Early career impact of electronic portfolios in music teacher training.

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EARLY CAREER IMPACT OF ELECTRONIC PORTFOLIOS IN MUSIC TEACHER TRAINING

(APA)

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Abstract

This descriptive study explored the educational impact of electronic portfolios in a music teacher education program of a mid-sized Midwestern university. Perceptions of 39 practicing teachers who had recently graduated from the program revealed that electronic portfolios provided opportunities to learn about educational technology and were perceived as reflective of effort put forth during university training. Responses also indicated that connection between effective teaching in principle and effective teaching in practice was not clearly evident as had been anticipated. Transfer of portfolio processes into teaching was not apparent. Recommendations are made for teacher education programs employing electronic portfolios.

Early Career Impact of Electronic Portfolios in Music Education

Introduction

Electronic portfolios are gaining popularity in teacher education as a means of validating individual performance. Although only recently implemented in many universities, electronic portfolios are not a new concept. Articles were written as early as 1993 on the benefits and use of electronic portfolios in education (Niguidul, 1993; Bushweller, 1995; Fasick & McLaren, 1995; Milone, 1995; Palmer, 1995; Holt, Luwick, & McAllister, 1996; Levin, 1996; Tancock & Ford, 1996; Cooley, 1998; Wiedmer, 1998; Hanfland, 1999; Young, 2002; Garthwait, 2003; Hewett, 2004). By using technology as a means to create, store, and manage both products and processes of learning and achievement, it is possible to show, "what students and professionals working in the field know and can do" (Wiedmer, 1998, p. 586).

According to Wilson, Wright, and Stallworth (2003), the reasons for implementing the electronic portfolio in pre-service teacher education are (a) to purposefully integrate technology into instruction, (b) to reflect on uses of technology during instruction, and (c) to create portraits of student development toward becoming a future educator. Creating electronic portfolios increases students' comfort with technology (Parker & Farrelly, 1994; Wellington, 1995; Faison, 1996; Bartlett, 2002). Electronic portfolios as a means of teaching technology are an efficient and cost-effective way to prepare teachers to use technology in an educational setting. "The development of an electronic portfolio becomes imperative for the teacher candidate who must show content knowledge and skills through the use of technology" (Holland & Lindsey, 2004, p. 39). They suggest that e-portfolio implementation insures that students understand how to use technology for the educational setting. Students gain confidence in their abilities to use and incorporate technology that will hopefully result in willingness to use technology in their future classrooms. According to Barrett (1999), e-portfolios encourage student responsibility for their own learning and produce teachers that are more inclined to use technology as instructors. Since new teachers

are now required to have some understanding of technology uses, the e-portfolio demonstrates what a new teacher knows and can do with technology (Gatlin & Jacobs, 2002). “Many teacher education programs are investigating ways to increase the pre-service teachers’ technological experiences through electronic portfolio assessment and implementation” (p. 515). But the question remains if there is impact beyond technology training. It is important to investigate the impact that e-portfolio integration has on the professional growth as a teacher. In an earlier study by Wilson, Wright, & Stallworth (2003), there was little apparent connection between the e-portfolio process and its contribution to the professional growth as a teacher. This study will seek to understand connection to and impact upon the perception of professional growth from those who have been involved in developing e-portfolios and are now teaching music in schools.

The Study

At a midsized Midwestern university electronic portfolios had been implemented as a requirement throughout the coursework for music education majors. Beginning in the students’ freshman year, electronic portfolios led to fulfillment of music education requirements which led to state licensure. The e-portfolio was built around the INTASC framework as required for teacher licensure in that state. INTASC is an acronym for Interstate New Teacher Assessment and Support Consortium who developed and implemented standards for effective teaching. During their first year on campus, students were introduced to the INTASC Principles and how these are reflected as standards in teaching. Students also learned basic techniques of web-authoring necessary for creating a web-based portfolio. In courses during the remaining years, assigned coursework were designed as artifacts tied demonstrating understanding and proficiency achievement in relation to the standards. Each student was expected to revise and update their personal e-portfolio throughout their teacher training. A final revision of the e-portfolio occurred during the student teacher experience during which the students replaced former artifacts from coursework with current and relevant examples demonstrating proficiency and achievement pertaining to the INTASC and music

standards. Although formative assessment was provided throughout the process, a summative evaluation marked successful completion of the music education program.

During the four-year period of e-portfolio integration, there was anecdotal evidence of educational and early career impact. For a more profound understanding of impact, descriptive. The purpose of this study was to analyze data collected from a survey of music education alumni who had completed an e-portfolio and from interviews of selected alumni. The research questions that guided the study were:

1. What will music education graduates perceive as the educational impact of the e-portfolio process toward teacher preparation?
2. What is the level of satisfaction with the e-portfolio process experienced in their undergraduate music education curriculum?
3. To what extent was the e-portfolio helpful in attaining a teaching position?
4. To what extent will music education graduates use and apply what was learned from the e-portfolio?

Procedures

The study began with interviews of the faculty who were involved during the development and initial implementation of the e-portfolio. These interviews, along with reviewing the literature that supported their decisions, provided an understanding of the fundamental goals of the project. From this information, survey questions were developed. The university faculty assisted in revising survey questions and wording. The survey was piloted with the senior music education students who were asked to describe their understanding of the questions. Following this first revision, the Office of Assessment made a final revision to the survey, primarily in format, prior to sending it to alumni.

This project identified 107 Music Education graduates from May 2001 through Summer 2004. Due to the option offered to students from the early years of implementation allowing choice of participation, it was impossible to determine who had completed an e-portfolio so all graduates were surveyed. The

researcher was able to confirm addresses for 104 (97.2%) of the graduates. Surveys in paper form were mailed to these graduates with an online option. Two follow-up mailings were sent to solicit the highest level of response. There were 41 respondents for a response rate of 39.4%. A 40% return rate may seem low but during the first two years of implementation, some of those in the graduating class were part of a former curriculum and not involved with the e-portfolio. An attempt was made to identify these students with the survey question, "Did you create an electronic portfolio while at *(removed for submission)*?" Those who were not involved with the e-portfolio may not have responded to the survey. Another possible reason may stem from the survey being administered and financed by the university Office of Assessment. Students are surveyed on many occasions while a student at the university and as well as following graduation. Graduates who may have been tired of receiving multiple surveys from this office may have thrown away the survey before the envelope was opened. An even more probable reason for this low return rate may have been the addresses themselves. Many students' contact information from university databases was the address of their parents. We discovered several students who did not see the survey because it was never forwarded from their parents' home. The return rate as it was can still provide insight into the early career impact of the e-portfolio process for music educators.

The survey included items pertaining to e-portfolio implementation during their coursework, perceived impact of the e-portfolio as applied to teacher preparation, direct applicability of the e-portfolio to their teaching career, and professional usefulness of the e-portfolio beyond the university. See appendix A to view a copy of the survey. Responses were collected using a 5-point Likert scale followed by open-ended response items.

Survey findings were used as a foundation for developing interview questions to enrich understandings of the data. See appendix B to view the interview questions. These interviews were administered over the telephone or through e-mail. All alumni who marked the box on the survey, "Please check hear if you would be interested in discussing the portfolios with faculty" were contacted for interviews. Interview data

were categorized by topic and coded by commonality to expose common perceptions as well as discover unique contributions of the e-portfolio. The categories of topics relating to graduates' perception of the e-portfolio were (a) impact toward understanding principles of effective teaching, (b) documentation of effort, (c) reflecting quality of learning, (d) technology training, (e) quality of faculty guidance, and (f) relevance to the teaching career. Comparing findings from both the survey and interviews provided suggestions for refinement of the music education curriculum and related instructional implementation of the e-portfolio process.

Discussion of Findings

This report will focus on the responses of the 39 respondents who completed an e-portfolio. See table 1 for the representation from each year of graduation. Of these respondents, 34 (87.2%) were currently teaching in school music programs.

Understanding principles of effective teaching

Two of the purposes of leading music students through the process of developing a portfolio are to document understanding and enable application of effective teaching principles. Of the respondents from the survey, 66.6% supported that the e-portfolio helped them develop an understanding of effective teaching principles as seen in Table 2. Since the eight graduates (20.5%) who disagreed were nearly equally represented from each year as seen in Table 3, the data suggests that a lack of understanding may not be due to the initial development of the e-portfolio program. Including those who responded "undecided", 43.4% not recognizing educational impact suggests that enhancements may be needed that can expose connection of e-portfolio development to understanding effective teaching practice. With an e-portfolio based upon principles of effective teaching, perception of educational impact in teacher development should be greater. In another part of the survey a larger percentage of graduates, 74.3% as seen in Table 4 felt that their electronic portfolio helped in understanding the INTASC principles. As compared to the lesser percentage in the earlier question, it appears some of the respondents did not

conceptually perceive the relationship between INTASC principles and the effective teaching of music. In portfolio development, clarification of the connection between INTASC principles and effective teaching in practice is important. This was further supported when the students were asked to look back upon their portfolio from the perspective of a teacher. Table 5 shows that although 51.3% described the portfolio as demonstrating mastery of skills for effective teaching, it is important to note that 48.7% did not recognize the portfolio as reflecting mastery of effective teaching skills.

In the four years of implementation represented by this sample, it had been assumed that students recognized a connection when they wrote descriptive essays of each INTASC principle and provided artifacts to demonstrate application. This survey indicates that students may consider the e-portfolio process as instructional in theory as described by the INTASC principles but not so much in practice as considered effective teaching: “When I went to write the essays and list artifacts, it became evident to me that I needed to work harder in particular areas to gain artifacts. I feel like I just worked to get my two solid artifacts and then didn't really think about the INTASC again once I had them.” Artifacts are student-selected examples that illustrate understanding and/or competence of a particular INTASC principle. This student’s response reflects a perception of the INTASC principles as an assignment to complete rather than a standard toward which to develop. It appeared that some students had difficulty connecting the display of artifacts in the e-portfolio to actual teaching practice. If a desired impact of portfolio development is to enhance transfer of theoretical concepts such as INTASC principles into effective instructional practice, then student recognition of a connection should be evident. The bridge that must be provided in e-portfolio implementation is engagement with and application of effective teaching principles. Music education coursework must expose commonalities and connections between effective teaching, as described by the INTASC principles, and effective teaching as exhibited in practice. If students consider e-portfolio tasks as assignments rather than a foundation for practice, then conceptual transfer might have to be exposed more clearly by the teacher. This assumption was later supported in the survey with only 51.3% describing their

portfolio as helping to clarify learning goals and expectations as seen in Table 5. Clarifying transfer of understandings into practice may be a key factor to enhance longitudinal impact.

Documentation of effort

A majority of the respondents (84.7%) recognized the e-portfolio as documentation of effort put into teacher training as seen in Table 2. This may be attributed to course assignments that were directly tied into the e-portfolio. Students appeared to recognize that efforts made in achieving e-portfolio goals were synonymous with expectations placed before them in coursework. The distribution between the years of implementation as seen in Table 6 demonstrates increased student recognition of effort. Implications suggest that the e-portfolio does demonstrate student effort when expectations are tied to coursework.

Reflecting quality of learning

Perceptions that the e-portfolio reflected the quality of learning were not as clear as reflection of effort. Although slightly over half of the graduates connected their e-portfolio to perceived learning, there was an nearly an equal percentage that did not recognize the portfolio process as reflecting quality of learning (see Table 2). A similar question asked later in the survey resulted with a slightly less positive response revealing that the e-portfolio was not strongly perceived as an effective way to assess achievement in the music education program (see Table 2). Less than half of the respondents indicated agreement that the e-portfolio was an effective way to assess achievement in the music education program. Although this appears discouraging, collegiate teacher preparation is not limited to the principles described by INTASC. An idealistic intention of the e-portfolio is to tie together what has been learned through the entire collegiate education and from prior experience. Portfolio reflection of the INTASC principles idealistically focuses all learning toward music teaching. But wording of the survey question, “Developing the e-portfolio accurately reflected the quality of my learning” does not specify only what is learned about effective teaching as described in the INTASC principles. This may have influenced the response. As discussed earlier in the findings, connections between the INTASC principles and the quality of learning as

it relates to classroom teaching do not appear to be automatically inherent in the e-portfolio. Student recognition of this connection may need to be strengthened. Graduates did recognize the influence that the e-portfolio had on facilitating reflection of their learning. Table 4 shows that 82% of the respondents acknowledged this impact. It may be that students are not perceiving the role that reflection can have upon effective teaching.

Even though process of reflection through portfolio development was not perceived as synonymous with learning, it was strongly perceived as supportive of the learning process. Mosenthal, Daniels, & Mekkelsen (1993) found that the use of portfolios guide a shift from "pedagogical thinking dominated by subject knowing toward a more balanced use of procedural and subjective knowing" (p. 333). Music education departments implementing e-portfolios should consider the e-portfolio as a means to enhance understanding of effective teaching principles through the meta-cognitive process of reflection. The e-portfolio is clearly perceived by students as reflective of effort but not strongly perceived as fully reflecting learning or as an effective means of assessing future achievement in the practice of teaching. It may be possible to alter this perception if authentic application in teaching practice can be documented in the e-portfolio.

Technology training

One of the purposes involved with including e-portfolios in the music education curriculum is in fulfillment of technology training essential to professional expectations in education. The survey found 89.5% of the graduates agreed that e-portfolio development helped them as a student to understand technology: “Creating the e-portfolio was a great tool to get students learning how to use the computer and various computer applications, as well as learning how to create a web-site”, “I am grateful for the technology experience that I received through publishing an e-portfolio, though it was sometimes a bit of a headache when I was a student.” When asked to consider the technology skills needed as a teacher, 96.4% related the relevance of technological learning to their career needs as a teacher. According to Bartlett

(2002) “creating electronic portfolios increases students’ comfort with technology” (p.91). This is one of the primary reasons for the incorporation of e-portfolios. It is a goal of teacher education programs to prepare teachers to use technology in their classrooms (Bartlett, 2002; Faison, 1996; Parker & Farrelly, 1994; Wellington, 1995). There is not question as to the importance of technology training and application for music teachers. Competency in technological applications will no doubt be a useful skill in their future occupation.

Faculty guidance

Improvement of educational impact of instruction is a consistent goal in teacher preparation. The study indicated that guidance from faculty was an important issue to consider. Table 4 indicated that only 43.6% agreed that additional guidance from faculty was provided in relation to the e-portfolio. The statistics from each year indicate that guidance had been improving over the course of the e-portfolio’s development (see Table 7) but response from opened questions suggest that it was a concern for music education students: “I did not receive any feedback from faculty on my portfolio other than my grade each semester prior to student teaching. More feedback throughout my years in the Music Ed program would have been extremely helpful.” Graduates felt that continued and additional feedback could positively impact learning through the portfolio process. More specifically, 69.2% felt that the e-portfolio could be a vehicle that both faculty and students could use to examine strengths and weaknesses of individuals (see Table 5). Similar to the findings of Wilson, Wright, & Stallworth (2003), graduates believed that through reflecting on classroom practices and selected artifacts the e-portfolio had the capability of becoming an important assessment tool. As seen in Table 5, when considered from a teacher’s perspective, 59% supported the portfolio as a vehicle to provide additional feedback from faculty.

In the process of pursuing the music education degree, at this university the e-portfolio had become an essential aspect in assessing student understanding, achievement, and preparation for teaching. The responses from the graduates indicated that the majority did not find the e-portfolio as important as the

other assessment components of their education (see Table 8). "During my studies in the music education department, I felt the e-portfolio was not used by the faculty as an assessment of my work. The efforts and achievements would have felt more worthwhile if the portfolio was looked at with feedback. I felt no one was interested in looking at what I was assigned to do." Feedback is an essential component of a students' recognition of achievement and learning. If student learning is to be a goal of an e-portfolio, then the formative nature of assessment should be evident to the students. To be considered by students as a valid means of assessment, feedback on content and instructional through processes as identified in the e-portfolio must be provided periodically throughout development so students have an opportunity for revision prior to summative evaluation.

Many of the suggestions that fall under the category of faculty guidance focused around a formative feedback, but also discussed uniformity of expectations from faculty: "My experience completing the portfolio and acquiring help from faculty was not favorable. I feel that the portfolio would be easier to complete if it was enforced equally in every class." The goals of the e-portfolio must be uniform across the department so students will perceive a consistent foundation to guide their understanding of how instructional reflection from the e-portfolio applies to the practice of teaching.

Relevance to the teaching career

In preparing students to become effective music teachers, perception of relevance to the teaching career is an essential goal of integrating an e-portfolio into teacher education programs. When asked to respond to the following statement, "My electronic portfolio helped me to gain valuable experience for my career" (seen in Table 4), the response did not indicate strong connections. Only 44.5% of the graduates either agreed or strongly agreed, 21.1% were undecided as to the relevance to their career and 34.2% either disagreed or strongly disagreed. Understanding of what is effective teaching and how to affect student learning is an intended outcome of artifact development and reflection involved in the e-portfolio. A portion of the graduates found their e-portfolios useful in support of their teaching: "I've taken several

documents that are stored on my portfolio and adjusted them for my teaching tasks." As student become teachers, there should be a smooth transfer of knowledge and experience. When assignments and e-portfolio expectations are authentic to school teaching, the recognition of relevance will be enhanced. What appeared to be missing from many e-portfolio elements were an authentic connection to expectations in school teaching:

> I think the process of making a portfolio was a valuable one though I was disappointed to find out that in the 'real world' didn't look at mine….One very positive aspect of the portfolio process is that it helped me prepare for the portfolio I will need for the National Boards, which is a very big deal where I'm teaching.

Some applied the process to their students' learning experiences: "My students are preparing to assemble a portfolio of their class work for a student-led conference. I allowed some of my students to view my e-portfolio to show them how a portfolio can be presented and used." This is encouraging as it suggests recognition of value beyond fulfillment of degree expectations. It was evident in open-ended responses and interviews that the connection reflective process or e-portfolio artifacts has with teaching was discovered while teaching. The awareness of such transfer into teaching practice did not appear to be evident during teacher preparation. As a result, many e-portfolio expectations were fulfilled as assignments rather than as a foundation for their future teaching.

Although some students did perceive relevant connections between the portfolio and their teaching: "I have used certain artifacts in my current teaching such as lesson plans, assessment tools, etc", over half of the graduates did not relate the portfolio experience as relevant to their teaching profession: "Make sure students understand that the portfolio is nothing but a container. They must fill it with very meaningful educational experiences. Portfolios won't get a person hired, being a great musician and teacher will." Graduates need specific guidance to understand authentic relevance of the e-portfolio process and its contents as they apply to the profession:

> When I started the e-portfolio, I thought, 'hey, this is great'. I really enjoy working on this. I added artifacts that seemed relevant while taking classes, but after the student teaching experience it became apparent that they weren't so relevant in teaching. I guess I'm saying that at one point, the reflection and documentation during the e-portfolio process became busy work but the busy work now helps me figure out how to use my e-portfolio as I teach.

The findings of this research as exposed in the above statements are similar to research by Frazier, Palmer, Duchein, and Armato (1993) who examined the impact of using portfolio assessment on pre-service teachers in an elementary education program. The pre-service teachers in their study also did not recognize how portfolios could be relevant in their teaching career. Meyer, Tusin, and Turner (1996) similarly found that the pre-service teachers did not seem to connect what they were doing in their teacher education class with what they would do in their own classroom in the future.

Of those who discovered relevance to their profession, the purpose changed upon shifting from student to teacher: "Before student teaching I used my portfolio as an archive but I eventually figured out that the portfolio was a way to showcase my achievements. It would have been nice to have unified guidelines from the faculty to help us think this way." This student's statement is reflective of the others who had continued the portfolio process in some way following their education. Portfolio enhancement in the profession is often understood as a showcase for achievements. This reflects the expectations of the profession when a portfolio is used for enhanced licensure and promotion. Data suggest that students' perceive the value of the e-portfolio process as guiding them to reflect on the practice of teaching. Relevance of reflective practice for professional development could have been enhanced during the curricular process if procedures to expose relevance and value beyond university instruction would have been integrated. Data also suggests that the e-portfolio can guide students to examine their own strengths and weakness as a teacher. What appears to have been lacking in the e-portfolio process is a function of this reflective tool in the students' future teaching career. In agreement with the findings of Meyer, et al.

(1996), teacher educators should provide guidance on how to integrate portfolios in the professional career. If there are experiences involved in portfolio development that should translate as valuable experience in the career of a teacher, and if university faculty desire for student to perceive practical application, the procedures to expose this relevance and practicality should be developed and incorporated into portfolio instruction.

During the interviews, graduates provided suggestions to enhance the portfolio process. Many understood the educational value of the e-portfolio: “The e-portfolio is a great process for a teacher to learn from. It is important to consider that because it is required, students do it for the assignment rather than for themselves. If you can find a way to get students to do it for themselves rather than for the grade, it’s value will be beyond measure.” This response clearly defines the importance for faculty to assist students in perceiving the relevance of reflective practices to teaching early in the portfolio process. Since the e-portfolio is required, students’ initial focus will be toward completing the assignment and the final grade. Usefulness into teaching practice cannot be assumed. Faculty who provide guidance in e-portfolio development play an essential role in facilitating student ownership reflective processes that can lead to self-improvement as a teacher in the profession. Interview responses exposed a desire for increased guidance as a foundation for e-portfolio development: “Perhaps teachers should tell majors why the portfolio process is important and maybe more guidance right off the bat.” A concern that the reflective processes involved in portfolio development may not be transferring into professional application was repeatedly exposed throughout the study. When asked if they have used their portfolio since graduations, 33.3% responded that they have rarely used it and 51.3% of the graduates had not used their portfolio following graduation. When asked to consider the skills learned through portfolio development and their usefulness for a classroom teacher, 32.4% responded “often” or “sometimes” as being used (see Table 9). Two-thirds of the graduates considered the skills as rarely or never used. If we consider the development of reflection as essential to the improvement of teachers in the profession, then there should be evidence of

these skills and understandings transferring to the professional lives of teachers. Exposure to useful application as a practitioner should be clear in the training of teachers. Although not presently considered by most graduates, relevance is possible: “I check my goals and philosophies to see how they may have changed or if I am still on the track that I want to be on. This has been extremely valuable. That alone is enough for me to say it is a necessity.”

Hewett (2004) suggests that the e-portfolio is “a communication strategy for teacher candidates to introduce themselves to potential employers” (p. 25). 43.6% of the graduates (nearly the same percentage as those who perceived relevance of the e-portfolio to the practice of teaching) responded positively that the portfolio was helpful in their job search (see Table 10). Of those who used their portfolio in their job search interviews, 75% shared the web addresses, 31.3% showed a paper version of the portfolio, and 18.8% showed the electronic version. But, more importantly, 62.6% received positive comments from the administrator during or following the interview process. One student described the usefulness of the e-portfolio in seeking a teaching position:

> My portfolio was most useful while I was job hunting and interviewing. Most administrators had not seen online portfolios and it gave me a tool to interactively demonstrate my teaching experience. Interviewers could look at my portfolio at their own convenience. In seeking out graduate schools, I have not found one that requires such an extensive and technologically advanced portfolio.

The e-portfolio has the capability of communicating student understandings and capabilities as well as technology proficiency to future employers. Coupled with reflection upon and relevant connections to teaching practice, the e-portfolio can become a valuable resource for future teachers if they are cognizant of these characteristics.

Recommendations

Teacher educators must continue to assess the focus on how portfolios represent knowledge and competence in teaching and reassess the view of an e-portfolio as a product of coursework, as noted by

Mosenthal et al. (1993). An opportunity is evident that student understanding of effective principles of teaching can be enhanced in the development of an achievement portfolio. An essential component for students to perceive relevance to instructional practice is a purposeful exposure by the teacher linking INTASC principles to effective teaching practice. This can be accomplished through: (a) selection of e-portfolio expectations linked to coursework that have direct application to authentic teaching in a music classroom as summarized in a quote from one of the students: “Too much time is spent creating the perfect lesson plan process and not enough time spent on developing abilities to implement these plans”; (b) linking reflection to the practice of teaching exemplified in the following statement: “Here's what went on in my head, ‘Oh, this artifact shows good teaching, I should include that on my e-portfolio.’ That's as about as far as I thought about strengths and weaknesses”; and (c) clarifying how practicum teaching experiences can be documented as artifacts demonstrating effective teaching principles as exposed in the following quotation: “It was not clear how to include information from my practicum teaching experience which I knew should have been reflected in the e-portfolio.” The goals of the e-portfolio must be uniform across the department so students will perceive a consistent foundation to guide their understanding of how instructional reflection from the e-portfolio applies to the practice of teaching.

To be considered by students as a valid means of assessment, feedback on content and instructional through processes as identified in the e-portfolio must be provided periodically throughout development so students have an opportunity for revision prior to summative evaluation.

Competency in technological applications is an evident contribution of the e-portfolio process. Even with this obvious instructional enrichment, many students experienced challenges that hindered the overall experience. “An additional class dealing specifically with web-site development, publishing, and maintaining during the freshman year would have cleared up a lot of confusion about the electronic portfolio.” Technical skills and understanding the processes of technology appeared to challenge many students. Technical challenges encountered in e-portfolio development inhibited many students’ perception

of the portfolio. The survey did not inquire specific challenges that were encountered but the faculty observed challenges due to cross-platform issues. Computer lab assistants dealt many of these issued but student frustrations were yet intensified by lateness of assignment completion. An important element exposed by this study focused on instructor feedback throughout the e-portfolio development. Faculty must be fluent with the technology that students will use in the e-portfolio development to provide assistance so technological challenges will not hinder instructional thought development. Procedures for identifying and addressing student needs, both technological and instructional, should be in place through periodic checks and consistent clarification of process as described by a graduate:

> Make a more streamlined approach to creating/updating would enhance the process. Especially concerning updating, there should be a standard expectation, timeline, and method. The guidelines/format should be unified across faculty and presented sequential so not all teachers approach the same issues.

Another issue of enhancement exposed through the interviews focused on technological skills beyond immediate e-portfolio concerns. Although students learn how to link to a pre-existing template, when confronted with updating a website for their school music organization:

> I had absolutely NO IDEA how to access or update this pre-created webpage. I had to do LOTS of asking different people *[sic]*, and TOO MANY hours trying to figure how to manipulate the commands to make the webpage look and act how I needed. In addition or in conjunction with the e-portfolio process, wouldn't it be great to teach college students how to create their own webpage? Looking back, I would have LOVED to learn how to create a page from scratch - not from a template, but from scratch. Having a band webpage that gets updated regularly is the BEST thing I've done so far. First, it creates another outlet for me in which to communicate to parents (one of the INTASC standards). Second, I can post sound files of classroom recordings and performance recordings for students to listen to (a National Standard!). Third, I can post assignments for students to review on the webpage.

> Fourth, the kids' favorite, I can post pictures for them to look at. They love to see themselves, and it begins to create ‘a chemistry’ between all students in all grades.

This statement goes beyond e-portfolio development and exposes the need to not only inform students about the relevance of skills and understanding to teaching practice but also to incorporate current teaching practice into the e-portfolio development. Knowledge of current practice and forethought concerning future responsibilities of music teachers will help guide e-portfolio expectations. When focused on needs and experiences in the profession, assignments linked as artifacts to the e-portfolio can easily transfer into teaching.

In agreement with Wilson, et al. (2005), Frazier et al. (1993), and Meyer et al. (1996), instructional efforts should include modeling of portfolio assessment reflecting relevant use as in-service teachers. Students not only need to be assessed, but also how to assess as exposed in an interview: “Here's what I think about the fairness of assessment - knowing what I know now, I would have rather had much more instruction on other instruments, rather than putting in so much time into my e-portfolio. I probably worked harder on my e-portfolio than most people but probably could have spent less time on it.” To encourage future teachers to utilize portfolio assessment for their students as well as for self-improvement, the process must not only include the development of an e-portfolio but also the use of portfolios as assessment. This will not only help student understand their role as a student but also the role of a teacher. Other forms of assessment that are used in music teaching should be included as artifacts demonstrating understanding and competence with forms of assessment. Expectations of e-portfolio content needs to be carefully considered so to be comprehensive and useful.

Music education faculty must remain cognizant of all skills and understandings needed to succeed as a music teacher: “as a woodwind player in a predominantly middle school situation, I felt scared to death as far as how to effectively teach brass and especially percussion.” An e-portfolio can encompass most, if not all, areas of student learning if the expectation for content and reflection includes practical refection of

achievement. “I guess I'm saying I would personally rather have more instruction on how to start students on each instrument and teach them good fundamentals more than I would want to spend lots of time on an e-portfolio that only focuses on ten standards of teaching.” The use of INTASC principles as a framework for the e-portfolio should include all of the skills and knowledge relevant to teaching in schools. It is essential to guide student exploration beyond the conceptual framework to relevant application as a teacher. Transfer will occur when students recognize useful application from e-portfolio reflection and content. In agreement with Wilson, et al. (2003), the elements required in an electronic portfolio need to be reconsidered as to how each element is presented to pre-service teachers to enhance their development as in-service educators.

In reference to self-promotion in an interview process, e-portfolios are new enough that substantial evidence of their contribution is unclear. It is evident that a paper form for an actual interview is preferred with the web-based e-portfolio as support: “my paper portfolio actually came in much handier at interviews to have that solid proof of my knowledge right there in front of me.” As technology becomes more widely used in education for documentation, it is possible that the use of an e-portfolio may also become essential.

Suggestions for future research

This was a small study from one university. Replicating this study with multiple universities, making note of variations and degree of implementation, should provide useful information of early career impact of electronic portfolios in music education and educational influence of the variety of e-portfolio methods. If replicated, a higher response rate should occur if the survey comes directly from the music education department rather than from an office of assessment. The challenge of finding current addresses for graduates will remain an essential problem to consider.

The interviews provided a depth of understand not available through the survey alone and should be an integral component of future methodology. Although short in length, the present survey appeared sufficient in supplying data with multiple questions of similar content to provide triangulation of response. The

wording of the survey question, “Developing the e-portfolio accurately reflected the quality of my learning” might be revised to specify only what is learned about effective teaching as described in the INTASC principles to help focus the response.

Mosenthal (1994) concluded that portfolios used in pre-service teacher education could and should stimulate the integration of conceptual knowledge. Additional research might also look how students find relevance of conceptual understandings as described by the INTASC principles to authentic teaching practices. Continue investigation into current requirements and expectations of music teachers is always important when the findings are applied directly into university course content.

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Table 1. Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Creation of a Portfolio				
Did not create a portfolio	**2**	**4.9**	**4.9**	**4.9**
Created a portfolio	**39**	**95.1**	**95.1**	**100.0**
Total	**41**	**100.0**	**100.0**	
Year of Graduation				
Valid 2001	**3**	**7.3**	**7.7**	**7.7**
Valid 2002	**10**	**24.4**	**25.6**	**33.3**
Valid 2003	**9**	**22.0**	**23.1**	**56.4**
Valid 2004	**17**	**41.5**	**43.6**	**100.0**
Valid Total	**39**	**95.1**	**100.0**	
Did not create portfolio	**2**	**4.9**		
Total	**41**	**100.0**		
Currently Teaching Music				
Valid Yes	**34**	**82.9**	**87.2**	**87.2**
Valid No	**5**	**12.2**	**12.8**	**100.0**
Valid Total	**39**	**95.1**	**100.0**	
Did not create portfolio	**2**	**4.9**		
Total	**41**	**100.0**		

Table 2. Percentage and Frequency Distributions for the survey questions: "Developing my portfolio…"

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
…helped me understand principles of effective teaching.	17.9% 7	48.7% 19	12.8% 5	15.4% 6	5.1% 2	100.0% 39
…documented the effort I put into teacher training.	46.2% 18	38.5% 15	.0% 0	15.4% 6	.0% 0	100.0% 39
…accurately reflected the quality of my learning.	7.7% 3	46.2% 18	17.9% 7	23.1% 9	5.1% 2	100.0% 39
…was an effective way to assess my achievement in the music education program.	7.7% 3	41.0% 16	17.9% 7	33.3% 13	.0% 0	100.0% 39

Table 3. Percentage and Frequency Distributions per year of graduation for the survey question: "Developing my portfolio helped me understand the principles of effective teaching."

Year of Graduation	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
2001	0.0% 0	66.7% 2	33.3% 1	0.0% 0	0.0% 0	100.0% 3
2002	20.0% 2	50.0% 5	0.0% 0	20.0% 2	10.0% 1	100.0% 10
2003	11.1% 1	55.6% 5	11.1% 1	11.1% 1	11.1% 1	100.0% 9
2004	23.5% 4	41.2% 7	17.6% 3	17.6% 3	0.0% 0	100.0% 17

Table 4. Percentage and Frequency Distributions for the survey questions: "My electronic portfolio helped me…"

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
…reflect on my learning.	12.8%	69.2%	2.6%	15.4%	.0%	100.0%
	5	27	1	6	0	39
…understand technology.	63.2%	26.3%	2.6%	5.3%	2.6%	100.0%
	24	10	1	2	1	39
…understanding INTASC principles.	41.0%	33.3%	10.3%	15.4%	.0%	100.0%
	16	13	4	6	0	39
…receive additional guidance from faculty.	12.8%	30.8%	17.9%	30.8%	7.7%	100.0%
	5	12	7	12	3	39
…gain valuable experience for my career.	10.5%	34.2%	21.1%	31.6%	2.6%	100.0%
	4	13	8	12	1	39
…examine my own strengths and weaknesses as a teacher.	25.6%	41.0%	15.4%	17.9%	.0%	100.0%
	10	16	6	7	0	39

Table 5. Percentage and Frequency Distributions for the survey questions: "As a teacher, I believe the electronic portfolio…"

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
…helped clarify learning goals and expectations.	.0% 0	51.3% 20	17.9% 7	30.8% 12	.0% 0	100.0% 39
…helped provide experience with technology.	56.4% 22	41.0% 16	2.6% 1	.0% 0	.0% 0	100.0% 39
…demonstrate engagement with INTASC.	33.3% 13	48.7% 19	5.1% 2	10.3% 4	2.6% 1	100.0% 39
…demonstrate mastery of skills needed to be an effective teacher.	12.8% 5	38.5% 15	17.9% 7	25.6% 10	5.1% 2	100.0% 39
…provide additional feedback from faculty.	12.8% 5	46.2% 18	10.3% 4	28.2% 11	2.6% 1	100.0% 39
…provide a vehicle for examining strengths and weaknesses.	20.5% 8	48.7% 19	17.9% 7	12.8% 5	.0% 0	100.0% 39
…are an important assessment tool, requiring students to explain and reflect on classroom artifacts and practices.	18.4% 7	50.0% 19	18.4% 7	13.2% 5	.0% 0	100.0% 38

Table 6. Percentage and Frequency Distributions per year of graduation for the survey question: "Developing my portfolio documented the effort I put into teacher training."

Year of Graduation	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
2001	0.0% 0	100.0% 3	0.0% 0	0.0% 0	0.0% 0	100.0% 3
2002	40.0% 4	30.0% 3	0.0% 0	30.0% 3	0.0% 0	100.0% 10
2003	44.4% 4	33.3% 3	0.0% 0	22.2% 2	0.0% 0	100.0% 9
2004	58.8% 10	35.3% 6	0.0% 0	5.9% 1	0.0% 0	100.0% 17

Table 7. Percentage and Frequency Distributions per year of graduation for the survey question: "My electronic portfolio helped me receive additional guidance from faculty."

Year of Graduation	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
2001	0.0% 0	0.0% 0	100.0% 3	0.0% 0	0.0% 0	100.0% 3
2002	0.0% 0	40.0% 4	10.0% 1	50.0% 5	0.0% 0	100.0% 10
2003	11.1% 1	33.3% 3	22.2% 2	11.1% 1	22.2% 2	100.0% 9
2004	23.5% 4	29.4% 5	11.8% 2	29.4% 5	5.9% 1	100.0% 17

Table 8: Percentage and Frequency Distributions for the survey question: Importance of e-portfolio relative to other parts of education

Much More Important	More Important	Of Equal Importance	Less Important	Much Less Important	Total
0.0%	7.7%	33.3%	46.2%	12.8%	100.0%
0	1	13	18	5	39

Table 9. Percentage and Frequency Distributions for the survey question: Portfolio skills used as a classroom teacher

Often	Sometimes	Rarely	Never	Total
5.4%	27%	29.7%	37.8%	100.0%
2	10	11	14	39

Table 10. Percentage and Frequency Distributions for the survey question:

	Yes	No	Total
Was the portfolio helpful in your job search?	43.6%	56.4%	100.0%
	17	22	39

How the portfolio was used.	Count	Percentage of Responses	Percentage of Cases
Shared the web address	12	36.4%	75.0%
Showed the e-portfolio during the interview	3	9.1%	18.8%
Showed a paper version during the interview	5	15.2%	31.3%
Received positive comments from the administrator	10	30.3%	62.5%
Other	3	9.1%	18.8%

Appendix A

(removed for submission) University Music Education Alumni Survey of Electronic Portfolio Experiences

You have been selected for this survey because you developed a portfolio as a student in the *(removed for submission)* Music Education program. As you may know, electronic portfolios are now required for all *(removed for submission)* education majors. The aim of this survey is to determine your level of satisfaction with and/or the impact of your electronic portfolio on your career.
The survey is completely anonymous to ensure your complete and honest participation. Your feedback is important, as it will guide the future direction of our program. We would sincerely appreciate your feedback. Thank you.
Since this survey is about electronic portfolios, if for some reason you did not create an electronic portfolio, please check here ⩔ and return the survey. Thank you.

1. In what year did you earn your degree? _____

2. Are you currently teaching music?

   ⩔ Yes ⩔ No *(If no, please skip to question 4 below.)*

3. If yes, which of the following best describes your teaching responsibilities? *(Please check all that apply.)*

   ⩔ Public School
   ⩔ General Music Elementary
   ⩔ Private School
   ⩔ Private Music Lessons
   ⩔ Choral Music Program
   ⩔ Band Program
   ⩔ Other (please specify) _____
   ⩔ Orchestra Program
   ⩔ General Music Secondary/H.S.
   ⩔ Other Elementary subjects
   ⩔ Other Secondary/H.S. subjects

4. How long have you been working in your current position?

   ⩔ 1 Year or Less ⩔ 2-3 Years ⩔ 4-5 Years ⩔ 6 or More Years

5. Developing my e-portfolio	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
…helped me understand the principles of effective teaching	⩔	⩔	⩔	⩔	⩔
…documented the effort I put into teacher training	⩔	⩔	⩔	⩔	⩔
…accurately reflected the quality of my learning	⩔	⩔	⩔	⩔	⩔
…was an effective way to assess my achievement in the music education program.	⩔	⩔	⩔	⩔	⩔

6. My electronic portfolio helped me to…

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
…reflect on my learning	∨	∨	∨	∨	∨
…understand technology	∨	∨	∨	∨	∨
…understand INTASC principles	∨	∨	∨	∨	∨
…receive additional guidance from faculty	∨	∨	∨	∨	∨
…gain valuable experience for my career	∨	∨	∨	∨	∨
…examine my own strengths and weaknesses as a teacher	∨	∨	∨	∨	∨

7. As a music teacher, I believe that electronic portfolios…

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
…help clarify learning goals and expectations	∨	∨	∨	∨	∨
…help provide experience with technology	∨	∨	∨	∨	∨
…demonstrate engagement with INTASC principles	∨	∨	∨	∨	∨
…demonstrate mastery of skills needed to be an effective teacher	∨	∨	∨	∨	∨
…provide additional feedback from faculty	∨	∨	∨	∨	∨
…provide a vehicle for examining strengths and weaknesses	∨	∨	∨	∨	∨
…are an important assessment tool, requiring students to explain and reflect on classroom artifacts and practices	∨	∨	∨	∨	∨

8. In comparison to other aspects of your music education at *(removed for submission)*, how important was the e-portfolio?

∨ Much More Important ∨ More Important ∨ Of Equal Importance

∨ Less Important ∨ Much Less Important

9. Has your opinion of the importance or usefulness of electronic portfolios changed since graduation?

∨ No
∨ Yes, I feel they are *more important* now than I did as an undergraduate
∨ Yes, I feel that they are *less important* now than I did as an undergraduate

Please continue…

10. Was the portfolio helpful in your job search?
    - ⩔ Yes
    - ⩔ No *(Please skip to question 12)*

11. If yes, how was your portfolio helpful to you in your job search?
    - ____ I shared the web address in my interviews or application letter.
    - ____ I showed my web portfolio in my interviews.
    - ____ I shared a paper version of my portfolio in my interview.
    - ____ I received positive comments from administration on the portfolio
    - ____Other *(please specify*) _____

12. Since your studies at *(removed for submission)*, how often have you used your portfolio? *(If never, please skip to question 13)*

    ⩔ Often ⩔ Sometimes ⩔ Rarely ⩔ Never

    In what ways have you used your portfolio?

    _____

    _____

    _____

    _____

13. How often have you used your portfolio skills as a classroom teacher?

    ⩔ Often ⩔ Sometimes ⩔ Rarely ⩔ Never

14. Overall, how difficult was the electronic portfolio to complete?

    ⩔ Very Difficult ⩔ Somewhat Difficult ⩔ Not Difficult

15. Finally, what suggestions do you have to improve the electronic portfolio process in music education at *(removed for submission)*? *(Please attach additional paper if necessary.)*

    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____

Volunteer for an Interview

An important part of this study is to interview alumni from the Music Education program during summer 2005.

☐ Please check here if you would be interested in discussing the portfolios with faculty in the future to help guide the enhancement of the educational process.

Thank you. Please return the survey in the enclosed, postage-paid envelope to the University Office of Academic Assessment and Institutional Research.

Appendix B

Interview Questions

1. Describe what you thought while a student at *(removed for submission)* of the e-portfolio process, its purpose in your educational progress toward becoming a teacher and how your consideration of its purpose may have changed over time. (more specifically, did reflection and documentation through the e-portfolio become more, or less, relevant to you as a music teacher and why?)

2. Looking back at the e-portfolio that you developed at *(removed for submission)*, explain your response to the following issues: (a) did this process expose particular strengths and/or weaknesses in teaching that you could build upon that may not have been evident without the reflection in the e-portfolio?; (b) does your portfolio reflect the learnings and/or understandings developed during your training at *(removed for submission)*? (c) Were portfolio assignments relevant to what you now know as music teaching and in what ways could the e-portfolio be a fair or unfair assessment of learning to become a teacher?

3. Please share specific areas of strength and weakness of the e-portfolio process at *(removed for submission)*and how this process could become more useful and relevant to the educational progress of becoming a music teacher.