Examining the Impact of the Creation of Digital Portfolios by High School Teachers and Their Students on Teaching and Learning

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This mixed methods study examined the perceived impact of the creation and implementation of digital portfolios by 29 high school inservice teachers and their students representing 20 school districts within one state. However, most research on digital portfolios has focused on preservice and not inservice teachers. Findings demonstrated that digital portfolio creation resulted in increased teacher learning about technology, a reexamination of their pedagogy, better comprehension of their students' learning, reflective processes, and assessment, and reciprocal learning between teachers and students. Future digital portfolio research should focus on reciprocal learning processes on a longitudinal basis to learn of its outcomes, benefits, and challenges. Additionally, digital portfolios should be embedded in inservice teacher education as long-term professional development tools to reap similar benefits as those realized by preservice teachers who have engaged in digital portfolio development.

Since the late 1980s, the use and implementation of digital portfolios (i.e., ePortfolios, electronic portfolios, or web-based portfolios) in education—at all academic levels—has been increasing. This is most evident in schools, colleges, and departments of education (SCDEs), many of which have integrated digital portfolios and more traditional portfolios as part of the accreditation process as required by organizations such as the Council for the Accreditation of Educator Preparation, which emphasizes performance-based assessment, and also because they "foster deep student reflection and learning" (Strudler & Wetzel, 2011, p. 166). However, most of the empirical, published research investigating digital portfolios in teacher education has centered on preservice teachers—and not inservice teachers (Milman & Kilbane, 2005; Milman & Wray, 2014). This study sought to examine the impact of the creation of digital portfolios by high school teachers who then led their own students in the creation of digital portfolios.

Digital Portfolios and Teacher Education

The majority of published, empirical research studies focusing on portfolios in teacher education has centered on preservice and not inservice teachers (Milman & Kilbane, 2005; Milman & Wray, 2014). Generally, portfolio research in teacher education has shown many positive benefits associated with portfolios, whether they were developed in a traditional, print-based format (i.e., a binder) or with digital tools/technology (i.e., digital portfolios or ePortfolios). For example, portfolios have demonstrated positive effects on teacher identity (e.g., Berrill & Addison, 2010; Hopper, Sanford, & Bonsor-Kurki, 2012), knowledge (e.g., Craig, 2003, 2007; Wilson, Hallam, Pecheone, & Moss, 2014), professional development (Boulton, 2014; Dietz, 1995), reflection (Fox, White, & Kidd, 2011; Lyons, 1998), and technology skills (e.g.,

Bartlett, 2002; Herner-Patnode & Lee, 2009; Milman, 2005). Challenges associated with portfolios in teacher education have also been well documented, particularly the tensions that arise between the needs of SCDEs when using portfolios as assessment tools and the needs and purposes of preservice teachers when developing portfolios (e.g., Strudler & Wetzel, 2005, 2008, 2011; Wetzel & Strudler, 2005).

This study involved several searches using different search terms in the ERIC EBSCO HOST database and 15 education, educational technology, and teacher education peer-reviewed journals to locate studies that investigated digital portfolios and inservice teachers. These searches yielded only 10 studies about inservice teachers and digital portfolios. Researchers who have examined digital portfolios vis-à-vis inservice teachers have researched teachers' professional development (Bala, Mansor, Stapa, & Zakaria, 2012; Beck, Livne, & Bear, 2005; Boulton, 2014; Fox, Muccio, White, & Tian, 2015; Milman & Kilbane, 2005; Romano & Schwartz, 2005; Sung, Chang, Yu, & Chang, 2009; Turner & Simon, 2013), reflective practice (Boulton, 2014; Pitts & Ruggirello, 2012; Romano & Schwartz, 2005; Sung et al., 2009; Turner & Simon, 2013), and transformative learning (Stansberry & Kymes, 2007). Considering the limited number of studies, there is a need for more empirical research about digital portfolios and inservice teachers.

Beck et al. (2005) conducted a study using the Electronic Portfolio Assessment Scale (ePAS) which included 188 preservice and 19 inservice U.S. teachers' ratings of the perceived effects of digital portfolios on their professional development. By comparing four different groups of teachers who developed different types of formative and summative digital portfolios, the researchers learned that certain types of portfolios received significantly higher ratings for their contribution to teacher professional development. They also discovered that "formative portfolios that focused

on teacher development better supported professional outcomes than did the summative accountability portfolio. It was concluded that portfolios should not be used for the summative accountability of teachers" (p. 221). Beck et al. (2005) also suggested that the process of developing digital portfolios might be more important than the end result. However, external validity has not been established for the ePAS instrument; therefore, its generalizability is limited. Moreover, the sample studied consisted of only 9% inservice teachers and 91% preservice teachers; expansion of the study's inservice population might have different results.

In a qualitative study, Milman and Kilbane (2005) investigated the role of digital teaching portfolios in nine inservice teachers' professional development and classroom practice. They found that digital teaching portfolios "fostered teachers' authentic professional development" (Milman & Kilbane, 2005, p. 57), "acted as catalysts for ongoing professional development," (p. 59), and helped the teachers experience "anew what it was like to be a learner again" (p. 61). However, their sample was very small. Therefore, their findings cannot be generalized to other populations; moreover, their study examined teachers in two different digital portfolio development courses at two different institutions in the United States. Similarly, Sung et al.'s (2009) mixed methods study of 44 inservice, contracted, full time, long-term, elementary school substitute teachers in Taiwan took place via a course; however, in their study the context was a classroom assessment, and not a digital portfolio development course. The researchers found the structure of the course coupled with multiple supportive measures—"guided journal writing, discussions forums, mechanisms for self- and peer-assessment" (Sung et al., 2009, p. 384), simultaneously cultivated the teachers' professional development and creation of their digital portfolios.

Bala et al. (2012) conducted a study of 20 primary and secondary English language teachers, from different schools in Malaysia, who had to create digital portfolios in a 6-week period. They determined the creation of digital portfolios cultivated the teachers' professional development, particularly their technology proficiency. However, a major shortcoming of this study is the lack of detail in the methods employed. It is also unclear why the teachers were required to develop digital portfolios and within what context (e.g., for a credit-bearing course or professional development). Boulton (2014) investigated how digital portfolios enhanced the career skills of eight first-year inservice teachers in England who had completed a graduate certificate or degree program the previous year. She discovered that although digital portfolio development promoted teachers' self-regulation, self-efficacy, and self-evaluation, several obstacles hindered the teachers' progress. Specifically, schools needed to embed digital

portfolios as professional development tools, provide opportunities for teacher collaboration, and schedule time throughout the school year for the teachers to continue working on their portfolios (Boulton, 2014).

Turner and Simon's (2013) study showed that digital portfolios promoted the professional development of nine teachers from England. Through the portfolios, the teachers made connections to and demonstrated their comprehension of theory and practice, documented changes in their beliefs and practice over time, and deepened their professional reflection about their teaching. Although their study did not specifically focus on digital portfolios, digital portfolios emerged as important components to understanding the teachers' professional development. Additionally, their description of the digital portfolios as "mediating objects" (Turner & Simon, 2013, p. 6) is similar to Milman's (2005) findings, in which digital portfolios acted as catalysts to teachers' professional development. On the other hand, Fox et al. (2015) discovered differences in teachers' professional growth as documented in program portfolios, depending on teachers' levels of experience. As such, they recommended differentiated approaches for teacher professional development.

Researchers of five studies (i.e., Boulton, 2014; Pitts & Ruggirello, 2012; Romano & Schwartz, 2005; Sung et al., 2009; Turner & Simon, 2013) found positive benefits related to inservice teachers' reflection or reflective practice and digital portfolios, although Romano and Schwartz's (2005) and Turner and Simon's (2013) studies were broader in scope. For instance, Romano and Schwartz (2005) investigated the impact of digital portfolios, online discussions, and videotaping of 10 elementary, middle, and high school beginning teachers teaching in the United States. Further, Turner and Simon (2013) studied their masters program, which required teachers to develop digital portfolios); they discovered that digital portfolios promoted the participants' reflective practice as both a process and outcome of digital portfolio development.

Three studies (Boulton, 2014; Pitts & Ruggirello, 2012; Sung et al., 2009) specifically investigated teachers' reflective statements in digital portfolios. Boulton (2014) discovered two major differences in inservice teachers' reflections when compared to those they crafted as preservice teachers. As inservice teachers, the length of their reflections was shorter and their content focused more on teaching practice; as preservice teachers, reflections were longer and centered on theory. In a study by Pitts and Ruggirello (2012) of nine inservice secondary science teachers in the United States, they found that the entries in the teachers' digital portfolios that best demonstrated teachers' reflective practice were those that "explicitly showed how they experienced growth (increased

professional competency) over time through well-coordinated sets of baseline- and post-baseline evidence" (Pitts & Ruggirello, 2012, p. 49). On the other hand, Sung et al. (2009) conducted analyses of the teachers' reflective statements in teachers' digital portfolios using Sparks-Langer et al.'s reflection framework. By analyzing the reflective statements, they found the highest level of reflection achieved by the largest majority of teachers (100%) according to the framework was 5. In this framework, reflections could range from 1 (no connection/reflection) to 7 (highest level of reflection). Yet, 68.2% achieved reflection level 6 and 34.1% achieved reflection level 7, illustrating that the reflective statements in the teachers' digital portfolios reached relatively high ratings on the Sparks-Langer reflection framework. Through the development of the digital portfolios, the inservice teachers demonstrated significant progress with regards to classroom assessment.

Stansberry and Kymes (2007) investigated whether or not the development of digital portfolios fostered transformational learning in 78 inservice teachers enrolled in four different semesters of a master's program in the United States. They also investigated whether or not the teachers would require their own students to create portfolios once they created theirs. Analysis of quantitative data demonstrated that it would be unlikely for teachers to have their own students develop their own digital portfolios. However, there was "evidence of transformational learning to some degree" (Stansberry & Kymes, 2007, p. 491) even though analyses of qualitative data provided a stronger connection between the development of digital portfolios and transformational learning. For instance, they found the development of digital portfolios fostered teachers' reflection and confidence, although they also were "disorienting" in that students described feeling "inept" and "confused" (Stansberry & Kymes, 2007, p. 492) in the early stages of digital portfolio development. Further investigation of these negative feelings might have resulted in a better understanding of the impact of the digital portfolios on the teachers, in addition to strategies they could employ to help them better support their own students in developing digital portfolios.

Although the studies in this review demonstrated several benefits when inservice teachers created digital portfolios, most of the studies were small-scale (ranged from $N = 8$ to $N = 78$ participants; e.g., seven of the studies $N \leq 20$ and in two studies $N \geq 44$). The investigations mostly occurred via credit-bearing courses in university settings and in graduate education programs (Beck et al., 2005; Milman & Kilbane, 2005; Pitts & Ruggirello, 2012; Romano & Schwartz, 2005; Stansberry & Kymes, 2007). Only one study (Boulton, 2014) involved investigating teachers in the field, and outside the context of a teacher education course.

Studies of inservice teachers and digital portfolios show a need for more research that is broader in scope, has a larger sample of participants, and takes place outside of a university setting.

Purpose and Research Questions

The purpose of this study was to examine high school teachers' perceived impact on their teaching and their students' learning resulting from the creation of digital portfolios by both the teachers and their own students. The main research questions were:

1. What are teachers' perceptions of the impact, if any, of digital portfolios on their teaching?
2. What are teachers' perceptions of the impact, if any, of digital portfolios on their students' learning?

Methods

This mixed methods study examined the perceived impact of the implementation of digital portfolios by 29 high school inservice teachers and their students, representing 20 school districts within a state in the United States. This study employed a QUAN + QUAL "concurrent triangulation" (Creswell, Plano Clark, Gurmann, & Hanson, 2003, p. 229) mixed methods design. Studies that employ this design involve the simultaneous collection of both qualitative and quantitative data.

Context

This mixed methods study investigated the impact of a two-year statewide, competitive grant project. The project involved the creation of digital portfolios published on the Internet using Sakai, an open-source web-based portfolio tool.

During Stage 1, teachers from different high schools across the state met in the state's capital five times to participate in face-to-face professional development workshops. During this time, they learned about the digital portfolio development process (Kilbane & Milman, 2003) from a consultant hired by the funding agency. They also learned to use the Sakai tools by creating their own digital portfolios, participated in discussions, and accessed online resources. Over a period of 10 months, the teachers created digital portfolios that contained nine snapshots bringing together various artifacts (e.g., multimedia presentations, photographs, digital video, animations, and classroom teaching materials) that demonstrated growth in their ability to integrate technology effectively over time. The teachers wrote a reflective statement using a framework

developed by Brown and Irby (2001) that communicated their professional thinking about each artifact and its significance to practice.

During Stage 2, which occurred over the summer and during the subsequent academic year, the same teachers involved in Stage 1 implemented a plan for using digital portfolios in their own classrooms to support student learning. A consultant and the grant's project manager assisted each teacher in identifying specific goals for the integration of digital portfolios and assisted them in formulating specific action steps. A consulting firm developed Sakai digital portfolio templates to meet each teacher's individual project specifications.

There were considerable differences in the ways each teacher implemented digital portfolios to support student learning. Some teachers used digital portfolios to help students organize their work in a showcase format, while others used them to facilitate students' understanding of how specific assignments linked to curriculum standards, and still others used digital portfolios to promote students' reflection and learning. Other differences existed as well in the teachers' efforts at implementation, including: the numbers of students involved, subject areas and grade levels represented, amount of time utilized, types of technologies integrated, and total number of weeks dedicated to digital portfolio development. Although differences existed, there was uniformity in the allocation of funding from the grant for equipment and other support tools ($20,000.00 per site) used for the creation and organization of the digital portfolios (i.e., Sakai) and reflection prompts students used in the portfolios.

During Stage 2, the teachers received online professional development opportunities that supported their efforts and presented the details of their implementation at a statewide technology conference held 12 months into Stage 2. A final grant meeting was held during this conference that enabled the teachers to debrief on their participation in the project with each other and the grant administrators.

Participants

The study's participants were the 29 high school (grades 9-12) teachers who participated in the digital portfolio competitive grant project. They represented 20 different school districts across the state. Selection for participation in the grant was based on the merit of proposals submitted by the teachers in these school districts. This process identified quality proposals that represented the diverse districts and regions from across the state and also teachers from varying school environments (i.e., rural, suburban, urban, and different socioeconomic levels). Nine of the participants were male and 20 were female. Their teaching experience ranged from three to 30 years and

all could be considered typical in their skill level related to technology skills and proficiency.

Data Sources and Analysis

The data used in this study was gleaned from the participants' responses to prompts on a 14-item questionnaire. The questionnaire was administered in-person and on paper at the final grant meeting held during Stage 2 of the project after participants had been involved for 20 months. It was administered as a part of the grant evaluation process and was completed by all of the participants in the study (100% response rate). Although participants could have chosen not to participate in the study, they all agreed to participate. The quantitative methods involved descriptive statistical analyses of the teachers' responses on the questionnaire. Five of the questions required answers on a Likert scale, as follows: 5 = *to a great extent*, 4 = *to a large extent*, 3 = *to a moderate extent*, 2 = *to a small extent*, 1 = *not at all*, and 0 = *NA*. These questions also included sub-items. Seven questions required a yes/no response. Although only one of the questions required an open-ended reply to the statement—"Please add any other comments you may have"—the other 13 questions had space for open-ended commentary. The questionnaire's content validity was achieved through review by two researchers. The two researchers also recommended the format of the questions.

The qualitative portion of the study involved analyses, using the constant comparative method (Glaser, 1965), of 301 unique comments in response to open-ended sections of the questionnaire. The four stages of this method involve

1. "comparing incidents applicable to each category,
2. integrating categories and their properties,
3. delimiting the theory, and
4. writing the theory." (Glaser & Strauss, 1967, as cited in Lincoln & Guba, 1985, p. 339)

To analyze the qualitative data, first major categories for investigation of the dimensions of the teaching and learning process were identified. Next comments related to each category were analyzed, and properties or themes were identified as they emerged. Comments within these themes were grouped together and analyzed for common ideas or properties. These properties were analyzed, and the meaning in these themes was summarized. Two researchers working independently applied these methods and then compared preliminary findings. These findings were then refined upon discussion and deliberation. The goal of discussion was to create themes based on the comments provided by the participants in the study that

would explain their perceptions, refine the themes, and answer the major research questions.

Results

This study examined the perceived impact of creating digital portfolios on teachers and their students. Both quantitative and qualitative findings indicated that the digital portfolios had a generally positive impact on teachers, the teaching-learning process, and their students.

Quantitative results from several items in the questionnaire are presented in Tables 1 and 2. Table 1 provides quantitative information about the impact of digital portfolios on teachers. Table 2 indicates the impact of digital portfolios on the dimensions of teaching and learning addressed in the study, using a simple "yes" or "no" as a possible choice.

The study's qualitative findings resulted from analysis of 301 individual comments offered in response to each of the items on the questionnaire that contained a prompt soliciting additional comments or suggestions. Two major themes emerged from these comments. They were classified into the following categories: (1) teacher learning and pedagogy; and (2) student learning, reflection, and assessment.

Theme 1: Teacher Learning and Pedagogy

The theme teacher learning and pedagogy centers on the learning teachers experienced resulting from the development of their own digital portfolios, as well as changes they made or planned to make regarding their pedagogical practices. Teachers indicated that using digital portfolios required a greater amount of time, challenged them to rethink existing planning and teaching practices, made teaching and students' products more interesting, engaged students more in their own learning, incorporated more 21st century skills, and fostered a teaching and learning environment that was more rewarding yet also frustrating. It was frustrating because the technology tool (Sakai) did not always work as they thought it should. By developing their own digital portfolios, teachers learned about using technology and improving their lesson planning. For instance, one teacher summed up technology-related learning: "The biggest impact of the entire process is the increased ability to use various forms of technology efficiently in the classroom." Similarly, the impact of digital portfolios on teachers' learning was also evident in their responses about lesson planning, as the following teacher's comment illustrates:

My lesson plans and the way I presented them has improved. After 28 years of teaching I forgot or neglected to do certain steps that are important to the success of a lesson. This was a great way for

me to get back to the basics. I have also encouraged other faculty members to create a digital portfolio with their students.

In this comment, it is evident the teacher learned and reexamined "anew" the necessary steps in the planning and teaching of a lesson.

Digital portfolio development also seemed to impact teachers' pedagogy, too. The development of digital portfolios promoted increased use and integration of technology, as one comment highlights: "My class became centered around technology and so all of my lesson plans had to be changed to incorporate it. The students also used technology every day which was a new experience for them." This comment illustrates a shift in pedagogical practice: it incorporated technology to a higher degree. However, teachers' changed practice also involved better and more timely communication with students, as another comment shows: "I was able to more clearly and quickly respond to their learning and they were better able to see their errors and improve their responses as it was clearly on their screen." Teachers also described how their teaching of academic content standards improved because the digital portfolio process made them more intentional about creating assignments that were responsive to standards.

Through the creation of their digital portfolios, teachers and students engaged in a reciprocal process of learning, in which teachers and students alike "struggled together to learn and create," as one comment affirmed. Two other responses echoed this sentiment: "I was able to share my successes, failures, and frustrations with them. They were able to view me as a fellow learner in this pilot project"; and, "My students could see that I 'practice what I preach.' They understood I wasn't asking them to do anything I hadn't done myself." These comments show the teachers recognized students were learning with them and that the students appreciated their teachers as learners who could empathize with them because their teacher had also "been there."

Theme 2: Student Learning, Reflection, and Assessment

Another major theme concentrated on student learning and reflection, as well as assessment. Generally, teachers expressed that through the creation of digital portfolios, students learned academic standards, developed self-assessment and reflection skills, and engaged more with content because they were motivated to learn. The following comment captures the integrated nature of this theme:

Through their reflections (required as part of the digital portfolio development process), the students

Table 1
Impact of Digital Portfolios on Teachers

As a result of your participation in the grant, to what extent has each of the following been enhanced for you?	*M*	*SD*
a. Knowledge about digital portfolios	4.52	0.68
b. Ability to create and use a digital portfolio	4.45	0.67
c. Ability to teach your students how to create a digital portfolio	4.31	0.65
d. Ability to use and integrate technology	4.14	0.88
e. Attitude towards using technology in the classroom	4.24	1.10
f. Collaboration with other teachers in or outside your school in the use of educational technology	3.93	1.10
g. Ability to coach/ support colleagues in the use of educational technology	4.00	0.95
h. Additional ways for collecting, storing, and sharing artifacts to demonstrate your or your students' growth and achievements	4.24	0.77

Note. N = 29

Table 2
Impact of Digital Portfolios on Dimensions of Teaching and Learning

Question	Yes	No
1. Did using a digital portfolio with your students have any effect on your teaching or planning for teaching?	96.6%	3.4%
2. Did using a digital portfolio change how or how much your students learned?	79.3%	20.7%
3. Do you think your students learned academic content standards differently through the use of digital portfolios?	72.4%	27.6%
4. Was using digital portfolios with your students important?	89.7%	10.3%
5. Did this project have any effect on your relationship with your students?	62.0%	38.0%
6. Did creating a digital portfolio yourself have any impact on your implementation of digital portfolio s with your students?	93.1%	6.9%

Note. N = 29

were required to look at the content standards and comment on which standards they had grasped and which they still needed improvement with. This allowed for a new understanding of the standards for the students. They also completed writing assignments within the genres required by the state requirements.

This statement shows that reflection, understanding (learning), and standards were all a part of the process for students to create their own digital portfolios. A critical component of student learning featured in the comments was teacher understanding of student learning such as comprehension of students' thinking and misconceptions. This was evident in numerous quotes, but especially in this one:

The portfolio alerted me to misconceptions students still held despite having completed the learning activities. I was able to modify instruction to ensure their understanding before they took the test. Their test performance improved as a result of this increased feedback.

This comment shows that teachers examined the students' learning processes in their digital portfolios, which also illuminated any misunderstandings they might have experienced that needed explanation and correction. In many ways, the development of digital portfolios changed not only how teachers planned, but also how they assessed or intended to assess their students, including how they viewed assessment. They did not perceive assessment as a thing, but rather a process that should also be showcased. Similarly, another statement reflected a change in teacher learning about assessment focused on more thoughtfulness as the following comment captures: "Using the portfolios did cause me to reexamine my methods of assessment."

Discussion

This study demonstrated that the development of digital portfolios by both inservice teachers and their students can impact them positively in a variety of ways, ranging from increased teachers' learning about technology and a reexamination of their pedagogy to

better comprehension of student learning, reflective processes, and assessment. Although several of the study's findings are similar to other studies that investigated digital portfolios and preservice (e.g., reflection) and inservice teachers (technology skills), this study demonstrated how digital portfolios benefited teachers, as well as possibly their students. Through analysis of teachers' responses, it appeared that both teachers and their students reaped benefits from creating their own digital portfolios because they were engaged in a process of self-reflection and creation, a process that stemmed from mutual understanding that each individual has similarly experienced this learning process. Also, teachers explained that the creation of digital portfolios by themselves and their students resulted in reciprocal learning process, in which both teachers and students engaged in learning from and with one another. Contrary to Stansberry and Kymes's study (2007), the teachers in this study not only developed their own digital portfolios, but they also supported students in developing theirs, too. By requiring their students to develop digital portfolios, these teachers reexamined the role of assessment and the ways in which they viewed assessment of students.

Limitations

This study has several limitations. First, the sample was limited to only 29 high school teachers within one state. Inclusion of more teachers from different grade levels, content areas, and states/countries might have different results. Second, the data reported in the quantitative section of this paper uses only descriptive statistics and is unable to determine whether there is any statistical significance to these data. Third, the study presents self-report data. This type of data, although it speaks to the teachers' perceptions of their participation, has limited reliability. It is also important to note that the participants' perceptions of their experiences are subject to internal bias due to numerous factors—for example, they may be inclined to feel an inflated sense of the impact resulting from digital portfolios because they feel positively about receiving funding and support from participation in the grant. Fourth, the study focused on teachers' and students' learning from the teachers' perspective. Future research should examine students' learning from their perspective, as well as the reciprocal learning process and its implications, particularly with regard to how it develops vis-à-vis the creation of portfolios by teachers with their students. Research examining the co-creation of digital portfolios by teachers and their students might provide new insights into the teaching-learning process, as well as foster deeper comprehension of teachers, their students, and their relationship to one another.

Conclusion

The use of digital portfolios in teacher education has grown exponentially across the United States; however, most of the published research centers on preservice teacher education rather than inservice teachers, even though research has shown many benefits for preservice teacher education. Considering the benefits evidenced in preservice teacher education research, it seems logical that inservice teachers—and their students—would also benefit from the creation of their own digital portfolios. Digital portfolios could be used as a form of long-term professional development for teachers. Yet, few studies have investigated inservice teachers and digital portfolios, and even less the creation of digital portfolios by inservice teachers and also their students. This study illustrated that the teachers participating in this study considered that the development of digital portfolios by themselves as well as by their students affected their own teaching practice and their students' learning positively. It also resulted in reciprocal learning between teachers and students. Further study is needed for examining digital portfolios as vehicles for inservice teachers' professional development and their students' learning. Finally, additional efforts by SCDEs and school districts to embed digital portfolios as long-term professional development tools for inservice teachers may reap similar benefits as those already realized by preservice teachers who have engaged in digital portfolio development. Therefore, portfolios should be considered as a strategy for inservice teacher professional development.

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