involved or interested in education has heard the call to reform American schools. According to Campoy (1992), one major view of reform called for restructuring which implies a radical change in the schooling process, emphasizing personalized education, with student understanding given priority over content coverage. This view of school reform advocated, among other things, that teachers are coaches or facilitators rather than dispensers of knowledge, and that learning is gauged by performance in actual or real-life settings rather than the scores produced on standardized achievement tests. Bruder, Buchsbaum, and Hill (1992) stated that

the plain fact of the whole reform issue is that "we cannot talk about reforming American schools without talking about technology" (p. 22). In a position paper released last April, the Council of Chief State School Officers said that "if America is to achieve its education goals, technology must move front and center and get the kind of consideration textbooks have gotten in the past" (p. 24). Though the modern tools of technology are important, Bruder and et al (1992) cautioned that they "must be coupled with new visions about the work of teachers and students" (p. 22) in order to succeed in tackling the enormous tasks in education. Technology, if used in the above context, has much to offer the restructuring movement.

One application of technology suited to restructuring is multimedia. Whether it is meeting crucial instructional needs or reforming the educational structure, multimedia, as we have learned earlier, is a powerful tool. It would, as Ambron described it, "change the way we look at knowledge and give us a new vision of reality" (Barker & Tucker, 1990, p. 22). Today, more and more corporations and universities are embarking on multimedia development and research. As computer hardware technology improves, multimedia is destined to move to the forefront of technology and well into the twenty-first century.

The benefits of multimedia could be harnessed in a number of different ways. For example, it could be used to prepare an interactive product for one-to-one or one-to-few learning; a lecture (group learning) delivered live, with the teacher managing the interaction of media and technology; or a presentation for delivery in real time or as a published product on disc without the use of a computer (Barker & Tucker, 1990).

Multimedia: What is happening to help teachers use this new technology?

Schools could spend a lot of money on the latest computer equipment and the most powerful software, but the new technology is not going to make an impact unless an investment is made in training teachers - the most important resource. University faculty, particularly all those who provide preservice and inservice education must become familiar with multimedia equipment and capabilities, must learn how to use multimedia, and must be able to effectively integrate multimedia in their instruction. In other words, Falk and Carlson (1992) were right when they said that "we must train the trainers" (p. 100).

The need for teacher training in technology could not be overemphasized. Kinnaman (1990) pointed out that many teachers today have been teaching for more than 15 years. It was only during

the last ten years, however, that schools have invested heavily in microcomputers. These teachers, who have not been exposed to computers as part of their preservice education, are now faced with the challenge to integrate new computer technologies in their instruction.

Even for some of them who have tried computers, they have been overwhelmed by the accelerating pace of the computer revolution. For example, the original Macintosh computer was introduced in 1984. Since then, more powerful models have evolved such as the Quadras, and recently, the docking stations which were released at the end of 1992. With the advent of more powerful computers, more exciting software and improved peripherals are being developed to take advantage of the new technological capabilities. Teachers, therefore, often find themselves in a maze as they try to sort through or keep themselves abreast of the latest developments in the computer world.

Perhaps one of the preliminary steps to get teachers started on multimedia is to expose them to the necessary computer hardware and software programs. One school, the North Carolina School of Science and Mathematics in Durham, North Carolina launched a three-stage plan, reported Manuel and Norman (1992). First, a one-day technology fair was held where teachers were able to see demonstrations of all the new hardware and software that are available. The second phase took

the form of a Technology Day, designed to give teachers hands-on experience with the new technologies. The third event was a Technology Week, during which teachers attended classes in which they could learn how to integrate specific technologies into the courses they teach. Because of the technology push, the use of technology at the School has increased significantly, and its Technology Committee felt confident in recommending a similar strategy to other schools.

As professors with research interests in the effective incorporation of multimedia instruction into learning environments, Falk and Carlson (1992) suggested that to fill the need for initial training, colleagues or consultants who are relatively knowledgeable in multimedia could offer workshops to university faculty and administrators. These workshops should provide hands-on opportunites to explore multimedia hardware and its capabilities, and applications as well as instructional models for using multimedia in teaching and learning.

Falk and Carlson (1992) added that while multimedia makes a great deal of sense to educators, few have models of how to apply this tool effectively. They wrote that the College of Education and Human Service Professions at the University of Minnesota at Duluth has developed several instructional models for using multimedia over the past seven years. Having participated in the development of

such applications, they advocated that the multimedia training to be integrated into the ongoing instruction at colleges and universities should demonstrate, among other models of instruction, the use of simulated interaction, structured observation, didactic presentations, and exploration.

In simulated interaction, a situation is created in which the student participates in and influences the interaction. In structured observation, a student follows set guidelines in observing video segments or another aspect of an application. Didactic presentations are usually well-organized lectures/presentations that selectively use text, audio, graphics and video to present content in a straightforward manner. Exploration allows a student to move through a multimedia application by himself and to explore various data in the form of text, graphic, video and sound. Applications that patterned these models have been utilized in over 30 course offerings and have documented positive results such as increased skills in group observation, heightened understanding of human diversity, and greater satisfaction with the instruction.

Wilson (1991) supported the emphasis that Falk and Carlson have placed on technology integration. In her opinion, multimedia environments, no matter how exciting, could not replace good teachers. These environments should, instead, be integrated into the learning process as one more resource for teachers and students

to draw on.

A research scientist and media designer, Brunner (1990) formulated several ideas as to what it takes to integrate technology into the curriculum. She advocated that teachers need to be "technology-literate" (p. 12). This means that they know, among other things, how to use a word processor, a graphics program, a database, a spreadsheet, a hypertext program, a scanner, a printer, a modem, a camcorder, a tape recorder, and a laserdisc player. To use these well, teachers need to develop a broader set of literacy skills which include familiarity with hardware and software options, visual literacy, and non-linear thinking. These skills become increasingly critical when it comes to multimedia production.

This does imply training for teachers, and Raj Chopra, who is currently a school superintendent, said it aptly, "that for any project to succeed three things must happen--training, training, and more training" (Bailey & Lumley, 1991, p. 12). That definitely calls for additional funding which must be worked into the overall budget. Washington D.C. has placed priority on teacher training by spending $1.6 million in 1983 solely on technology staff development (Buchsbaum, 1992). Besides teacher training, Washington D.C. considered adminstrative commitment as key to the technology program's success.

This leads us to the other equally important resource, the administrators. In fact, Brunner (1990) added that along with technological literacy, a support system is necessary to make integration work, one that comes primarily from the administrators. Bailey and Lumley (1991) noted with a sense of humor that many of the staff development programs designed to integrate technology into the curriculum have been "tornados" because teachers were thrusted into crash courses, and then tossed back into their classrooms, supposedly ready to use the technology (p. 12). The writers believed that administrators, while holding important responsibilities pertaining to hardware and software investment, also have a crucial role in staff development programs.

In terms of leadership, staff training should emerge from the central office, and the focus of this leadership should be to support and guide teachers in technology training and use. Pearlman (1991) cited the state of Michigan's Classroom of Tomorrow program which requested teachers, needing computers for their own use in the classroom, to submit their proposals. Of the state's 72,000 teachers, 20,000 submited proposals, and 10,000 of them were awarded the hardware. Another example is modeled at the Cuyahoga Valley Regional Vocational Technical School outside Cleveland, Ohio, where teachers completed 100 hours of inservice computer training

in the first year of the program in exchange for computers and printers for their personal use at home. They then researched the types of technology used in their areas of expertise and chose the kind of software and auxiliary equipment to purchase for use with their students during the second year of the program.

As far as planning for staff development is concerned, Bailey and Lumley (1991) suggested that it is best done by selecting a group of teachers and administrators and involving representatives from all groups--teachers, principals, media specialists, etc. to develop a written action plan for technology integration. The actual training activities are critical as they must focus on actual classroom or administrative uses of technology, sensitive to staff members' personal needs and motivation, supported with tangible incentives for teachers, and offered as an ongoing process.

Eiser (1990) compiled an interesting needs list of what teachers expected from their administrators. Among them were time (to play with equipment, search for new ideas, development, etc.), freedom to make software choices, and inspiration (faculty meetings that focused on future planning, and administrators serving as role models in the use of technology). Buchsbaum (1992) suggested that some incentives to teachers might include free course enrolment, inservice recertification every five years, a consortium of area colleges and

universities that will award graduate credit for certain courses at discounted tuition fees, and salary credit points for training sessions.

Bailey and Lumley (1991) added that an important step to implementing the actual integration of technology is help from colleagues who are well-versed in technology to model its use in classes, intensive peer observation, and follow-up coaching. Opportunities to visit other schools or businesses that use the technology should be encouraged. Finally, for emerging technologies to become a permanent part of the school, steps must be taken to institutionalize research about technology and its impact on student achievement and attitudes, teacher performance, long-term student performance, and parents. Such information should made public to the board of education and parents.

Conclusion

The purpose of this review was to discover why multimedia appeals to educators, and what is happening to help teachers use this new technology. Many universities throughout the nation are adopting new technology tools that improve the teaching/learning process. The technology emphasis today focuses on multimedia as a powerful tool that would help teachers overcome the major instructional problems they face as well as an aid to reforming American schools. This implies that teachers must be given

opportunities to learn about this new technology so that they, in turn, can integrate it into their respective curriculum.

SECTION 4

IMPLEMENTATION PLAN

The University of Northern Iowa's implementation plan for multimedia within its various Colleges is still at its infancy at this time. Two multimedia platforms have been purchased, for example, by the College of Education as an initial effort to introduce multimedia to its faculty. In cooperation with the various Colleges, the Educational Media Center is in the process of implementing a plan that will, among other objectives, provide leadership in terms of training, equipment, and facilities to support faculty development in the use of multimedia. The University's overall purpose is to assure that multimedia technology is acquired, developed, and integrated within its curriculum throughout the campus.

Multimedia Vision

The implementation of multimedia technology calls for a radical change for most educational institutions throughout the nation as they move from a teacher-centered philosophy of teaching to one that is learner-centered. Envisioning that change to be gradually affecting its various Colleges in the near future, the University of Northern Iowa (UNI) seeks to provide opportunities for its faculty to become conversant with this new tool of technology. Furthermore, in light of the rapid growth in the use of multimedia in business and industry today, UNI also seeks to be able to train its students in this area so that

they will be more marketable when they graduate. Hence, UNI is committed to the development, training, and integration of multimedia technology within its various Colleges.

Multimedia Definition

The next logical step the University must do is to define what multimedia is and who its users are. In general terms, multimedia systems retrieve voice, video, and still images from a variety of different sources such as videotape, compact discs, photographic images, computational models, etc., and integrate them into a cohesive presentation. Multimedia per se is not a new concept. What is new is that computer technology has evolved to the point where compact, but powerful computers can store, retrieve, synthesize, and control material from a wide variety of sources.

Presently, there are two major types of computer systems used for multimedia: Apple Macintosh and IBM. Since these two systems are not interchangeable, and the majority of users are divided between both systems, the University believes that a responsible approach to multimedia would need to include both types of systems. For this multimedia workshop in this project, the Macintosh platform was used.

The main users of these multimedia systems are the University's faculty members, administrators, support staff, and students at both undergraduate and graduate levels.

Multimedia Goals

The next step is to establish what goals the University would need to ensure that multimedia is successfully implemented in its various Colleges. Each of the University's five Colleges has set its own unit goals and objectives for multimedia. Some of these goals overlap or are expanded according to each College's current technology situation. The following multimedia technology goals, set by the College of Education, are the premise for this project:

1. Integrate multimedia usage and development into courses and support services offered by the College.

2. Provide access to multimedia hardware and software to the College's students and faculty in the IRTS student microcomputer laboratories and the Faculty Development Center.

3. Train faculty and students on appropriate utilization of multimedia in classroom settings.

4. Utilize multimedia within the College's support services, specifically Instructional Resources and Technology Services and Advising.

5. Conduct research on the impact of multimedia utilization on the educational process.

The multimedia workshop that this paper describes in the following section was developed as a effort to assist the College in meeting the goal that pertains to training faculty.

The Project: "How to Make Movies with Your Mac" Multimedia Workshop

As stated in the preceding section, one of the College's goals is to train its faculty on the use of multimedia technology. The multimedia workshop being offered was designed to introduce to faculty members who are new to multimedia its basic concepts, and to show how the QuickTime and Adobe Premiere programs work. This half-day workshop was held this spring semester (additional related workshops may be planned later by the IRTS) and was open to a select group of faculty members in the College of Education. An invitation letter together with a workshop schedule and a promotional poster (see Appendix B) were sent to the potential participants. A floor plan of the room set-up for the workshop is found in Appendix C.

After completing the workshop, participants should be able to attain the following five objectives:

1. Know what the term "multimedia" means and the primary types of data it works with.

2. Recognize the different types of computer hardware and software that are necessary to produce QuickTime movies.

3. Understand what a QuickTime movie is.

4. Understand how video and sound are put into the computer.

5. Demonstrate how the QuickTime and Adobe Premiere programs work together to produce a QuickTime movie.

To attain the above objectives, several types of instruction and media were used. The types of instruction included a short lecture, demonstrations, facilitation of hands-on activities, as well as question and answer. The types of media used were computer-generated slides, handout, activity sheet, poster, Macintosh computers, QuickTime, Adobe Premiere, and Aldus Persuasion software programs, large TV monitor, camcorder, laserdisc player, Canon still camera, cassette player, video clips, still image clips, animation clips and sound clips.

Computer-generated slides, produced with the Aldus Persuasion program, were used during the first part of the workshop in conjunction with the introductory short lecture. A large TV monitor also was be used to project the contents of the computer screen. These slides provide a visual hook to the learning process as new concepts were being introduced. (Printed samples are in Appendix D. Since they do not look quite the same as on the computer screen in terms of their overall effects, a 3.5" disk containing the slides is also enclosed.)

Questions and answers were encouraged throughout the session to help clarify any terms or concepts that might arise. Posters were used to promote the workshop. They were sent out to potential participants together with the letter of invitation to attend the workshop. These posters were also put up on walls of the room where the workshop would be conducted. The handout (see Appendix E) consisted of a glossary of terms commonly raised in multimedia and

it served as reference for participants during and after the workshop. The activity sheet (see Appendix F) acted as a hands-on guide to participants as they made a movie using the Adobe Premiere program.

The primary focus of the workshop was on demonstrating the QuickTime and Adobe Premiere programs. Three computer stations were set up, one using a Quadra 950, and the other two, Quadra 700 models. In addition, a set of clips containing video, sound, still image, and animation, which were preloaded on each of the computers, were also be used during the demonstration. These clips were retrieved within each of the Macintosh computers, and then put together to produce a QuickTime movie.

The media materials necessary for the workshop were designed and produced by this writer who also conducted the workshop. An outline of the content taught is attached in Appendix G.

SECTION 5

EVALUATION PLAN and SUMMARY

Evaluation Plan

There were two types of evaluation done for the workshop: formative and summative. Before the workshop was conducted, the curriculum materials that were developed were shown to a few potential participants and other interested parties. After the workshop, participants were asked to fill out an evaluation form (see Appendix H) to critique the session. Evaluation was also done by the trainer herself.

Summary

The formative evaluation was helpful in gauging how the materials and instructional plan would be received by the participants. The computer-generated slides and handouts were felt to be appropriate and appealing by those who were asked to preview them. They also felt that the computer-generated slide presentation was especially effective in getting learners' attention and in demonstrating to teachers its potential use in their respective classrooms. Although the quality of the two QuickTime movies on Dr. William Callahan, Associate Dean of the College of Education, and Dr. Sharon Smaldino, Associate Professor in the Department of Curriculum and Instruction, could be better, the limited hardware and software available at this time made quality a secondary issue. From comments received from those who previewed these two movies, it would still be alright to

show them since this would afford the opportunity to highlight the technicalities involved and the importance of getting the right equipment for a quality production. In addition, those who were shown the movie put together with Adobe Premiere liked it and felt it would be an appropriate activity for participants to try on. The overall content and organization of the workshop were also found to be acceptable by those who were asked to preview them.

The summative evaluation revealed that the workshop held on April 23, 1993 went well. Nine people attended the workshop, and they felt that the workshop's content was relevant and helpful to them in their professional development. They said that they have been looking for ways to excite their students in learning as well as to improve their own teaching strategies, and found that the workshop has helped answered many of their questions concerning QuickTime and Adobe Premiere as instructional tools in the classroom. The participants liked the computer slides very much, helping them to understand the material as well as giving the presentation a professional look. They especially liked the transitions between slides, the slide builds within each slide, and the graphics incorporated in some of them. They were very interested in the use of the Persuasion program, and favored a quick demonstration which they found to be enlightening and helpful.

The participants also liked the demonstrations and hands-on opportunities which they found to be helpful. One of the participants

commented that he would appreciate having a greater diversity of video, sound, still image and animation clips for the hands-on experience. The limited hardware and software available at this time made building a library of such resources a secondary issue. Four of the participants who tried the hands-on expressed interest and excitement about the video capture using a camcorder, and editing with Adobe Premiere. Two of the participants used the camcorder to capture each other's image onto the computer screen, and were excited to see themselves on the screen. They then imported those images to the Adobe Premiere, tried the special effects, and made a movie out of it. They exhibited much excitement about their final product. Another two participants explored putting a movie together with the Adobe Premiere, using the set of clips which were preloaded on each of the computers. They experimented with the program's various special effects, filters, split features, and were fascinated by its ease of use, and thought it to be an exciting tool for their students to create stories with. The handout of glossary terms was also useful to them with one participant suggesting more handouts.

Participants felt that the overall conduct of the workshop was well paced, the content well organized, the stated objectives met, and that the trainer presented and explained the material well. Most of the participants felt that the length of the workshop was appropriate, and

that their questions were answered. They also felt that the workshop was useful and would recommend it to their colleagues.

Having conducted this workshop, the following recommendations could be made.

1. Instead of planning a coffee break at the third hour of the workshop, it should be scheduled during the second hour which ended the session on video capture. The coffee break would be followed by some hands-on for capturing video with a camcorder before proceeding to the Adobe Premiere.

2. Shorten the length of the entire workshop to four hours maximum.

3. It is always helpful to have a technical resource person on site who will be responsible for the technical aspects of handling the hardware so that the trainer can concentrate on the workshop presentation.

Personally, this author felt that the workshop has been a very beneficial experience, especially in providing insight into how adults learn. It is hoped that this workshop has helped stimulate further interest and discussion among faculty members concerning QuickTime potential in the classroom.

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APPENDIX A

The following three pages contain a summary of the technology literacy survey which was conducted among faculty members at the College of Education, University of Northern Iowa.

SUMMARY OF COLLEGE OF EDUCATION FACULTY TECHNOLOGY LITERACY

In December 1991, College of Education faculty were asked to complete a Technology Needs Assessment. Of 240 faculty members, 70 (29%) completed and returned the extensive form. In the first section of the survey, faculty were asked to indicate their degree of familiarity with various technologies. The scale for this section was as follows:

1 = Never heard of this technology

2 = Heard of this technology, but have not used it

3 = Use this technology, but not comfortable with it

4 = Use this technology, and comfortable with it

5 = Capable of helping others with this technology

Respondents generally were most familiar with traditional technologies. For example, overhead projectors received a cumulative 4.49 and slide projectors 4.35. Faculty also evidenced more expertise with microcomputers than with mainframe computers. In word processing, for instance, microcomputers received a 4.12 and mainframes a 2.73. Within the area of microcomputers, respondents showed most familiarity with word processing (4.12), spreadsheets (3.25), computer-assisted instruction (3.22), and databases (3.18). The

areas of least familiarity were artificial intelligence (1.36) and interactive video (2.26).

Faculty also were asked whether or not they used traditional and/or emerging technologies in several situations. Eighty-three percent said they used these when preparing to teach; 80% said for personal uses; 77% said for teaching; 76% said for other professional projects; and 3% said not at all.

Respondents indicated a split in the type of computers that they use at their homes, offices, etc. Sixty-six persons stated that they used IBM; 65 stated Macintosh; 46 stated Apple II; 23 stated the mainframe; 15 stated other MS DOS; and 2 stated "other."

Faculty responses indicate that microcomputer word processing has joined more traditional technologies as being part of course requirements. For example, 49% of the faculty said they require students to make overhead transparencies; 44% require students to use word processing; and 40% require students to view videotapes.

Although faculty showed a comfort level of only 2.26 with interactive video and 2.10 with multimedia, they expressed an interest in professional development in these areas. When asked what new technology besides microcomputers they need, more said videodisk players and software than anything else. Twelve gave this answer; only 5 said the next highest item --VCRs.

Lastly, respondents evidenced strong interest in learning more about this technology. Fifty-nine of 70 faculty (80%) willingly listed times that they would be available for faculty development workshops in various technological areas. Thirty-two faculty (46%) said they are capable of helping others learn about one or more of the new and emerging technologies.

APPENDIX B

The following pages contain the invitation letter which was sent out to potential participants of the workshop, a workshop schedule, and a promotional poster to inform potential participants of the topic, date, time, venue, and name of person who conducted the workshop.

The University of Northern Iowa

Interdepartmental Communication

March 23, 1993

Dear

Invitation to attend a QuickTime and Adobe Premiere Workshop (April 23, 12-5 pm)

You have been identified as a potential candidate to participate in a workshop on QuickTime and Adobe Premiere. Marcia Ng, a graduate student, majoring in Communication and Training Technology, developed this workshop as her research project. It is sponsored by the Faculty Development Center within the College of Education, and is offered to a select group of faculty members/administrators who have expressed interest in multimedia.

A copy of the promotional pamphlet as well as the workshop schedule are enclosed for your reference. Since computer workstations are at a premium, the number of participants is limited to twelve. We would appreciate if you could indicate your decision by returning the Response Form by April 7, 1993. Thank you!

Yours sincerely,

.....
Marcia Ng, Graduate Student

.....
Dr. Sharon Smaldino, Associate Professor
Curriculum and Instruction

.....
Julie Wilkinson, Director
Instructional Resources and Technology Services

"How to Make Movies with Your Mac"

Friday, April 23, 1993 at SEC 540

12:00 - 12:10 p.m.	Welcome and Introduction
12:10 - 12:45 p.m.	Basic Multimedia Concepts
12:45 - 1:45 p.m	Demonstration of Video and Sound capture with QuickTime
1:45 - 3:00 p.m	Demonstration of Video editing with Adobe Premiere
3:00 - 3:15 p.m	Coffee break
3:15 - 5:00 p.m	Hands-on opportunities on QuickTime and Adobe Premiere

(Please bring your own brown bag. Snack and beverage will be provided)

.....(Detach here).....

RESPONSE FORM

"How to Make Movies with Your Mac"

(Please reply by April 7)

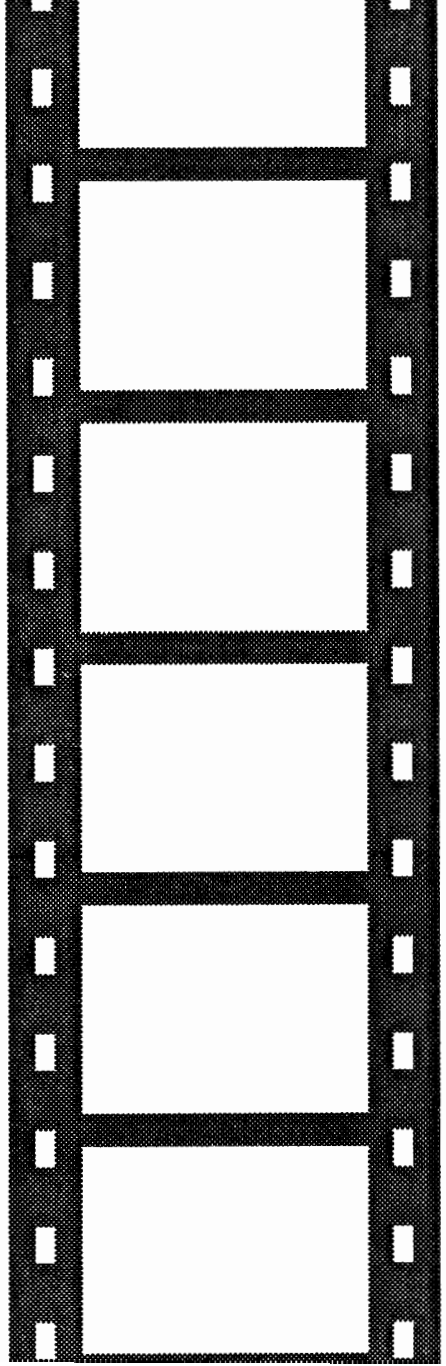
[ ] Yes! I want to participate in the above workshop. Please register my name.

[ ] Sorry, I cannot attend this time.

Name: _____ Telephone #: _____

Department: _____

Mail to: Julie Wilkinson, IRTS, SEC 222. Campus zip code: 0609.



"How to Make Movies with your Mac"

Friday, April 23
12 - 5 p.m.
SEC 540

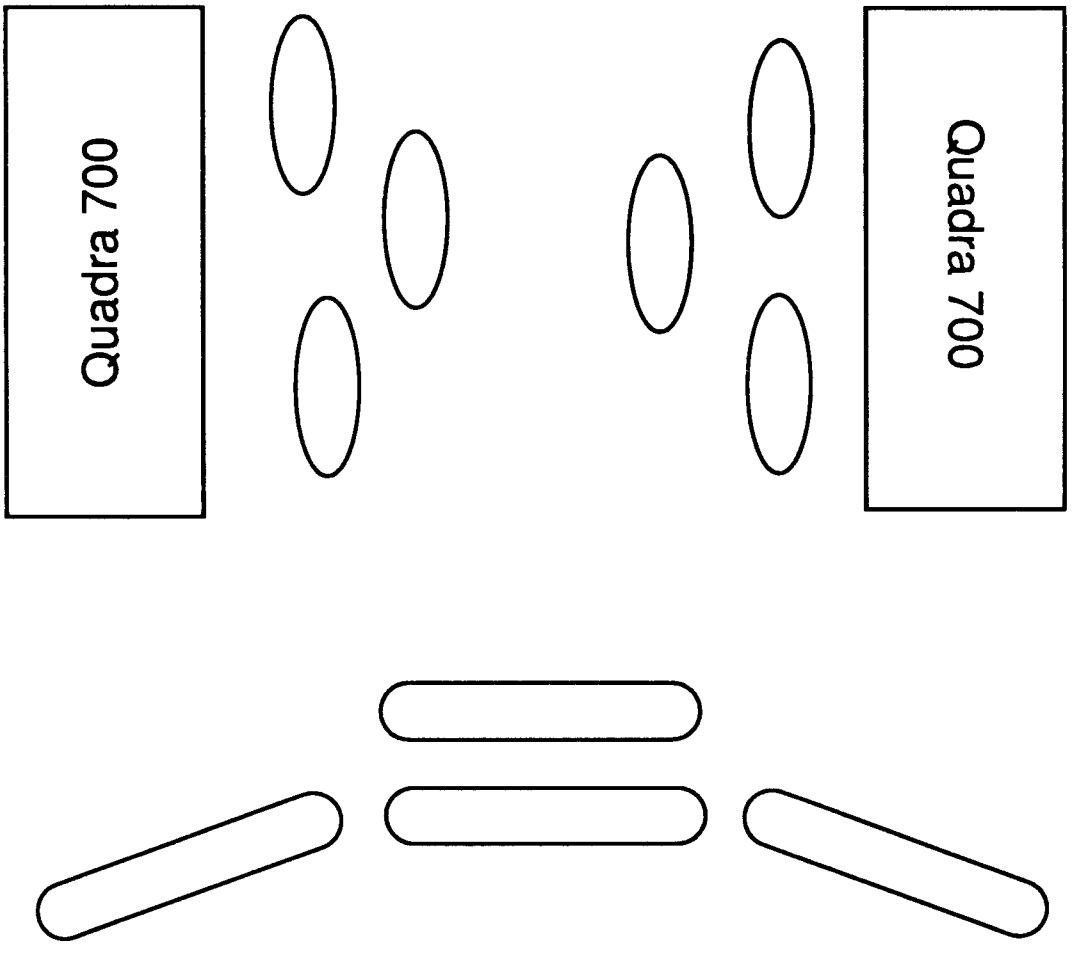
A Workshop on QuickTime and Adobe Premiere developed by Marcia Ng

Graduate Student
Majoring in Communication & Training Technology

APPENDIX C

The following page shows the floorplan of the classroom used for the session.

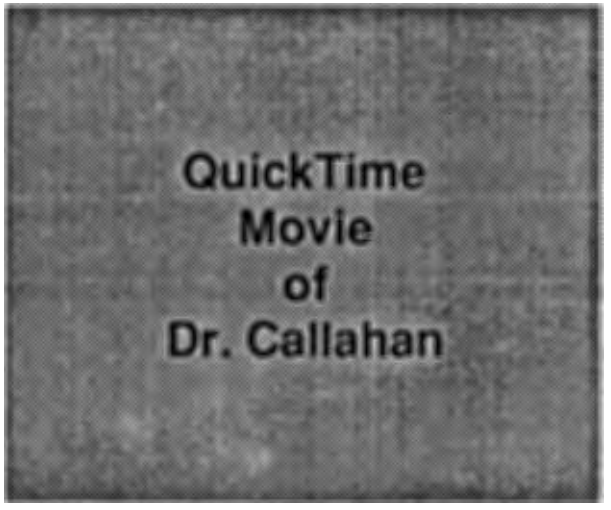
Floorplan



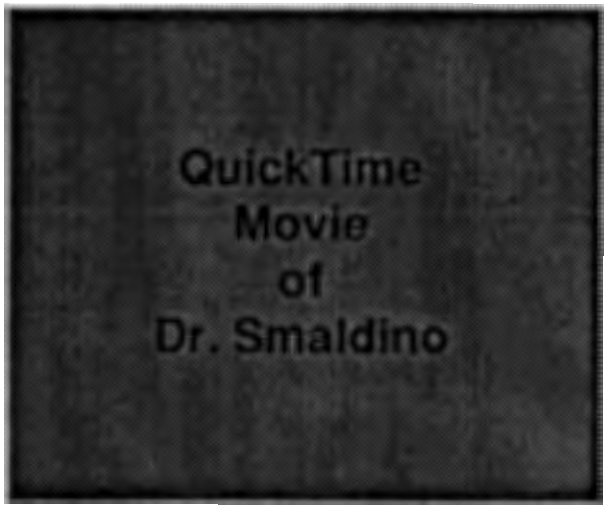
APPENDIX D

The printed samples of slides appear on the pages 47 to 61. They have been produced with the Aldus Persuasion software program. The printed samples do not reflect the overall effect of the slides because the original slides have color, background, graphics, shadow, and transitions, all of which could not be captured on the printed copies. Hence, a 3.5" disk containing the original visuals is also attached. The disk does not contain the two QuickTime movies on Dr. Bill Callahan and Dr. Sharon Smaldino due to disk storage limitation. Each of these movies took approximately 28-30 MB in their uncompressed form, and about 6-8 MB compressed. They could, however, be retrieved for viewing from the Quadra 950 which is located in SEC 137.

Our Educators Speak Out



Our Educators Speak Out



System Hardware and Software Requirements

- Must have a 68020, 68030, or 68040 processor
- Must be able to display color
- Must run System 6.0.7 or 7.0.x.
- QuickTime requires approx. 450K of hard disk space, and 4M RAM is best for viewing movies. To edit movies, plan no less than 8M of RAM.

TYPES OF DATA

- Still images
- Motion video
- Sound
- Animation
- Text

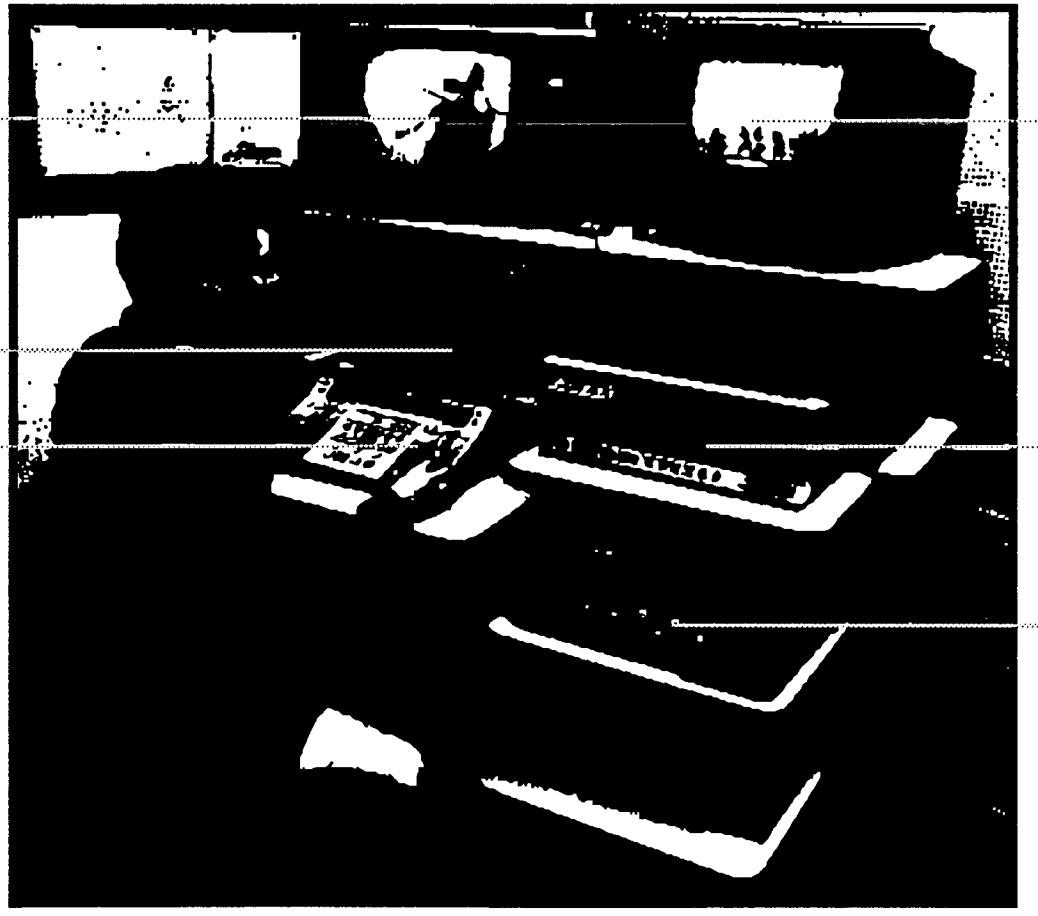
Hardware and Software

- Still image sources
- Video and audio sources
- Digitizing hardware
- Digitizing software
- Editing software

Still Images Sources

- Still video camera
- Flatbed scanner
- Slide scanner
- Kodak's PhotoCD

Editing Control Unit



Video and Audio Sources

- Camcorder
- Videocassette recorder
- Laserdisc player
- CD-ROM player
- CD player

Digitizing Hardware

- RasterOps MediaTime
- Radius VideoVision
- WT's MoonRaker
- SuperMac's VideoSpigot
- Macromedia MacRecorder
- AudioMedia

Digitizing Software

- VideoSpigot's Screenplay
- Apple's Movie Recorder
- RasterOps MediaGrabber

Editing Software

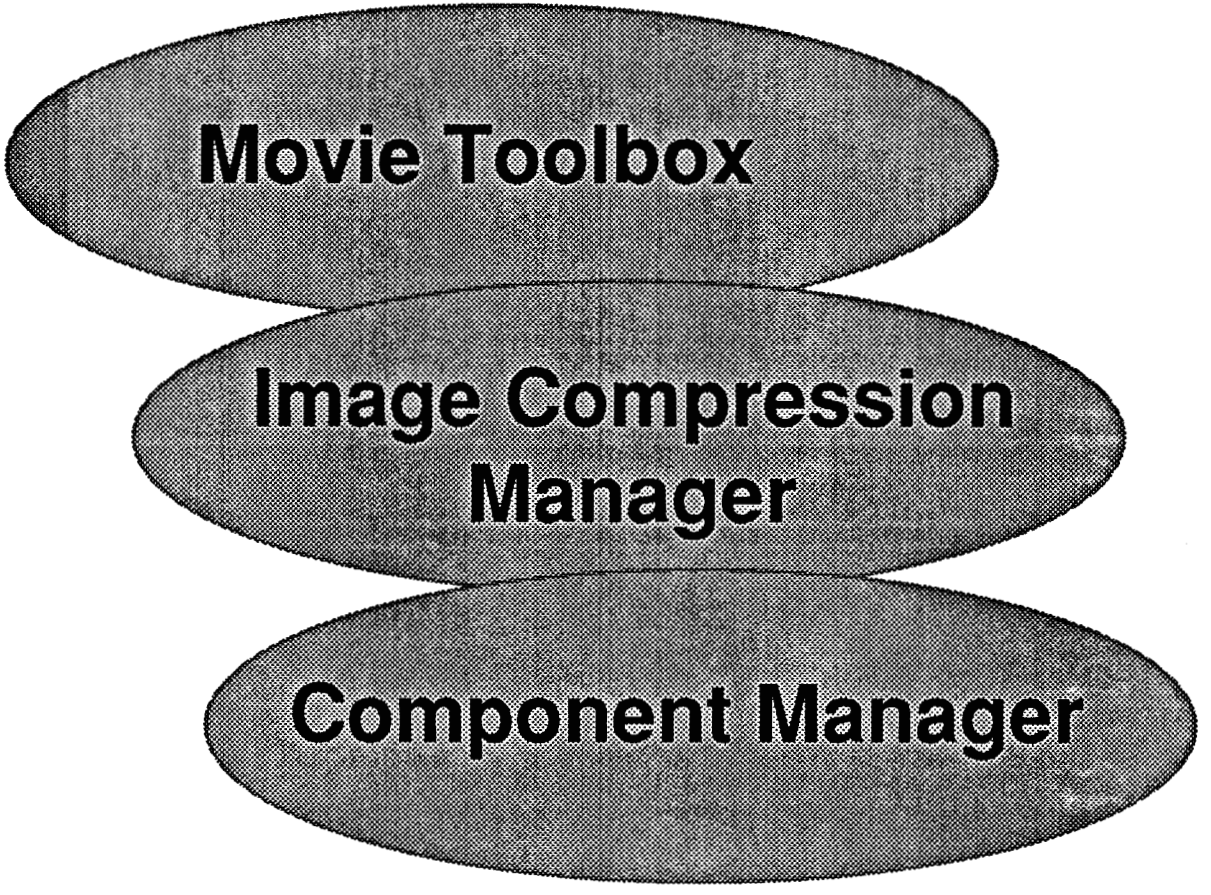
- Adobe Premiere
- Macromind MediaMaker
- Macromind Director
- DiVA VideoShop
- SoundEdit Pro

What are movies?

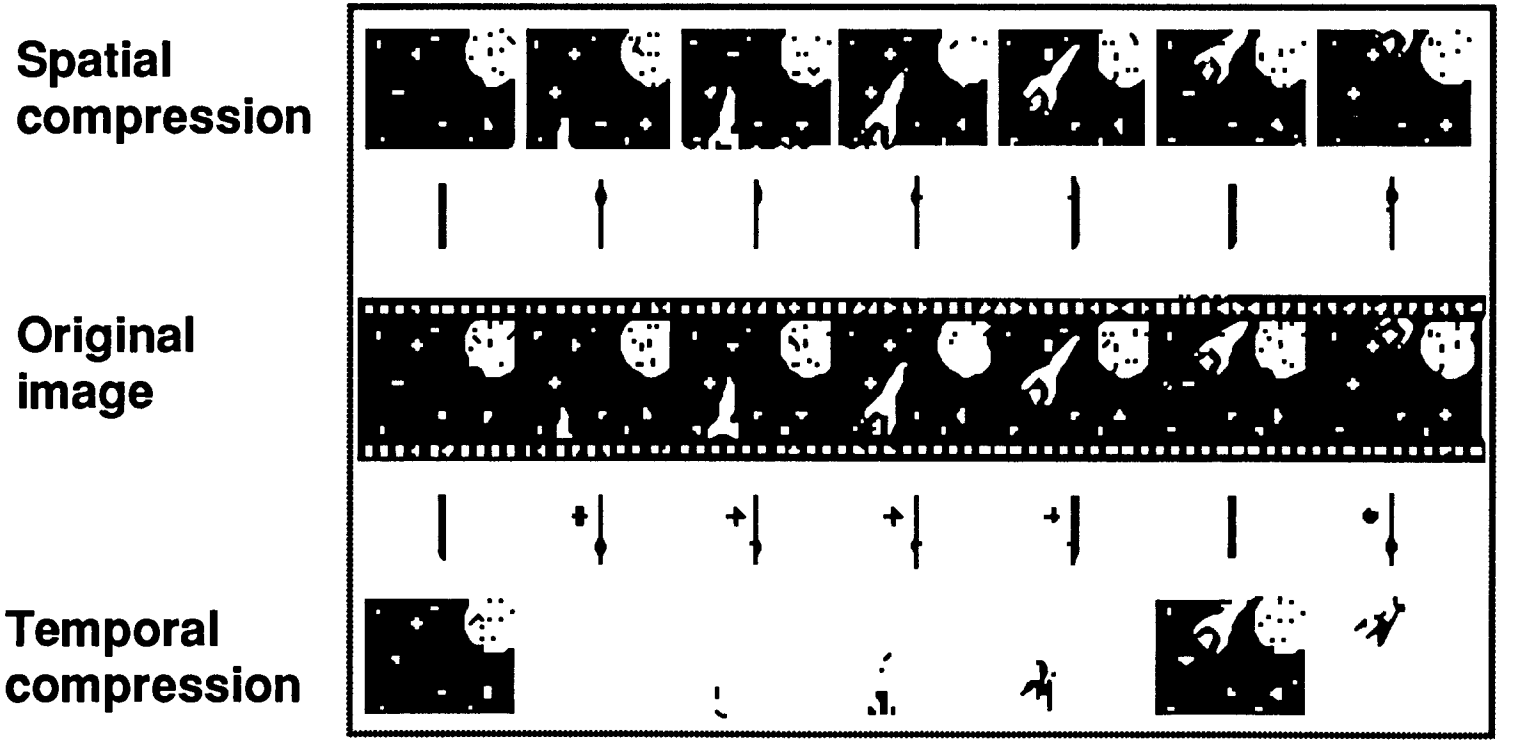
- Movies have frames
- Movies have multiple tracks
- Movies have standard controls
- Movies are documents

Type of Clip	File Formats
Still Image	PICT Adobe Photoshop
Audio	AIFF snd SoundEdit
Animation	PICS
Movie	QuickTime

What is QuickTime?



Temporal and Spatial Compression



APPENDIX E

The glossary that appears on the following four pages consisted of terms that one usually encounters in multimedia technology. It was intended to serve as a reference guide for participants during and after the workshop session.

Adobe Premiere

is a QuickTime editing program that allows you to combine video footage, sound, animation, graphics, and still images in your QuickTime movies. With it, all you have to do is gather the various clips and information you want to use, and arrange them in the order you want them to play. You can add visual transitions, such as dissolves, page turns, and spins, and you can superimpose images on different clips.

Analog recording

is the method of recording that uses continuously varying voltages to direct the magnetization patterns of standard audio tape, or the pattern of grooves in a phonograph disc.

The AppleCD 150/300

A CD-ROM drive for Macintosh computers that works with CD-ROM discs as well as standard audio compact discs. One disc can hold over 650 megabytes of information - equivalent of 270,000 pages of text, one to eight hours of speech or music (depending on the sound quality), hundreds of high-resolution color images, or a combination of text, sound, and graphics. Your Macintosh system software must be version 6.0.5 or later.

Bandwidth

is a measurement of the amount of data transferred in a period of time, and is measured in kilobytes per second.

Bit depth

is the number of bits used to describe the color of each pixel on the computer display. This is directly related to the number of colors that the computer can display at the same time. A bit depth of 2 means that the monitor can display only black or white pixels; a bit of 4 means that the monitor displays 16 different colors; a bit of 8 allows 256 different colors; a bit depth of 16 allows 65,536 different colors, and a bit depth of 24 allows 16,777,216 different colors.

Capture bit depth

is the bit depth at which the board can digitize the video source. While 24-bit color produces the best image, 16-bit color produces very similar quality, and Apple's Video Compressor saves only 16 bits anyway.

Compression

is an entire field of mathematics that has recently come into its own in the areas of telecommunications, computers, television, and audio. Its goal is to find ways to make the same information fit into smaller containers. In lossless compression, no information is lost in the translation. The decompressed file is exactly the same as the original file. Lossy compression sacrifices some less important information when compressing files, but it saves a great deal of space.

Computer Eyes

is a powerful SCSI frame grabber that instantly captures high-quality, full-screen images for professional imaging applications. It captures 640 x 480 pixel, 24-bit color images in 1/30 second and includes QuickTime support for building movies. Images are saved as PICT, TIFF, MacPaint, or QuickTime movie formats.

Desktop video production

is in many ways similar to multimedia presentation, except that the end result is seen on film or video tape, rather than displayed interactively on a computer screen.

Digital Image Compression

has emerged as a viable solution for significantly and effectively reducing the file size of large still images. The most widely accepted one is developed by he JPEG. To see the advantage of image compression, a compression ratio of 20:1, for instance, reduces the size of an average video frame from 1 MB to a mere 50 KB. The same compression ratio reduces a second of full frame, 640 x480, U.S. television from 30 MB to 1.5 MB, a full minute of U.S. television from 1.7 GB to 90 MB.

Digital recording

is recording made by translating analog information into numbers and recording the numbers. It is the predominant method of creating professional transcriptions of sound. It gives increased fidelity, and allows enormous manipulation power of the sound information once it is in the digital domain.

Dithering

is the technique of making adjacent pixels different colors to give the illusion of a third color. Dithering can produce the effect of shades of gray on a black-and-white display, or more colors on an 8-bit color display.

Dynamic Data

is time-based information that must be experienced by the viewer or audience over a predetermined amount of time.

JPEG

stands for the Joint Photographic Experts Group, an international committee of engineers, scientists, and mathematicians. It determines the worldwide standard for compressing still images so that publishers, artists, multimedia authors, and users could depend on an approved technology for compressing still images on computers.

Key frame

is a frame in a temporally compressed movie that has been spatially compressed. QuickTime does not have to read any other frames to decompress the key frame. Key frames give QuickTime a chance to recover if it has to skip some of the temporally compressed frames. A good rule of thumb is have a key frame for every frame per second.

Kodak's PhotoCD

digitizes regular slides or negatives and places them on a special format CD. Kodak has released an application that enables you to access the images on a PhotoCD using a CD-ROM drive attached to your Mac. You will be able to view thumbnails of the images, open and view the images, and save a copy of the image to a hard disk.

Laserdisc players

make excellent video source for digitizing because of the high resolution image: over 400 lines - much higher than a standard VHS recorder (about 250 lines). Most players have a clean pause that makes digitizing single frames much easier. Many are frame-accurate, making the use of non-real time frame grabbing applications possible.

MacroMind Director

is the multimedia presentation and animation tool for the Macintosh. With it, you can easily create combine animations, graphics and text, and then synchronize these with sound and video to produce effectve multimedia communications: from animated "slide" shows and productions to interactive presentation, information kiosks, technical visualizations-and more. It includes a programming language—called Lingo—that offers functionality similar to HyperTalk, the programming language used in HyperCard.

MediaMaker

is a multimedia production tool that allows you to select, media elements, and assemble them into synchronized sequences of images and sounds. MediaMaker has two main parts: Collections and Sequences. In the Collections section, you assemble a database of elements, such as segments from videotapes, videodiscs, compact discs, and Mac graphics, animation, and sound files. In the Sequences section, you synchronize a complete, self-running audio-visual production which you can show live or print to videotape.

Movies

are documents that hold the dynamic data that QuickTime manages. Although the term "movie" suggests that QuickTime is used only to display film or video images, QuickTime movies can consist solely of sound or an animation,or a screen recording.

Multimedia Presentation

is a term that describes the usage of a personal computer to produce high quality animated color graphics with sound tracks for presenttions, sales reports, and proposals, as well as interactive kiosks, point of purchase displays, or museum exhibits. They can be seen on a Macintosh monitor, a large display screen, or video projector.

Non-real time recording

either records a frame at a time, pausing as long as it takes to grab and store the frame, or uses multiple passes to grab all the frames. Once the movie is recorded to QuickTime, it is played back at the original rate.

QuickTime

is a software extension to the Macintosh system that gives your Mac the capability to capture, store, manage, synchronize, and display dynamic data—data that changes over time, like video, animation, or audio. It requires system software version 6.0.7 or later and a 68020 or better processor.

SMPTE time code

SMPTE stands for Society of Motion Picture and Television Engineers and is a popular time code format in film and television. It shows time in HH:MM:SS:FF, where HH=hours, MM=minutes, SS=seconds, and FF=frames. Each frame in NTSC (30 frames per second) has a unique code stored with it.

Sampling rate

is the rate at which incoming data is converted into digital snapshots. While 22kHz is the highest sampling rate and best quality sound that you can get from a Mac today, 11kHz is preferable due to the smaller file size. Recording at 22kHz and then down sampling to 11kHz can produce a better quality sound than just recording at 11 kHz.

Scanning frequency

for the video camera captures at 60 Hz (two fields per frame, 30 frames per second) while a Mac monitor scans around 72 Hz.

Sound

is a change in pressure that occurs in the air around you when an object vibrates and produces sound waves. These changes in pressure spread out in a wavelike pattern, and these patterns in the air are called sound waves, and a graphical representation of a sound is called a waveform.

Synchronization

is the task of keeping the audio and video together—making sure that the sound happens at the same time as the action that created the sound.

Temporal compression

works on the theory that a sequence of images is related in some way--that the next frame is similar to the current frame. Rather than compressing the next frame, a temporal compressor works out the differences between the current frame and the next frame, and removes redundant information. In a temporally compressed movie, only the changes between frames (except at key frames) are recorded. Spatial compression, in contrast, refers to the compression techniques used to squeeze each original image or frame to a smaller size.

Transcoding

is the process of recompressing a movie using different compression options. For example, you can adjust the compression levels, key frame rate, or bit depth of a movie, or recompress a movie with another compressor for distribution purposes. The utility Movie Converter is a transcoding tool on Apple's QuickTime Starter Kit.

Transition

is a post process (any step in movie production performed after the principal photography is completed) applied when cutting between two shots.

Visualization

is a term used to refer to simulations, prototypes, conceptual diagrams, and other animated phenomena that are created with computers for research, design, or education.

Video Digitizer

captures the video signal and sends it in a digital format to the Macintosh. Sometimes, also known as a frame grabber. A VDig is a system extension that lets QuickTime-compatible software communicate with different hardware.

Video storage in hard disk

A single full-frame (640 x 480 pixels), 24-bit of video converts to about 1 MB of digital data. The conversion problem is complicated by the fact that 25 to 30 such frames go by every second, so that a second of video requires your computer to transfer approx. 30 MB of information each second to the hard disk drive and other components! This is much faster than data can currently be transferred on any desktop computer. The Mac NuBus can transfer 10 MB/sec. Transfer rates of today's drives vary from 150 K/second for CD-ROM drives to 1.1 MB/sec for the fastest hard drives, and the fastest local-area networks transfer at speeds of only 2 MB/sec. Storing the data can be a big problem. At 30 MB/sec, a mere 20 seconds of full-frame, full-motion, video on a personal computer would quickly fill an entire 650 MB hard drive, and a single minute would fill 1.7 GB! Digital audio takes about 1.3 MB per minute of medium-quality monophonic recording.

APPENDIX F

The following pages show the activity sheet which was used to provide participants with a guide to do some hands-on video editing with the Adobe Premiere.

Adobe Premiere - Activity Sheet

1. Create a Black matte (in Video Track A) to play for three seconds.

2. Use Cross Dissolve special effect (in FX track) to fade the white still image (in Video Track A) into the Title clip in Video Track B for two seconds.

3. Play the title, "Emboda Presents" (in Video Track B) over a five-second duration.

4. Place the Push special effect in the FX Track for one second before the title disappears to play the Jump Dancer clip (in Video Track A).

5. Place the Radial Wipe special effect in the FX Track for one second to fade the Glider clip (in Video Track B) into the Jump Dancer clip.

6. When the Glider clip stops playing, the Juggler clip (in Video Track A) starts playing.

7. As the Juggler clip plays, the Live still image clip (in the Super Track) fades in as a superimposed clip over the Juggler clip and the first half of the Rowing Crew clip (in Video Track A). The Live still image clip appears four times.

8. About half-way into the fifth second of the Rowing Crew clip, the Live still image clip fades in again as a superimposed clip over the Rowing Crew clip (in Video Track A).

9. The Finale clip (in the Super Track) appears as a superimposed clip over the Rowing crew clip.

10. Place Classical audio clip (in Audio Track A) to begin at the first second of the timeline, and ends at the 9th second.

11. Place Handel music clip (in Audio Track A) to begin next to Classical audio clip, and end at the edge of the third image from the last of the Rowing Crew clip. Set Handel music clip's IN point at 2:07 and OUT point at 10:23.

12. Place Splash audio clip (in Audio Track A) to begin next to Handel music clip.

APPENDIX G

The following pages contain the content outline of the workshop that was taught.

CONTENT OUTLINE

Basic Multimedia Concepts

1. Change in definition of multimedia
2. Our Educators Speak Out
3. Types and sources of computer data
4. System hardware and software requirements
5. Digitizing hardware
6. Digitizing software
7. Editing software
8. Movies 101: What are Movies?
   What is QuickTime?
   Compression

Demonstration of Video and Sound capture

1. Using VideoSpigot's Screenplay and a camcorder
2. Using QuickTime's Movie Recorder and a camcorder
3. Using VideoSpigot's Screenplay and a laserdisc player
4. Using ComputerEyes to grab a single frame of video
5. Using a sound utility program and a cassette player

Demonstration of Video editing

1. Using Adobe Premiere editing program with stock of clips containing video, still images, sound, and animation.

APPENDIX H

EVALUATION

The evaluation form on the following page was distributed to participants after the workshop has been conducted.

"How to Make Movies with Your Mac"

Evaluation

		Yes	No
1.	I found the workshop challenging and stimulating.	☐	☐
2.	The workshop's content was relevant and helpful to me in my professional development.	☐	☐
3.	The stated objectives were met.	☐	☐
4.	The computer slides helped me to understand the material.	☐	☐
5.	The handout was helpful.	☐	☐
6.	The trainer presented and explained the material well.	☐	☐
7.	The workshop was well paced.	☐	☐
8.	The content was well organized.	☐	☐
9.	The demonstrations were understandable and useful.	☐	☐
10.	The hands-on experience was helpful.	☐	☐
11.	The length of the workshop was appropriate.	☐	☐
12.	Participation by the group was encouraged.	☐	☐
13.	All my questions were answered.	☐	☐
14.	I would recommend this workshop to my other colleagues.	☐	☐

Comments:

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