Using Electronic Portfolios to Archive Student Performance

Phyllis M. Olmstead

University of Central Florida, phyllis@olmstead.com

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USING ELECTRONIC PORTFOLIOS TO ARCHIVE STUDENT PERFORMANCE

by

PHYLLIS M. OLMSTEAD

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Education in the Department of Instructional Programs at the University of Central Florida Orlando, Florida

April 1994

Major Professor: Barry W. Siebert
ABSTRACT

This study regards the use of portfolios for evaluating and documenting student progress and performance. In consideration of the far reaching and global nature of education, the researcher included educators from both the United States and other countries. Based upon the great importance that many countries and states have placed upon servicing students by alternative means, the population sample examined included 500 teachers instructing by both conventional and distance education modalities. Many current educational reform measures and legislative issues concern the attainment of job skills; therefore, both vocational and non-vocational instructors were included in the study.

Examined in the study are the media utilized in retaining portfolios (paper, product samples, audio/video tape recordings, computer diskette files, electronic mail files) by both conventional and distance education instructors. Paper and product samples in portfolios are considered as non-electronic methods for archiving student work. Audio and video tape recordings, computer files, and electronic mail files are considered electronic methods for portfolio archiving. Distance education and vocational
educators, respectively, are examined for the use of electronic and non-electronic portfolios.

A six question instrument was developed and a pilot study was conducted. The instrument included a question on whether or not the instructor used portfolios and a written description of the type of portfolio currently used. Those educators indicating the use of portfolios then classified, by type, the methods used in maintaining the portfolios. The respondents were further asked if they taught by distance education modalities. An additional questions ascertained the forms of distance education used to provide instruction. A final question asked the respondent to list the program or subject that she/he taught the majority of the time.

Findings indicate that approximately 40% of the educators surveyed use portfolios, but several of the respondents indicated the implementation of portfolios in the near future. No difference was found to exist between the use of electronic and non-electronic portfolios among teachers using portfolios. The same was true for both distance educators and vocational instructors using portfolios.
This dissertation is dedicated to the spirits of two very wonderful people.

Cupiedean Willis Pirkle
George Howard Pirkle

My grandparents have been wonderful inspirations throughout my life in the development of my desire for education. My grandmother died during the final phase of the preparation of this document, but her spirit continues to invade my thoughts and feelings as I complete this work. Granny will certainly be watching closely as I walk across the stage to be hooded.
ACKNOWLEDGEMENTS

Great appreciation is extended to Jeffery, my husband, for his support throughout my graduate school experience. He made a lot of meals and washed a lot of clothes while I studied and wrote. I can not express the depth of my gratitude to him for his work and support.

Larry R. Hudson advised me during both my masters and doctoral programs. He asked me to participate in several collaborative presentations and papers, both nationally and internationally. One day during my masters program, Dr. Hudson said, "Phil, when you do your doctoral research . . ." It was at that time I realized a doctoral degree was a possibility for me. For these reasons, I extend to Dr. Hudson a heartfelt thanks.

Barry W. Siebert has functioned as my committee chair for this dissertation. He has been very patient through the entire process and has been very supportive. I truly appreciate the ease at which I could contact Dr. Siebert, virtually 24 hours a day, by phone or electronic mail.

Thanks are extended to my committee members, Dr. Holt, Dr. Baab, Dr. Dziuban, and Dr. Butler, for their work in supervising my research and composition of the text of this
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My dissertation would never have been completed if it had not been for the moral support provided by my peers. Special thanks are extended to Yasmeen Qadri and Jittinun "Looky" Boonsathirakul. They were there to talk to throughout my program and were great study partners.
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<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>AVERA</td>
<td>American Vocational Education Research Association</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>Compact diskette--read only memory</td>
</tr>
<tr>
<td>CBE</td>
<td>Competency Based Education--often used in vocational and physical education programs</td>
</tr>
<tr>
<td>CBI</td>
<td>Computer Based Instruction</td>
</tr>
<tr>
<td>©</td>
<td>Copyright symbol</td>
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<tr>
<td>ERIC®</td>
<td>Educational Resources Information Center</td>
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<tr>
<td>FASTER</td>
<td>Florida Automated System for the Transfer of Educational Records</td>
</tr>
<tr>
<td>FIRN</td>
<td>Florida Information Resource Network</td>
</tr>
<tr>
<td>ICDE</td>
<td>International Council on Distance Education, an affiliate organization to the United Nation's Education, Scientific, Cultural Organization (UNESCO)</td>
</tr>
<tr>
<td>IEP</td>
<td>Individual education plan. Frequently associated with students with special educational needs.</td>
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<td>ITCA</td>
<td>International Teleconferencing Association</td>
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<tr>
<td>NCTM</td>
<td>National Classroom Teachers of Mathematics</td>
</tr>
<tr>
<td>NII</td>
<td>National Information Infrastructure: Agenda for Action or NII Agenda</td>
</tr>
<tr>
<td>OCPS</td>
<td>Orange County Public Schools</td>
</tr>
<tr>
<td>®</td>
<td>Registered Trademark</td>
</tr>
<tr>
<td>SCANS</td>
<td>Secretary's Commission on Achieving Necessary Skills</td>
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<tr>
<td>SCC</td>
<td>Sinclair Community College</td>
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CHAPTER I

INTRODUCTION

Technology is extremely important in today's classrooms. Many current reform efforts echo the need for technology and technological training for both teachers and students. Instructors, both in the conventional classroom and in distance education programs, need to be aware of the great impact of technology on their students' lives. Students, future workers, will be inundated with computers and other forms of technology in their homes and cars, at recreational facilities, on their shop floors, in boardrooms, and in shopping centers.

President Clinton and Vice-President Gore have spearheaded a program known as the National Information Infrastructure: Agenda for Action (NII) (The White House, 1993). The program is commonly referred to as the "Information Superhighway." The Executive Summary of the NII points out that:

Development of the NII can help unleash an information revolution that will change forever the way people live, work, and interact with each other: People could live almost anywhere they wanted, without forgoing opportunities for useful and fulfilling employment, . . . The best schools, teachers, and courses would be available to all students, without regard to geography, distance, resources, or disability. (TAB A)
It is quite obvious that Americans will become technology dependent—whether in the form of electronic television shopping or the acquisition of a degree from an institution on the other side of the continent.

The documentation of the acquisition of skills will become a very important job for tomorrow's educator. Students will need to prove to a potential employer, possibly thousands of miles away, that they possess the skills and talents necessary to fulfill the requirements of the job being sought. The labor department has been working on a means of detailing the skills needed for specific tasks.

The United States' Secretary of Labor's Secretary's Commission on Achieving Necessary Skills (SCANS) (1991) report's five competencies and three-part skills lists reinforce the importance of the reform of education in meeting the needs of a changing and more technological world. The SCANS competency list includes a competency called technology. The technology competency reads:

**Technology:** Works with a variety of technologies

A. Selects Technology—chooses procedures, tools or equipment including computers and related technologies

B. Applies Technology to Task—Understands overall intent and proper procedures for setup and operation of equipment
C. Maintains and Troubleshoots Equipment--Prevents, identifies, or solves problems with equipment, including computers and other technologies. (p. xvii)

The SCANS report includes a list of foundation skills that the committee considers mandatory for the proper functioning of all future workers, not just the college bound. The SCANS basic skills include:

1. reading,
2. writing,
3. arithmetic/mathematics,
4. listening, and
5. speaking.

The thinking skills considered desirable by the committee include:

1. creative thinking,
2. decision making,
3. problem solving,
4. visualizing,
5. knowing how to learn, and
6. reasoning.

Also included in the document was a list of personal qualities desired. The qualities desired are: responsibility, self-esteem, sociability, self-management, and integrity/honesty (SCANS U.S. Department of Labor, 1991, p. xviii).
In a different reference, Gwen Solomon (1992) states, "New tools allow students to pursue interdisciplinary learning and to look at information in new ways," she perceives "computers as electronic doorways, allowing people easy access to whatever they want to do" (p. 328). Her vision is a definite marriage of the idea of computers as tools for learning, the SCANS concern for creative thinking and problem solving, and the NII Agenda's intent for global access to technology.

James D. Purcell (1992) writes "Reform of the U.S. education process calls for integrating many different aspects of change, including technology" (p. 2). The use of technology, especially teleconferencing, will prove to be an important feature in many adult lives in the near future. Preparing future workers to understand and utilize teleconferencing and other technologies should be an important educational concern. All reform measures to implement technology in the classroom will require a concerted effort by teachers, teacher educators, administrators, parents, students, and community businesses in order to prepare students for their place in the future.

But are educators ready to face the coming onslaught of technology? Are old comfortable modes of teaching and evaluation being preserved at the expense of the students' future? Can we as educators implement the new (to some genre) "authentic" methods of instruction and evaluation?
Will evidence of performance and progress in the form of products and performances be accepted by mainstream educators and institutions instead of the standardized achievement and easy to score objective tests? Are educators implementing currently available technological means of archiving student achievement? Will authentic assessment and evidence portfolios fade away in a few years as another top-down educational reform effort fad (Abruscato, 1993; New York Times, 1993)?

Statement of the Problem

Teachers around the globe should be using portfolios (an alternative assessment technique) to evaluate and document student progress and products. In this rapidly changing world of technology, teachers should use technology to maintain these portfolios. Distance education teachers (as required by the NII Agenda) should be using electronic and non-electronic portfolios to document learning. Both vocational and non-vocational teachers should be using electronic and non-electronic portfolios to document skills achieved and to make education a reflection of the technological world of work (as required by the SCANS report).
Research Questions

The research questions examined in this study are:

I  What portion of educators use portfolios to document student progress and products?

II What percentage of educators use electronic portfolios to evaluate student progress?

III What portion of the distance education teachers use electronic portfolios to assess student progress?

IV What percentage of vocational teachers use electronic means to maintain student portfolios in assessing student progress?

Terminology

The following terminology will be used throughout the document.

Alternative Assessment: "alternatives to traditional multiple-choice, standardized achievement tests; ... refer to direct examination of student performance" (Worthen, 1993, p. 445), performance-based, authentic, and portfolio assessment (Wiggins, 1993).

Authentic Assessment: The use of non-standardized and non-objective examinations for measuring achievement or progress. The assessing of students in a manner and situation representing an occurrence of the event in the real world (Wiggins, 1993).
**Direct Assessment:** The personal observation by the instructor of the student performing skill being evaluated. See Alternative or Authentic Assessment.

**Electronic Media:** Media used by electronic storage devices to record data (type, video, or audio), i.e., computer diskettes, computer diskette read-only-memory (CD-ROM), videotape, audiotape.

**Electronic Portfolio for Lifelong Learning**

A permanent portfolio prepared over the student's (read person's) entire educational career and maintained on one or more electronic media (Olmstead, 1993a).

**Non-vocational:** Courses that are not directly identified as being within the categories listed as vocational. Courses include, but are not limited to, academic and classical studies. See Vocational.

**Performance Assessment:** A type of alternative assessment, i.e.; constructed--response items, writings, oral discourse, exhibitions, experiments, and portfolios (Feuer & Fulton, 1993). Performance-based assessment evaluates the students ability to perform tasks (Wiggins, 1993). See also Alternative or Authentic Assessment.

**Portfolio:** A group of selected examples of student work collected for a specific purpose. Also called personal educational portfolio, student performance portfolio, personal portfolio, or student portfolio. Student and
teacher select materials for the portfolio. Some districts or states require specific items for inclusion (Abruscato, 1993; Arter, 1990; Arter, 1992; Arter & Spandel, 1992; Feuer & Fulton, 1993; Paulson, Paulson, & Meyer, 1991; Saylor & Overton, 1993; Stenmark, 1989; Wiggins, 1993; Sweet, 1992)

**Student Products:** "writing in the form of journals or open-ended questions, videotapes, audiotapes, computer demonstrations, dramatic performances, bulletin boards, debates, student conference presentations, student designs and inventions, investigation reports, simulations, mathematical art, physical construction of mathematical models" (Stenmark, 1989, p. 6)

**TAB:** The White House chose to indicate page or section numbers of the *NII Agenda* by using the term TAB. In the case of computer wordprocessor packages, a search command could be invoked to forward to the TAB indicated in the table of contents. Electronically accessed data, such as the NII, are readable in a hardware dependent manner. Page numbers on a document are dependent upon the wordprocessing software package used to view the document or the printer and paper size used to produce a hardcopy.

**Vocational:** Courses that teach a trade or teacher education courses for vocational programs (e.g., agriculture, business, marketing, health, technology education, public service).
Limitations

There is no one source for a diverse population of international educators that includes both conventional and distance education instructors. The selection of respondents could not be random over the entire population of teachers but was randomly selected within the educational databases. The data cannot be generalized for application to the entire population of teachers in the world, only to those teachers in the accessible subpopulations.

Educational terms are subject to personal interpretation. One educator’s interpretation of a product sample could be interpreted by another educator as a paper file. For example, an essay could be considered a paper file by an agricultural teacher; whereas, a creative writing teacher might consider the same essay a product sample. For this reason, this research will classify both paper files and product samples as non-electronic methods of documenting performance. Electronic methods of documenting performance and production include some type of electronic device used to record and store information. Examples of these devices are videotape recorders, audiotape recorders, wordprocessors, and computers.
CHAPTER II

REVIEW OF RELATED LITERATURE

Listings in the Educational Resources Information Center (ERIC®) database surged from a low of 10 listings in 1988 to a high of 148 listings in 1992 using the keywords "education and portfolios not finance" (search date March 2, 1994). ERIC® entries include professional papers, monographs, and research submitted to the national database as well as published journal articles. The increase in listings reflects nearly a 15 fold surge in the publication of articles on the topic. If the number of entries on the ERIC® database reflects current research interest in a subject, the sudden surge in publication listings reflects a considerable interest in educational portfolios by the educational community.

Judith Arter (1990) states that "portfolios for instruction and assessment has become a popular buzz word" (p. 1). State departments of education have stepped into the alternative assessment arena by requiring portfolios as a portion of a three-part assessment program for all students (Koretz, 1992; Saylor & Overton, 1993).
Portfolios

One form of documenting student competence is an alternative form of assessment known as a personal education portfolio. Portfolios have been used for many years in art, finance, modeling, photography, engineering, and other career areas where examples of work are gathered to verify competence or quality (Olmstead, 1993a). The EQUALS staff and the Assessment Committee of the California Mathematics Council also points this out in the Assessment Alternatives in Mathematics (Stenmark, 1989).

Reform Issues

Theodore Sizer and Bethany Rogers (1993) supported the use of portfolios in an article in Educational Leadership. They state, "Students' work should be maintained over time in portfolios or files. The work should be kept at school and should be open to the students, teachers, families, and chosen representatives of the district and state" (p. 26).

The SCANS (1991) report assumed the use of portfolios in the classroom in the following statement:

The SCANS competencies are tested in the same way--formal assessments at grades 8 and 12, but daily reinforcement occurs in curriculum activities centered on team efforts, school projects, and diaries, notebooks, and records of experiments maintained in each student's portfolio. (p. 20)

In order for items to be placed in a student's portfolio a portfolio system must already be in place.
Many language teachers use portfolios to document progress from the beginning to the end of courses in writing skills, syntax, and creativity. In the past portfolios were stored away after the completion of a course not to be seen again, except in the case of the dreaded state audit. Storage of these paper files for accountability proved to be cumbersome (M. Smith, personal communication, August 1993).

The state of Vermont’s portfolio project is limited to grades four and eight for the subject areas of writing and mathematics (Abruscato, 1993). Daniel Koretz (1992) reports that in "about half of the [Vermont] schools investigated, local staff had already expanded the portfolio program beyond the two grades . . . and principals in other [sic] numerous other schools expect to follow suit" (p. 1) soon. Orange County (Florida) Public School (OCPS) Board Members voted on the acceptance of an alternative assessment pilot project and grant during their August 10, 1993 board meeting (OCPS, August 10, 1993).

Experience Issues

Bellarmine College, Louisville, Kentucky, permits students to petition the college for credits toward a degree based upon portfolio application (Academic Affairs, 1992). Students examine course descriptions and build an extensive portfolio that exhibits their personal experiences reflecting completion of the content of the courses for credit requested. Students pay partial fees for an ungraded
"pass" of the courses successfully supported by the written portfolio application.

Sinclair Community College (SCC), Dayton, Ohio, has a complete program developed to authenticate student experiences for college credit. SCC offers a three-credit-hour course that guides lifelong learners through the development of an extensive life experience portfolio. The portfolio includes a chronology of post-high school life, a life event story, a goal paper, an experience competency report, and documentation for each competency claimed. Upon completion of the portfolio development process, an extensive screening sequence is followed to verify competency and skill achievement. The college also offers credit by examination and by program evaluation (Mann, 1993).

Curriculum Issues

Writing is a viable means of providing documentation of student understanding in all subject areas. Sarah Freedman from the Center for the Study of Writing, University of California, Berkeley, was quoted by Hill (1992) as saying, "Time [and class size] work against teachers' efforts to do the kinds of writing that would be maximally effective." Hill further stated, "Writing across the curriculum advocates believe that writing should not be its own subject--writing is a way for students to understand all subjects (p. 21)."
Several states have started using writing portfolios in state education reform initiatives as forms of alternative assessment across the curriculum, including teleconferencing programs. For example, schools in Kentucky began using writing assessments for verification of competency in writing, reading, mathematics, science and social studies in the fourth, eighth, and twelfth grades during the spring of 1992 (Hill, 1992; Saylor & Overton, 1993). The Kentucky plan appears to be a direct rewrite of the America 2000 (U.S. Department of Education, 1991) goal number three:

American students will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy. (p. 3)

Another example of writing across the curriculum can be seen in the state of Maryland. With the aid of Potomac Edison Company, Maryland instituted the use of computer-based instruction (CBI) in 1988 across different subjects with varying outcome objectives (Wilder & Fowles, 1992).

Assessment Issues

Students' work can be evaluated by trained judges (Hill, 1992; Koretz, 1992) or committees (Wilder & Fowles, 1992), computerized writing software packages (Neff, Bourret, & Nelson, 1992; Quesoftware, 1990), CBI modules (Wilder & Fowles, 1992), self-editing (Bracey, 1992; Cleveland &
Michael P. Ford and Marilyn M. Ohlhausen (1991) conducted a survey that assessed the "Strengths of using Portfolio Assessment." Ninety-one percent of the respondents stated that portfolio assessment was a "positive indicator of student growth" and that 89% were "more confident in documenting growth when talking with parents" (p. 3).

Jay Simmons (1990) conducted a research project determining that conventional timed-writing assessment procedures, in comparison to portfolio writing assessments, dramatically undervalued the writing ability of students. This devaluation was especially pronounced for those students on the lower end of the writing scale. In Simmons' study the students selected their favorite three pieces of writing produced during the year to place in the portfolio. The students also took a timed-writing test. Both the timed-writing test and portfolio pieces were evaluated holistically. "When we compared the timed-test scores with the median score in the portfolio assessment we found that timed tests significantly underestimated writing ability, especially for weaker writers" (p. 28).

During the course of the portfolio process students and teachers are able to reflect back over previous stages of the writing process of one paper or over a period of time.
through several papers to determine if and where a student’s skills have developed or stagnated. Personal observation of learning becomes a viable alternative assessment technique and can be affected by personal goal setting and individual education plans (IEP) with the aid of electronic portfolios.

**Portfolios via Technology**

The use of the computerized evaluation for electronically stored portfolios can be conducted in minutes and requires much less storage facilities than conventional paper portfolio systems. The use of electronic grammar checkers or readability evaluations to evaluate student writing in a wordprocessor results in detailed reports of grammar, readability levels, and clarification comments (Olmstead, 1993b; Quesoftware, 1991). One high-density diskette could store a year or more of student’s writings as well as teacher inserted comments, electronic evaluation reports, and suggestions for change. These files are easily exchanged between teacher and student wordprocessing systems by either diskette exchange or electronic transfer via a local computer network or a modem connection. Modem transfers eliminate the need for compatible computers and software by the school and student.

**Individual Impact**

In a computer versus pencil writing study by Gerald Bracey (1992), students who worked on computers wrote
lengthier pieces and they readily accepted opportunities to revise the work at a later date. Students who wrote using paper and pencil tended to write less than those students on computer and tended to decline the opportunity to revise their work at a later date. Bracey determined that "average writers were most creative when they used word processors and revised while writing," but "only 47.5 percent of fourth graders performed at a minimal or adequate level on a persuasive writing essay" (p. 12).

Writing across the curriculum using word processors helps students be more creative, improves thinking skills, and improves their ability to analyze their own writing (Bracey, 1992; Farr et al., 1990; Hill, 1992; Stotsky, 1990). The use of other forms of technology can aid in documenting student work and progress. In addition to computer diskettes, video tape recorders (Milone, 1991), scanners, and still-frame video input cameras (Holzberg, 1992; Warnshuis, 1992) can be used to record content for student portfolios.

How can a student's dance performance, speech, piece of art, or skit be fairly documented in a portfolio or explained in words? A video-audio recording is a more logical method of documenting a visual or auditory activity than conventional paper and pencil critique forms (Bruder, 1993). Audio input devices are available to add student and teacher voice to computer records. Students are even able
to develop an audio story-line to go along with visuals incorporated in their portfolios (Cron, 1992).

Isabelle Bruder (1993) talks extensively about the use of technology with alternative assessment. Bruder calls for the use of varying technologies for student projects and presentations. Multiple technologies, including video, audio, and computer media, can be implemented to document student activities and products.

System Impact

The Florida Automated System for the Transfer of Educational Records (FASTER) provides for the electronic exchange of student files over Florida Information Resource Network (FIRN). The Council of Chief State School Officers "announced the completion of the first phase of development of SPEEDE/ExPRESS, a system which will exchange student records electronically at the national level" (Castor, 1993). The FASTER system was a model for the development of SPEEDE/ExPRESS. Implementation of the new system could facilitate the exchange of electronic portfolios so that students may continue their portfolios over their lifetime no matter what city or state they move to. The development of the "Information Superhighway" should help facilitate the SPEEDE/ExPRESS. Original portfolios transmitted or stored electronically could then be exchanged and used in the screening process for school enrollment and college admittance. The use of technology could easily reduce any
concern for portfolio archiving or storage problems (Bruder, 1993). Only 33% of Ford and Ohlhausen’s (1991) survey respondents deemed storage difficulties as a "Reason for Not Using Portfolio Assessment" (p. 3).

Social Impact

One continuing thread throughout the literature on alternative assessment is the desire to simulate real life. School activities should parallel activities of the citizen worker (this sounds a lot like the SCANS Report). Stotsky discusses using writing about real life civic issues in order to make writing meaningful and part of being a responsible citizen (Stotsky, 1990). Wiggins (1993) calls assessment in real-world situations authentic assessment.

Dr. Arthur Hansen’s (1992) buddy computers in the home provide families with computers that allow the students to work at home on school projects and families to share the computer using experience that they may have at work. The Purdue President Emeritus says:

Mastery of fundamental computer skills is becoming a job prerequisite in our world where manufacturing no longer lures students out of school and onto the assembly line. Workers today must be able to take a team approach to problem-solving. They must possess critical-thinking skills that enable them to analyze a situation and propose effective solutions. They must achieve a level of comfort with technology—comfort based on a solid understanding of computer applications and computer functions, from the simplest to the more complex. (pp. 62-63)
Distance Education via Technology

Global learning has dissolved the walls of the classroom. Conventional teaching techniques are not able to reach and access global resources in a timely manner. In the past, pen pal correspondence between students in different countries took weeks to complete one interaction. Application of telecommunications in the classroom can facilitate real-time correspondence and learning.

Processes

Students seeking information from cohorts around the globe may receive responses to inquiries within minutes or hours of an inquiry. Documenting computer driven telecommunications in an electronic portfolio will add richness to the learning experience. The implementation of an electronic portfolio such a distance education program could not be simpler. Files can be downloaded directly into portfolio files or can recorded by a telecommunications log file.

Live electronic mail exchange of writing can result in extensive and rewarding collaborative projects. Some educators refer to this kind of exchange as one form of teleconferencing. Most students and teachers involved benefit from online collaborative writing projects (Foster, 1992; Stacey, 1994). Peer and self-editing skills become well developed and the process can be less threatening than in person critiques (Dorazio, 1992; Foster, 1992). All
levels of students, primary through graduate school, can benefit from electronic mail education communities and from accessing reference materials and books via computer networks (Shapiro & Hughes, 1992).

Systems

Sivin-Kachala and Bialo (1992) outline telecommunication systems that facilitate learning at home. Many computer based learning programs are detailed, including FIRN. Local, state, regional, national, and international learning networks are listed along with possible implementations and cost factors. Instructional Resource Guide: Telecommunications: Opening the Windows of the World (Ambler, Jacobs, Potter, & Davis, 1991) further details how one state teleconferencing system utilizes distance technologies for learning.

In Florida, students using FIRN can utilize multiple means of completing lessons with the aid of distant correspondents. "Guest speakers" (politicians, scientists, business leaders), who otherwise would be inaccessible, can be interviewed via the computer at their own convenience or can answer electronic mail inquires. A few of the computer teleconferencing networks accessible through FIRN are: AT&T Learning Network®, America Online®, Campus 2000, FrEdMail, GTE World Classroom®, National Geographic Kids Network®, SciLink, Library User Information Service (LUIS) (including ERIC®), Telecommunications Opportunities for Gifted Learners
TOGL), and Florida Abroad (FIRN, 1991). The INTERNET and BITNET connections via FIRN and the Florida Abroad, GTE World Classroom®, and Campus 2000 are a few of the programs students can use to access international connections via a computer account on FIRN (Ambler, Jacobs, Potter, & Davis, 1991).

**Concerns**

The conventional compartmentalization or fragmentation of learning has been a major thorn in the side of education. Portfolios must not be seen as a single evaluation of an individual program during a single year of a person’s educational career. In the case of the Vermont Portfolio Project, the portfolios were compartmentalized to fourth and eighth grades in just writing and mathematics classes. A holistic grading system, often used in portfolios evaluation, should be seen as part of a holistic learning system. It should not be viewed as just one tool used in one or two courses (Koretz, 1992).

**Instructor Inservice**

There is little literature on the negative aspects of portfolios as a form of alternative assessment. It is rather evident that there could be several administrative drawbacks in the use of comprehensive portfolios for lifelong learning. Abruscato (1993) wrote that

The real challenge to the success of the portfolio system will be the support of teachers. If teachers
feel that this project is just another directive from above, ... the level of attention needed to create and maintain a portfolio system will (p. 477) never be reached.

The State of Florida is conducting a pilot program on scoring that will attempt to measure if teachers can be trained to score portfolio type performance measures consistently across students, teachers, and districts (personal communication, FDOE, July 30, 1993). In reference to measurable evaluation techniques, Blaine Worthen (1993) discusses the various opinions of educators concerning the use of strict rubrics for scoring. He found that there are both supporters and detractors of uniform standards for scoring portfolios. There are people who wish to provide comparable assessments for accountability purposes and others who realize that making students evaluations comparable may destroy "the power and richness of assessment [that is] tailored to the student's needs and achievements" (p. 450). Mary L. Crowley contends that "not all portfolios need to be assessed. For example, if the primary function of the portfolio is to display a student's accomplishments" there is no reason to evaluate the portfolio as a whole (Crowley, 1993, p. 546).

Koretz (1992) reports low reliability of scoring across the state of Vermont in the evaluation of individual student assessments. "Despite the unreliability with which individual students' work was scored, statewide average
scores are quite reliable because of the large number of students" (p. 3). He further states that teachers found the programs inaugural year burdensome and that the program needed improvement. He counters these concerns with the claim that support was widespread and that "many educators reported that the system was a powerful lever for instructional change" (p. 1). They felt that the program had renewed their enthusiasm for teaching and had altered their own assessment of students.

Additionally, a consistent hardware and software setup should be considered to make a broad based interchangeable portfolio program (Bruder, 1993). For example, all departments and students should have access to the same version of WordPerfect® and IBM® compatible computers in order to afford students and teachers a sense of comfort in using their skills. Computer phobia, caused by failure at the console, should not be permitted to thwart the implementation of a portfolio system.

The State University of New York (SUNY) Brockport has implemented a writing program to evaluate student writing during college years. They assert that the use of ongoing assessment is valid to measure instructional outcomes and suggest the use of portfolio assessment for formative evaluations. The SUNY project recommended "in the absence of resources to support multiple measures of writing,
alternating the single-test essay and portfolio offers the best of both worlds" (Brand, 1992).

Another important factor to consider would be college wide (district wide, school wide) implementation. All departments and colleges would have to be trained to implement the program simultaneously. A current open university or other distance education facility utilizing teleconferencing would be more prepared to implement the program system wide than most conventional institutions. A conventional institution would probably have to train department clerks to start handling the portfolios and then slowly train all instructors.

Implementation will require careful teacher training. Time will be needed to fully inservice faculty for effective assessment. Northwest Missouri State University found that dedicated instructors felt benefits in teaching and evaluation, but some instructors complained that it took "too much time, is too much work, and 'unobjective and uncontrolled.'" The proponents of the portfolio program claimed "teachers of writing [were able] to gain other perspectives on making evaluations. It allows teachers to place their evaluations in a bigger context, and by so doing to gain in assessment skills" (Allen, 1992).

A program at Kamehameha Early Education Program in Hawaii evaluated the change in experience from scope and sequence of skills to a whole literacy and portfolio
assessment curriculum. The researchers determined that "transition to the new curriculum and portfolio assessment was difficult for practitioners . . . (with) traditional conceptions held about instruction and assessment" and that the instructors of the "old school" were apprehensive about the ability of the assessment process in measuring specific mastery of skills (Yumori & Tibbets, 1992).

Expense

One drawback of a holistic electronic portfolio could be the original high cost of implementing any technologically advanced educational program. The cost factor could be minimal if current equipment and software inventories were scanned and taken into consideration prior to implementation of the system. Current technology could be utilized to begin the program, eliminating high start-up costs. Video and audio recorders, slide projectors, and standard cameras can be used to initiate a technology based portfolio system.
CHAPTER III

METHODS AND PROCEDURES

The following methods and procedures cover both the original pilot study to test the instrument and to determine the number of subjects needed for the final study.

Pilot Study

Instrument Development

The instrument (see Appendix A) was developed to determine if the subjects used portfolios for evaluative purposes. It was determined that the respondent’s use of the word portfolio should be detailed. Since a quantitative survey listing portfolio descriptors could not be all inclusive and would be quite lengthy, the subjects were asked to describe their portfolio system by type, selection process, and duration of use.

Additionally, portfolio users were asked to indicate the type of portfolio implemented. Non-electronic portfolios were identified as being in either paper or product form. Electronic portfolios were defined as being on audio or video tape, computer diskettes, or in electronic mail files. Identification of subjects as either distance or conventional education was to be determined. Type of distance education methods was added to the survey to
ascertain whether the answer to the distance education question was accurate. Program of instruction identification was added to classify teachers as either vocational or non-vocational. Surveys were not marked in any fashion so anonymity could be questioned.

Implementation

A pilot study was conducted to determine the sample size needed for the available population of educators and to evaluate the instrument. The pilot study was conducted on teachers at an Orange County, Florida, middle school. The school’s strategic plan includes the implementation of portfolio documentation in the near future. The dual purposes of the study were explained during a faculty meeting, both to evaluate the instrument and to aid in the implementation of the school plan. In addition, the faculty were asked to include any comments regarding the clarity and the composition of the instrument. One week after the distribution the instrument the instructors were reminded to return any instruments that had not already been returned.

Results

Nearly 30% of the respondents indicated that they used portfolios in their classrooms. Many of the teachers responding indicated that they used one or more electronic modalities to maintain portfolios. Only one instructor indicated the use of distance education. The only non-
academic instructor that returned the instrument completed was the art instructor. All other respondents were teachers of academic subjects.

The data were tallied and examined (see Appendix B). A standard error test (Ary, Jacobs, Razavieh; 1990) was conducted on the results of the pilot study to determine sample size (see Appendix C). The results of the standard error test using a .05 confidence interval indicated a minimum sample size of 494 individuals. Minor clarifications were added to the instrument as recommended by the pilot respondents.

**Final Study**

The final survey instrument (see Appendix E) was distributed through the postal system and electronic mail to educators in distance education and conventional instruction. Respondents were randomly selected from the members of the International Council on Distance Education (ICDE), attenders of the International Symposium on Computer Conferencing (Miller, 1991), those educators listed in Wilbur and Lambert's *Linking America's Schools and Colleges: Guide to Partnerships & National Directory* (1991), and in *Who's Who in Vocational Education Research: 1993 Membership Directory of the American Vocational Education Research Association* (AVERA) (AVERA, 1993). The total available population was 2,266.
Instrument Dissemination

Domestically addressed surveys included a personalized cover letter (see Appendix D), the survey instrument (see Appendix E), and a preaddressed stamped return envelope. The stamp was unique so that return mail could be easily identified as part of the survey. Internationally addressed surveys included a personalized cover letter, the survey instrument, and a preaddressed return envelope. International return envelopes could not be prestamped. Electronic mail included the personalized cover letter and the survey instrument. Electronic mail surveys could be answered by regular post or by electronic mail (see Appendix F). Electronic mail identifies the sender; anonymity of electronic mail subjects could be preserved by the use postal return. Conventionally mailed instruments could also be returned via electronic mail. The same form of the final survey was distributed to all respondents.

Instrument Collection

Responses were received over a two-month period. A two-month period was selected to permit lengthy postal times needed to reach and receive returns from remote locations in some foreign countries. Electronic mail returns were the most timely and some domestic returns were the least timely. One electronic return was received the same day it was transmitted. Of the 500 surveys distributed, 266 responses were received (53.2%).
Some respondents sent advance electronic mail responses upon receipt of the instrument (received by electronic mail and postal mail). They notified the researcher of intent to reply or to expound upon the request for disqualification. The electronic contacts included requests for copies of the completed research. Many responses included unsolicited return addresses, business cards, and letters of encouragement.

Mail responses included current research on portfolios, classroom criteria for portfolios, future plans portfolio or distance education implementation, and grading systems for students. Most domestic responses included a common understanding of portfolios. International responses, on the other hand, hinted at a lack a clarity or interpretation of the meaning of the word portfolio in the educational environment. Some respondents indicated the use of portfolio type techniques but did not refer to them with the terms currently used in United States.
CHAPTER IV

DATA ANALYSIS

Returned instruments were sorted as either qualified or unqualified to be examined. Unqualified returns included those returned by the postal system due to change of address/unforwardable, self-disqualified (respondent asked to not be included), a change of duty of respondent from an instructional position to research or administration only, or the insufficient completion of the instrument. Surveys returned with a forwarding address were remailed to the new address. Of the 266 instruments received, 47 instruments were disqualified by the respondent or the researcher (17.66%). The remaining instruments used in the tabulation of the data totaled 219 (43.8% of the original sample, 82.33% of the surveys returned).

Research Question I

What portion of educators use portfolios to document student progress and products?

Portfolio use was determined based on the response to question one:

Do you use individual student portfolios to evaluate student performance or progress?
Survey item two:

If you answered YES to question 1, please describe the portfolio system that you use (a. type of documents, b. selection process, c. duration of use).

was used to qualify responses to survey question one.

TABLE 1

TEACHERS BY PORTFOLIO USE

<table>
<thead>
<tr>
<th>TEACHERS</th>
<th>USE</th>
<th>DON'T USE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed</td>
<td>87.0</td>
<td>132.0</td>
<td>219.0</td>
</tr>
<tr>
<td>Percent</td>
<td>39.73%</td>
<td>60.27%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Of the qualified responses, nearly 40% of the respondents currently use portfolios for assessment. A significantly larger number of educators in the sample population do not use portfolios for measuring student performance and products than do use portfolios. Qualifying statements given for survey question two indicated the impending implementation of portfolios in many situations.

Survey item two responses (see Appendix G) included type of documents, selection process, and duration of portfolio use. Document types varied immensely. Portfolio content was generally selected by the student. Some instructors required that the portfolio contents follow a specific set of guidelines.
The largest number of respondents indicated that the portfolios were either used for one term or for two years or more. The third highest level of responses was for portfolios used from one to two years. Four respondents indicated that the portfolios were intended for use during a related career.

**Research Question II**

What percentage of educators use electronic portfolios to evaluate student progress?

Portfolio use was based upon a "yes" answer to question one and confirmed by hand written answers to survey item two. Electronic methods of portfolio maintenance was indicated by a "yes" answer to question three parts 'c,' 'd,' or 'e' (audio and/or video tapes, graphics or text stored on computer disks, electronic mail files).

**TABLE 2**

<table>
<thead>
<tr>
<th>PORTFOLIO TYPE</th>
<th>ELECTRONIC</th>
<th>NON-ELECTRONIC</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed</td>
<td>45.0</td>
<td>42.0</td>
<td>87.0</td>
</tr>
<tr>
<td>Percent</td>
<td>51.72%</td>
<td>48.28%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Portfolio teachers responding to the survey indicated near even use of electronic versus non-electronic portfolios. That is, just over 50% of instructors using
portfolios use some form of electronic media to maintain the documentation.

**Research Question III**

What portion of the distance education teachers use electronic portfolios to assess student progress?

Distance education was determined by a "yes" response to question four:

Do you teach by distance education?, with verification by the response to survey item five (list the forms of distance education that you use).

**TABLE 3**

**DISTANCE EDUCATION TEACHERS BY ELECTRONIC PORTFOLIO USE**

<table>
<thead>
<tr>
<th>PORTFOLIO TYPE</th>
<th>TEACHERS</th>
<th>ELECTRONIC</th>
<th>NON-ELECTRONIC</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed</td>
<td>21.0</td>
<td>16.0</td>
<td></td>
<td>37.0</td>
</tr>
<tr>
<td>Percent</td>
<td>56.76%</td>
<td>43.24%</td>
<td></td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Table 3 indicates that just over 56% of the distance education teacher responding to the survey used some form of electronic media to maintain their students' portfolios. Nearly 17% of the qualified responses were from distance education instructors using portfolios.
Research Question IV

What percentage of vocational teachers use electronic means to maintain student portfolios in assessing student progress?

Survey question six:

What program or subject do you teach the majority of the time?

was used to determine vocational versus nonvocational status. Some respondents stated that they were vocational teachers and then further clarified their position with the subject area(s) instructed.

<table>
<thead>
<tr>
<th>PORTFOLIO TYPE</th>
<th>TEACHERS</th>
<th>ELECTRONIC</th>
<th>NON-ELECTRONIC</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed</td>
<td>15.0</td>
<td>15.0</td>
<td>30.0</td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>50.0%</td>
<td>50.0%</td>
<td>100.00%</td>
<td></td>
</tr>
</tbody>
</table>

Observation of the response numbers of vocational educators using and not using electronic portfolios shows an even distribution between the categories. The sample of vocational instructors using portfolios was nearly 14% of the qualified survey respondents.
CHAPTER V

DISCUSSION AND RECOMMENDATIONS

A synthesis of the data collected will be presented in this section. Both qualitative and quantitative data were collected. The quantitative data were presented in the previous chapter along with the interpretation of the data in relationship to each research question.

Discussion

The data collected indicates that portfolios have been adopted for use by about 40 percent of the teachers surveyed. Several respondents who do not currently use portfolios indicated that their institutions or states would be implementing the use of portfolios over the next year or two. Further studies will likely indicate an increase in the use of portfolios across the population. In the population of teachers using portfolios, the educators are just as likely to use electronic portfolios as not. Portfolio teachers who instruct at a distance are just as likely to use electronic portfolios as not. The same is true for vocational teachers using portfolios.

Respondents indicated that portfolios are used from one term in educational programs up to the duration of the
related career. Some respondents stated that the portfolios were intended for future professional use by the student. Internship portfolios were one type of instrument that were intended for both evaluative purposes and as future reference tools. Most electronic portfolios were also maintained in both paper or product form. That is to say, most teachers who utilize electronic portfolios also use non-electronic means of documenting student work.

Several respondents indicated that portfolios are implemented institution-wide. Recall that some of the respondents who indicated that their institutes were not currently using portfolios qualified their negative response by stating that a formal implementation process was under development and that the use of portfolios is imminent.

Recommendations

In an age of rapid mobility and high technology, conventional methods of maintaining and documenting student performance and products are truly outmoded. Educational agencies and individual educators need to develop easy to use and broadly available technological strategies for reflecting student achievement and understanding. The use of educational networks and the "Information Superhighway" will make the development and maintenance of individual electronic student portfolios broad based and widely applicable.
Electronic files could reduce paper cost and storage problems. Transmission of files via modems will reduce the need for photocopying of cumulative records, mailing envelopes, and postage. Therefore, the use of electronic portfolios might reduce office supply costs and have a positive ecological impact.

Portfolios can become a reliable tool for evaluating student skills and for documenting achievement. Electronic portfolios could result in high quality, compact, detailed samples of student work. Accountability standards could be more easily verified by large sets of data available by electronic portfolios.

It is imperative that teachers become involved in the use of current technology in order to afford their students with all the opportunities of the ever expanding world of telecommunications. The use of telecommunications for education, by its very nature, will permit easy documentation or logging of skills and performance. Electronic portfolios will become a natural spinoff of the students' use of computers to conduct research, compile data, and complete projects.

The issue of portfolio ownership could be eliminated with the implementation of an electronic portfolio process. Electronic portfolios can be easily duplicated. The initial institution could maintain the original material and make duplicates available (with student permission) to the
Job skills can be documented using portfolios in academic as well as vocational classes. A student need not register for a vocational program to learn and practice career related activities. All teachers should take the opportunity to utilize job-related activities in their courses whether or not the course is a vocational program. An electronic portfolio will permit recording of these skills and the documentation of student performances that are above and beyond the catalogue description of the course enrolled in.

It is recommended that all local school agencies examine the implementation of an electronic portfolio system and include such a program in their long-range strategic plan. Teachers and students should be encouraged to co-develop a portfolio program that will best suit the needs of their community. The system should take advantage of technology currently available and examine private and government grants to obtain additional state-of-the-art equipment that can be used for both instruction and evaluation.

Electronic Portfolios for Lifelong Learning® (Olmstead, 1993a) can be applied in virtually any school environment. It can be implemented at any educational level. Diskettes can be set up with empty directories that can be expanded as needed. If all students receive the same directory,
including postsecondary education, some might be inspired to fulfill their potential and seek higher education.

A sample directory for an electronic portfolio diskette (see Appendix H) might include:

- Primary
- Secondary
- Postsecondary
- Undergraduate
- Graduate
  - Masters
    - Advisement
      - Application
      - Masters Intent
      - Program of Study
    - Foundations
    - Research
    - Specialization
  - Doctorate
    - Advisement
      - Application
      - Doctoral Intent
      - Program of Study
    - Correspondence
    - Professional Memberships
    - Submissions and Publications
    - Core Program
      - Course Work
      - Comprehensive Examination
    - Research
      - Quantitative
      - Qualitative
      - Comprehensive Examination
    - Specialization
      - Course Work
      - Comprehensive Examination
    - Dissertation
      - Proposal
      - Dissertation
- Resume

Further Research

Additional research should be conducted on the impact of electronic portfolios on school finances and the environment. A paperless classroom could be a great
deterrent to waste in the school and increase efficiency. The use of permanent, non-paper portfolios could have a positive effect on the purchase of paper goods for printing and archiving student achievement. Furthermore, storage facilities could be used more efficiently with the reduction in paper files. Reduction in paper purchases and use could reduce the need to produce and recycle paper products.

A longitudinal study should be conducted to examine the long-range effect of the portfolio movement in the classroom. Will the portfolio movement be a short lived fad or will there be a major change in assessing student success? The study should examine the most successful methods of documenting and evaluating student performances and products. Characteristics to be considered could include efficiency, effectiveness, and economy.

The findings of this study in no way imply that a portfolio should be completed for every student. However, it is an option that may be considered based upon the needs of the child and the current instructional setting.
APPENDICES
APPENDIX A

Pilot Survey Instrument
Pilot Survey Instrument

1. Do you use individual student portfolios to evaluate student performance or progress?
   Yes ___  No ___ (If you answered NO go to question 4.)

2. If you answered YES to question 1, please describe the portfolio system that you use (type of documents, selection process, duration of use).

3. If you answered YES to question 1, which of the methods listed below do you use to maintain student portfolios? Mark YES or NO for each method listed.
   Yes  ___  No  ___  Portfolio format

   Non-electronic methods
   ___  a. Paper files
   ___  b. Product samples

   Electronic methods
   ___  c. Audio and/or video tapes of performances or products
   ___  d. Graphics or text stored on computer disks
   ___  e. Electronic mail files

4. Do you teach by distance education?  YES ___  NO ___
   (If you answered NO go to question 6.)

5. If you answered YES to question 4, list the forms of distance education that you use.

6. What program or subject do you teach the majority of the time?

Thank you for taking the time to complete this survey. Please return the survey to:
University of Central Florida Dissertation Project
Phyllis M. Olmstead
620 Sherwood Oaks Circle
Ocoee, FL 34761 USA

Phone number (407) 299-6159 (return FAX not available)
By Electronic Mail:
FIRN:olmstep INTERNET:olmstep@firnvx.firn.edu
BITNET:olmstep@firnvx
APPENDIX B

Results of Pilot Study
Results of Pilot Study

The following memo is a detailed report of the results of the portfolio instrument survey. Twenty-five of the seventy-nine teachers returned the survey instrument. Seven people indicated that they used portfolios, seventeen respondents stated that they did not, and one form was returned blank. Discrepancies occur between items where some respondents answered some parts of the instrument and not other parts.

Pilot Survey Instrument Results

1. Do you use individual student portfolios to evaluate student performance or progress?
   Yes 7  No 17  (If you answered NO go to question 4.)

2. If you answered YES to question 1, please describe the portfolio system that you use (type of documents, selection process, duration of use).

   a. The portfolios will be used the entire year. The portfolios will contain students (sic) final copy of their writing. Students will be asked to pick a piece of writing to be graded and I will pick certain pieces to be graded.

   b. Depends on subjects and methods of teaching: usually written, products, following directions product and artistic product

   c. Mostly for writing process papers. English--writing assignments--best student work--individual grades--portfolio grade.

   d. All of my students have a portfolio, all creative writing does into it, they choose the ones that will be graded.

   e. I have taught a brief computer elective course in which, they were graded by final product(s).

   f. Cumulative for 9 weeks--I let students choose their best samples of several things that I list. For example, a test, a worksheet, a report, an illustration, etc.

   g. Portfolio includes: computer & hand generated maps, graphs, data tables & letters. Students
will evaluate & choose best work to be included. Duration--19 week period.

3. If you answered YES to question 1, which of the methods listed below do you use to maintain student portfolios? Mark YES or NO for each method listed.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Portfolio format</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7</td>
<td>Non-electronic methods</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>a. Paper files</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>b. Product samples</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Electronic methods</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>c. Audio and/or video tapes of performances or products</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>d. Graphics or text stored on computer disks</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>e. Electronic mail files</td>
</tr>
</tbody>
</table>

4. Do you teach by distance education? YES 1 NO 6
   (If you answered NO go to question 6.)

5. If you answered YES to question 4, list the forms of distance education that you use.

Jason Project will be a unit our entire team will be using.

6. What program or subject do you teach the majority of the time?

   7  Yes--English (3)
   Mathematics (1) Integrated Team
   Science---Life (1)
   General (1)
   Social Studies (1)

   16 No--Art (1)
   English (2)
   Mathematics (3)
   Science (2)
   Social Studies---World History (2)
   World Geography Gifted (1)
   History (1)
   American History (1)

   Did not answer program or subject area (3)

   1 Returned not completed.
APPENDIX C

Sample Size Calculation
SAMPLE SIZE CALCULATION

\[
1.96 \sqrt{\frac{pq}{n}} = 0.04
\]

\[
1.96 \sqrt{\frac{(.29)(.71)}{n}} = 0.04
\]

\[
\sqrt{\frac{(.29)(.71)}{n}} = \frac{0.04}{1.96}
\]

\[
\frac{(.29)(.71)}{n} = \left(\frac{0.04}{1.96}\right)^2
\]

\[
\frac{.2059}{n} = 0.0004164
\]

\[
n = 494.48
\]

\[
n = 494
\]

\[
\alpha = 0.05
\]

\[
n = \text{sample population needed}
\]

\[
p = 7 \text{ positive respondents}
\]

\[
q = 17 \text{ negative respondents}
\]

Formula from Ary, Jacobs, & Razavieh (1990)
APPENDIX D

Cover Letter
Dear Colleague:

Your assistance is needed in conducting global research in the area of portfolios in the classroom. Your name and address were randomly selected from a listing of active educators and researchers.

Enclosed is a survey instrument on portfolios in education. This instrument is a crucial piece of my dissertation research project. I hope that you will do me the courtesy of completing the survey (in English) and returning the instrument to the enclosed address or by electronic mail (olmstep@firnvx.firn.edu). If you are not in instruction at this time, please pass this on to the instructor covering your courses.

Feel free to add comments that you consider important in using portfolios in an educational environment. Your input is greatly appreciated in an area that I personally consider vital in the rapidly changing classroom.

Thank you for your time and consideration of this issue. If I can assist you in any way in the future feel free to call upon me.

Sincerely,

P. M. Olmstead, M.Ed.
APPENDIX E
Portfolio Survey Instrument
Portfolio Survey Instrument

1. Do you use individual student portfolios to evaluate student performance or progress?
   Yes ___  No ___ (If you answered NO go to question 4.)

2. If you answered YES to question 1, please describe the portfolio system that you use (a. type of documents, b. selection process, c. duration of use).

   ________________________________________________

   ________________________________________________

3. If you answered YES to question 1, which of the methods listed below do you use to maintain student portfolios? Mark YES or NO for each method listed.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>___</td>
<td>___</td>
</tr>
</tbody>
</table>

   **Portfolio format**

   **Non-electronic methods**
   ___   a. Paper files
   ___   b. Product samples (i.e., drawings, models, finished pieces of work)

   **Electronic methods**
   ___   c. Audio and/or video tapes of performances or products
   ___   d. Graphics or text stored on computer disks
   ___   e. Electronic mail files

4. Do you teach by distance education?
   YES ___  NO ___ (If you answered NO go to question 6.)

5. If you answered YES to question 4, list the forms of distance education that you use.

   ________________________________________________

   ________________________________________________

6. What program or subject do you teach the majority of the time?

   ________________________________________________

   ________________________________________________

Thank you for taking the time to complete this survey.
Please return the survey to: Phyllis M. Olmstead
University of Central Florida Dissertation Project
620 Sherwood Oaks Circle
Ocoee, FL 34761 USA
Phone number (407) 299-6159 (return FAX not available)
Electronic Mail: INTERNET: olmstep@firnvx.firn.edu
           BITNET: olmstep@firnvx
APPENDIX F

Sample Electronic Mail Responses
Subject: your survey

I received a copy of the survey you are doing on portfolio assessment. The Ministry of Education no longer directly marks student work and so I am unable to respond to your survey. I would, however, be interested in receiving the results of your work when they are available. I am currently, the Director of Technology and Distance Education for B.C..
ELECTRONIC MESSAGE

Date: 01-Nov-1993 03:20pm EST
From: pepost@magnus.acs.ohio-state.edu
Level:
Tel No:

TO: OLMSTEP

Subject: Re: Portfolios

PORTFOLIO SURVEY INSTRUMENT

1. Do you use individual student portfolios to evaluate student performance or progress?
   Yes _X_ No ___ (If you answered NO go to question 4.)

2. If you answered YES to question 1, please describe the portfolio system that you use (a. type of documents, b. selection process, c. duration of use).
   a) papers, reading cards, projects, drawings, presentations,
   b) students select best efforts to turn in
   c) 1 quarter (field and clinical evaluations kept on file)

3. If you answered YES to question 1, which of the methods listed below do you use to maintain student portfolios? Mark YES or NO for each method listed.
   Yes  _X_  No ___ Portfolio format
   Non-electronic methods
   a. Paper files
   b. Product samples (ie; drawings, models, finished pieces of work)
   Electronic methods
   c. Audio and/or video tapes of performances or products
   d. Graphics or text stored on computer disks
   e. Electronic mail files

4. Do you teach by distance education? YES _X_ NO ___
   (If you answered NO go to question 6.)

5. If you answered YES to question 4, list the forms of distance education that you use.
EMAIL to communicate with student teachers and local teachers

6. What program or subject do you teach the majority of the time?

Technology Education

Thank you for taking the time to complete this survey. Please return the survey to:

P. M. Olmstead
University of Central Florida
Dissertation Project
620 Sherwood Oaks Circle
Ocoee, FL 34761 USA

Phone number (407) 299-6159 (return FAX not available)

Electronic Mail:
INTERNET: olmstep@firnvx.firn.edu  BITNET: olmstep@firnvx

Paul E. Post  The Ohio State University post.1@osu.edu
#190 W.19 AvRm200  Educational Studies:  (614) 292-7471
Colmbs, OH 43210 Technology Education  fax 292-2662
APPENDIX G

Survey Item Two Responses
Survey Item Two Responses

2. If you answered YES to question 1, please describe the portfolio system that you use (a. type of documents, b. selection process, c. duration of use).

YES Portfolio--YES Distance Education

<table>
<thead>
<tr>
<th>RESPONDENT RESPONSE</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 a papers, reading cards, projects, drawings, presentations</td>
<td></td>
</tr>
<tr>
<td>b students select best efforts to turn in</td>
<td></td>
</tr>
<tr>
<td>c 1 quarter (field and clinical evaluations kept on file)</td>
<td></td>
</tr>
<tr>
<td>2 SE UTILIZA EN EL CUESTIONARIO ADJUNTO.</td>
<td></td>
</tr>
<tr>
<td>3 a grades; clinical evaluations (including final and anecdotal.) copy of registration; copy of grade sheet sent to student eligibility from professional association</td>
<td></td>
</tr>
<tr>
<td>b based on eligibility verified by prof. assoc.</td>
<td></td>
</tr>
<tr>
<td>c Kept for one year after student completion. Grades kept permanently in registrars office.</td>
<td></td>
</tr>
<tr>
<td>4 a Evaluation of performance, Certificates of completion, letters of Recommendation</td>
<td></td>
</tr>
<tr>
<td>b End of Quarter products</td>
<td></td>
</tr>
<tr>
<td>c 2 years</td>
<td></td>
</tr>
<tr>
<td>5 a 1 community study</td>
<td></td>
</tr>
<tr>
<td>b individual ID’s counts</td>
<td></td>
</tr>
<tr>
<td>c Spr of Jr yr</td>
<td></td>
</tr>
<tr>
<td>a 2 yearly program guide</td>
<td></td>
</tr>
<tr>
<td>b ind. selects pgm</td>
<td></td>
</tr>
<tr>
<td>c Fall of Sr yr</td>
<td></td>
</tr>
<tr>
<td>a 3 Portfolio of Lesson Plans</td>
<td></td>
</tr>
<tr>
<td>b Ind. selects unit</td>
<td></td>
</tr>
<tr>
<td>c Fall of Sr yr</td>
<td></td>
</tr>
<tr>
<td>a 4 Video taped lessons</td>
<td></td>
</tr>
<tr>
<td>b ind provides tape</td>
<td></td>
</tr>
<tr>
<td>c Fall of Sr yr</td>
<td></td>
</tr>
<tr>
<td>6 Completed Work--Interior Design Program</td>
<td></td>
</tr>
<tr>
<td>7 a Writing assignments, lesson plans--these documents are compiled, no standardized tests.</td>
<td></td>
</tr>
<tr>
<td>b We use this for all Ag Ed students.</td>
<td></td>
</tr>
<tr>
<td>c Throughout their academic career, 3-4 years</td>
<td></td>
</tr>
<tr>
<td>8 a educational planning process-paper document portfolio as part of the degree planning process.</td>
<td></td>
</tr>
<tr>
<td>b Completion of agreed upon tasks</td>
<td></td>
</tr>
<tr>
<td>c Whole program</td>
<td></td>
</tr>
<tr>
<td>9 * action research results * journal entries (reflection) * video [sic] tapes that provide</td>
<td></td>
</tr>
</tbody>
</table>
SURVEY ITEM TWO RESPONSES

RESPONDENT RESPONSE

evidence [sic] of transforming theory into practice

10 Distance education - self directed group of topics from study

11 Code system for standard mistakes. For other conceptual misinterpretations additional written information is registered by the tutor - We keep our files for ten years.

12 Portfolio assessment is not used often by students; alternatives methods for which experiential learning are preferred.

13 I can’t describe as I don’t understand clearly what you mean the term ‘portfolio system’ [editor: from Magyar (foreign) -- but marked YES for paper files, audio and/or video tapes of performances or products, and graphics or text stored on computer disks]

14 a Type of documents : Report Book I & II.
(ATTACHED) [editor: from Pakistan (foreign) -- respondent sent a copy of a primary and secondary school grade book for recording grades -- pages tear out, forming report cards]

b Selection Process : Monthly, Terminal and annual assessment.

c Duration of use : Throughout the year.

15 a Personal file with details recorded for each assignment sent in for assessment; photo-copies of all assignments.

b I am unsure what you mean by 'selection process.' Student work is marked on criterion--reference basis; assessment is on-going (formative).

c For duration of student’s enrolment period.

16 Not sure what you mean by portfolio, but I use journal/diary entries, projects-- usually semester length. [editor: from Monash, Australia (foreign) marked yes for all forms of non-electronic and electronic methods]

17 Can’s actually Experience has taught one that one needs to use holistic--about "art type" of evaluation. [editor: from Australia (foreign) but marked YES for paper files, product samples, audio/ video tapes, and disk storage]

18 Students develop + perfect products throughout the semester + collect them in the portfolio.
Products include scholarly article, practical project, letters requesting conference papers, ERIC® search printout.

19 Evaluation of basically print-based portfolio for life experiences credit purpose.
RESPONDENT RESPONSE

20  a  Written assignments
    b  Selected and prescribed by subject specialists
    c  One academic year
21  a  Essays (n=3)
    b  In class writing, out of class argumentation, Research; combination of student selected + Pre determined [editor: from Saint Paul, MN (domestic) manuscript quite illegible]
    c  1 quarter
22  We encourage teachers to use portfolios a part of the assessment process—especially when they are doing innovative teaching which is difficult to assess, otherwise.
23  We use them as culminating experiences in some classes and programs where they contain lesson plans, teaching materials. We **** use them as basis for making entry decisions for our Ed.D. in Ed. Administration.
24  Our university uses a paper portfolio’s for Writing evaluation
25  Multiple assignments resulting in 30 - 50 page portfolio. — advertising analysis, ceremonial discourse, etc as part of Composition II.
26  In student teaching the students assemble a "resource file" including video tape of teaching, lessons plans, self-evaluation + other evaluations, tests, materials, etc.
27  each class has a component
28  The Continuous Assessment system is practiced in both elementary, middle, and High Schools. Weekly or Daily performance of each individual pupil is recorded on a large sheet of paper for final assessment at the end of each term.
29  [editor: no comments but marked paper files, product samples, and audio/video tapes]
30  English composition I—Essays + revisions & Basic Communication—memos, bus letters + resumes, essays
31  Documents are at discretion of advisors and are kept until graduation of student.
32  In the most part I use this for Honors/post-graduate students.
    a  I especially use Guided reading assignments
    b  For post-graduate students
    c  Throughout candidature (usually a year full time or equivalent)
33  Formative evaluation, twice per course, same questions every course
SURVEY ITEM TWO RESPONSES

RESPONDENT       RESPONSE

34 [editor: respondent included a document named "1993-94 AGRICULTURAL EDUCATION MAT--Final Evaluation Procedures for Portfolio and Oral Examination--FORM C" as response for question 2.]

a) Introduction, table of contents, resume, endorsements, papers generated during specific graduate level courses in Agriculture, concluding statement. "The content of the portfolio will include revised papers and projects completed as part of your course work. . . . work samples, video-tape of your teaching, and materials documenting additional professional activities in agricultural education.

b) Student selects documents as specified in content list by institution. Self selects video-tape of teaching and material samples.

c) To be generated prior to final oral examination by committee and could be used by for employment purposes.

35 We have a unit/pts selection system whereby dist. learners accumulate blocks (courses) of 5/10/20 pts towards their study degrees. However, most are mature students; teachers + other professionals.

36 Modified--assignments are portfolio items--i.e. classroom management plan, lesson plan & revision, etc. plus reflective pieces on each.
YES Portfolio--NO Distance Education

<table>
<thead>
<tr>
<th>RESPONDENT</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Resume’, Goals &amp; Philosophy, Transcript, PPST Test Scores, Seminars Attended, Tuberculin Test, Ltrs of Recommendations, Field Experience Logs, Organization &amp; Honors</td>
</tr>
<tr>
<td>2</td>
<td>Samples of each project presented professionally Products submitted for grading during the semester. Students may redo + correct mistakes. All projects included in final port.</td>
</tr>
<tr>
<td>3</td>
<td>[editor: did not answer 2 but marked YES for paper files and product samples--wrote at bottom &quot;Most all teacher files are paper.&quot; ]</td>
</tr>
<tr>
<td>4</td>
<td>This is a competency--based portfolio which students sue to organize their coursework, professional development activities, + employment experience to demonstrate proficiency or to identify areas which need work. The Portfolio is a college wide document designed to build a comprehensive record of instructional and non-instructional activity during the course of a students college experience (available upon request).</td>
</tr>
<tr>
<td>5</td>
<td>A clinical Performance Record to record progress and to Evaluate the last 2 weeks of the clinical (Nursing) Experience one per semester (4 semesters total).</td>
</tr>
<tr>
<td>6</td>
<td>Students choose 3-5 examples of their work to include with their resume and letter of application.</td>
</tr>
<tr>
<td>7</td>
<td>Competency based instructional system using a competency profile which incorporates SCANS competencies, daily progress as well as task + competency completion notes.</td>
</tr>
<tr>
<td>8</td>
<td>Last Spring--I tried it for 1 course--teaching methods--Students developed their philosophy teaching. A unit of study--lessons plans--video tape of teaching performance. I would do it again.</td>
</tr>
<tr>
<td>9</td>
<td>Student projects--Tests--Folder of completer ***wings--Student Term paper in their major field</td>
</tr>
<tr>
<td>10</td>
<td>All design classes are judged on end of semester Portfolio--finished presentation + prelim work. Transfer students are placed &amp; credits accepted by portfolio review of previous graphic work.</td>
</tr>
<tr>
<td>11</td>
<td>Completion of competencies--criterion-based curriculum Attendance/Behavior--Employability rating</td>
</tr>
<tr>
<td>12</td>
<td>On site observation reports--paper handwritten</td>
</tr>
</tbody>
</table>
Evaluation of completion of individualized learning packets

- Types of documents: assignment sheets, instruction sheets, advisory committee handbook, lessons plans, tests, procedure sheets, school policy handbook
- Set criteria--satisfactory or unsatisfactory grade--competency based
- 4 weeks to prepare--can use throughout teaching experience

Students are given a list of portfolio contents requirements when they enter the program. Each program specific course requires documentation in the portfolio.

We use an entry assessment paper; course evaluation; papers for various courses along with a writing assignment purpose sheet attached to it; outside reading, outside accomplishments + self-eval. as a learner.

Course assignment (papers), news Articles, Journal, Related Literature, class presentations, posters

[editor: no answer in blank but marked YES for paper files and product samples]

S keeps a journal of the assigned readings for Us 1 semester course--from time to time I ask for a photo copy of a page or 2 which may be referred to during this essay "exam"

If class elects to have most of final grade determined by individual portfolios, I distribute assignment sheet which includes course required competencies (+ thus varies by course number). Portfolio contents (almost always essays) are self selected revised essays by student to meet criteria given + each entry must include a self-reflective cover sheet.

Assignments; Course Plans and Material, developed over period of 18 months.

22 a Video, audio tapes, papers, instructional materials (units)
    b instructor with assistance by student
    c begin junior year, extends through senior year (2 yrs)

Only for student teachers in some disciplines

Contents Students prepare a portfolio that gives a portrait of themselves as a thinker. Portfolio is discussed in a conference between student and professor. The student MUST do a portfolio to
pass the course—but the portfolio itself is not graded.

25 Required in student teaching and in select certification programs. Eventually will be required in all undergraduate certification program.

26 The portfolio is a process assessment tool. It begins in the first Education courses taken and is used to document students growth from the beginning to end to the program. During the final term, students construct a product portfolio from the process portfolio.

27 But only for prior learning assessment for adults. Portfolio consists of 1) Goal statement, 2) chronologue, 3) Degree Program, 4) Course credit requests, and 5) Documentation

28 Students use portfolios for entry into teacher education and for documenting their course performance

29 A writeup (Science Activity Sheet, SAS) is used for each science activity we do. These are combined along with written + physical materials to create the Science Activity Portfolio (SAP).

30 My grad students in ED 645, Develop. Read. in the Elem. Grades, must collect in a folder their class notes, reading notes, class content journal, and all handouts. These inclusions are graded as some portion of 50 points which counts in the course grade. [editor: included a student handout on the student portfolio]

31 a Work Samples
   b Student Choice + required parts
   c 1 yr

32 a Student journals of their tutoring experience and reader-responses to class text
   b students select entries to comment upon and to write their term paper
   c semester

33 Student's projects (art assignments) examples, individual projects, critiques selected by conference (teacher/student) or student choice when need arises to send portfolio student's work (4 years of High School Art) is all kept in portfolio. As contest, scholarship competitions, etc. arise, work is selected to be sent (either original work or slides thereof) to competition. Work is also sent to "advanced placement" judging for college credit. Work may be sent to universities or art schools as part of admittance
procedure. H.S. grades are based on additional work added to portfolio over the course of a grading period or semester for class assignments, individual projects sketchbooks, etc. Work is judged by students, peers, teachers, professionals in are field (jurors).

34 I use "unit" folios in Numerical Analysis, with homework, programs, discussion papers on unit topics.

35 Composition and other written work in Advanced Conv. + Comp. in French audio recordings + evaluations in Applied Phonetics (French)

36 a Type of documents: student self-assessment inventories, student projects, VCR tapes of student presentations, student writing (reports)

b Selection process: we attempt to select representative examples of student’s work across subject areas.

c Duration: since 1984.

37 CAEL prior learning portfolios

38 [editor: respondent attached a two page handout "TEACHER INTERN PORTFOLIO"-in response to question 2. In brief the handout outlined the portfolio as including: Resume: bio statement, transcript, test scores, certificates, honors, letters of recommendation from site and university supervisor, principal, faculty, etc.; Internship Notebook; Unit Plan; and Position Paper. Video tapes and materials or artifacts were suggested as parts of the portfolio.

39 Honors; work completed; drawings; letters of reference; committee responsibilities; classroom activities, video of teaching in several methods courses (4 yrs.)

40 Writing portfolios, includes all preparation, record keeping, and selection of best pieces essay tests, term papers, and objective test (all papers)

41 a I select the best over-all papers to enter in grade book

b Entire semester--carry over if I have next semester

c The portfolio is essential to the transferability of the course out of the community college to a 4 yrs school.

Weekly quiz, weekly assignments; progress on final project: mini-projects such as very brief essays compiled into semester portfolio. For Research course it’s pretty cut & dried, for Architecture
<table>
<thead>
<tr>
<th>COURSE STUDENTS MY EMPHASIZE VISUAL OR VERBAL ASPECTS, HISTORIC, CONSTRUCTION OR SOCIAL SCIENCES ASPECTS.</th>
<th>I ENCOURAGE THE USE OF PORTFOLIOS IN THE COLLEGE--HIGH SCHOOL FIELDTRIP PROGRAM TO KEEP BOTH STUDENTS AND HIGH SCHOOL TEACHERS PILOT PROGRESS. [EDITOR: RESPONDENT MARKED YES FOR PAPER FILES, PRODUCT SAMPLES, BUT QUALIFIED AUDIO AND/OR VIDEO TAPES WITH INSTRUCTOR'S PERMISSION. COMPUTER DISK METHOD NO RESPONSE WAS MARKED AS NO CAPABILITY.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>43 Daily logs, lesson plans, autobiographies, teacher evaluations, observation/site visits</td>
<td>44 PHILOSOPHY STATEMENT: ANALYSIS OF JOURNAL WRITING; LESSON PLANS; PROJECTS; JOURNAL ENTRIES; PLACEMENT TEACHER COMMENTS; CREATIVE ARTS FOLDER.</td>
</tr>
<tr>
<td>45 ASSESSMENT FOR MASTER'S IN ED. LEADERSHIP SCORE OF 3 OR 4 (1-4 HI SCALE) BY TWO PROFS (NOT STUDENT'S ADVISOR) THEY MAINTAIN + HAND IN FINAL COLLECTION</td>
<td>46 PRE/POST-TEST SCORES, STANDARDIZED TEST SCORES, PROJECTS. PERIOD--PER SEMESTER</td>
</tr>
<tr>
<td>47 PAPER FILES, VIDEO TAPES;</td>
<td>48 DOCUMENTS: TESTS, PAPERS, LESSON PLANS AND UNITS, RESPONSES TO STUDENT TEST, VIDEO TAPES OF CLASS, JOURNAL ENTRIES</td>
</tr>
<tr>
<td>49 WE USE STUDENT JOURNALS GIVING THEIR OWN COMMENTS ABOUT THE LECTURES (NOT CONTENT MATERIAL REHASHED) AND THEIR INTEGRATION OF THE MATERIAL WITH NEWSPAPERS, T.V.....</td>
<td>50 NOTE: VAST MAJORITY OF STUDENTS AND FACULTY UTILIZING PORTFOLIOS ARE IN NURSING (BSN + MSN). SOME MASTER'S DEGREE STUDENTS IN EDUCATION ALSO SUBMIT PORTFOLIOS FOR CREDIT. [EDITOR: RESPONDENT ATTACHED &quot;PRIOR LEARNING PORTFOLIO DEVELOPMENT&quot; EXPLANATION OF DETERMINING CREDIT BY PRIOR LEARNING.] DOCUMENT INCLUDED; A) RESUME OUTLINE OF LIFE AND /OR WORK EXPERIENCES, LIST OF COURSES THAT CREDIT IS DESIRED FOR, ESSAY OF LEARNING EXPERIENCES, TRANSCRIPT OF TRANSFER CREDIT, DOCUMENTATION OF JOB EXPERIENCES, &quot;PETITION FOR ACADEMIC CREDIT FOR PORTFOLIO ASSESSMENT&quot; FORM. B) CONTENTS SELECTED BY APPLICANT TO FULFILL NEEDED ITEMS LIST. C) &quot;THE ORIGINAL WILL GO TO THE FACULTY EVALUATOR. ONE COPY WILL REMAIN ON FILE IN THE COORDINATOR OF PORTFOLIO DEVELOPMENT'S OFFICE. THE SECOND COPY SHOULD BE RETAINED FOR THE STUDENT'S RECORDS.&quot;</td>
</tr>
<tr>
<td>RESPONDENT</td>
<td>RESPONSE</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
</tr>
<tr>
<td>51</td>
<td>Tip sheets, brochures, posters, news releases, newsletters, video, cassette,</td>
</tr>
</tbody>
</table>
APPENDIX H

Electronic Portfolios for Lifelong Learning
INSERT DISKETTE HOLDER AND DISKETTE HERE
REFERENCES


