## ePortfolio as a Measure of Reflective Practice

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This instructional article outlines the qualities of effective ePortfolios and how reflection and student growth is measured. Student exemplars and assessment rubrics show how, despite changing tools and evolving standards, sustained collaboration and student coaching yields reflective practitioners in content areas and in technological knowledge. As part of summative assessment within a teacher preparation program, teacher candidates prepare an ePortfolio to demonstrate reflective practice and growth in learning across their arts and humanities programs (e.g., within the Music K-12, History and Social Sciences 6-12, and English 6-12 teacher licensure programs). This article illustrates the importance of privileging meta-cognitive practices that facilitate student ownership of their own learning and growth. Used not as compilation of artifacts, ePortfolios are instead positioned as a pedagogical space where teaching and learning are as transparent as possible. As such, ePortfolios examples and practices are exemplified and discussed within the pedagogical content knowing and technological pedagogical content knowledge frameworks.

#### ePortfolio as a Measure of Reflective Practice

Support for electronic portfolio (ePortfolio) use in higher education has increased over the past decade due to calls for greater accountability concerning student learning; ePortfolios' perceived promise to provide long-term storage for student work beyond the scope of their college careers; and the authentic and holistic assessment opportunities that a well-structured ePortfolio process can provide (Watson & Doolittle, 2011). As Watson and Doolittle (2011) explained, "what makes an ePortfolio [effective] . . . is the pedagogy within which the ePortfolio is embedded" (p. 30). Within this article, we will describe how three different teacher preparation programs collaborate in their use of ePortfolio to amplify pedagogical choices and to encourage and assess reflective practice. Within any university program, encouraging reflective practice is important to preparing thinking practitioners who show that they can adapt to new technologies, new standards, and new environments. Set within the context of our (a) discipline-specific national standards, (b) the need to prepare digital pedagogies for 21st century classrooms. (c) National Council for Accreditation of Teacher Educators (NCATE, now CAEP) and state teacher education standards, and (d) a recognition that learning to teach is a socially constructed process of self-organization and enculturation, ePortfolios have emerged as a capstone experience wherein teacher educators support and assess students' learning and development as they undertake their journey to the other side of the desk, from student to teacher. Collaborative work with ePortfolios in English, music, and history and social science education programs has emerged over the last decade as a signature pedagogy through which students are prepared to be reflective teaching practitioners and demonstrate reflective habits and behaviors. While faculty and platforms have changed, our programmatic

work with ePortfolios has been sustained, refined, and aligned across changing technologies and faculty attrition. Beginning in 2007, our programs have undergone a sustained self-study of our processes and requirements to facilitate student reflective practice. A key emphasis of our efforts has been to identify ways for our student practitioners to use the networked space of the ePortfolio itself and their public ePortfolio defense to present the case that in their journey from student to teacher, they have become capable of engaging in the type of reasoning that Aristotle referred to as *phronesis*; the deliberative reflective reasoning required of expert curriculum decision-makers that weaves together theory, context, and practice (Aristotle, 1976; Fenstermacher, 1994). This instructional article describes how ePortfolios have been theoretically and practically conceptualized, integrated, and sustained within, and through, the teaching and learning environments across programs; and how our work with ePortfolio integration has evolved to create the opportunity and space for our students to publicly demonstrate and reflect upon their learning and growth.

### Teaching and Learning Environments: ePortfolio Use to Capture and Document Forms of Student Teacher Pedagogical Knowledge

Over the last decade, ePortfolios have become an important tool and instructional scaffold providing our students with the opportunity to craft and present an evidence-based, professional account of their emerging knowledge, skills, and dispositions as selfaware, reflective beginning teachers of not simply content, but also of children in today's 21st century classrooms. EPortfolios have emerged as a way for students to begin to capture and illuminate the often elusive, ethereal, and context-specific complexities of knowledge growth in teaching, in terms of their emerging *pedagogical content knowing* (PCKg), as referenced by Shulman (1986, 1992) and Cochrane, DeRuiter, and King (1993); and technological pedagogical content knowledge (TPACK) as referenced by Mishra and Koehler (2006; see Figure 1). PCKg, as defined by Cochran et al. (1993), is a teacher's emerging "integrated understanding of . . . subject matter pedagogy, content, student characteristics, and the environmental context of learning. PCKg development is continual" (p. 266). PCKg is the conflation of learning theory, individualized instruction. and content area knowledge. It is one thing to know the conventions of a particular field, but domain-specific pedagogical knowledge is the understanding of how to teach it. TPACK, as described by Koehler (2011), emerges from the construct of PCKg and reveals the intersecting foundational forms of knowledge necessary for the appropriate and authentic integration of technology to support teaching and learning in 21st century classrooms. As Kilbane and Milman (2003) explained,

Digital teaching portfolios are one of the best ways for teachers to communicate the level of their and skill knowledge within educational technologies. The increasing role of technology in learning environments makes the demonstration of technology competence more important now than ever before. Teachers who create portfolios in this way demonstrate their knowledge of hardware, software, and the integration of the two for the purpose of creating useful educational tools. Although the process of making traditional teaching portfolios helps teachers examine their competence and chart their future growth as professionals, the creation of digital teaching portfolios also provides them the opportunity to think more seriously about how their career will be affected by the role of technology in the classroom and society. (p. 6)

Developing an understanding of the nature and forms of knowledge growth in teacher education begins

Figure 1 Technological Pedagogical Content Knowledge



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with the recognition that the ability to reflect on and in action is what defines the profession of teaching (Schön, 1987). Teachers are professionals and not technicians. Shulman (1986) noted:

The professional holds knowledge, not only of how—the capacity for skilled performance—but of what and why. The teacher is not only a master of procedure but also of the content and rationale, and capable of explaining why something is done. The teacher is capable of reflection leading to selfknowledge, the metacognitive awareness that distinguishes draftsman from architect, bookkeeper from auditor. A professional is capable not only of practicing and understanding his or her craft, but of communicating the reasons for professional decisions and actions to others. (p. 13)

ePortfolio construction and the subsequent public defense presentation provides students with a medium to reflect on and share their experiences across their graduate program and to create a contextually aware, evidence-based case of their developing professional selves from which to look forward into their future careers.

### Conceptualizing, Integrating, and Scaffolding the Process to Support Student Learning

Over the years, we have learned that not all ePortfolios are equal. What is often lost in the rush to use digital technologies to foster and assess student learning is an understanding that an ePortfolio is not simply a storage site, database, electronic scrapbook, or simplistic archival collection of students' accumulated course work over their university career. Rather, an ePortfolio goes beyond simply collecting and storing artifacts toward leveraging digital technologies' potential to make unique linkages, connections, and reflections among multiple experiences and artifacts in ways that would not otherwise be possible with a traditional paper portfolio. The ability to select artifacts and make links among standards, learning principles, experiences, and beliefs provides students with the opportunity and virtual space to develop layers of reflections that set their past, present, and future in direct tension as they seek to explain and unpack how their ongoing pedagogical decisions and activities influence and shape their own students' growth.

Helping students understand the nature and purpose of the ePortfolio process is vital and begins early in their program. Students are provided with an orientation to the process within their first semester and given examples of exemplary ePortfolios from previous years. Additionally, a vital part of the orientation begins with the end in sight (Wiggins & McTighe, 1998). Each incoming cohort of students is invited to the ePortfolio defenses of the current cohort as a way to not only show the process but also make the ePortfolio presentation a visible scholarly event that is open to a community of peers. Each cohort also has access to previous cohorts' portfolios, as all are public, and these are examined and unpacked within the methods courses as a way to provide examples and non-examples of strong professional reflective portfolios. Students are also provided with our ePortfolio assessment rubric (e.g., see Appendix A) so that they can begin to develop an understanding of the types of acceptable and appropriate evidence and indicators of their knowledge growth that might be layered within and through their reflective ePortfolio. The evaluation rubric of ePortfolios is modeled upon the themes and principles from the Interstate New Teacher Assessment and Support Consortium (INTASC), discipline specific National Standards from the National Council for the Social Studies (NCSS), the National Council for the Teachers of English (NCTE), the National Association for Schools of Music (NASM), the standards from the International Society for Technology in Education (ISTE), and state standards.

Upon working with students to help them identify desired results and determine acceptable evidence, the foundation is set for beginning the yearlong process of designing experiences and supporting assignments to help students in the ePortfolio construction and presentation process. Coursework and instruction are aligned so that students can follow four umbrella steps in creating their ePortfolios:

- 1. Collect: Throughout the year students learn the importance of collecting and saving artifacts from coursework across their programs and from their field experiences as potential sources of evidence to help illuminate the process of learning to teach, or in other words, their growth in terms of their knowledge, skills, and disposition as they negotiate and reflect upon their journey to the other side of the desk.
- 2. Select: Collecting the artifacts is simply the first stage; our students are then expected to develop a critical, evaluative, and inferential lens through which to make decisions regarding which key artifacts can serve as the most appropriate and meaningful evidence of their growth from student to teacher.
- 3. Reflect: Working with the concepts of critical incidents or well-remembered events, students begin to construct slices of evidence-based narrative reflections that describe how their experiences have influenced their transformation from content specialist to content teacher.

4. Connect: Students begin to look for associations and points of connection among their experiences, reflections, artifacts, and standards in order to construct and present a "portrait" of themselves as a beginning teacher who (a) is committed to all students, (b) knows the subject and how to teach the subject, (c) is responsible for managing and monitoring student learning, (d) can think systematically about their practices and learn from experiences, and (e) is an active member of a learning community.

We evaluate their ePortfolios for evidence of these five components. We believe that reflection is at the heart of the ePortfolio, as it most clearly shows us what our students think about what they are learning. Reflecting means being intentionally thoughtful about defining an experience, explaining that experience, and determining future implications and actions. Through explanations and demonstrations of model ePortfolios from past cohorts we seek to provide students with generative ideas for how to approach the iterative collect, select, reflect, and connect process. This level of pedagogical support reveals the porous nature of our methods classrooms, as students in each program meet with each other to discuss the nature of the ePortfolio and also to learn about the institutional networks of support that exist through campus technology support. their matrix By initially populating with artifacts/evidence that they *collect* over the year, they then select what they consider to be the most appropriate pieces for their portfolio, reflect on why these are important in illustrating their journey, and finally, find ways to connect their evidence based accounts and reflections together (see Gibson & Barrett, 2003). This process, we believe, allows our students the opportunity to work with "multiple forms of evidence" (Penny-Light, Chen, & Itelson, 2012, p. 61) to convey within a strong ePortfolio the depth of their understanding, their ways of knowing, and how they feel about their readiness to assume a teaching position.

In addition to the big picture strategies of supporting collection, selection, reflection, and connection, we also provide instruction and support at a more focused and disciplinary-specific scale. For while we teach the same methods and field internship courses, our students come from distinct disciplinary content areas (e.g., music, history and social studies, and English). Because our programs are sequenced, our students take these classes across the year, and we have aligned our general and disciplinary specific assignments and capstone projects deliberatively and purposefully within our courses for the benefit of the students' learning. By embedding tasks in the coursework and field experiences, we plan for students ePortfolio as Reflective Practice 102

to create the many artifacts that they will need. They are then able to select from these assignments the artifacts that they will reflect on and connect together in their ePortfolio. Students are able to make individual choices about their selections. We evaluate the many reflective tasks required to help students increase their level of critical thinking (e.g., in the blogs that they contribute to for the field class). Experiences within the courses that illustrate this are shown in Table 1.

### Artifacts Supporting Reflective Practice in ePortfolios

As shown in Table 1, students collect artifacts to share in ePortfolios, and these show student reflection at different places within their program of learning: daily, weekly, and after units, courses, and programs of study. Artifacts, including tweets, video collages, vlogs, and blogs, show incremental reflection on learning that, when synthesized in an ePortfolio, demonstrate student development over time.

### Twitter/Tweets

Tweets, in particular, show how students not only synthesize their learning in 140 characters or less, but it also connects them with a professional learning network beyond their university cohort. Teacher candidates tweet reflections bi-weekly as collaborative professional development. Tweets illustrate how a candidate might be feeling, acting, or thinking as a teacher-this often includes how they operationalize their beliefs in actions. This is also an important practice in students' creation of a professional digital footprint. Students situate themselves as professionals in their public displays of learning. For example, Josh Thompson, a preservice teacher in the English Education program, reflected in his ePortfolio (https://sites.google.com/a/vt.edu/josh-thompsonenglish-education-eportfolio/community-of-practice)

that Twitter allowed him to maintain weekly contact with members of his learning cohort and also enabled him to follow leaders in the field of English Education. Thompson explained that he was able to "see trends in the field of English Education as well as ways to meaningfully incorporate technology into my (https://sites.google.com/a/vt.edu/joshclassroom" thompson-english-education-eportfolio/community-ofpractice). Cohort members shared ideas, asked for help, and were able to be less isolated in their internship experiences because of short Tweets (e.g., see https://twitter.com/search/realtime?q=vtenged13&src=t vpd) that could be easily checked on phones or student home pages. The screen shot shown in Figure 2 shows how a shared public hashtag can provide a way for students to connect with each other, ask questions,

	Course Assignment	s with Program Teaching	and Learning Environme	nts
Selected examples across programs	Fall EDCI 5724 Methods class 1 Curriculum planning <sup>1</sup> Assess student learning <sup>2</sup> Teacher work sample website <sup>3</sup> Case studies of students with special needs <sup>4</sup> Journal review <sup>5</sup> Petcha Kutcha 20x20 presentation <sup>6</sup> Digital internship, wiki collaboration <sup>7</sup> 10 NCSS themed Lesson plans. Lesson Study: Micro-teaching reflections on practice" Educational autobiography and Teaching Metaphor This I believe video Literacy, Language and Inquiry essay review	Fall EDCI 5964 Field Studies Observations <sup>8</sup> Reflective blogs <sup>9</sup> Lesson plans <sup>10</sup> Discussion audit <sup>11</sup> Unit deconstruction collaboration Student shadowing <sup>12</sup> Synthesis vlog Classroom and teacher observations Prior Knowledge Interviews	Spring EDCI 5744 Methods class 2 Unit plans <sup>13</sup> Budget project <sup>13</sup> Travel project <sup>13</sup> Ning collaboration Lesson Study: Micro-teaching reflections on practice Measuring student growth Teaching Reasoning through Writing Research project and video Focus on student learning <sup>14</sup> Using digital technologies to support student learning analysis Action research project and video presentation	Spring EDCI 5754 Internship student teaching Reflective Vlogs Video collages <sup>15</sup> Reflection-for- action tweets <sup>16</sup> Teaching videos <sup>17</sup> Lesson plans <sup>18</sup> ; Curriculum mapping project
What the	Leads to meta	Leads to meta	Leads to meta	Leads to meta
course leads to	reflection in ePortfolio	reflection in ePortfolio	reflection in ePortfolio	reflection in ePortfolio
<ul> <li><sup>2</sup> https://vt.digicatid</li> <li><sup>3</sup> https://vt.digicatid</li> <li><sup>4</sup> https://scholar.vt.</li> <li>18fe4c93475b&amp;id=</li> <li><sup>5</sup> https://vt.digicatid</li> <li><sup>6</sup> https://sites.googl</li> <li><sup>7</sup> https://sites.googl</li> <li><sup>8</sup> https://vt.digicatid</li> <li><sup>9</sup> http://teacher.jump</li> <li><sup>10</sup> https://vt.digicatid</li> <li><sup>11</sup> https://docs.goog</li> </ul>	gication.com/Wildt-ariele_wildts on.com/Wildt-ariele_wildts_epon on.com/danielupton_ArchiveMay edu/osp-presentation-tool/viewP =59678435F6ECF9E23599371 on.com/Wildt-ariele_wildts_epon le.com/site/shaunadamseportfolio le.com/site/marileahshowalter/co on.com/Wildt-ariele_wildts_epon per.wordpress.com/ ion.com/Postman-nathan_postma gle.com/document/d/1j-vo0YTK. ogle.com/document/d/1GZYPVj	tfolio-May-2012/IVStudent_I y2012/IVStudent_Learning_A resentation.osp?sakai.tool.place: 81028A75&pageNumber=2 tfolio-May-2012/IMusic_Con b/media#page-comments mmunity-of-practice tfolio-May-2012/III_Teaching_ ans_eportfolio-May-2012/III_T AfNxMbCEtyfP5_x4ZMLJnUiF	_earning_Assessment ssessment ment.id=c2d3d432-2c3b-4fb1-80 itent_Knowledge Music_Pedagogical_content_kno eaching_professionally_Professi PLN8089x8bCg/edit	)d3- owledge_a onal_and_Peda

 Table 1

 Course Assignments with Program Teaching and Learning Environments

 <sup>12</sup> https://docs.google.com/document/d/1G2YpVjz3NpFDamOnLHjyrom6eJctApV8UCWFGxnEjqw/edit#https:// ent/d/1GzYpVjz3NpFDamOnLHjyrom6eJctApV8UCWFGxnEjqw/edit
 <sup>13</sup> https://vt.digication.com/danielupton\_ArchiveMay2012/III.\_Teaching\_Professionally\_Professional\_and\_Peda
 <sup>14</sup> https://scholar.vt.edu/osp-presentation-tool/viewPresentation.osp?sakai.tool.placement.id=&id=835ED102FF8CD339FF547E6715E3F8CB&pageNumber=4
 <sup>15</sup> https://vt.digication.com/danielupton\_ArchiveMay2012/IV.\_Student\_Learning\_Assessment
 <sup>16</sup> https://sites.google.com/site/emilyreedlove/community-of-practice-1
 <sup>17</sup> https://sites.google.com/site/shaunadamseportfolio/unpacking-practice
 <sup>18</sup> https://docs.google.com/file/d/0B31N3PuDF7nYUnR3TXlob20yU1E/edit om6eJctApV8UCWFGxnEjqw/edit#https://docs.google.com/docum

	Figure 2 Tweets from #vtenged13
	#vtenged13 phenom. AGREE COMPLETETLY and explained so well "Let me Axe You About Using 'Axe'" wp.me/p2wDN0-tz via @wordpressdotcom Expand
_	13 Mar
	piclits.com/blog.aspx?Poem Practicing poetry on PicLits.com in preparation for my lesson. Having too much fun on here <b>#vtenged13</b> Expand
_	11 Mar
	usingenglish.com is a great way to help students get prepared for their SOL or just to make the basics more solid # <b>vtenged13</b> Favorited by Amanda M Expand
1	6 Mar
	Reich hits it home.MIT Students Debate the Value of iPads in the Classroom blogs.edweek.org/edweek/edtechr via @educationweek #digitalself #vtenged13 Expand
	5 Mar
	With the talk of a couple snow days, I'm anxious to see how my afternoon goes. Anyone else battling snow day hoorays? #vtenged13 Expand
	4 Mar
	Per @englishcomp's recommendation last night on Twitter, my class

share ideas, and garner support. Effective use of public tweets includes a professional online persona and positive reflection that results in changes in practice that then are manifested in classroom practice. The challenges students overcome as they monitor their own improvement in practice in the classroom are minimized. Students do not need to wait for a supervisor or Clinical Teacher to tell them what needs improving; they learn quickly from the collage videos the areas that need improvement. As Kelsey, a pre-service teacher in Music Education, suggests, "I could do big but really needed to work on small" in terms of non-verbal gesture in the music classroom; the emphasis is on her own selfassessment and her advice to herself for improvement.

### **Video Collages**

Video collages, also called montages (see Figure 3), show students' reflection on their growth over time. Students take data on their work in the form of video and create a montage of scenes that make

explicit their personal growth over time. The video is a short, three-minute reflection of their growth in a focused area across one month. The way these clips of teaching across each month are put together shows how students reflect on practice in their teaching. For example, Kelsey, a music education student, included video collage (https://vt.digication.com/Lundа kelsey lunds eportfolio-May-2013/My Goals) to show her growth in the process of musical conducting. She shows a video of herself teaching early in her internship and writes, "After watching these videos, I understand why students always play forte [loud]. In the next two [video] clips, I told the classes to start piano [soft]. Unfortunately, my pattern size doesn't match my request." (e.g., see bottom of Student Learning [Assessment] page, in https://vt.digication.com/Lundkelsey lunds eportfolio-May-2013/Contact). Working on something as specific as pattern size in the teaching of music and reflection on this growth in a video collage together demonstrate how an ePortfolio can use the affordances of multimedia displays to create an

Figure 3 *Video Collage* 



effective place for reflection. In assessing such reflection, we look for changes in practice that are seen by the students, so that we are supporting and nurturing dispositions of reflection and thoughtfulness that students, once they have left our programs, will take into their first professional teaching positions.

### Weekly Blogs and Vlogs

In order to have benchmarks of reflective practice, students use blogs to connect with university supervisors and faculty and their own cohort. Through these blogs and vlogs, students measure their own growth one week at a time (see Figure 4). Teacher candidates reflect weekly via vlog (i.e., video logs) and blog (i.e., web logs as text) posts as a way to unpack their practice and to support other teacher candidates. Some candidates comment on the pages of other candidates, widening the professional learning community and deepening their own knowledge. The students are given a choice as to when they wish to create a video log (i.e., a talking head video recounting their week's progress) or a blog post (i.e., a written text piece recounting their week's progress). In previous research, we found that giving students a choice of which modality they chose to reflect improved their level of reflective practice (Kajder &

Parkes, 2012). While the weekly blogs/vlogs can stand alone as evidence of reflective practice, we have found that as part of the ePortfolio creation process students revisit their posts and treat them as relational artifacts/narrative records that can be connected thematically and then re-connected in different ways-often alongside other artifacts such as lesson plans, and student work-to demonstrate challenges that have been overcome and those yet to be overcome, and/or growth over time within specific areas of their teaching. For example, students have taken individual posts created throughout the year to then illustrate and make sense of their emerging abilities to (a) use digital technologies to support the teaching and learning process, (b) manage and monitor student learning, (c) design and implement standard- based units and lesson plans, and (d) implement specific learning strategies to support student learning.

Often students would use their blogs as a space to share the provenance of their activities, reflect on the implementation of their activities, and detail lessons learned for the future. In his ePortfolio presentation, Ben initially acknowledged his initial reluctance to blog/vlog as an assignment and only saw its value as a space to capture his experiences and as a reflective tool as he moved through the year:



Figure 4 BLogging and Vlogging

When we first got this assignment I was not really looking forward to this at all. I had never done a blog before. I did not see myself as really writing everything down. That really was not my thing, but I have really come to enjoy this and I plan on continuing it after graduation and into my first job, and it was just a great place for me to write about what happened that day . . . and it [if] it was a stressful day I could go and sit down and write . . . and what is really great about it is, I could come back and read it. I would do a lesson that did not go very well and I would get on the blog and write something and come back and look at it and know how to improve for next time. It gave me time to get down out of my head real quick and then be able to reflect on it later. So it was a great tool for me that I plan to continue using.

Importantly, Ben also used one of his later Vlog posts to begin to reflect on the distinction between being a teacher of students and a student of content. He used this post to articulate and give value to the range of strategies he had used during his student teaching, strategies that he would continue to use and develop in his first year to engage students and move him away from being the stereotypical history teacher who does little more than take on the role of teller of the tale of the past. Ben suggested that the strategies he now had in his "toolbox" gave him a leg up, creating lesson plans and units . . . I really feel that these tools are just a key part of teaching. You can know all of the content in the world, everything about history, but if you can't communicate it in a way that students understand, it is not going to do you much good. These different strategies help engage students, and engagement is huge, because if you engage them it means they are going to hold onto that information longer than just "here is a lecture, here is a piece of paper and take some notes, study them and take a test" . . . that fosters rote learning and . . . I don't want that in my classroom. I want students to dig into the information and really feel like they are growing from it, rather than just learning it for the sake of taking a test.

### Artifact Inclusion in ePortfolio

Students themselves choose what to integrate from all the class-work activities, assignments, and products into their ePortfolios, as per the constructivist paradigm, acting as autonomous, selfaware, self-regulated, and self-mediated thinkers. We as faculty meet and decide in advance how we will align and sequence this process. Our intensive, ongoing revisions started in 2007, but our programs have had a long history of using ePortfolios. Discussions among the music, history/social science, and English education faculty in 2008 led us to explore our processes and requirements for student reflective practice. We analyzed our methods coursework and student artifacts, and after conducting content analyses, we discovered that our students had different levels of aptitude for thinking and writing reflectively about becoming a teacher. In 2009, we immersed ourselves in self-study of the literature on reflective practice and devised new pedagogies for our students. We required them to complete blog posts (i.e., weblogs) and vlog posts (i.e., VideoLogs). We transcribed and analyzed student reflective data (after student graduation, IRB exempt #08-777) and found that levels of reflective practice differed between these two modalities. We added Video Collages and Twitter to our curricula for our 2009-2010 students to consider using as vehicles for reflection. After transcribing again the material and analyzing the content of the reflective posts, we observed that students were more deeply reflective when they Vlogged and created the Video Collages. We created an overall rubric to guide conversations with students about their professional dispositions and asked our students to reflect on their beliefs and behaviors in their reflective practices (e.g., blog, vlog, tweets, collages). Our 2010-11 study data showed a deepening of all reflective practice in our students, as we created and administered a rubric to evaluate levels of reflective practice both in class and in the ePortfolio. Candidates who reflect both in and on practice possess an important professional disposition. The reflections that students create give us insight into accounts of their understandings their and misunderstandings and also into their thinking as teachers, especially when candidates link theory to practice and consider the moral and ethical implications of their teaching beliefs and behaviors. When students were given choices of modalities, the quality of reflections improved.

As practitioners who use ePortfolios, our primary goal is to be exemplary teachers; our collaboration has only strengthened our individual teaching skills and the learning of our students. We have analyzed pages of student reflective data to ascertain whether our approach was working and whether we had adhered to best practices for our students in using reflective practice as part of teaching and learning (Kajder & Parkes, 2012; Parkes & Kajder, 2011). We found that students gained deeper levels of critical thinking skills when they were afforded the choice of reflecting with a variety of multi-modal methods. By questioning our pedagogical techniques and analyzing student data for evidence of improvement, we were able to increase our students' skills and we learned more about ourselves. We, in turn, became more reflective teachers ourselves in terms of designing ways to integrate ePortfolios within and through our courses and establish a

collaborative teaching and learning environment to support the ePortfolio creation process.

How we integrate ePortfolios into our courses. Students experience immediate, formative, and summative feedback (i.e., assessment) that facilitates the use of their reflective practice about their own classroom contexts. Within the methods classes, we give our students assignments that contain reflective prompts (https://docs.google.com/document/d/1hzvGLA qUagiOi3hrX w-2bba9uRTVyjlVch6QjEEC4s/edit?pli=1), as suggested by Larrivee (2008) and Rickards et al. (2008). For example, when they conduct a peerteaching episode, they watch the video to examine their teaching to evaluate their and write a reflective paper about what they saw and how they might improve their future work. While students are in field internships, we are able to respond to students quickly and with evaluative comments (e.g., see https://docs.google.com/document/d/1D-

y1uWvLIIPBbeizZy0pMhnb2umt7ttvC9awrMmMEcw) through the blogs they keep about their observations in schools and their perceptions of their own learning. They question old beliefs and look for new information; they re-examine their knowledge, their thoughts, experiences, and behaviors as developing teachers in the K-12 setting. The timely feedback we give them is critical in the pedagogical instructional cycle, and while criteria based, it is particularly formative for both the students and us as teachers. After receiving feedback on reflections or class products, the students know immediately where they need to improve. By asking them to self-assess with rubrics and criteria before they submit their work, we find that when asked to review and reflect on their efforts, our students show a willingness to monitor and deliver outstanding quality work of their own volition. With increasing opportunities to share and collaborate in class and out, with the use of blogs, the discussion threads, and e-mail communication, students often problem-solve issues and find and share solutions rather than just make a "one-stop" learning goal, such as, "What is on the test next week?" An example of this collaboration is exemplified by this student's e-mail sent to members of his cohort:

I recommend you take a look at the videos just to listen to H coach you through the process. H has the creation matrix part down. If you have questions on creating the interface hit-up the blog for some help.... H's coaching is very good. Here is the link. (http://www.youtube.com/watch?feature=player\_e mbedded&v=YYLXY9OuV E)

to the related student-made video tutorial. We regard this student-created tutorial, unprompted by faculty, as an illustrative example of how the ePortfolio creation process not only helps facilitate autonomous, creative, and intellectual thinking but also offers possibilities for encouraging interaction and collaboration among cohort members. Such collegial collaborations reflect the kind of dispositions one needs in order to become a forwardthinking colleague in any professional learning community.

The mix of independent and collaborative problem-solving exhibited throughout the year with the ePortfolio process ultimately makes an impact on student-teachers' own learning, and critically, on their teaching and learning practices as professionals in K-12 settings. This gives them quality artifacts from which they can select to craft their narrative accounts of their growth in their ePortfolio. They take this reflective work, connect it, and then reflect again as part of the process constructing their teacher identities as reflective practitioners. The meta-reflective practices that surface in the ePortfolio are also assessed summatively.

The teaching and learning environments. Collectively, we each teach a section of four classes that are paired, two in the fall and two in the spring. Each semester, one class is set on campus and the other is set in the field, in K-12 schools where students are learning to teach. Our students' learning is enhanced by experiencing and using these technologies because they are able to show us how they think, as well as what they know and can do, first as a student and finally as a teacher; they can illustrate this to us most effectively using audio, video, text, and reflective practices within the course management system, blogs, and later, the ePortfolio platforms. Their ePortfolios are then richly multimodal products of their journey from student to teacher; and as a product, they become a space to celebrate the studentteachers' learning. It is, however, the process of creating the ePortfolios that strongly impacts and shapes our students' learning paradigm.

### Looking Ahead

When our programs began working with ePortfolios, sustainability was an issue because of technological difficulties, such as lost and broken links to past artifacts that stymied efforts to effectively move forward in the intent to incorporate effectively the practice of reflection within and across programs of study. Our work is now held on different platforms in order to give more ownership to the students, allowing them to take their ePortfolios onto the job market and into their first jobs. We use Scholar (a Sakai platform) so that they experience a Learning Management System, and we have allowed them choice by experimenting with a variety of different platforms to host their ePortfolios: from Netscape to Dreamweaver to Filebox, a variety of different storage sites, and Weebly, GoogleSites, and Digication. We give students these choices so that they can sustain their work as developing practitioners into their lives as lifelong learner-teachers.

Because the tools of technology change constantly, it is important that ePortfolio implementation be made with colleagues and that deliberative decisions be made within the engaged scholarship of teaching (Boyer, 1997; Hatch, 2005), We have in process a research study to refine further and calibrate our ePortfolio assessment rubric. Testing our reflective-practice assessment tool and ascertaining agreement between judges is important to assuring that we are measuring what we propose to measure and that we do so consistently from year to year.

Our future goal is simply to articulate the concept of meta-reflection in ePortfolios and to encourage metareflection in our students. Our ongoing efforts are clearly aligned with our conception of the scholarship of teaching. This, as Shulman (2011) pointed out, should be "public, subject to peer evaluation, and subject to use by members of one's disciplinary community" (p. 4). For us, it's not a question of how we will sustain our dedication to effectively integrate ePortfolios to improve student learning. Our primary goal is now to reflect and refine our processes to continue supporting student learning with ePortfolio beyond their graduate careers and toward National Board Certification, long after teacher candidates have left our programs.

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### Appendix A Rubric for ePortfolio

### ARTS AND HUMANITIES – DEPARTMENT OF TEACHING AND LEARNING GRADUATE MASTER OF ARTS – EDUCATION EPORTFOLIO EVALUATION RUBRIC

Student name (Printed)	Date of defense:	

Evaluator name (Printed)	) Signature:	
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### The chair and each member of the committee will be required to evaluate each ePortfolio individually. Evaluations will be averaged to give a final score.

This evaluation is modeled after recommendations from the Interstate New Teacher and Support Consortium, along the guidelines set forth by the National Council for Accreditation of Teacher Education. Please complete the evaluation using the following rubric and give one score per area I-V.

3 Exceptional (Distinguished) The candidate exhibits superior mastery of the knowledge, skills, or dispositions required by the standard. The candidate substantially exceeds expectations by providing multiple layers of connected and convincing evidence to show exceptional performance in meeting the professional standard or principle.

2 Strong (Proficient) The candidate exhibits intermediate to advanced performance in relation to essential knowledge, skills, or dispositions required by the standard. The candidate exceeds satisfactory expectations by providing multiple sources of clear evidence to make a strong case for meeting the professional standard.

1 Competent (Basic) The candidate exhibits minimum performance in relation to essential knowledge, skills, or dispositions required by the standard. The candidate meets minimum expectations by providing at least 3 pieces of evidence to meet the professional standard.

0 Unsatisfactory. The candidate exhibits unacceptable performance in relation to the essential knowledge, skills, or dispositions required by the standard. The candidate provides little or no evidence for meeting the standard and does not meet minimum acceptable expectations.

### Scoring 13-15 Exceptional, 10-12 Proficient, 5-9 Competent, 0-4 Unsatisfactory

TOTAL SCORE:

NCATE Standards	INTASC 2011	Elements / Focus	Indicators of	Score
	Standards/ Principles		success	
I. CONTENT KNOWLEDGE (1.a)	Standard #4: Content	Knowledge of	Score analyses and	Score: I.
Teacher candidates have in-depth	Knowledge	music	rehearsal guides	
knowledge of the content that they plan to	The teacher understands			
teach as described in professional, state,	the central concepts, tools	Analyses	Review of materials	
and institutional standards. They	of inquiry, and structures of			
demonstrate their knowledge through	the discipline(s) he or she	Conducting skill	Lesson plans	
inquiry, critical analysis, and synthesis of	teaches and creates	_	-	
the subject. All program completers pass	learning experiences that	Performance skill	Listening guides	
the content examinations in states that	make these aspects of the			
require examinations for licensure.	discipline accessible and	Aural skill	Reflection about	
Candidates in advanced programs for	meaningful for learners to		teaching	
teachers are recognized experts in the	assure mastery of the	Musicality		
content that they teach.	content.		Teaching video	
		Knowledge of	evaluations	
		music history		
		5	Lessons taught	

### II. PEDAGOGICAL CONTENT KNOWLEDGE (1.b)

Teacher candidates reflect a thorough understanding of the relationship of content and content specific pedagogy delineated in professional, state, and institutional standards. They have in-depth understanding of the content that they plan to teach and are able to provide multiple explanations and instructional strategies so that all students learn. They present the content to students in challenging, clear, and compelling ways, using real-world contexts and integrating technology appropriately. Candidates in advanced programs for teachers have expertise in pedagogical content knowledge, and share their expertise through leadership and mentoring roles in their schools and communities. They understand and address student preconceptions that hinder learning. They are able to critique research and theories related to pedagogy and learning. They are able to select and develop instructional strategies and technologies, based on research and experience that help all students learn.

*Standard #1: Learner Development* The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropria and challenging learning experiences. *Standard* #2: *Learning Differences* The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

Standard #8: Instructional Strategies The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways. Standard #3: Learning Environments The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self motivation. Standard #5: Application of Content

The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Standard #7: Planning for Instruction The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upor knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

	Plans for lesson Modeling	Arrangements Audio recordings	Score: II.
e 1	Imitation	Lesson plans	
l, iate	Verbal association Symbolic association Learning from the	Lesson plans adapted for children with special needs Reflection about teaching children	
	familiar	with special needs	
	Movement	Score arrangements	
	Direct instruction Creativity	Website resources Journal reflections	
eir ly	Diagnostic and pre- scriptive teaching	Score analyses	
te and	Positive and efficient class & rehearsal environment	Listening guides	
lf	Learner-centered activities		
ect es			
ı			
oon m, y, the			

### III. PROFESSIONAL AND PEDAGOGICAL **KNOWLEDGE SKILLS** (1.c)

Teacher candidates can apply the professional and pedagogical knowledge and skills delineated in professional, state, and institutional standards to facilitate learning. They consider the school, family, and community contexts in which they work and the prior experience of students to develop meaningful learning experiences. They reflect on their practice. They know major schools of thought about schooling, teaching, and learning. They are able to analyze educational research findings and incorporate new information into their practice as appropriate. Candidates in advanced programs for teachers reflect on their practice and are able to identify their strengths and areas of needed improvement.

They engage in professional activities. They have a thorough understanding of the school, family, and community contexts in which they work and collaborate with the professional community to create meaningful learning experiences for all students. They are aware of current research and policies related to schooling, teaching, learning, and best practices. They are able to analyze educational research and policies and can explain the implications for their own practice, and for the profession.

growth, and to advance the profession.

			1
<i>Standard #8</i> : Instructional Strategies The teacher understands and uses a	Expectations for behavior	Assessment tools	Score: III.
variety of instructional strategies to	UCHAVIOI	Teacher work	111.
encourage learners to develop deep	Efficient handling	samples	
understanding of content areas and their	of materials, music	sumples	
connections, and to build skills to apply	and instruments	Lesson plans	
knowledge in meaningful ways.		p	
Standard #3: Learning Environments	Pacing, enthusiasm,	Budget projects	
The teacher works with others to create	and teacher	0 1 5	
environments that support individual and	intensity	Self evaluation of	
collaborative learning, and that		teaching video	
encourage positive social interaction,	Conducting skill	-	
active engagement in learning, and self-		Classroom and	
motivation.	Analysis of music	rehearsal	
Standard #5: Application of Content		management plans	
The teacher understands how to connect	Clear learning goals		
concepts and use differing perspectives	& instructional	Anecdotal	
to engage learners in critical thinking,	procedures	observations of	
creativity, and collaborative problem		student response	
solving related to authentic local and	Active engagement	т <u>т</u>	
global issues.	of students	Lesson and	
Standard #7: Planning for Instruction	A	rehearsal plans	
The teacher plans instruction that	Activities based on curriculum	designed to develop sound	
supports every student in meeting rigorous learning goals by drawing upon	standards	fundamentals, aural	
knowledge of content areas, curriculum,	stanuarus	skills, and	
cross-disciplinary skills, and pedagogy,	Short and long term	performance with	
as well as knowledge of learners and the	planning	understanding	
community context.	plaining	understanding	
Standard #6: Assessment	Lesson plans	Journal reflections	
The teacher understands and uses multiple	L'essen prans		
methods of assessment to engage learners		Curriculum plans	
in their own growth, to monitor learner		1	
progress, and to guide the teacher's and		Travel projects	
learner's decision-making.			
Standard #9: Professional Learning and		Responses to	
Ethical Practice		journal articles	
The teacher engages in ongoing			
professional learning and uses evidence		Case study of IEPs	
to continually evaluate his/her practice,			
particularly the effects of his/her choices			
and actions on others (learners, families,			
other professionals, and the community),			
and adapts practice to meet the needs of			
each learner.			
Standard #10: Leadership and			
Collaboration			
The teacher seeks appropriate leadership roles and opportunities to take			
responsibility for student learning, to			
collaborate with learners, families,			
colleagues, other school professionals, and			
community members to ensure learner			
the second secon			

IV STUDENT LEARNING	Standard #1: Learner Development	Sequential age	Journal reflections	Score:
(1.d)	The teacher understands how learners	appropriate music	that observe student	IV.
Teacher candidates focus on	grow and develop, recognizing that	instruction	learning and / or	
student learning and study the	patterns of learning and development		motivation	
effects of their work. They	vary individually within and across the	Activates prior		
assess and analyze student	cognitive, linguistic, social, emotional,	knowledge and	Teacher work	
learning, make appropriate	and physical areas, and designs and	experience (learn	sample –	
adjustments to instruction,	implements developmentally	from the familiar)	assessment tools	
monitor student learning, and	appropriate and challenging learning	,		
have a positive effect on	experiences.	Using assessments	Pre-post tests of	
learning for all students.	Standard #2: Learning Differences	to diagnose student	student learning	
Candidates in advanced	The teacher uses understanding of	readiness, to	C C	
programs for teachers have a	individual differences and diverse	understand learner	Reflections about	
thorough understanding of	cultures and communities to ensure	progress, to inform	pre-post testing of	
assessment. They analyze	inclusive learning environments that	future instruction,	student	
student, classroom, and school	enable each learner to meet high	and make	achievement	
performance data and make	standards.	summative		
data-driven decisions about	Standard #6: Assessment	evaluations about	Self evaluation of	
strategies for teaching and	The teacher understands and uses	student	conducting video	
learning so that all students	multiple methods of assessment to	achievement.		
learn. They collaborate with	engage learners in their own growth, to		Reflective practice	
other professionals to identify	monitor learner progress, and to guide		about one's own	
and design strategies and	the teacher's and learner's decision-		communication via	
interventions that support	making		gesture	
student learning.	Standard #9: Professional Learning			
	and Ethical Practice		Lesson plans	
	The teacher engages in ongoing			
	professional learning and uses evidence		Case studies of	
	to continually evaluate his/her practice,		students with	
	particularly the effects of his/her		special needs and	
	choices and actions on others (learners,		students for whom	
	families, other professionals, and the		English is not their	
	community), and adapts practice to		first language	
	meet the needs of each learner.			

V. PROFESSIONAL	Standard #9: Professional Learning	Reflections on	Philosophy	Score:
<b>DISPOSITIONS</b> Candidates	and Ethical Practice	teaching	statement	V.
work with students, families,	The teacher engages in ongoing	-		
colleagues and communities	professional learning and uses evidence	Professional growth	Rationale for music	
in ways that reflect the	to continually evaluate his/her practice,	_	in the schools	
professional dispositions	particularly the effects of his/her	Participation in		
expected of professional	choices and actions on others (learners,	school district	Review of	
educators as delineated in	families, other professionals, and the	events	participation in	
professional, state, and	community), and adapts practice to		national / state	
institutional standards.	meet the needs of each learner.	Awareness of	organizations	
Candidates demonstrate	Standard #10: Leadership and	community		
classroom behaviors that	Collaboration	resources	Journal reflections	
create caring and supportive	The teacher seeks appropriate		about teaching	
learning environments and	leadership roles and opportunities to	Respective and	one's peers	
encourage self-directed	take responsibility for student learning,	productive		
learning by all students.	to collaborate with learners, families,	communication	Attendance at	
Candidates recognize when	colleagues, other school professionals,	with families	faculty meetings	
their own professional	and community members to ensure			

dispositions may need to be adjusted and are able to	learner growth, and to advance the profession.	Self awareness of dispositions	Attendance of field hours, direct
develop plans to do so.			instruction and
		Willingness to	observation
		respond to supervisor/ clinical	Disposition self or
		faculty suggestions	professor
			evaluations
			Professional
			Resume

Scoring: 13-15 Exceptional, 10-12 Proficient, 5-9 Competent, 0-4 Unsatisfactory

TOTAL SCORE: \_\_\_\_\_

Capstone or	Level 0	Level 1	Level 2	Level 3	Score
macro-	(Unsatisfactory)	(Basic)	(Competent)	(Distinguished)	
reflection in		70-80	80-90	90-100	
ePortfolio					
Reflection	No reflection on	Does not recognize	Is unclear which	Acknowledges and	
on practice	practice is given	change to practice but	changes to practice	articulates changes in	
		discusses it	occurred	practice	
		Does not perceive	Perceives	Analyzes	
		relationships between	relationships between	relationships between	
		student learning and	student learning and	student learning and	
		teaching practices but discusses them	teaching practices	teaching practices	
			Engages in critical	Engage in critical	
		Does not engage in	criticism of one's own	criticism of one's own	
		critical criticism of	teaching	teaching offering	
		one's own teaching	0	alternatives for future	
		but discusses one's		practice	
		teaching		1	
Critical	No reflection of	Does not perceive	Is unclear which	Acknowledges and	
reflection	growth is given	area of change in	changes to beliefs or	articulates change in	
of growth		beliefs or assumptions	assumptions have occurred	beliefs or assumptions	
		Does not observe self	occurred	Observes self often in	
		in the process of	Partially observes self	the process of	
		thinking	in the process of	thinking	
			thinking		
		Does not question		Questions commonly-	
		commonly-held	Questions commonly-	held beliefs offering	
		beliefs	held beliefs without	solutions	
			offering alternatives		
		Does not craft	Narratives refers	Narrative weaves	
		narrative using past	minimally to past	richly between past	
		experiences,	experiences,	experiences,	
		reflections, or	reflections, and	reflections, and	
		learning	learning	learning	
Total Score		Ĭ	Ŭ	Ŭ	/200

# **Reflective Practice Component of ePortfolio**