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Digital teaching portfolios: Catalysts for fostering authentic professional development

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Abstract

Abstract: This paper reports the findings of a qualitative study examining the role of digital teaching portfolios in teachers' professional development and classroom practice. The participants, all teachers, took part in a formal course in which they develop a digital teaching portfolio. The findings suggest that the processes involved in creating digital teaching portfolios fostered their authentic professional development, and were a catalyst for their ongoing professional development. Furthermore, engagement in creating a portfolio was instrumental in these teachers' self-discovery and learning.

Résumé: L'article présente les conclusions d'une étude qualitative sur le rôle des portfolios numériques d'enseignement dans le perfectionnement professionnel et la pratique en salle de classe des enseignants. Les participants, tous des enseignants, ont pris part à un cours formel pendant lequel ils ont développé un portfolio numérique. Les conclusions suggèrent que les processus concernés par la création de portfolios d'enseignement numérique ont favorisé un réel perfectionnement professionnel et qu'ils constituent un élément déclencheur pour leur perfectionnement professionnel continu. De plus, l'engagement vis-à-vis la création d'un portfolio est à la base de l'auto-découverte et de l'apprentissage de ces enseignants.

Introduction/Purpose

Teaching portfolios—compilations of professional materials that present a "structured

documentary history of a set of coached or mentored acts of teaching, substantiated by samples of student portfolios" (Shulman, 1998, p. 37)—are growing in popularity as a means for assessing the competence of both inservice teachers and teacher candidates. This may be in part because teaching portfolios can promote professional knowledge development (Mokhtari, Yellin, Bull, & Montgomery,1996; Zidon, 1996), professional growth (Dietz, 1995; Green & Smyser, 1996; Wray, 2001), and reflective thinking and practice (Borko, Michalec, Timmons, & Siddle, 1997; Dietz, 1995; Jackson, 1998; Loughran & Corrigan, 1995; Lyons, 1998; Stroble, 1995; Wade & Yarbrough, 1996), all of which are important components of teacher professional development.

With the advent of new, multimedia technologies, teaching portfolios are being developed using a variety of methods and published on the World Wide Web (WWW). Teaching portfolios developed and displayed in digital format are often called digital teaching portfolios, multimedia portfolios, electronic portfolios, e-folios, and webfolios (Kilbane & Milman, 2003, 2005; Milman, in review). Professional materials included in digital teaching portfolios are presented using a combination of digital media such as audio recordings, graphics, hypermedia programs, database, spreadsheet, video, and word processing software. Such portfolios contain content that resembles more conventional teaching portfolios but have unique characteristics that influence their design, production, and sharing.

Although the use of digital teaching portfolios is increasing, research on this topic is in its infancy. Most research on digital teaching portfolios has focused on teacher candidates' professional development. For example, several researchers (Barrett, 1999, 2000; Kilbane & Milman, 2003, 2005; McKinney, 1998; Milman, 1999, 2000) contend that the creation of digital teaching portfolios fosters teacher candidates' confidence in their abilities as educators and in their use and application of technology. However, no studies have examined the role of digital teaching portfolios in inservice teachers' professional development. Nor has much research investigated how creating a portfolio in digital format facilitates professional development in competencies other than those related to technology.

This paper describes a qualitative study investigating the role digital teaching portfolios can play in the professional development of inservice teachers. Participants were teachers enrolled in an elective course on developing digital teaching portfolios. The purpose of the study was to learn:

- What role, if any, the digital teaching portfolio development process played in inservice teachers' professional development as it relates to technology and as it relates to other professional areas (i.e., understanding the learning process, standards, etc.)
- What inservice teachers learned about themselves as professionals and as individuals by creating digital teaching portfolios.

Paradigm and Theoretical Framework

The paradigm utilized in this study was interpretive inquiry which focuses on meanings and patterns of meanings reflected in social interaction and the interplay between such

interaction and the wider social context in which it occurs. Reality is not viewed as separate from the individual but is viewed as complex, contextual, and embedded in multiple contexts. Human acts are seen as intentional and should be examined from the actors' points of view (Erickson, 1986).

The theoretical framework defines the role of the researcher, forecasts the design for data collection, and grounds the study in a larger context. The theoretical framework used in this study was symbolic interactionism. Symbolic interactionism rests on three primary assumptions: 1) human beings act toward things on the basis of the meanings that things have for them; 2) the meanings of things are the product of social interaction; and 3) meanings change when self reflective individuals symbolically interact with each other (Denzin, 1992). This approach, applied to the study of teaching and learning, defines teaching practice as a culture created by students and teachers as they interact. Bolster (1983) argues that much social science research is irrelevant to teaching, since it fails to focus on the process of teaching. Also, he contends that one way to get at the process of teaching and the meanings constructed by teachers is through symbolic interactionism. He suggests that a more effective model of research on teaching relies on the assumption that people are both the creators and products of the social situations in which they live. They make meaning out of what happens around them, and how they and others interact. In this study, symbolic interactionism (Blumer, 1969) provides the means for interpreting the role of digital teaching portfolios in teachers' professional development.

Methods, Data Sources, and Data Analysis

Qualitative methods were employed in this study. The primary method for collecting data reported in this paper was document analysis, although phone interviews, ranging between 20 and 30 minutes, were conducted with six participants. Document analyses involved examination of online class discussions, course journals, course assignments, and web-based digital teaching portfolios. The researchers were the instructors of their respective courses although the delivery method was different for each, as described in the course context. The researchers maintained journals during the course, which included observations, student comments, and anecdotal notes about student progress and questions. Also, the researchers communicated with one another throughout the semester about course progress and outcomes.

Erickson's (1986) approach to data analysis, analytic induction, was utilized. Analytic induction calls for the generation of empirical assertions which are then warranted through a search for instances of confirming or disconfirming evidence. Through the analysis of data and the questions that originated the study, a set of empirical assertions were formulated and warranted through a search of confirming and disconfirming evidence.

Researcher as Instrument

The researchers in this study played a participant role in that they were the instructors of their respective courses (taught separately at two different institutions in different states) and they conducted the phone interviews; however, the instructors interviewed students in

the other course, not students within the same course that they taught. It is important to recognize that in qualitative research, the researcher is the instrument and a fundamental part of the study (Erickson, 1986; Marshall & Rossman, 1995). In this light, the mere presence of the researcher can affect the participants' behaviour. Erickson (1986) notes that the most important tasks of researchers are to immerse themselves in the environment in which they are studying, and to portray individuals' perspectives accurately. Researchers need to be thorough and reflective, writing rich, descriptive field notes that capture everyday events. One source that acts to sensitize the researcher to provide the most accurate portrait possible is a familiarity with the literature. A brief review of the literature is included in this study.

Validity

In interpretive inquiry, validity is achieved through a variety of strategies. Critical components in establishing validity are the relationship between the role of the researcher, the data collection strategy, the data analyses, and the conceptual framework. In this study, the conceptual frameworks determined the research design, strategies, and questions of the study. Validity also can be attained when the researcher thoroughly addresses the five threats to validity (Erickson, 1986). Each of the threats to validity is addressed below.

The first and second threats to validity are an inadequate amount of data and variety in the kinds of data collected to warrant the assertions. These threats can occur if the researcher does not have sufficient data or enough variety to warrant the assertions. These threats were addressed by collecting and triangulating (Mathison, 1988) a variety of data sources and methods over the course of an entire semester. Data sources included students enrolled in the two courses. Data methods included participant observations, interviews, document analyses, instructor journals, and field notes. Consequently, a large amount of data was amassed. Also, data were collected to the point of saturation, the point where the collection of data supports what has been learned without introducing any new information. Saturation was most evident in the analyses of documents and interview transcripts when they were not presenting any new confirming or disconfirming evidence.

The third threat to validity, the faulty interpretation of the data, happens when researchers fail to comprehend the "key aspects of the complexity of action or of meaning perspectives" (Erickson, 1986, p. 140). This transpires when researchers have not been in the field long enough or when participants are deceitful, usually due to a lack of trust. To counteract the threat in this study, there was close attention to the amount and depth of confirming and disconfirming data collected for each assertion, with an emphasis on the data's representation of student perspectives.

The fourth threat to validity is inadequate disconfirming evidence. This results when the researcher conducts an inadequate investigation for disconfirming data. For instance, the researcher might only look for data that supports assertions instead of performing a rigorous examination of the data in search of disconfirming evidence. In this study, the

threat was checked through a thorough examination of all of the data collected. Assertions were accepted only after a review of the entire corpus of data found no disconfirming evidence. In cases where data did not support an assertion, the assertion was either modified or eliminated. This process recurred until no disconfirming evidence existed for each assertion.

The fifth threat to validity is inadequate discrepant analysis. This threat ensues when the researcher insufficiently scrutinizes disconfirming evidence. This happens when the researcher does not compare confirming and disconfirming evidence to find characteristics that might expose defects in the assertions. This threat was addressed through discrepant analyses of all of the data to compare patterns and disconfirming instances that emerged. Also, the revision of assertions took place until they were warranted and no discrepant data could refute them.

Course Contexts

All of the participants in this study were enrolled in an elective, three-credit course designed to teach them how to develop digital teaching portfolios. The courses were offered at two different institutions, one private (referred to as "SCDE 1") and one public (referred to as "SCDE 2"). Also, each course was taught by one of the authors of this paper. Although each course had similar objectives and course sequence, the delivery methods were different for each.

The objectives of each course were for participants to design, create, and evaluate digital teaching portfolios using the World Wide Web as the publishing medium, reflect upon their professional knowledge base and teaching processes, and become more proficient in the use of technology. Participants were not required to possess web-design skills prior to taking either course (although those enrolled in the SCDE 1 had to meet program requirements for the masters program in which they were enrolled, which required some prior technology competence.) Also important to note is the fact that neither class was set up to teach web-design skills, instead they were designed to teach the digital teaching portfolio development process. As the creation of a digital teaching portfolio required web-design skills and other technical skills, such skills were taught indirectly as a part of the larger task.

The topics for each of the first few classes provided students with information and readings about portfolios, portfolio development, the contents of portfolios, and the standards that might used for developing digital teaching portfolios. During these first few weeks, participants were asked to examine and critique digital teaching portfolios to understand their components, organization, and design.

Classes during the remainder of the semester concentrated on how best to organize and display the contents of digital teaching portfolios, as well as how to use technology for developing one. Participants in the classes were asked to read several articles pertaining to portfolios and web design during the semester. Students read a book about digital teaching portfolios (Kilbane & Milman, 2003). Students performed formative and

summative critiques of each other's portfolios in the class.

The SCDE 1-portfolio course was taught virtually using the online course management system, Prometheus (which was acquired by Blackboard, Inc. in 2002) through a masters level technology program in a private school of education. Prometheus is similar in many ways to Blackboard and WebCT. It is a web-based course management system that allows participants to access the course syllabus, lectures, grades, and assignments via a web-based interface. Also, this system allows participants to participate in online synchronous and asynchronous discussions, to collaborate in groups, and to post and download files.

Participants in the SCDE 2-portfolio course met physically in a computer lab weekly throughout a 15-week semester. During eight of these weeks, their instructor was also physically present with them in the lab whereas for the other seven weeks of the class, a teaching assistant conducted the class and the instructor joined the group via videoconferencing. The teaching assistant took a majority of the responsibility for teaching the web-design component of the class.

Participants

The teachers who participated in this study were enrolled in an elective digital teaching portfolio course offered at one of two different institutions. Although students with other backgrounds also were enrolled, (e.g., Doctoral Student, Information Technology Consultant), the participants in the study were all teachers, since the focus of the study was teachers' professional development. Table 1 is a description of the participants.

Table 1: *Participants*

Findings

The purpose of this study was to examine the role digital teaching portfolios played in teachers' professional development and the lessons learned from creating these portfolios. The table below outlines the series of assertions that were warranted through analytic induction.

Table 2: *Assertions*

Assertion 1: The processes involved in creating digital teaching portfolios fostered teachers' authentic professional development.

Authentic learning allows students to explore, discover, discuss, and meaningfully construct concepts and relationships in contexts that involve real-world problems and projects that are relevant and interesting to the learner (Donovan, Bransford, & Pellegrino, 2000, as cited in Visible Knowledge Project & Georgetown University, 2002).

The definition above applied to the professional development of teachers means that "authentic" professional development involves teachers in exploring, discovering,

discussing, and meaningfully constructing concepts and relationships in contexts that are relevant and interesting to them. Harris and Grandgenetz (2002) contend that "authentic professional development occurs when [teachers] actively learn—and reflect on that learning, both individually and collaboratively" (p. 54). Therefore, two other critical components of authentic professional development are reflection and collaboration.

The teachers who participated in this study were involved in authentic professional development as defined above. During the *process* of creating their digital teaching portfolios, teachers engaged in activities that yielded experiences that were valuable to them personally and professionally. These activities forced them to explore, discover, discuss, and construct new meaning about themselves as professionals and as individuals. They explored the applications of technology, discovered the benefits of reflection by examining their practice, and discussed each other's accomplishments when working collaboratively and when critiquing each other's portfolios.

Through the creation of digital teaching portfolios, teachers explored and increased their knowledge about the application of technology. For instance, teachers learned to use multimedia design tools—either a web site development program (e.g., Dreamweaver) or authoring language (e.g., Hypertext Mark-Up Language). They explored using software programs such as image editing programs (e.g., Adobe Photoshop) or concept mapping software (e.g., Inspiration), as well as how to integrate multiple software programs in creating their portfolios. For example, they learned to use one program to manipulate images and then copied and pasted these images into another software program.

Teachers also discovered the benefits of reflection by examining their practice through the "considering stage" (Kilbane & Milman, 2003, 2005) of the digital portfolio development process. This stage involves collecting, selecting, and reflecting on the portfolio's contents. In this stage, teachers critically analyzed and reflected about their practice. One teacher described the process and the kinds of questions she asked herself during this process:

It is good to reflect back on work that was accomplished numerous years ago and see where I was in my educational and developmental stages. Am I still in the same train of thought? Do I feel that I need to change things? These are some of the questions that I ask myself as I go through the process of gathering artifacts for my portfolio . (SCDE 2, Participant#7, journal, 2002)

The example above illustrates teachers' thinking processes while creating their digital teaching portfolios and demonstrates how we believe they analyzed their past, present, and future goals and practice.

Reflection also resulted in teachers gaining a greater appreciation for and understanding of their professional work as teachers, as one teacher explained:

I have learned that there is more significance to the work that I do than I thought. I have rarely taken time to reflect on any type of work that I do. The process of producing

artifacts and reflecting has allowed me to see a little deeper into the significance of them. (SCDE 1, Participant#11, week 15 online discussion posting, 2002)

Also, another teacher indicated she was able to transfer her learning to her students, as the following quote indicates: "*I am using so much of what I learned with my students already. They have also received benefits from this course*" (SCDE 1, Participant#6, week 15 online discussion posting, 2002).

Other examples of the benefits and application of teacher reflection were evident in the reflective statements—statements that provided a description, analysis, and plans for future changes and/or professional development about the contents of their portfolios—they posted along with their artifacts. These statements went beyond simply describing the context of the artifacts. They also included sections about how their practice or beliefs were changed as a result of the artifact. Some even included plans for future professional development or changes to be made if the artifact (e.g., a lesson) were used again, as the following excerpt from one teacher's reflective statement illustrates (note: the reflective statement was much longer and included sections about the description, analysis, and appraisal of the artifact):

Transformation: *Since I created this artifact, another intelligence has been developed - the Naturalistic Intelligence. I am interested in finding ways to incorporate that intelligence into the project and using this in future classrooms. I created this as an undergraduate, and as I look back on it, I see some activities that could be developed further and some that I would change. I can see that I didn't take into account the difference between ordered counting, number recognition and the concept of number. I would change it so that I would focus on one specific concept*. (SCDE 2, Participant#7, reflective statement in digital teaching portfolio, 2002)

Another aspect of authentic professional development that teachers were involved in was discussing each other's accomplishments and critiquing each other's portfolios. By providing formative and summative feedback to one another, teachers not only gained input about the technical and visual aspects of their portfolios, they also shared professional knowledge. The activity engaged them in conversation about professional practice, their own strengths and weaknesses. And these interactions fostered camaraderie and friendship. In addition, teachers learned the value of *group*, as opposed to individual learning, as the following two teachers explained:

I enjoyed being able to work with my peers as it made for a more supportive and productive learning experience. Although we were all working individually on our own portfolios, we still managed to work as a team in completing them from participating in activities that joined our thoughts to frequent conversations about how we can modify the look of our portfolios. (SCDE 2, Participant#3, journal, 2002)

On the professional level of creating my portfolio it has been very helpful to have other teachers around to give feedback. There are many teachers on many levels and coming

from various backgrounds [in this class]. This diversity gives us many perspectives from which to work and think. Having a few people read over my educational philosophy was very helpful. It helped to see what kind of message I am sending to my reader. If I were working on my own to create this portfolio, I would not have the input of other members of the class. I would not have the feedback about pieces of the portfolio or on myself as a teacher. It has helped me to reflect on my role as an educator. It has also taught me about working together; it is a new experience for me to work together as a team to create individual pieces of work. Usually a team works together towards one common goal for the team. Here, however, we work as a team to create personal products—we work together to have everyone come out with a product they are proud of. (SCDE 2, Participant#5, journal entry, 2002)

It is impossible to single out the processes that most greatly influenced teachers' authentic professional development. Perhaps it was the entire process and the learning that ensued that was most important, as one teacher sums up: "*For me, this project was the single most significant project of graduate school. Not so much because the product is so great, but because the process was so meaningful*" (SCDE 1, Participant#2, week 15 online discussion, 2002).

Assertion 2: Digital teaching portfolios acted as catalysts for teachers' ongoing professional development.

The process of creating digital teaching portfolios acted as a catalyst for teachers' professional development in three distinct ways. First, the process aroused teachers' desires to learn more about using technology. Second, it inspired teachers to continue learning by motivating them to update their digital teaching portfolios. Third, the process prepared teachers to implement digital teaching portfolios in either their own classrooms or schools.

Digital teaching portfolios motivated teachers to seek out more knowledge, expertise, and skill in the use of technology. Although teachers admitted they had learned and applied a great deal of technology skills, they also recognized that this prompted them to want to learn even more. In some cases, this was due to a lack of confidence in the skills that they had acquired, whereas in others it was because they wanted to expand their knowledge by incorporating more advanced features in their portfolios. One teacher went so far to describe the software programs in which she wanted to gain more expertise:

The new knowledge and skills that we learned from this course has definitely inspired me to learn more new things in the realm of technology. After using programs such as Dreamweaver and Adobe PhotoShop I am ready to go and buy them! I am also ready to get introduced to more advanced software and incorporate it into frequently updating and improving my digital portfolio in the future. (SCDE 2, Participant#3, journal entry, 2002)

Another teacher had similar feelings: "*Using new and different technologies has always fostered a keen sense of wanting to learn more new and exciting things. This class has helped to keep that sense going and feeding it higher*" (SCDE 2, Participant#6, journal

entry, 2002).

The digital teaching portfolios served as the beginning of ongoing, teacher-directed professional development to be accomplished through maintaining, updating, and revising their digital teaching portfolios. For instance, one teacher indicated, "*I know my May 7th portfolio will not be the end of my portfolio development—it will only be the start*" (SCDE 1, Participant #8, week 15 online discussion posting, 2002). And, even though it was not required, all of the teachers had plans for updating their portfolios after the end of the semester, although motivations varied from teacher to teacher. Some teachers described the need to maintain portfolios for their own professional development, whereas others reported wanting to maintain, update, and revise their portfolios to obtain promotions or other employment, as the following comment indicates:

I plan to update [my digital teaching portfolio] on a regular basis as I want to keep the classroom, student and teacher links relevant to what I am doing in education now. Currently most of my portfolio focuses on the past but I feel a great need to add current projects, starting next year and keep a dynamic and possibly interactive approach to the web site. Also, as I apply for promotion or other jobs which will be in the near future, I will tweak it each time so I expect to be looking at it often. (SCDE 1, Participant #7, week 16 online discussion posting, 2002).

Whatever the motivation, the digital teaching portfolios sparked an interest in teachers to continue developing through them.

Another outcome of creating digital teaching portfolios was that teachers were prepared and interested in implementing portfolios in their own schools. That is, because teachers had participated in the process of developing digital teaching portfolios, they were now equipped to teach others how to develop their own. One teacher described the presentation she planned to do for her faculty and her hope to encourage others to do the same as the following comment illustrates:

On May 22nd, I will be doing a 2 hour presentation for the staff members at [my school]... where I will encourage others to venture out on the same path we have been on this semester! Maybe this will open doors that I never even knew were there! (SCDE 1, Participant #4, week 16 online discussion posting, 2002).

To wit, by leading others in the development of their own digital teaching portfolios, teachers themselves were participating in their own professional development and nurturing the growth of others.

Assertion 3: While learning new technology skills through the creation of digital teaching portfolios, teachers experienced anew what it was like to be a learner again.

The process of learning can be exhilarating, but it also can be very frustrating. Often teachers, like most adults, forget what it feels like to be a learner. But while learning new technology skills through the creation of their digital teaching portfolios, teachers were

reacquainted with the challenges and thrills of the learning process and discovered anew what it is like to be a learner. This experience made teachers more empathetic with the experiences their own students face during everyday classroom learning.

During the portfolio development process, teachers were able to experience what it is like to be learners again because creating a digital portfolio provided them an authentic and meaningful context for learning the new vocabulary, processes, rules, and conventions of Hypertext Mark-up Language (HTML) and web design. One teacher likened this experience to learning a new language, as the following quote demonstrates:

Learning to create a digital teaching portfolio in HTML format definitely helped me remember what it feels like to be a first time learner. Many times I found myself ready to pull my hair out I was so frustrated! It was almost the same feeling as when I was learning another language—very different and unfamiliar. I think learning Spanish was the last time I felt exactly like this. I think that going through this process will help me as an educator by allowing me, when teaching, to step back and get in my students shoes more. This way I will recall how it felt to be in their place and therefore will be more patient and understanding with their frustrations. (SCDE 2, Participant#3, journal entry, 2002)

Although adults on the whole have many experiences that provide them opportunities to learn, they bring some existing knowledge to most of these experiences. Because learning to be literate in HTML uses very little prior knowledge, this experience more closely replicates the type of learning their students do. For example, teachers need to learn first how web browsers read HTML to display text and images on a web page. Then they must learn to use an HTML editor (e.g., Dreamweaver) to create a file that will be viewed on the web. Finally, the file must be uploaded to the file server so other Internet users can view it. Uploading the file requires conceptual understanding about how files are copied, transferred, and housed on servers that may be far away, and technical know-how about how to utilize and set up file transfer protocol (FTP) software to actually make the transfer. Also, teachers must understand that files such as images are not embedded within HTML files, but also need to be uploaded separately. These are not skills or knowledge that teachers would have unless they had some prior experience developing and posting web sites.

Along with learning anew what it was like to be a student, teachers also developed empathy towards their students as a result of creating their digital teaching portfolios, as the following indicates:

This semester I was usually in the position of not knowing anything, so I kept thinking about my second graders, especially those who struggle to get their information. In addition to gaining technological skills, and getting organized, I know that I learned more about compassion towards my students. I know that I will be a better teacher for having been through this process. (SCDE 2, Participant#7, journal entry, 2002)

Although learning in and of itself has value, when teachers become learners again we

suspect that it makes them better teachers. At the very least, it makes them more knowledgeable about their craft and what it feels like to be learners. At the most, it makes them feel more empathetic towards their students and promotes their understanding of the individual differences that influence learning. Although more technically skilled teachers are likely to be more proficient teachers, more empathetic educators are better humans.

Conclusion

Teachers, who devote so much of their time and energy attending to their students' learning, have less time than most professionals to devote to their own. Time spent learning can build teachers' knowledge and confidence in their practice. Yet much of the professional development offered to teachers fails to meet their immediate needs, is difficult to transfer into their own classroom practice and is too broad and generic to be helpful. Schools must work harder to provide teachers with professional development opportunities that build on teacher's prior knowledge, is teacher-directed, ongoing, and moves beyond "one shot" workshops that have little, if any impact on their teaching let alone student achievement. In other words, teachers need to participate in professional development that is authentic in nature—professional development that requires teachers to explore, discover, discuss, and construct new meaning.

Yet, teachers have different motivations for creating digital teaching portfolios. Many may choose to create them because they want to have a portfolio, or some type of physical and tangible compilation of their work as an educator. For others, having a portfolio may mean having something that can be used as a tool for employment, certification, or other career oriented activities. New teachers may use their portfolios during job interviews. Experienced teachers may submit portfolios for licensure or to demonstrate competence for continued employment. And some teachers may use their portfolios to showcase their qualifications to the community. Regardless of the motivation, professional development that involves the creation of digital teaching portfolios may be a useful approach for fostering authentic professional development.

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