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e-Portfolios in Music Teacher Education
by Vicki Lind

In their landmark report *Technology and the New Professional Teacher: Preparing for the 21st Century Classroom* (1997), the National Council for Accreditation of Teacher Education (NCATE) called for innovative approaches to teacher education that would take advantage of new technologies in preparing future educators. In response, many states have included strong technology components when developing standards for the teaching profession (Tran, Baker, and Pensavalle 2005). Future teachers are now expected to use technology to facilitate and assess student learning in the K-12 setting.

Preservice teacher education programs must find ways to prepare future teachers to use technology in their own teaching. In order to meet this goal, colleges of education must not only teach the skills necessary to use technology but must also help preservice teachers understand how to use technology to enhance learning. Doering, Hughes, and Huffman (2003) describe the need for preservice teachers to learn with technology and not just from technology. Rather than passively learning in an environment supported by technology, preservice teachers must engage in activities that require higher order thinking about the application of technology in their work.

One tool currently being investigated as a means to acquire skills while simultaneously building an understanding of the role of technology in education is the electronic portfolio. In this article I outline the distinctive advantages of e-portolios in the context of teacher education programs; I then provide the results of a qualitative study addressing the value of e-portfolios in the more specific context of a teacher education program in music. By providing preservice teachers with the opportunity to enhance their technological skills and to reflect critically upon their work as educators, e-portfolios can serve as an invaluable resource for meeting educational standards and promoting effective teaching practice.

e-Portfolios in Teacher Education

Recent research has established the value of e-portfolios as a resource for helping preservice teachers develop technology skills, document their work towards meeting professional standards, and reflect on their teaching practice. Milman (1999), for example, found that preservice teachers working with e-portfolios learned valuable technological skills while engaged in activities that reflected sound pedagogical principles. Developing e-portfolios allowed future teachers to learn the value of technology as both a teaching and a learning tool by engaging them in activities that directly supported their own learning. Likewise, Cunningham and Benedetto (2002) observed that through the use of digital portfolios to facilitate learning, preservice teachers gained skills as students that directly transferred to their work as teachers in K-12 settings. Other researchers have found that student teachers who work with digital portfolios are more likely to use technology in their teaching and that such teachers are better able to create meaningful experiences using technology in their lessons (Goldsby and Fazal 2000; Gatlin and Jacob 2002).

Moreover, with the growing importance of national and state standards in teacher education, e-portfolios are emerging as a way to document preservice teachers' ability to meet teaching standards while simultaneously demonstrating these future teachers' competency with technology. Gatlin and Jacob (2002) describe e-portfolios as providing a "richer snapshot" of preservice teachers' achievement and expertise as well as being a documentation of their technological skills (35). Because students are able to provide a more complete picture of their abilities using a variety of sources in e-portfolios, they are better able to demonstrate their academic competencies. Similarly, digital portfolios may provide an authentic means to embed technology standards into the assessment process; students can demonstrate their ability to use technology

while creating portfolios that document their ability to meet all of the required standards.

Portfolios have long been credited as a tool for facilitating critical thinking through reflective practice, and digital formats, or e-portfolios, are now seen as a way to connect this type of critical thinking to the use of technology (Levin and Camp 2002; Brown 2002; Devanney and Walsh 2002). Electronic portfolios allow for the inclusion of broad types of evidence to document learning, including video and audio media; Cunningham and Benedetto (2002) report that developments specifically in video technologies permit teacher candidates to collect, review, and manipulate video to demonstrate their growth as reflective professionals and as practitioners.

The work specific to music education often mirrors that of general education, and thus electronic portfolios are beginning to appear as components of many teacher preparation programs in music (Exhibit 1). Describing an electronic portfolio project implemented in music education at Case Western Reserve, Bauer and Dunn (2003) reported on the value of the portfolio process. The authors stated, "The real strength of the e-portfolios is the activities in which the students are engaged. Through continuous reflection, accumulation and selection of artifacts, and receipt of feedback, students are developing valuable skills that will serve them as professional educators" (17). Berg and Lind (2003) also discussed the value of the experiences students had while developing e-portfolios. They found evidence that constructing e-portfolios facilitated reflective practice and led students to assess their own learning. Students were able to reflect on their teaching, analyze their strengths and weaknesses, and set goals for continued improvement.

The e-Portfolio Study at UCLA

Motivated by the increased emphasis on e-portfolios in teacher education as well as my own experiences with designing and implementing e-portfolios in music teacher education, I carried out a qualitative study investigating the experiences of preservice music education students working with digital media to develop teaching portfolios. This project focused specifically on the use of electronic portfolios as a tool to facilitate reflective practice and as a way to document preservice music teachers' experiences as they prepared for the teaching profession. I framed the investigation with two broad research questions:

- What components of the portfolio process best facilitated music students' learning?
- What media best documented students' growth in musicianship, scholarship, and teaching ability?

Twenty-four undergraduate students enrolled in the music education program at the University of California at Los Angeles (UCLA) participated in this study. Nineteen of those students were enrolled in an introductory music education course and had to develop an electronic portfolio as part of the requirements for the course. Five senior-level students, who were not enrolled in the class, also agreed to participate in this study. They chose to continue working on previously designed portfolios, a decision that was independent of the requirements for the degree; their responses provided valuable longitudinal data for the study. I was one of two faculty members assigned to team teach the introductory course. I introduced the requirements for the portfolio project and provided technological support for students as they worked to complete the requirements.

To understand the students' experiences better and to look more closely at the process of portfolio development, I conducted a qualitative study investigating the experiences of these 24 students. I collected data using student interviews and field observations. Students enrolled in the introductory class participated in a focus group interview after completing their initial draft of the portfolio. The focus group interview lasted 45 minutes and centered on the decision-making process. I conducted a second group interview at the conclusion of the class, asking open-ended questions related to choice of media, organizational strategies, and future directions. I also conducted interviews with the five students who were working on their portfolios independent of the class. These interviews focused on the process of developing the portfolio, reasons for developing the portfolio beyond the requirements, and changes in the portfolio over time. Informal interviews

and field observations were conducted as students worked in the computer lab designing and refining their portfolios. Supporting data included e-mail correspondence, student reflections, and completed electronic portfolios.

Portfolio Design

In order to allow for flexibility and still provide a clearly articulated purpose, students developing portfolios for the first time were required to provide documentation in three major categories: (1) Teaching, (2) Musicianship, and (3) Academic Content. The students were provided with a PowerPoint template outlining the three headings (Exhibit 2). Additional slides were linked to the three headings, providing students with blank spaces to import their work. Section 1, *Teaching*, included slides for each of the six California Standards for the Teaching Profession (1997):

1. Engaging and Supporting All Students in Learning
2. Creating and Maintaining Effective Environments for Student Learning
3. Understanding and Organizing Subject Matter for Student Learning
4. Planning Instruction and Designing Learning Experiences for All Students
5. Assessing Student Learning
6. Developing as a Professional Educator

Students documented their ability to meet the standards using media they felt best illustrated their understanding of these six standards. Section 2, *Musicianship*, included four categories: (1) Principal Instrument, (2) Secondary Instruments, (3) Keyboard, and (4) Voice. Voice majors were given only the first three categories. Students were expected to import media that best illustrated their ability to sing and play. Section 3, *Academic Content*, consisted of five categories guiding students to document their understanding of music history, music theory, world music, human development and learning, and music pedagogy.

Students could choose to continue working with PowerPoint by linking video clips, audio clips, and work samples to the categories provided on the template or they could choose to use a different format for their portfolios while still adhering to the same topics. Because the portfolio had to include video, audio, and written documentation, students were instructed to choose a format that allowed them to link the required categories to diverse types of media. Students chose to create their portfolios using a variety of authoring tools, including PowerPoint, FrontPage, Netscape Composer, and Microsoft Word. Although we did not post portfolios on the Web, the portfolios resembled Web sites in their design. All students created a cover page that served as an index that would serve to guide readers to supplemental files. Most of the students burned their portfolios on CDs or DVDs in order to share their work with the class; others chose to store their documents on laptops or portable hard drives.

Promising Practices

We designed this study to explore the advantages of incorporating digital media into the portfolio process and to determine whether the experience of working with digital media would enhance learning. The results of the qualitative inquiry suggest that digital media do indeed make a difference. Working with digital media was a unique experience that helped students show evidence of their teaching skills and also resulted in robust learning experiences.

The students involved in this project relied heavily on digital media to document their learning. Students frequently included audio clips of performances (Exhibit 3) as well as video clips of peer teaching (Exhibit 4) and student teaching (Exhibit 5) to provide evidence of their work as musicians and teachers. Participants were encouraged to link single video or audio clips to several different categories or teaching standards when appropriate. For example, written scores and audio recordings of original compositions could be used to demonstrate work in both musicianship and scholarship categories and could be linked to the teaching

standards requiring the effective use of technology ([Exhibit 6](#)). All students included edited video clips illustrating their success at learning secondary instruments (any instrument other than their primary solo instrument) in both the scholarship and musicianship categories ([Exhibit 7](#)). The portfolios included several video clips of students teaching during preservice fieldwork ([Exhibit 8](#)), and the majority of students believed these clips to be the most important component of the portfolio. As one student said, "What better way to show you what I know than to let you see me in action?" Additionally, students included assignments completed for various classes and materials generated for use in preservice teaching events, linking them at certain points to corresponding state standards ([Exhibit 9](#)).

Requiring students to include a variety of types of evidence gathered from all classes proved to be a key component to this project. During the focus group and individual interviews, students discussed their field experiences in relation to what they were learning in class, and they connected their work in various courses to their teaching. Students not only used their work from musicology and ethnomusicology to document scholarship, but they also drew upon the work in these courses to develop curriculum and lesson plans for early field experiences. They relied on assignments from music and general education classes to document their ability to meet the standards for the teaching profession, and they referred to their work in these classes when talking about their growth as prospective teachers.

Researchers credit e-portfolios with facilitating reflective practice (Berg and Lind 2003; Bauer and Dunn 2003), and the experiences of our students bear this out. The preservice music education students discussed thinking deeply about their pedagogical philosophy and about what was important to them as teachers. The inclusion of digital video was particularly important in promoting reflective practice. Students looked for clips that best showed their teaching and in so doing had the opportunity to assess their own actions critically, whether working in front of their classmates during peer teaching events or being in front of public school students during field experiences. One student teacher made the following observation as he discussed working with his video recordings:

In assembling my video to [edit], it made me sensitive to just how much of my 53-minute lesson is "good" or "usable." It made me inspect the efficiency of my lessons and how well I spend my time in the classroom. For example, I was appalled at how long I sat there depressing the "Fast Forward" button looking for usable material, most of which was going through the parts where I just went on and on talking.

It should be noted that prior to this experience, all of the students had made video recordings of their field work and had watched these recordings, written self-critiques, and filled out observation reports. Video editing, however, was a very different activity. Rather than merely watching themselves teach and then writing about certain episodes, students searched for teaching behaviors to connect to the teaching standards. They reviewed their video sessions several times and each time seemed to learn more about their teaching. Through this process, the preservice students became more aware of their use of time, the clarity of their instruction, their idiosyncrasies in behavior, and the strengths and weaknesses in their teaching.

Encouraging preservice student teachers to continue working on their portfolios beyond the requirements of a single class also proved to be an important component of the process when considering reflective practice. In the case of students who revised e-porfolios they had completed two or three years earlier, the process promoted further reflection on their professional growth. For example, Elizabeth, one of the five seniors involved in this study, commented on the changes she noticed in her teaching practice:

Mostly I noticed the change in me when . . . I went back to two years ago—it was amazing how naive I was and how incomplete [my thinking] was . . . now it is much more about what I'm going for as a teacher. I noticed both the growth in the portfolio and in me as a teacher and knowing what I want to do.

Students frequently revised their portolios as they reflected on their teaching practices, but they pursued different paths depending on what stage of the process they had reached. Students who were beginning the process often documented their scholarship by including written assignments, original scores, and PowerPoint presentations that were required in various general education, music theory and history, world music, and music education methods courses. However, a noticeable shift occurred in the types of evidence students included in portfolios as they worked independently of class requirements. The senior-level students deleted many assignments that had originally been posted and replaced them with original essays generated specifically for the portfolio. One student explained the change by talking about the need for the portfolio to reflect her own personal beliefs and values as a teacher. Martha, a fifth-year senior who had worked on her portfolio for three years, made a similar observation: "As I continued to work, I was better able to understand what I meant to do and what I wanted to do as a teacher, and I was able to put that into my portfolio." As participants continued to revise and refine their work, they began to create portfolios independent of the requirements of the department. The students were motivated by the desire to reflect their unique teaching philosophy and to develop a portfolio that was a personal documentation of their work.

Initially, students tended to struggle with the unpredictable nature of portfolio development; they wanted to know exactly how their portfolio should look. However, the students eventually came to understand that the contents of the portfolio were not set in stone, and they grew accustomed to making frequent changes. The flexibility of the digital media, which allowed the students to access and modify their work easily, facilitated this understanding. Participants were required to think about the portfolio as a fluid, ongoing process and were encouraged to revise the content frequently. Many of the students continued to revise their portfolios well after the grading period had ended, and several continued to update their portfolios in subsequent years.

McKinney (1998) suggests that reflective practice allows learners "not only [to] step back from experiences but also to form connective links to rethink past experiences in the context of new ones and ideally to develop ways of applying those insights to future endeavors" (86). The preservice teachers in our study experienced these benefits of reflective practice. They thought critically and deeply about their experiences as both students and teachers, made connections between their academic work at the university and their teaching practices, and brought new ideas and convictions to their teaching.

Future Considerations

While this study reports positive results from implementing e-portfolios in teacher education, certain questions remain. First, this project required an immense amount of faculty and student interaction. Because the class size was relatively small and because only a few students were working on their portfolios outside of the requirements of the department, ample time was available for department members to devote to this project. Using portfolios in larger programs would be challenging. Certainly, any department would have to consider the resources required when looking at implementing e-portfolios.

Importantly, students working with e-portfolios tended to make connections between their academic course work and teaching. While having the ability to link single documents to several different areas of the portfolio may have facilitated this way of thinking, further research is needed to identify why this specifically occurred. Additionally, as students continued working on their portfolios independent of class requirements, they tended to reject the structured template we provided and expressed a strong desire for more freedom in designing and developing a personal portfolio. Whether or not this flexibility is possible or desirable at an earlier point in the process is worthy of further investigation.

Finally, in the longer term, further research would be merited concerning the sustained value of e-portfolios in promoting the instructional use of technology beyond the preservice stage of teacher education as well as in advancing the careers of teachers as they meet standards and receive accreditation in their work. Such research would contribute to the further expansion of e-portfolios as recognized, respected, and rewarded forms of professional practice.

Conclusion

While questions still remain regarding the use of e-portfolios in music education, our experiences tended to be quite positive. As teacher educators, we constantly look for ways to provide experiences for our students that will help prepare them for a career in education. Teacher education is a dynamic, multidimensional process—not merely an exercise in transmitting knowledge from one generation to the next. Finding ways to facilitate learning and at the same time capture the complexities of teaching and learning in a preservice teacher education program is certainly a challenge; our research suggests that e-portfolios may be a valuable tool in this process.

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