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Theater Education and Emerging Technologies

Michael E. Butterworth

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5 June, 2000

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Place Holder: Oral Approval Form

Place Holder: Written Approval Form

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Abstract

Theater educators need compelling arguments for including the use of emerging technologies in the secondary theater classroom. The research documents the current uses of emerging technologies in the secondary theater classroom and contrasts the uses of traditional theater technologies with the uses of emerging technologies. Interviews with theater professionals identify current issues and practices in the theater community regarding the usage of technology. A telephone survey of theater teachers reveals patterns of technology use in the Seattle School District. The research concludes that theater teachers have many tools at their disposal to teach students the processes of artistic problem solving and the tools of technology are one of those very compelling and powerful tools.

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Chapter One

Introduction

Background

Many researchers, futurists, and educators believe that our society has entered an unprecedented age. They argue that new technologies are setting the stage for new ways of conceptualizing how we learn, teach, and access information (Fisher, Dwyer, Yocam, 1996). These new technologies include microcomputers, multimedia computers, video cameras, word processors, internet services, e-mail, digital sound recorders, CD-ROM, various telephone devices, and videodiscs. According to Kinnaman (1993) more than two million microcomputers found their way into American classrooms during the 1980s, and the most recent decade has only seen the numbers grow. Research from Quality Education Data cited in CEO Forum's (1997, p. 24) report, *From Pillars to Progress*, notes public schools averaged nine computers for every student in 1996-97 school year, down from twenty-two computers for every student at the close of the Eighties. According to U. S. Department of Education statistics in the same document, nearly 65% of all American schools currently have access to the internet.

Educators acknowledge that there is a proliferation of the tools of technology in schools. Today's students are in need of training in these new tools. In the CEO Forum's document, the introduction contains language that is typical of literature on the future of technology and education: "to thrive in today's world and tomorrow's work place, America's students must learn how to think and have a solid understanding of how technology works and what it can do" (p.3).

There are disciplines within schools wherein application of these emerging technologies is not readily apparent. A theater classroom in a typical K-12 setting seems to need little else besides an instructor, students, and a performance space. Yet theater artists have a history of

taking advantage of available technologies to create special effects on the stage (Athapoulos, 1983) . From the pulley to the hydraulic lift, limelight to computer assisted lighting, amphitheaters to audio enhancement, theater artists utilize the most current technologies to create visual and auditory worlds to entertain and educate their audiences. Playwright Julian Hilton (1993) notes "while theatre is an art form, it is an art form intrinsically enabled by technology" (p. 158) .

Although the history of theater contains many examples of artistic fascination with technology, do new and emerging technologies belong in the theater classroom? As these new technologies continue to enter schools, what impact, if any, could or should they have on the theater classroom? Kathleen Blum poses the question, "So what does all this mean to drama educators? Will drama be left behind in this great surge of progress because it does not utilize classroom tools? Will we turn down our screens, cover the keyboards and pretend they don't exist while we teach drama?" (1990, p. 4) .

Problem Statement

Little is known about the degree to which theater educators have identified rationales, barriers, and examples for the inclusion of emerging technologies into their curricula and classrooms.

Research Questions

1. What are the current uses of emerging technologies in the professional theater?
2. What are the current uses of emerging technologies in theater classrooms?

Outcomes

The research explored rationales and barriers for the inclusion of emerging technologies in the theater classroom. It provided a look at what is currently in practice in professional theaters,

and suggested several areas for further analysis and study. The study provided legitimate motivations for the inclusion of technology in the theater classroom.

Significance

While this study used theater educators in the Seattle School District and theater professionals in Seattle, Washington, the issues discussed will be useful for educators in other regions in planning theater and technology curricula.

Scope

The research took advantage of Seattle's richly varied theater community and secondary drama teachers in the Seattle School District. It included interviews with theater professionals and Seattle School District theater educators who were identified by their agreement to be interviewed. The research did not examine elementary age or adult theater education. Literature was acquired from national and international sources.

Assumptions

It was assumed that theater education in the classroom should reflect best practices in the professional theater community.

It was assumed that most theater teachers do not have the requisite knowledge, skills, or rationale for integrating technology into their classrooms. It was assumed that most theater educators think of technology only in its use backstage for lighting and sound amplification rather than as a communication tool in live performance.

Definition of Terms

A note on the spelling of theater: theater is spelled two ways, the American spelling, *theater*, and the European spelling, *theatre*. The text of this proposal uses the American spelling, but various documents and theater companies use the European spelling, and that spelling has been preserved in quotations and titles.

Backstage: areas behind the scenes of a theater where sets are stored

Educational Theater: departments in schools that teach the skills associated with the performance and production of theater

Emerging technologies: newer technologies of the past twenty years that are being introduced into the classroom.

Experimental or fringe theater: theaters outside the mainstream, and usually not professional.

Interactive Multimedia: “a collection of computer-centered technologies that give a user the capability to access and manipulate text, sounds, and images” (Ambron and Hooper, 1990, p. xi).

Performance Art: theatrical performances that come out of a visual arts tradition

Professional theater: theater that pay actors and other personnel union wages

Technical theater: “all organizational and procedural aspects of the construction, painting and operation of scenery and properties” (Gillette, 1987, p. 486).

Technology: the combination of the rules of science and the human imagination (after Izenour, 1988, p 225).

Chapter Summaries

Chapter Two focuses on current thinking and research on the use of emerging technologies in the theater classroom. It begins with defining briefly the purpose and scope of theater education. It includes a definition of theater technology and describes a variety of other approaches to the topic suggested by historical movements. The chapter cites recent articles and research on emerging technologies in various theater classroom settings.

Chapter Three describes the methodologies used to gather data, including literature review, interviews with four theater professionals, and a phone survey of six Seattle School District secondary theater educators. Chapter Four presents the findings of the research. It includes summaries of responses to interview questions and phone survey questions. Chapter Five

presents the implications of the findings and suggests recommendations for further research on the subject.

Chapter Two

Literature Review

Introduction

A review of the related literature is presented under the following topic headings:

1. The purpose of theater education
2. Theater technology
3. Emerging technology in the theater classroom

Themes found across topics are documented in the chapter summary.

The purpose of theater education

It is helpful in negotiating and interpreting the range of articles and writing on theater and technology to define and discuss the purpose of theater education and the kinds of subject matter and topics available to theater arts educators.

Most advocates for K-12 education in the arts cite two main purposes for this kind of instruction. One is the knowledge of the arts discipline itself; its practice, vocabulary, history, and cultural foundations. The other purpose involves the social behavior, habits of mind, and analysis that arts advocates believe transfer to the general quality of life of students who study the arts (Consortium of National Arts Educators, 1994, Artsedge, 1996) .

To meet these goals, theater educators in a K-12 setting have many curricular and pedagogical decisions to make. There are many topics and specializations to choose from under the umbrella of the theater arts. The study of the theater arts can include such diverse topics as playwrights, playwrighting, play producing, acting, voice, analysis of texts and live performance, improvisation, movement and dance, theater history, cultural contexts, theater design, lighting, scenery, costuming, and make-up (Consortium of National Arts Educators, 1994) . Last (1990) ,

in her theater curriculum for the state of Wisconsin, embraces this diversity. A carefully designed and executed theater arts curriculum "actively involves students as observers, organizers, creators, and evaluators in a wide range of experiences that can help them to develop physically, intellectually, and emotionally" (p. 5) .

Last (1990) also discusses and describes classroom drama and theater as a continuum. At one end of the continuum is dramatic play. Dramatic play involves exercises, games, and improvisational techniques designed to free up creativity in students. In the middle of the continuum is informal drama, which "includes a wide range of dramatic activities and situations developed by and for students themselves rather than for an outside audience" (p. 3) . At the other end of the continuum is formal theater. "Theatre is a more formal discipline and art form, culminating in a dramatic presentation by actors, designers, and technicians usually on stage or in a planned environment, before an audience." She points out that the word theater originates from the Greek word for "seeing or viewing place" (p. 3) .

This research study focuses on the use of technology in the theater classroom. The array of subject matter available to theater educators and the continuum from dramatic play to formal theater are all reflected in the research on theater education and technology. Although this research shows examples of technology being used to support all of the available theater topics across the continuum, technology also has a set of special meanings of its own in the theater arts which will be explored in the next section.

Theater technology: Traditions and definitions

One of the challenges associated with research in theater and technology is that theater technology has come to mean many things. As Potts (1984) states "theatre design and technology is a very broad and inclusive art" (p. 6) . Theater technology is traditionally defined in terms of its backstage, behind-the-scenes support for the environment of a theatrical

performance. Arnold (1994) distinguishes scene technology from other kinds of theater technologies, defining scenography as "the full range of audiovisual elements that establish the artistic unity required by the scene" (p. 1). For George Izenour (1996), theater technology focuses on the architecture of theater buildings, scenery moving devices, and machinery used to illuminate the stage. Millet (1996) breaks down theater technology by distinguishing between "technical theater, the art and practice of mounting productions for the stage; and theater engineering, the art and practice of researching and developing systems and structures for theatrical use" (p. 476).

As mentioned earlier, theater technology is associated most closely with scenery movement and lighting. In much of the theater literature, theater technology is discussed in combination with the design elements necessary for any theatrical enterprise, hence discussion of the technology used in lighting a stage play is discussed along with the design process of lighting a stage play. Seven areas of theater technology and design are identified by the International Thespian Society. They are "theatre space, scenery, properties, lighting, sound, costume, and makeup" (p. 6). These seven areas are standard in most theater textbooks aimed at high school and college students. (Gillette, 1987, Arnold, 1994, Taylor, 1999). Most of the book length works and articles on theater technology are concerned with specializations in these seven areas.

Expanding the definition of theater technology to more than the pulleys and wenches that move curtains and sets, and electric circuitry that run lighting instruments, then the technological needs of theater become vast. Hot glue guns, hair dryers, any manner of cutting tools, and sewing machines can all find themselves enfolded in the all-encompassing terms of theater technology. Even what constitutes an established theater technology is not fixed. As Richard L. Arnold (1994) points out in his textbook, *Scene Technology*, "methods of operation and

construction techniques change and expand with the development of technology resulting in both new solutions and improvements to existing practices" (p. 2) .

While trying to define theater technology can be difficult, so can confining the practices of theater technology to the theater. In a speech before the National Communication Association, professor Stan Kaye (1997) discusses the training of undergraduates in theater design and technology. He emphasizes that the definition of theater must expand to include other potential employers for his students. His list includes "legitimate theater, studio and independent film, network and cable television, corporate television, rock and roll, country music, theatrical touring, themed entertainment, casinos, cruise ship entertainment, broadcasting, amusement parks, corporate shows and presentation" (p. 3) . He summarizes by saying that "everyone from politicians to corporate executives is using theater technology to get their message out in the most powerful way" (p. 4) .

One perhaps surprising element in the theatrical record of the Twentieth Century that cannot be ignored in this research is a strong distrust of too much reliance on technology. The bias against technology in the theater showed up in the interviews for this research. Perhaps its clearest articulation comes from Peter Brook's seminal 1968 book, *The Empty Space*: "... a man walks across this empty space whilst someone else is watching him, and this is all that is needed for an act of theatre to be engaged" (p. 9) . The text, the actor, the space, and the audience are all that are really needed for theater. Brook rails against both the symbolic and actual mechanization of much of the professional theater, in particular the professional theater in New York City known as Broadway. "Broadway is not a jungle, it is a machine in which a great many parts snugly interlock. Yet each of these parts is brutalized; it has been deformed to fit and function smoothly" (p. 19) . In conversations with theater artists this attitude comes across as an

interesting bias against the large theater spectacles of the 1980s and 90s, such as *Miss Saigon*, *Les Miserables*, and *Phantom of the Opera*.

Even theater technicians wonder out loud at this trend. Wilson (1994) writes :

whatever new is developed by and with technology, it would sadden me greatly if it resulted in a degradation in the ability of actors using only their skill and craft, the words of a good playwright, with few or no costumes and props, and performing on a bare stage to transport me to Thebes or Elsinore where I could experience the dramatic interaction of a group of characters and a dramatic catharsis. (p. 474)

Many theater artists attribute the reliance of technologically complex productions to a constant awareness of competition with film, video, and television.

Another tradition that adds to the discussion of theater and technology is that of performance art. Performance art is a form of artistic expression that comes from visual artists "who desired to add human beings and human-beings-in-action to their palettes" (Harbin and Salazar, 1993, p. 3) . Emerging in the 1960s, these performances, often called happenings, are an "exciting and disturbing blend of visual art, dance, and theatre" (p. 3) . In the 1970s and 80s a multi-media dimension was often added to such performances as new technologies added slide and video projections into artists' expression of ideas (Druin, 1996) . The 1990s version of performance art is referred to by one theater professional as slash art (Education director, 1998) . That is to say, because theater is often narrowly defined as a play with a plot, productions that incorporate other arts are often clumsily referred as such things as theater/dance/concert/video in order to describe them accurately. Aesthetic and semantic considerations seem to cloud inclusion of technology and its place in the theater arts, particularly when the technology is integrated as a performance element.

One historic tradition seems to cut through the aesthetic debate on technology and the performing arts. The Bauhaus movement in Germany during the 1920s did not shy away from technology or its machinery. The following extended quotation describes the scope of the Bauhaus movement by one of its practitioners, Walter Gropius (1961) :

During the all too few years of its existence, the Bauhaus embraced the whole range of visual arts: architecture, planning, painting, sculpture, industrial design, and stage work. The aim of the Bauhaus was to find a new and powerful working correlation of all the processes of artistic creation to culminate finally in a new cultural equilibrium of our visual environment.... Teachers and students as a working community had to become vital participants of the modern world, seeking a new synthesis of art and modern technology. (p. 7)

Oskar Shlemmer (1961) further illuminates the position of the Bauhaus artists by stating "among the emblems of our time are the new potentials of technology and invention which we can use to create altogether new hypotheses and which can thus engender, or at least give promise of, the boldest fantasies" (p. 17) . With its concentration on space, form, and light, photographs of Bauhaus productions look like strange expressionistic paintings come to life. Although the Bauhaus arts movement seems to have little effect on contemporary theater aesthetics with their concentration on realism, Gropius' plans for a Totaltheater are routinely mentioned in theater history texts. In these plans, Gropius conceived of a mechanized theater building that could change configurations depending on the needs of an individual performance. One could push a button and create a proscenium theater, or push another button and create a theater in the round. Although this kind of theater has never been fully realized because of cost, many experimental theaters routinely change the relationship between audience and performance space through the use of platforms and collapsible seats. Some theater directors, notably Hal

Prince in his 1973 production of Bernstein's *Candide* and the 1980s performance of *Cats*, have used the concept of environmental theater, recreating the interior of the theater building to provide a unique performance environment for a play. It is in such productions, with their creative use of available technologies, that the ideas of Peter Brook and Walter Gropius intersect. The empty space of the performance area can be transformed in ways that accentuate the authenticity of a production's concept and truly create a unique world for a production.

Emerging technologies, such as computers and microprocessors, have had a tremendous impact on traditional theater technologies. Wilson (1996) states that "the influence of technology on the performing arts has been accelerating for the last 30 years" (p. 474). His examples range "from box-office ticketing to sound and from motorized scenery flying and heavy rigging systems to computer costumes pattern generation." He sums up: "for an engineer with an interest in the performing arts, the last 15 years have been an exciting time" (p. 474). In his article for the *Oxford Illustrated History of Theatre*, John Russell Brown describes the current use of technology in theater as "sensational spectacle, using mobile scenery, computerized lightning, 'sound enhancement,' and well-drilled actors," that overwhelm "audiences with crashing chandeliers, helicopters flying on to the stage, whole cities going up in flames" (1996, p. 502). These kinds of special effects would have been dangerous and next to impossible without computers. Russell notes that other forms of technology, such as slide projected scenery, video, film, and even robotics have found a place on the contemporary stage (p. 503-504). Perhaps it is the adaptability of technology to the aims of theater artists that makes a certain definition of theater technology ultimately a pastiche of impressions. Special effects artist Joe Aveline (1995) sums up this flexibility:

Throughout the history of theatre, people creating effects have used the available technology to their best abilities. What we in the theatre have always been good at is applying existing

technology derived in other fields for our own purposes. The thundersheet could never have been used until the invention of strip steel mills. (p. 3)

The ingenuity of theater artists, the development of new and emerging technologies, and the demands of audiences ever more sophisticated in their exposure to media, as well as strong traditions for the primacy of acting technique and the playwright's art, create a complex and shifting backdrop for further discussion into the uses of technology in theater classrooms. What begins as a deceptively simple question, what impact if any should or could emerging technologies have on the theater classroom, seems to demand a series of somewhat complicated answers of the personal experience of educators and artists with some of the fundamental questions involving theatrical aesthetics, purpose, and meaning.

Emerging technologies and the theater classroom

Emerging technologies are variously defined in educational literature. Although some of the technology described in educational literature is new, some of the applications of technology involve older technologies used in new ways. Emerging or new technologies are defined largely in contrast to traditional teaching tools. In the literature it is clear that even older more established technologies, such as slide projectors and overhead projectors, have new uses when used in conjunction with newer technologies.

Agnew, Kellerman, and Meyer (1996) define emerging technologies in their support of multimedia learning environments. These include the video camera, still camera, audio cassette recorder, laser disc player, music system with compact-disc, digital-audio player, word processing computer, multimedia computer, slides, and photographs (pp. 21-22). The value of such teaching tools relies on their ability to enhance perception. Kemp and Smellie (quoted in Bazeli, 1997) define perception "as the process whereby a person becomes aware of his or her

environment through the use of the senses. People learn from what they perceive, and carefully designed visual experiences can influence that learning in a positive way" (p. 1) .

Many newer technologies fall under the category of multimedia. Sorrow (1997) defines multimedia "as the ability to combine and utilize communications media, such as text, graphic art, sound, animation and video for presentation of information" (p. 1) .

Several articles describe the successful use, or make suggestions about using new and emerging technologies in the theater classroom. The scope of research was expanded to include higher education sources because little was available on K-12 theater classrooms.

LeRoy Finkel (1991) includes a section on the uses of emerging technologies in the visual and performing arts in his *Technology and the Information Age Classroom*. "Film strips, slides, films and audiotape recorders are technologies that have long been used to enhance the study of aesthetics of theatre in the drama/theatre curriculum" (p. 85) . Finkel further suggests that computers be used "to draw ground plans and construction plans for scenery, to edit scenes for acting, to design and print programs, [and] to inventory equipment" and supplies (p. 85) . Finkel mentions the use of computerized lighting boards and the practice of using video cameras and VCRs "to record and play back rehearsals and performances for self-evaluation" (p. 85) . "Projectors and slides or templates" (p. 85) can be used for special effects and scenery. Finkel's list is comprehensive and suggestive but contains very little on how to implement his suggestions in the classroom.

Professors at Austin Peahy State University in Tennessee taught a World Theater course using distance learning technologies. These include e-mail, listservs, and the World Wide Web. (Boyd, Jones, Olson, Duncan, 1996) . The teachers of the World Theater course found that the "immediate access to information and reference materials, both traditional and non-traditional... an empowering tool for both students and the faculty" (p. 8) . Distance learning became an

exciting reality and allowed the small college access to a wealth of information. Students both learned to use the technology and created in depth projects and presentations.

Ball State University in Indiana experimented with an introductory theater course delivered through interactive television. The question that lingered in researcher Merrion's mind (1992) was whether anything would be lost in teaching a fine arts course via video. She sat in both the campus classroom and in the remote site. She found when at the remote site she was more dependent on the visuals provided on the television monitor. She found herself "more attentive and less conscious of passing time" (p. 340). Because students were required to attend a live performance of a play for discussion and analysis, the pictures and video clips used in the class did not become a substitute for the actual experience of live theater.

The use of video clips and pictures for analysis of production values and aesthetics is one of the major goals of The Shakespeare Project. The Shakespeare project is "a multimedia system consisting of a hypercard stack and a two-screen workstation linking Macintosh, videodisc player and video monitor" (Merrill et al, 1996, p. 282). Friedlander (1989), the developer of the project, believes that "a performance is a complex event, and we need ways to seize and study that event without distorting or freezing it in time" (p. 34). The use of this set of multimedia tools allows for students to grasp "that there is no correct and final stage version of a dramatic text; that is, no one performance version of a play, no matter how fine, is the final model for this play" (p. 35). The possibility of study through the integrated technologies allows students to examine videotape scenes and still pictures of different performances of the same play.

The Getty Center for Education in the Arts has produced a video exploring the role of Computer Technology in Arts Education. Although focused on the visual arts the findings of the experts consulted in the video may be applicable to the use of computers in the theater arts classroom. The problems identified by the experts video-taped are that technology is slow to be

accepted by the community, that technology is expensive, that teachers are ill-prepared to use technology, and that software designs should be linear in structure for them to work well (Getty Center for the Arts, Abstract, 1991) .

Pacino and Michelini (1994), instructors in the telecommunications department at Ball State University in Indiana, have experimented with an interactive-video simulation to "facilitate the understanding of cause and effect relationship of multi-camera video directing" (p. 20) . The process they used involved shooting a scene using three cameras and providing students, through computer interface, access to the three versions. The students can then make choices about editing the three camera shots using the computer, videodiscs, and videodisc players. The authors were in the middle of their first semester using the technology and reported favorable results. They cite that studio time has been freed up, that administration looks favorably upon the use of interactive technology, and that students enjoy the freedom to sharpen their directoral skills without wasting videotape themselves.

Blum (1989) has written about the use of computers in theater classrooms. She asserts that "computers can be integrated into the drama classroom" (p. 4) . Blum says that computers won't take the place of the physical activity characteristic of theater classrooms, but rather she believes that computers will "be used in conjunction with the physical activity to provide a medium for experimentation and creativity" (p. 4) . Blum provides a scaffolding for the use of computers in the theater classroom, using the artistic processes of perceiving, comprehending, imagining, creating, and evaluating of Sommer, Rollins, and Wheetly (1987) .

In the area of perceiving Blum cites the visual capabilities of computers and their pictorial, videodisc, and video playing applications. "For example, students could use the computer to view two pictures of the same scene from two different productions of Hamlet" (p. 5) . The ensuing discussion comparing and contrasting the choices of directors in staging the scene would

allow students "to use their skills of perception in order to better evaluate a theatrical production" (p. 5). In the area of comprehending, Blum uses the example of a historical collage of pictures on the computer, creating the sense of history needed to understand the worlds of various plays. She says this could be a jumping off point for scene work using the images to inspire students understanding of time and place.

Evaluation of theatrical work can be enhanced, according to Blum, through the use of computer conferencing and linked discussions among students. Creativity can be inspired through the use of the graphics capabilities of computers, and through their word processing capabilities. Situations, scene outlines, and dialogue can be explored on the computer before students explore them through the active work of the drama classroom. Finally, Blum uses the example of computer simulations for exploring setting and movement on the stage. Blum closes by stating that "using computers in the drama classroom is a new and relatively untested idea, but it is not without merit or promise. Computers are in schools to stay, and I believe they should also be in the drama classroom" (p. 7).

Many of the ideas explored by Blum were in their beginning stages when she wrote her article. Since the publication of her article one theater simulation package has become available. Called *Opening Night* (1995) and created by MECC it centers around the staging of a Nineteenth Century melodrama. The interface involves the choosing of dialogue, sets, characters and has a limited vocal capability. The software package *Author, Author* includes outlines for creating dialogue and scenarios for scenes and plays and a tutorial list of prompts and questions for helping students stay focused.

Summary

The research suggested that theater has always had a technological component. It has the ability to adapt current technologies to its own purposes. One of the purposes of theater

education is to educate students who can observe, organize, create, and evaluate in a "wide range of experiences" (Last, 1990, p. 5) . The articles above, although different in scope and intent, suggested several possible applications of technology for the theater classroom that can meet the stated curricular goals of theater education. Many of the articles suggested that the use of video, laser discs, and multimedia software can provide students with the analytical skills necessary for assessing and making sense of live performances and theatrical texts. Chapter Four will present these findings in greater detail.

Chapter Three

Methods

Introduction

Three methods were used to study the topic of theater education and emerging technologies. They were: a literature review, key informant interviews, and phone interviews with theater educators in the Seattle School District.

Literature Review

The purpose of the literature review was to discover the existing body of knowledge on the topic of emerging technology in theater education. The literature review also defined current definitions of theater technology. Fink (1998) defines a literature review as "a systematic, explicit, and reproducible method for identifying, evaluating, and interpreting the existing body of recorded work produced by researchers, scholars, and practitioners" (p. 3) . Borg, Gall, and Gall (1993) identify the purpose of the literature review "to describe the state of knowledge about the problem...investigated..." (p. 76) .

The literature review was conducted using ERIC, the World Wide Web, the resources available at the University of Washington Suzallo and Drama libraries in Seattle, Washington, and the Seattle Public Library. Interlibrary loan services were also used when available. There were limitations due to periodicals available at the University of Washington and Seattle Public Library as well as publications that are not included in ERIC or the Periodical Guide to Literature, or Humanities Index. Topics searched included the key words: theater, technology, education, computers, drama, multimedia, performance, art, stage, lighting, scenery, curriculum, and design used in a variety of combinations.

Key Informant Interviews

The purpose of the key informant interviews is to gain the expertise of experts. Artists were sought out who were willing to share their unique experiences using emerging and traditional theater technologies in their work. Weiss (1994) writes in his guide to interviewing, *Learning from Strangers*:

We would do best to interview people who are especially knowledgeable or experienced. To enrich or extend our understanding, we might also want to include as respondents people who view out topic from different perspectives or who know about different aspects of it. (p. 3)

Weiss further suggests that qualitative interviews can further certain aims in research such as "developing detailed descriptions" and "developing holistic descriptions" (p. 9, 10) of the problems studied. The aim of the interviews with theater professionals was to create a template for understanding the current issues facing theater artists and their actual, rather than theoretical, use of technology. The qualitative interview was deemed appropriate for garnering such information.

Key informant interviews were conducted with four Seattle theater professionals; an artistic director with a professional non-profit theater; a former artistic director of a fringe theater and current education director of a professional non-profit theater; a theater professor and historian; and an artistic director of a non-profit educational theater performance company. The criteria for selection of informants included professional experience that involved both theater and technology, the fact that their primary living is made in the theater arts, and recommendations from other theater artists. They signed a release form agreeing to be interviewed. A sample of the release form appears in Appendix B. An attempt was made to include key informants that represented a wide range of theatrical experience at different levels of professional theater.

3. Are you aware of or do you have access to the following technologies at your school: video camera, still camera, audio cassette recorder, laser disc player, music system with compact-disc, digital-audio player, word processing computer, multimedia computer, slides, and photographs.

Which of the preceding technologies have you used in your classroom?

4. What kind of lighting system do you have?

5a. Do you personally use a computer to create materials for course work?

5b. Do you have access to a computer in your classroom?

6. Have you ever video-taped rehearsals or performance for class critique?

7. Do your students have access to a computer in your classroom?

8. Have you ever had students create products for classroom projects using a computer?

9. Have you ever taken courses or workshops in the use of technology?

10. Are you aware of theater simulation software packages? Which ones?

11. Do you ever teach the use of a particular technology? Which ones? If you do, would you characterize the teaching of it as: one-on-one as need comes up, small group instruction, or whole class instruction?

12. Do you use publication software? Computer assisted drafting (CAD)?

13. Do you use lighting, sound, or other technologies in productions?

14. Do you teach a stage craft course or the equivalent?

15. What do you consider the primary barriers to using technology to support your curriculum?

a. time

b. my curriculum concerns primarily acting technique

c. resources (access to the equipment)

d. personal knowledge in the use of various technologies

e. money

16. Personal Information

Years teaching:

Years in present teaching position:

Theater teaching status:

- a. I teach no theater courses, I just direct plays
- b. 1 theater course and play direction
- c. 2-4 theater courses (part-time in theater) and play direction
- d. full-time theater teacher and play direction
- e. part-time theater teacher and no play direction

Summary

The research methods chosen were designed to obtain information on the current uses of technology in the professional theater and in the secondary school theater classroom. The methods chosen were designed to be qualitative in nature rather than quantitative. The literature review provided valuable insight into the history of theater technology and some of the experimentation that is occurring in theater classrooms. Interviews with theater professionals were designed to learn what was currently happening with technology in the professional world of theater and the phone survey questions attempted to discover what kinds of technology tools were available to theater educators in Seattle.

Chapter Four

Findings

Introduction

Each of the research methods employed for this study yielded relevant information about the uses of traditional and emerging technologies in the theater and in theater education. The literature review provided valuable background for framing questions about technology use in the theater and theater education. The literature review contributed to understanding about both traditional theater technologies, such as electric lights and stage machinery, and the use of emerging technologies, such as video, computers, and the internet. Interviews conducted with theater professionals were relevant because theater is largely about telling stories. The theater professionals believed they had very little to say about technology. Each interview filled nearly ninety minutes with intriguing and amusing stories about successful and not-so-successful uses of technology. The telephone survey of theater educators provided a limited but relevant glimpse of the actual presence and use of the tools of technology in theater education. The telephone survey revealed that one of the initial assumptions could be largely false.

Literature Review

The uses of technology in the theater range from the traditional to the experimental. Traditional uses include technology to move scenery, light the stage, and enhance the natural voice. Experimental uses include video projection, sound design, robotics, and the use of multimedia (Brown, 1996). The literature review revealed no single definition of theater technology. Nonetheless there is no doubt that emerging technologies are having a profound effect on what is possible in professional theatrical productions (Wilson, 1996). From the design process to live performance, from research to communication, the theater community is experiencing the technology revolution in its own unique way. What is problematic for many artists is how to negotiate the

intersection of these technologies with what is expected and needed from an arts medium that is largely defined and differentiated from other media by its live components.

In the theater classroom, emerging technologies are confined largely to their ability to support research, communication, and delivery of content. Although disparate in many respects, the authors of the articles found for the review of the literature suggest several applications of computers to the theater classroom that either have been envisioned or tried out. The comparative capacity of video-discs and CD-ROM (Blum, 1989; Boyd, Jones, Olson, Duncan, 1996; Finkel, 1991; Friedlander, 1989; Merrion, 1992; and Merrill, 1996) are cited by many to be advantageous for theater students. The ability to go back and forth quickly among images or short video-clips provides students with access to materials that can sharpen their critical and cooperative skills. Although these experiences perhaps should not take the place of attending live performances, the authors of these articles suggest that the interactions with technology can prepare students for live performances with a clearer understanding of the artistic choices behind them (Blum, p. 5 and Friedlander, p. 33).

Other applications suggested by the review of articles concern the use of word processing capabilities (Blum, Finkel), internet access (Boyd et al), and simulation programs (Pacino and Michelini, Finkel, Blum, MECC). Again most of these applications in the classroom provide students with the opportunity to research and analyze theatrical history, texts, and the environment of performances.

While the literature suggested several possible applications for the use of emerging technologies in the theater classroom there was little or no mention of emerging technologies and their use in support for educational theater performances, or what Last (1990) calls formal theater. Indeed there were few articles on the use of traditional theater technology as discussed in Chapter Two in the support of theater performances in schools. The notable exceptions were the curriculum guides and

text books that included sections on theater technology. But what was missing was a discussion of the pedagogy and practical suggestions for use of technology in the classroom theater production.

Key Informant Interviews

The purpose of the key informant interviews was to discover how theater professionals view theater technology and the use of emerging technologies both in theatrical production and as a support for their work. The interviews were not designed to be a representative sampling of the theatrical community, but rather to be way of exploring the best practices of the theater community through expert testimony (Weiss, 1994) and to provide a counterpoint to the survey with educators.

Interviews with theater professionals echoed the changes in the theater environment documented in the literature review. The four artists interviewed discussed the expanded ability to support research, communication, and enhance production values especially through the use of the internet. When asked about their definition of theater technology (question one), all four of the theater professionals interviewed mentioned computerized lighting capabilities and sound technology. Two did not mention computers as a theater technology until asked about their own use of computers. The theater professor uses computers in his research and has created a web site with undergraduate and graduate students devoted to the history of theater architecture. The director of the educational theater performance group uses computers and video with her production partner to create the special montages and video tapes essential to her productions.

When asked about their experiences in making decisions regarding the use of technology in their work (question two), the artists interviewed often segued naturally into the answers for question three, describing projects they've worked on using technology, and question four, describing the technology that they have used to support their work. When asked about their own use of computers the theater professionals mentioned the increased access to information, the ability to do research on the internet, and the flexibility of e-mail. The assistant artistic director made special mention of

telephone technology that allowed stage managers, whose job it is to contact actors, to send a single cast call out to all actors with the push of a button. She also describes the difference three years can make, and a move to a new facility:

When I first came to [this theater] three years ago we had a phone system that had... eight lines with the punch button things and the way you knew you had a call was the receptionist yelled down the hall. [laughs] Now we have this very sophisticated voice mail system where... someone can call directly to your extension...(Artistic director, 1998) .

She laments, however, that for all its convenience, "voice mail has made people not see each other face to face as much" (1998) . She has used computers to maximize efficiency. For example, she created a tracking system for literary management, the process by which agents send in scripts by playwrights from around the country. She could "track any play that came in" and she rarely lost any scripts, a crucial aspect of good relations with literary agencies. She, the education director, and the theater professor mentioned the changes designers have experienced.

According to these artists, the decision to use an existing technology to support a production idea is a complex one dictated by budget, aesthetics, and availability. The artists were all insistent in one way or another that appropriateness of the technology was also a factor. The artistic director told a story of a recent production at the theater where she worked. The director wanted a walkable bridge above the set and pieces of furniture to slide in and out of the set on the theater's hydraulic system. The budget would not allow for both items, he had to decide whether he wanted the expensive bridge or the sliding scenery. The artistic director asked him "are you going to sacrifice the whole play for this one scene [on the bridge as] it's a very techno-driven show?" The seamless flow of the furniture suited the world of the play better, and was therefore more artistically and aesthetically important. The technologically driven piece of scenery won over the static bridge. In another example she described how she eschewed some scenery moving technology in directing "A Christmas Carol!"

because the world of the play isn't a technological one. Actors moved the scenery. However, she did have fun using technology for the ghosts and the spooky effects. But she reiterated that she would just as soon direct a play with great words, great actors, and no gadgetry at all. But no matter what the artistic choices made, "the art and the technology need to collaborate" (1998) The education director stated that "technology must serve your concept of what the world of the play is" (1998) .

Question five asked the artists to react to those in the theater community who are against too much reliance on technology. In describing their various theater projects the idea of the empty space often came up. The concept of the empty space, as described in Chapter Two, was Peter Brook's (1968) assertion that the text, the actor, the space, and the audience were all that are really needed for theater. Again the artists interviewed returned to their concept that the technology must serve the performance needs of a particular text or idea. The artists did discuss their use of sound design, lighting, scrim, hydraulic lifts, floor projections, video, slides, and so forth, but they always returned to questions of aesthetics and appropriateness. The art and the technology must work together, that the "humanity should stay in tact" even "when you've got a bunch of cool toys" (Education director, 1998) . "In the end," said the artistic director, "theater is not about technology, it is about people" (1998) .

One of the professionals interviewed has found a particular and unique application of emerging technologies to the theater. She has created a series of solo performance pieces that involve an actor and a moving video image projected on a screen or a television monitor. These theatrical performances were developed in response to the environmental challenges created by performing in classrooms. The television screen provides the background and the environment for the historical pieces and the actor portrays a character interacting and evolving in that historical environment. The project has been phenomenally successful. She has produced shows about slavery, the Holocaust, the European immigrant experience in America, and the civil rights movement. Her actors have

travelled all over the country. However, when asked if this way of producing theatrical pieces has spawned any efforts to create a curriculum for producing such pieces in the classroom, the artist seemed surprised. It appears that no such effort has been documented to her knowledge.

When asked about the effect of performance art on the use of technology in the theater (question six), three of the artists mentioned that it gives permission for theater artists to blend different media into, as one of the artist called it, slash art.

Question seven asked the artists to give their opinion as to which emerging technologies were having the greatest impact on contemporary theater. According to the artists interviewed, technology is currently having its greatest impact on sound design, with digital audio tape (DAT) technology allowing a kind of flexibility with recorded sound never before possible. "Big changes in sound," as the assistant artist director put it. She added "we will see more use of film video and slides" (1998). The theater professionals interviewed also commented on the effect of technology on the design process. Personal computers and e-mail are allowing designers to be more cost and time efficient. Designers truly can work from their homes and do not have to travel as much. The theater professor has had the problem of getting his colleagues to accept the integration of computers into the curriculum. He's had a particularly successful theater architecture project using the World Wide Web and research from undergraduate students.

The funding for various theater technologies is limited, according to the answers the respondents gave to question eight. Question eight asked about the available resources, or equipment in theater technology and the money available for technology. The artists described the process of having to decide which technology can best serve a play or idea when there is a limited budget. Sometimes one idea for a special effect must prevail over another because of cost. All the theaters in Seattle, according to the artistic director and the education director, share some of the more expensive machinery, for example, video projectors and certain kinds of scrims and screens. The smaller fringe

or experimental theaters in Seattle were more likely to be experimenting with avant-garde forms of theater and usually borrow a lot of equipment. Bartering is common among theater artists.

Finally these theater artists, when asked what they wished to see in new artists and students in regards to technology (question nine), did not answer exclusively with what new technical skills they wished to see. The artistic director stressed that "if somebody's a theater student, if they want to be an actor, I love them to know about what goes on behind the scenes because they are going to be better if they understand that.... They will appreciate the people who make their art... then the people who make their art are motivated to make it even better" (1998) . The artists all mentioned the need for team players and problem-solvers in the arts. The education director and the assistant director mentioned especially that the new technologies presented new challenges because they simply offered more choices to theater artists. Collaborations between theater directors, designers, and technicians are becoming more important as budgets become tighter and the visual sophistication of audiences increases.

Telephone Survey

The findings of the telephone interviews with theater teachers in the Seattle School District revealed that technology is being used, but in ways limited by time, budget, hardware, and knowledge. The overwhelming emphasis in Seattle drama programs is on a comprehensive curriculum in theater, therefore not every theater subject can be covered in depth including all the ways technology can be used in the theater. Computers are used to support word processing and publicity, and lighting and sound technology are used primarily in support of formal theatrical production. Although many of the respondents mentioned the aging technology in lighting and sound in their school buildings, there seemed to be a trend towards upgrading lighting systems and sound capabilities.

The survey attempted to elicit straightforward responses but failed in this regard. The researcher, as part of the community of theater educators in Seattle, was known by the respondents, and many of the responses were qualified, amended, and commented upon. The following summary of the responses includes commentary that attempts to capture some of the richness of the actual responses to the questions beyond the straightforward answers given. Like the key informant interviews, the telephone survey tended to add to the qualitative, anecdotal data collected for this research.

Background of respondents. The six teachers in the Seattle School District interviewed represent over a hundred years of collective teaching experience, averaging 17.5 years of total experience and 11.6 years in their present positions. All of the teachers surveyed are full-time equivalent teachers in their schools. Respondent A has worked in Seattle for twenty-seven years, the last five in his current position. He also teaches Language Arts. The building he was working in when interviewed was scheduled to be torn down and replaced with a state of the art new one. He was looking forward to the new theater facility and its better lighting and sound systems. Respondent B has worked in Seattle for six years and is involved in local theater projects outside of her school job. She also teaches multimedia courses at the high school and has extensive computer training. A twenty-one year veteran of the Seattle School District, respondent C also directs community theater outside of his school job. He works at one of Seattle's top academic high schools and has taken his theater students all over the world. He is one of the few theater teachers who teach theater full time. Five of the teachers surveyed call themselves part-time theater teachers who also direct the school plays. In addition to teaching theater these teachers teach other subjects at their schools. Respondent C is the only ethnic minority (Asian) among the respondents. Respondent D has taught for nine years at one of Seattle's most culturally diverse high schools. He has extensive artist in residence programs at his high school and also teaches language arts. Respondent E has been teaching for fifteen years at Seattle's only Kindergarten-12th grade school. She has received a counseling degree and is looking

to leave teaching theater and language arts to pursue a career as a school counselor. Respondent F felt she was not very technology savvy. She has taught language arts and theater for twenty-seven years, fifteen of those years at one of Seattle's most economically distressed high schools.

Question findings and commentary. The following section summarizes the phone survey results question by question with commentary following each question. Some of the questions were simple yes or no questions and those results are given in the text as percentages. Some of the questions called for more individual responses, and those responses are listed with each respondent given a letter from A-F. For complete results see the appendix.

Table 1

Question 1. When you think of theater technology, what comes to mind?

Respondent	A:	Computerized lighting and theater web sites
	B:	Sets, lights, sound, props, and costumes- technology makes them work- equipment
	C:	Computer theater programs, light plot design, set designs on disc, costume patterns, microphones
	D:	Lighting, machines, and sound
	E:	Lighting and sound boards
	F:	Software, stage layout and scenery. I'm computer illiterate and have no time to learn.

The responses to the question listed in Table 1 demonstrated a wide range of thinking on the topic of theater technology among the theater educators surveyed. The educators surveyed usually responded with a list of things that fell under the category "theater technology." Lighting and sound were the most frequently listed as examples of theater technology. One respondent.

gave a partial definition: "technology makes them work." The responses to this question indicate that theater educators knew the tools of theater technology in a traditional sense as defined in the literature review.

Table 2

Question 2a. Do you have a computer lab at your school?

Yes: 83.4% No: 16.6%

Question 2b. Have you ever taken students in your theater classes to the computer lab?

Yes: 33.2 % No: 66.8 %

In Table 2 five of the six teachers surveyed stated that they had access to a computer lab. This seemed to confirm the evidence in the literature of the proliferation of computers in schools. The one exception (respondent E) mentioned that the school where this respondent worked had disbanded a computer lab and spread the computers throughout the building, with fifteen stations available in the library. Two of the respondents mentioned that access was a problem because of on-going staffing problems and conflicts with other academic departments in the school. The two respondents that took students to the computer labs had students work on theater related writing assignments.

Table 3

Question 3. a. Are you aware of or do you have access to the following technologies at your school? b. Which of the following technologies have you used in your classroom?

Technology	Respondent:					
	A.	B.	C.	D.	E.	F.
1. video camera	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/yes	yes/yes
2. VCR	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/yes	yes/yes
3. television	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/yes	yes/yes
4. slide projector	yes/ yes	yes/ yes	yes/yes	yes/no	yes/yes	yes/used to
5. overhead projector	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/no	yes/no
6. personal computer	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/yes	yes/no
7. multimedia/CD-ROM	yes/ yes	yes/ minimal	yes/yes	no/no	yes/yes	yes/no
8. sound recorder	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/yes	yes/yes
9. digital camera	no/ no	yes/ yes	yes/yes	yes/yes	yes/yes	yes/no
10. CD-Player	yes/ yes	yes/ yes	yes/yes	no/no	yes/yes	yes/no
11. internet access	yes/ yes	yes/ yes	yes/yes	yes/no	yes/yes	yes/no
12. laser disc player	no/ no	no/ no	no/no	yes/yes	yes/no	yes/no
13. digital sound recorder	no/ no	yes/ recent	no/no	no/no	no/no	no/no
14. mixing capabilities	yes/ yes	yes/ yes	no/no	yes/yes	yes/yes	no/yes
15. digital video camera	no/ no	yes/ yes	no/no	no/no	no/no	no/no
16. video editor	yes/ yes	yes/ yes	no/no	yes/yes	yes/yes	yes/yes

Note: First response listed is answer to question 3 a. Second response, separated by slash, is answer to question 3 b.

This survey question includes a list of the newer tools of technology. The respondents seemed to indicate that, at least among this small sampling, theater educators were keeping up with technology, using the tools to support curriculum and projects. The newest and least familiar technology tools towards the end of the list were used less frequently among the respondents. Respondent B, who had the most access to the tools, was also a teacher of a computer media course.

Table 4

Question 4. What kind of lighting system do you have?

-
- A. Rheostat Transformer
 - B. Rheostat Transformer
 - C. Electronic
 - D. Computer enhanced electronic
 - E. Computer enhanced electronic and restate transformer
 - F. Rheostat Transformer
-

The answers to this question reflected the aging infrastructure of older school buildings in Seattle. Rheostat transformers are a lighting system that is about fifty years old. Respondents A and B commented that their buildings will have newer lighting systems in the next two years due to district rebuilding (A) and fundraising (B). Respondent C did fundraising ten years ago to replace a rheostat transformer. Respondent E shared theater space with a community theater that did the lighting upgrades and respondent D had school district support of lighting upgrades in 1994 which replaced a rheostat transformer. The responses seemed to indicate that technology upgrades happen through two primary methods: teacher initiated fund-raising or school district money and initiative.

Table 5

Question 5a. Do you personally use a computer to create materials for course work?

Yes: 83.4 % No: 16.6 %.

Question 5b. Do you have access to a computer in your classroom?

Yes: 83.4 % No: 16.6 %.

Respondent F was the only educator to claim being technology illiterate. Although this respondent didn't personally use a computer to create classroom materials, the respondent did have student teacher assistants create materials. Respondent D was the only one who did not have a computer in the theater classroom although this respondent had access to a computer in the Language Arts classroom used by the teacher.

Table 6

Question 6. a. Have you ever video-taped rehearsals or performance?

Yes: 100 % No: 0 %

b. Have you used these for class critique?

Yes: 50 % No: 50 %

The question represented by Table 6 generated some unsolicited responses from respondents A and C who had strong feelings about using the medium of video tape to discuss and critique live performance. Although several articles in the review of the literature mention the use of video taped rehearsals, none mention the shortcomings that these educators expressed. The educators had no issue with videotaping performances for archival purposes, but using them for class critique in place of the experience of watching performances live was seen as not

educationally valuable and as misleading. Respondent E, however, wished to have more time for this activity and found the practice valuable.

Table 7

Question 7. Do your students have access to a computer in your classroom?

Yes: 50% No: 50%.

In Table 7 three of the six educators had computers that students could access in their theater classrooms but in ratios of 30 students to 1 computer. Respondents B and D had no computers for student use in their theater classrooms.

Table 8

Question 8. Have you ever had students create products for classroom projects using a computer?

Yes: 50% No: 50%

This question needed clarification in asking and became: do you have any assignments with which you require students to use a computer? Although half responded affirmatively, those that responded in the negative added that students generated many assignments with computers even though they were not required to do so.

Table 9

Question 9. Are you aware of theater simulation software packages? Which ones?

Yes: 33.2% No: 66.8 %

Opening Night was the simulation software mentioned by both respondent A and D.

The two educators who affirmed knowledge of theater simulation software both mentioned Opening Night from MECC (see earlier discussion of this software in the literature review) . Neither educator, however, used the software in their courses.

Table 10

Question 10a. Do you ever teach the use of a particular technology? Which ones?
b. If you do, would you characterize the teaching of it as: one-on-one as need comes up, small group instruction, or whole class instruction?

A: No

B: Newer technology taught in small group or whole group instruction.

C: Microphone usage and lighting taught mostly one on one as need arises.

D: Lighting taught in small group and one on one as need arises.

E. Lighting, sound, video taught in small group.

F: Lighting taught in small group.

The results expressed in table 10 provided anecdotal evidence that technology, when taught in theater classrooms, is often taught in small group settings as the need for knowledge among students is discovered. Commentary from the respondents indicated that often the principles of a particular technology are taught in whole class settings. An example of this would be a class lecture on the principles of theatrical lighting or sound, but the actual hands on training happens with smaller groups of students around a computerized light or sound board. Most of the respondents added that they had students teach each other, especially lighting technology.

Table 11

Question 11. Have you ever taken courses or workshops in the use of technology?

Yes: 66.8 % No: 33.2 %

Four of the respondents have had some training in computers and other technologies. The range of experience and training was not covered by the questions, but from commentary around this question the training acquired by educators varies widely. Respondent F, who frequently mentioned the lack of technology savvy during the survey, does use students to bridge the gap in knowledge. Respondent E has not had formal technology training, but mentioned that years in theater prepared this respondent for figuring out new technology when the need for it arises.

Table 12

Question 12. a. Do you use publication software? b. Computer assisted drafting (CAD)?

a. Yes: 83.4 % No: 16.6%

b. Yes: 16.6% No: 83.4%

Table 12 shows a trend that most theater educators used publication software in creating show programs, flyers, and other materials for their theater projects. The one respondent who answered negatively added that students often created such materials for this teacher. Most of the respondents did not know what Computer Assisted Drafting (CAD) was or its theater applications in creating set plots and elevation drawings. The one educator who used CAD also teaches a multi-media computer course.

Table 13

Question 13. Do you use lighting, sound, or other technologies in productions?

Respondent	A: lighting, sound, video, slides
	B: lighting, sound
	C: lighting, sound, slides
	D: lighting, sound, video, slides
	E: lighting, sound, video, slides
	F: lighting, sound, video, slides

Table 13 reveals the somewhat unsurprising results that all of the theater educators surveyed used lighting and sound technologies in their productions. Perhaps more surprising is that several of the educators used slides and videos in productions. Many of these educators mentioned that they had assistance in using video and slides, usually through grant projects with outside artists.

Table 14

Question 14. Do you teach a stage craft course or the equivalent?

Yes: 50 % No: 50%

The stage craft course seemed to be where most of the one on one training for using technology in support for the theater curriculum occurred for the respondents. Respondents A and F did not teach a stage craft course but both indicated that much of such a curriculum is integrated into other theater courses taught by the respondents.

Table 15

Question 15. What do you consider the primary barriers to using technology to support your curriculum?

a. time

b. my curriculum concerns primarily acting technique

c. resources (access to the equipment)

d. personal knowledge in the use of various technologies

e. money

A:	B:	C:	D:	E:	F;
1. money	resources	money	time	money	time
2. time	acting	knowledge	money	resources	money
3. resources	money	resources	resources	time	money
4. acting	knowledge	time	knowledge	knowledge	knowledge
5. knowledge	time	acting	acting	acting	acting

In table 15, money, time and resources seemed to be the overall barriers to using technology in the theater classrooms of these teachers. Respondent B stood out for acknowledging acting technique as the focus of the theater program as one of the top barriers. One of the assumptions of the research was that this response would come in to play more often towards the top of theater educators' lists, yet it showed up at the bottom of most of the them.

Summary of telephone survey

The phone survey refuted one of the assumptions of the research. It was assumed that most theater teachers do not have the requisite knowledge, skills, or rationale for integrating technology into their classrooms. The survey demonstrated that although the skill levels vary, and the access to some of the newest forms of technology vary, all of the educators surveyed have used technology to support their programs. Even respondent F, who purported to be ignorant of technology, used the knowledge of the students to bridge the gap in her knowledge.

Another assumption refuted by the survey results was that most theater educators think of technology only in its use backstage for lighting and sound amplification rather than as a communication tool in live performance. Most of the educators have used slides and/or video in performance.

The phone survey suggested that theater educators find ways to integrate technology into the everyday teaching they do. Some of the constraints of time, resources, money, and to a lesser degree, program emphasis, all added up to an intriguing picture of a discipline being shaped by technology in indirect ways, rather than a discipline completely ignoring technology tools, or a discipline completely immersed in them.

Summary

Because theater technology has such specific yet varied meanings in the minds of theater professionals and educators, discussion of the use of other kinds of emerging technologies was often confusing. For example, in all the interviews conducted, conceptualizing the personal computer as a theater technology did not occur naturally to the individuals being interviewed. Across the research methods, technology in the theater seemed to serve in the communication of ideas, whether those ideas were part of the interchange between performers and their audience, among members of an artistic community, or between educators and students.

The theater professionals highly recommended that computer skills be included in any curriculum for students, however they seemed to emphasize knowledge of problem solving and the elements of the design process. That such processes can be enhanced and expanded through the use of the tools of contemporary technology is suggested by the literature (Blum, 1989, Boyd, Jones, Olson, Duncan, 1996, MECC, 1995, Merrill et al, 1996, Merrion, 1992, Pacino and Michelini, 1994) . Theater educators seemed to have access to these tools and are using them, but the use of technology varies widely because of access and knowledge.

Chapter Five

Conclusions and Recommendations

Introduction

This chapter presents the implications of the research and its findings for the use of the tools of technology in theater education. It includes analysis of the commonalities across research methods, the gaps in the research, and suggestions for further research.

Conclusions

The study indicated that theater artists have a historic legacy of using technology to suit their uniquely theatrical purposes (Arnold, 1994, Aveline, 1995). While some of that technology is borrowed from other disciplines and industries, the theater has created its own definitions for technology. Theater professionals, although cautious about how much technology is ultimately good for theater, reiterated that the technology revolution is having its own irrevocable effect on the theater community (Brown, 1996, Izenour, 1990, Wilson, 1996, Key informant interviews, 1998).

One rationale for including the use of technology tools into the theater classroom is that theater professionals are seeing more and more of their colleagues with these skills (Kaye, 1997). For example, artistic directors are able to use the internet to view the theatrical seasons and artistic choices being made by theaters across the country. Designers are able to communicate through e-mail, and stage managers can use the features of today's phone technologies to send the crew and cast call times at the push of a button to many people at once (interviews, 1998). But are these time saving, research gathering tools enough of a reason to use valuable class time to teach the tools of technology, or should theater educators rely on the Business and Art departments to teach the use of these tools to students?

The design and scope of an effective theater curriculum then could include reference to skills learned by students in other disciplines, as the skills learned by students in the theater classroom should be accessible to them in other disciplines. As Blum (1989) points out "the drama class provides creative experiences of all sorts which the computer [for example] could help to translate into concrete concepts and terms..." (p. 7) . The key is to make explicit the skills being taught and to include examples of how those skills are used in other disciplines and for other purposes.

Gaps in the research

The telephone survey attempted to elicit straightforward responses to a set of questions about the use of technology in the theater classrooms in Seattle secondary schools but failed in this regard. As mentioned briefly in Chapter Four, the researcher, as part of the community of theater educators in Seattle, was known by the respondents, and many of the responses were qualified, amended, and commented upon.

One of the theater professionals who has experience in working with theater educators in the classroom was quite passionate about what she described as an over-emphasis on acting and performance technique in the secondary theater classroom. She believes a balanced theater curriculum exposes students to the whole experience of theater, especially the design process with all of the complexity of working in teams or singularly towards a common vision. Theater curricula and standards, including the ones reviewed for this study (ITT, 1984, Last, 1990, Potts, 1990, Consortium of National Arts Education Associations, 1994) , also emphasize the possibilities of the theater arts for educating the whole child. Perhaps one of the barriers that exists for integrating technology into the theater classroom is its emphasis on acting technique. Very little in the literature or in the interviews showed that technology is used much in support of the actor. Perhaps further research could study the amount of time theater educators spend on

different parts of the theater curriculum and what aspects of the theater curriculum they deem most important.

The lack of literature on any kind of technology intended for theater educators in the secondary schools may suggest that theater educators in high schools were simply not using technology. The phone interview survey suggested that this is not an accurate assumption to make. Theater educators are curious, knowledgeable problem-solvers by the nature of their discipline (Aveline, 1994). Theater educators share information in informal ways, through conferences, theater festivals, and conversations. As O'Farrell (1992) surmises artists

are engaged in a creative process that actually might be inhibited by too much analysis.

Some drama teachers share the artists reluctance to rely on analytical methods. This may be because ... the teacher of drama is functioning as an artist and the demands of research sometimes appear alien to the creative process. (p. 25).

So theater educators at the secondary level are not sharing the pedagogy of the use of technology tools in publication form. This implies that valuable information regarding the practical, aesthetic, and theoretical dilemmas facing theater educators at the secondary level in regards to technology could remain anecdotal, isolated, and limited by the imagination and knowledge of individual teachers. More could be shared in publication form about what theater educators do with traditional as well as emerging technologies in the theater.

Suggestions for further research

The study revealed several other areas for further research. As Booth, Colomb, and Williams (1995) remind "the immediate cost or benefit of a research problem is always some further ignorance and misunderstanding that is more significant, more consequential than the ignorance or misunderstanding that defined the condition" (p. 53).

1. State and national surveys should be conducted by regional and national educational theater societies and professional organizations on the access and use of technologies in theater classrooms. Such a broad study would add to the data collected by the telephone survey in this research and provide a more comprehensive and representative sample of the use of technology in theater classrooms.

2. The pedagogy of technical theater needs research and that research needs to be shared. This could include curriculum piloting of technology integration models for theater classrooms.

3. Sharing of anecdotal and practical information on the use of all levels of theater technology in local and national educational journals and publications.

Summary

Historically, theater technology has tried to be a virtually invisible element of a theatrical production. But because theater is in large part defined by its live elements, a theatrical presentation can happen without any of the trappings or machinery currently associated with the professional theater (Brooks, 1968) . Although this study started out to prove that technology use in the theater classroom is vital, it has failed to find such proof. A successful theater classroom can indeed be just the students, the teacher, and a performance space. However this study also suggests that theater education strives to be more than simply an academy for the actors of tomorrow. The national standards movement in the arts, including standards for theater education, does attempt to integrate the arts into the lives of students. The theater arts also attempt to create habits of mind and social behavior that benefit the quality of student lives and the community around them:

Arts education benefits both student and society. It benefits the student because it cultivates the whole child, gradually building many kinds of literacy while developing intuition,

reasoning, imagination, and dexterity into unique forms of expression and communication.

(Consortium of National Arts Educators, 1994)

Technology can be an enriching element towards that purpose. The computers and other tools of technology do not have to be ignored by theater educators. Theater educators may choose the degree to which they integrate the tools of technology into their classrooms.

Ultimately the decision on how and when to use traditional stage technologies as well as emerging technologies rests with the theater educators. Theater educators could advocate for more money and resources for the tools that they need to integrate technology into their curriculum (CEO Forum, 1998). As so much focus of current educational spending is on work place applications, theater educators could create a case for how their artistic endeavors mirror the real world of creative problem solving and team work. This research suggests that the development of appropriate curricula could lead to deeper understanding of the creative process, and prepare students to use the tools of the emerging technology in creative endeavors.

Aesthetic and pedagogical questions remain. If the predictions of the theater professionals interviewed for this study are accurate, the theater artists of tomorrow will have a vast array of tools, many of them technological, from which to choose as they create, write, produce, and design. Being able to make sense of the choices and choose wisely and appropriately may be one of the more important lessons theater educators pass on to their students.

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Appendix

Telephone Survey

Background of respondents. The six teachers in the Seattle School District interviewed represent over a hundred years of collective teaching experience, averaging 17.5 years of total experience and 11.6 years in their present positions. All of the teachers surveyed are full-time equivalent teachers in their schools. Five of the teachers surveyed call themselves part-time theater teachers who also direct the school plays. In addition to teaching theater these teachers teach other subjects at their schools. The other teacher is a full-time theater teacher who also direct plays.

Question 1. When you think of theater technology, what comes to mind?

Respondent A: Computerized lighting and theater web sites

B: Sets, lights, sound, props, and costumes- technology makes them work-
equipment

C: Computer theater programs, light plot design, set designs on disc, costume
patterns, microphones

D: Lighting, machines, and sound

E: Lighting and sound boards

F: Software, stage layout and scenery. I'm computer illiterate and
have no time to learn.

Question 2. Do you have a computer lab at your school?

Yes: 83.4% No: 16.6%

Question 2b. Have you ever taken students in your theater classes to the computer lab?

Yes: 33.2 % No: 66.8 %

Question 3 a. Are you aware of or do you have access to the following technologies at your school? b.

Which of the following technologies have you used in your classroom?

Technology	Respondent:					
	A.	B.	C.	D.	E.	F.
1. video camera	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/yes	yes/yes
2. VCR	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/yes	yes/yes
3. television	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/yes	yes/yes
4. slide projector	yes/ yes	yes/ yes	yes/yes	yes/no	yes/yes	yes/used to
5. overhead projector	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/no	yes/no
6. personal computer	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/yes	yes/no
7. multimedia/CD-ROM	yes/ yes	yes/ minimal	yes/yes	no/no	yes/yes	yes/no
8. sound recorder	yes/ yes	yes/ yes	yes/yes	yes/yes	yes/yes	yes/yes
9. digital camera	no/ no	yes/ yes	yes/yes	yes/yes	yes/yes	yes/no
10. CD-Player	yes/ yes	yes/ yes	yes/yes	no/no	yes/yes	yes/no
11. internet access	yes/ yes	yes/ yes	yes/yes	yes/no	yes/yes	yes/no
12. laser disc player	no/ no	no/ no	no/no	yes/yes	yes/no	yes/no
13. digital sound recorder	no/ no	yes/ recent	no/no	no/no	no/no	no/no
14. mixing capabilities	yes/ yes	yes/ yes	no/no	yes/yes	yes/yes	no/yes
15. digital video camera	no/ no	yes/ yes	no/no	no/no	no/no	no/no
16. video editor	yes/ yes	yes/ yes	no/no	yes/yes	yes/yes	yes/yes

Note: First response listed is answer to question 3 a. Second response, separated by slash, is answer to question 3 b

Question 4 What kind of lighting system do you have?

- A. Rheostat Transformer
- B. Rheostat Transformer
- C. Electronic
- D. Computer enhanced electronic
- E. Computer enhanced electronic and rheostat transformer
- F. Rheostat Transformer

Question 5 a. Do you personally use a computer to create materials for course work?

Yes: 83.4 % No: 16.6 %.

Question 5 b. Do you have access to a computer in your classroom?

Yes: 83.4 % No: 16.6 %.

Question 6. a. Have you ever video-taped rehearsals or performance?

Yes: 100 % No: 0 %

b. Have you used these for class critique?

Yes: 50 % No: 50 %

Question 7. Do your students have access to a computer in your classroom?

Yes: 50% No: 50%.

Question 8. Have you ever had students create products for classroom projects using a computer?

Yes: 50% No: 50%

Question 9. Are you aware of theater simulation software packages? Which ones?

Yes: 33.2% No: 66.8 %

Opening Night was the simulation software mentioned by both respondent A and D.

Question 10 a. Do you ever teach the use of a particular technology? Which ones?

b. If you do, would you characterize the teaching of it as: one-on-one as need comes up, small group instruction, or whole class instruction?

A: No

B: Newer technology taught in small group or whole group instruction.

C: Microphone usage and lighting taught mostly one on one as need arises.

D: Lighting taught in small group and one on one as need arises.

E. Lighting, sound, video taught in small group.

F: Lighting taught in small group

Question 11. Have you ever taken courses or workshops in the use of technology?

Yes: 66.8 % No: 33.2 %

Question 12. a. Do you use publication software? 12 b. Computer assisted drafting (CAD)?

a. Yes: 83.4 % No: 16.6%

b. Yes: 16.6% No: 83.4%

Question 13. Do you use lighting, sound, or other technologies in productions?

Respondent A: lighting, sound, video, slides

B: lighting, sound

C: lighting, sound, slides

D: lighting, sound, video, slides

E: lighting, sound, video, slides

F: lighting, sound, video, slides

Question 14. Do you teach a stage craft course or the equivalent?

Yes: 50 % No: 50%

Question 15. What do you consider the primary barriers to using technology to support your curriculum?

- a. time
- b. my curriculum concerns primarily acting technique
- c. resources (access to the equipment)
- d. personal knowledge in the use of various technologies
- e. money

A:	B:	C:	D:	E:	F;
1. money	resources	money	time	money	time
2. time	acting	knowledge	money	resources	money
3. resources	money	resources	resources	time	money
4. acting	knowledge	time	knowledge	knowledge	knowledge
5. knowledge	time	acting	acting	acting	acting

Release Form

I, _____, agree to be interviewed by Michael Butterworth for research purposes only and in partial fulfillment of his completion of a Master's in Science in Educational Change and Technology Innovation at Walden University . I agree to let Mr. Butterworth tape- record the interview(s), use the information I provide, and quote from the interview, provided that

1) my anonymity is guaranteed in the final document by being referred to in the most generic sense (i.e. an artistic director of a professional theater in the Puget Sound region, or professor of theater at a university in the Puget Sound region), and

2) all tape recordings are erased or destroyed within one year of the date of the interview.

Printed Name _____

Signature _____

Date _____