Improving Self-efficacy for Electronic Portfolio Development

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Abstract. This paper discusses the main issues and related studies of electronic portfolio development in education. It presents how a blended learning process on weblog-based portfolio development has been adapted and implemented into one graduate education course. The effectiveness of such a blended learning process on students' self-efficacy has been examined. Discussion and conclusion of enhancing student-oriented electronic portfolio development for educational programs/courses are included.

Keywords: Electronic Portfolio, Learning Tasks, Instructional Strategies, Weblog, Blended Learning Process.

1 Introduction

Educators have long been concerned with the professional portfolio development due to its numerous benefits: fostering self-assessment and reflection, providing personal satisfaction and renewal, providing tools for empowerment, promoting collaboration, and providing a holistic approach to assessment [1]. With the expansion of technology in education, more recent studies have reported the use of electronic portfolios also known as e-portfolios or digital portfolios in teacher education. An electronic portfolio is defined as a portfolio that uses electronic technologies, allowing the portfolio developer to collect and organize portfolio evidences/artifacts in many media types (audio, video, graphics, text) [2]. Comparing to developing paper-based portfolios, there are some major advantages of developing electronic portfolios on: accessibility, portability, storage, creativity, teacher technology skills, self-confidence, and so on [1][3].

Although the benefits and advantages of electronic portfolios are very promising, developing an electronic portfolio is quite challenging in practice: it takes several stages to process – collection, selection, reflection, projection/direction, and presentation [4]; it is time-consuming for students to assemble and for teachers to guide and provide feedback; unfocused instruction and/or ill-defined tasks lead to low reliability for evaluations in portfolio assessment; and the electronic portfolio requires a level of technological skill that not all teachers and students possess [5]. While

S.K.S. Cheung et al. (Eds.): ICHL 2013, LNCS 8038, pp. 167–177, 2013.

electronic portfolios are expanding in teacher education programs, and the participants are mounting, the question "electronic portfolios for whom?" has been raised. As Ayala [6] argued, "the knowledge promoted under the guise of electronic portfolios is hardly student-centered. Very little research exists integrating student voices into the dialogue of electronic portfolios. The voices that are integrated are primarily those of administrators and some faculty." It appears that self-efficacy, which is defined by Bandura [7] as "the beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations," is essential for students' electronic portfolio development. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave [7]. Therefore, finding ways to improve students' self-efficacy on electronic portfolio development is very much needed.

Accordingly, the present study expands upon earlier research of instructional strategies on learning tasks and the use of weblogs for professional portfolio development by presenting how a blended learning approach on developing weblog-based portfolios has been implemented into one graduate education course. It also examines the effects of such an approach on students' self-efficacy on learning and performance.

2 Related Studies

2.1 Learning Tasks and Instructional Strategies

As the basic instructional unit, tasks can be characterized as well structured and/or ill structured [8][9]. The previous literature has suggested that it is vital to balance these types of tasks. On one hand, excessive well-structured tasks may fail to challenge students, undermine optimal levels of self-regulation, limit cognitive engagement to shallow processing, restrict opportunities for students to establish cognitive resources for high-road transfer, and decrease performance [8][10][11]. On the other hand, a surfeit of ill-structured tasks may increase students' anxiety due to ambiguities about means and ends and be extremely difficult for students to carry out, resulting in withdrawal rather than constructive engagement [8][12].

There are a variety of strategies that have been used to design and implement learning tasks in different learning environments [13]. Forcier [14] developed two models of instructional strategies - linear and non-linear. A linear model is characterized by a direct, sequential and outcome-driven strategy. A nonlinear model is characterized by an indirect, random and process-driven strategy, which allows individuals the room to determine their own path to goal attainment without having a hierarchical structure or predetermined outcome imposed on them [14]. One of our early studies examined how a bilinear instructional strategy incorporating both linear and nonlinear instructional models was designed and then implemented in a graduate applied technology course [15]. The results indicated that using a purposeful combination of both linear and nonlinear strategies within a problem-based approach provided students with dimension of learning that neither one alone can achieve. Students held very positive perceptions toward: usefulness of the course, effectiveness

of learning process and learning atmosphere, proficiency in multimedia and Internet, awareness of technology integration on completed projects, etc.

In one of our recent studies [16], we applied the bilinear instructional strategy into a hybrid graduate course that combined face-to-face (F2F) classroom instruction with computer-mediated learning (CML). As shown in Figure 1, a construction with five consecutive stages blended learning process was designed and then implemented. The results verified that pre- and in-service teachers could actively engage in practices of inquiry, design, and research in collaborative groups with an interest in educational technology to design tangible, meaningful artifacts as end products of the learning process. The effectiveness of such an instructional approach on various forms of knowledge among pre- and in-service teachers was confirmed.

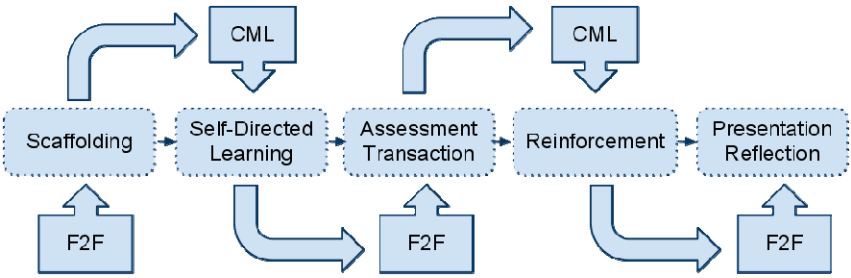

Fig. 1. Five-stage blended learning process

2.2 Weblog and Portfolio Development

Recent Web 2.0 applications such as blogs, wikis, social bookmarking, and podcasts, have emerged in a rich, interactive, user-friendly platform that allow users to read and also to write to the Web [17][18]. As one of most widely used Web 2.0 applications, a Weblog is constantly comprised of reflections and conversations from the developer and viewers; it stimulates interaction [19][20][21]. Ganley [22] noted, "Weblogs, because of their flexibility, their public nature and their rich linking structure, can be a powerful tool in our pursuit of such a classroom. They allow us to visualize learning, contextualize course content, encourage meta-reflective practices, and practice collaboration." Two studies further confirmed and supported this statement. One study conducted by Fiedler [23] examined Weblogs as reflective conversational tools, and found Weblogs supporting aspects of:

- recording and representing one's personal patterns of meaning or actions;
- reflecting upon the representations;
- reiterating the process of explication and reflection;
- shifting from a task-focused level to a learning-focused level of awareness;
- supporting the construction of a personal mini-language to converse about the process of learning;
- supporting a gradual internalization of the tool.

Another study directed by Eide and Eide [24] investigated Weblogs on brain structure and function, and found that Weblogs could:

- promote critical and analytical thinking;
- be a powerful promoter of creative, intuitive, and associational thinking;
- promote analogical thinking;
- be a powerful medium for increasing access and exposure to quality information;
- combine the best of solitary reflection and social interaction.

Weblogs, therefore, have shown a great deal of potential for developing and reforming electronic portfolios in education [25]. To distinguish it from a typical electronic portfolio, a Weblog-based portfolio is usually called a "blogfolio" [25]. As shown in Figures 2 and 3, the differences between blogfolios and typical electronic portfolios are clear: blogfolios show every stage of the process, typical electronic portfolios show the finished outcomes; blogfolios are conversational, typical electronic portfolios are monological; blogfolios open for inputs from outside, typical electronic portfolios are one dimensional starting from inside; blogfolios update constantly, typical electronic portfolios stop from time to time; blogfolios are interactive, typical electronic portfolios are inactive; etc. [26]

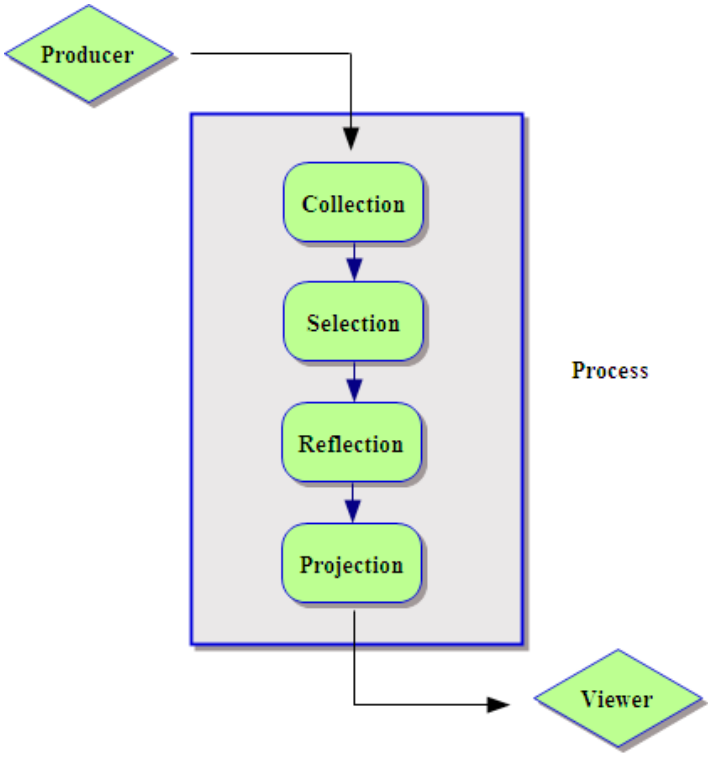

Fig. 2. Typical e-portfolio development

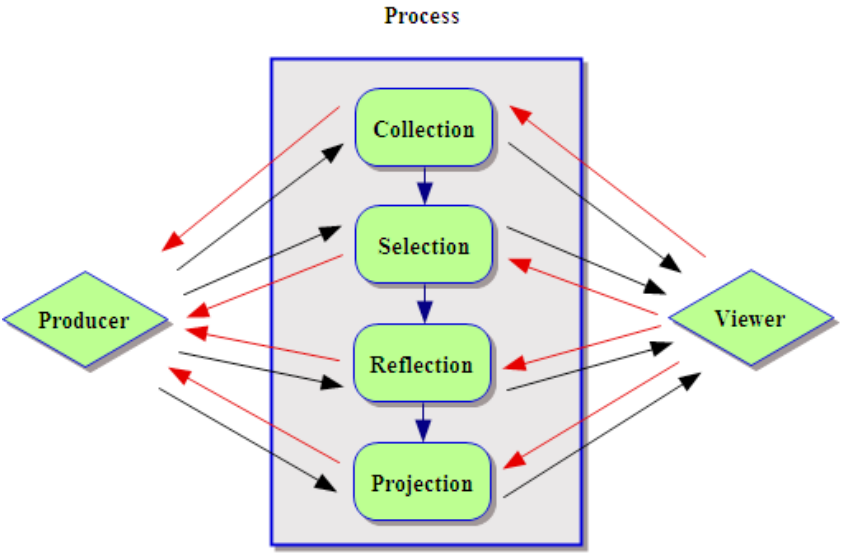

Fig. 3. Blogfolio development

Our previous studies found that developing blogfolios could enhance a sense of community and promote collaboration, communication and interaction, and student-centered assessment and reflection [25][26][27].

2.3 Research Questions

In this study we concentrate on exploring the blogfolio development on building students' self-efficacy through our previous five-stage blended learning process [16] into one graduate education course. The following questions guided this study:

- How could we adopt and implement a blended learning approach, which combined both face-to-face instruction and computer mediated learning, for students' blogfolio development?
- What were the effects of developing blogfolios on students' self-efficacy?

3 Method

3.1 Participants and the Course

The participants of this study came from one section of students (N = 30) who were enrolled in the graduate course entitled *Portfolio Development and Professional Synthesis,* offered at a university in the northeastern region of the United States during the fall semester in 2009 (n = 19) and the spring semester in 2010 (n = 11). Twenty-nine participants were pursuing graduate level education programs in content areas of

biology, chemistry, English, literacy, mathematics, social studies, technology, etc. One participant was a visiting scholar from a university in China.

The course *Portfolio Development and Professional Synthesis* introduces pre-service and/or in-service teachers to issues related to professional development especially in terms of personal portfolio development and other professional activities to further support and contribute to the betterment of the filed of education. In this process, portfolio development will serve as the main measure of preparedness and readiness with class activities to support this process. Portfolio development can provide documentation and evidence of the developing teacher's abilities in a multitude of areas, e.g., knowledge of content area, classroom management, supporting diverse student learning needs, etc.

As one of hybrid courses in the university, two-thirds of the course learning activities had been moved to the computer mediated learning (CML) environment while the contact time in traditional face-to-face (F2F) teaching and learning had been reduced to one-third of the course.

3.2 Procedure

As shown in Table 1, the five-stage blended learning process [16] was adapted and implemented into the course, which incorporated linear and nonlinear instructional models in the blogfolio development.

Table 1. Five-stage blended learning process

Stage	Task	Setting	Week
Scaffolding	The concept and foundations of portfolio; performance standards and portfolio development; main components of a teaching portfolio; examples of completed portfolios; guidelines and resources for artifacts and supporting documentation; introduction of weblogs; steps to building a weblog and managing files; etc.	F2F classroom instruction; synchronous communication; well-structured	2
Self-Directed Learning	Individual weblog creation on WordPress; autobiographical sketch/self-introduction; teaching philosophy; review of guidelines and resources; organization of portfolios around performance standards; collection and selection of artifacts; development of support documentation (introductions, explanations, and reflections); etc.	CML; asynchronous communication; ill-structure	5-6

Table 1. *(Continued)*

Formative Assessment & Transaction	Sharing what individuals had done on their ongoing blogfolios; discussion of challenges, questions, and concerns that individuals experienced; acquisition of possible and potential solutions, strategies, resources, and steps to enhance individuals' blogfolios; construction of a rubric for the self- and peer-evaluation; features of WordPress.com appearance (e.g. themes, widgets, menus, header, and related link); etc.	F2F classroom instruction; synchronous communication; well- and ill-structured	2
Reinforcement	Revision and continuation on individuals' blogfolios; selection and addition of professional resources/links; blogfolio design enhancement (professional appearance and personalized production); etc.	CML; asynchronous communication; ill-structure	4-5
Presentation and Reflection	Overview of individuals' blogfolios; self- and peer-review of blogfolios; conversation on use of portfolios for professional growth and development; interviewing skills development and practice; etc.	F2F classroom instruction; synchronous communication; well- and ill-structured	1

For the outcomes of completing five-stage blended learning process, a sample of students' blogfolios is depicted on Figure 4.

3.3 Data Collection and Instrumentation

To assess the effectiveness of the process of blogfolio development on students' self-efficacy, participants from the course were asked to fill out the online Self- and Task-Perception Questionnaire (STPQ) voluntarily at the end of the fall semester in 2009 and the spring semester in 2010. Among the returned surveys, 27 out of 30 students' responses (90 %) were completed and usable.

The STPQ was originally developed by Lodewyk and Winne [12]. It consists of seven statements on self-efficacy for performance and self-efficacy for learning with 5-point scale ranging from 1 (very much not true of me) to 5 (very much true of me). The declaration "Based upon my experience on my blogfolio development -" was added at the beginning of all items for this study. In addition, an open-ended item/box that allowed students to report their learning experiences was added at the end of the STPQ.

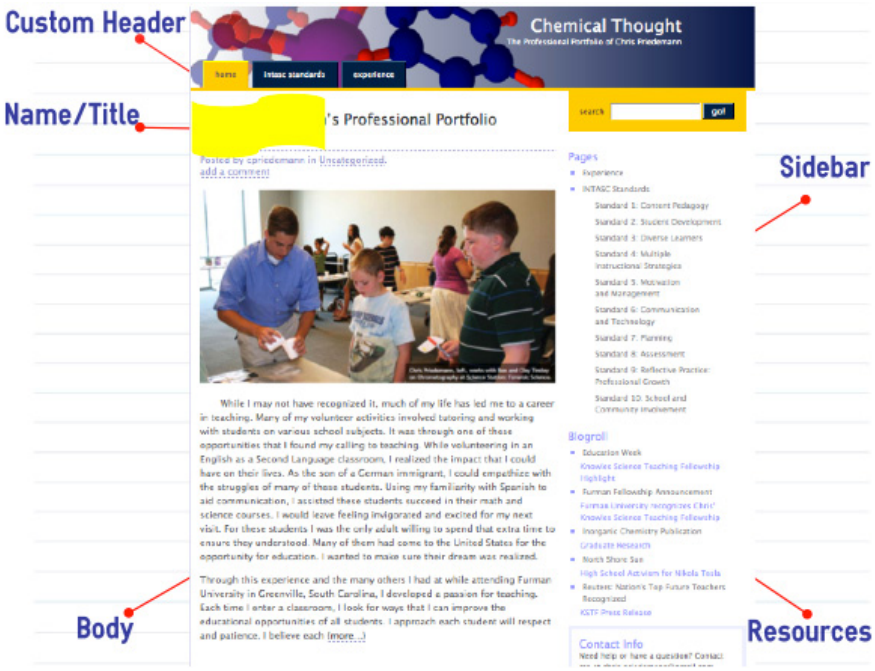

Fig. 4. A sample blogfolio

4 Results

The present study clearly demonstrated positive effects of developing blogfolios through five-stage blended learning process on students' self-efficacy. As indicated in Table 2, very high mean scores were found on both self-efficacy for performance and self-efficacy for learning. These findings correlated with comments from participants on the open-ended feedback box such as, "I think that this process made me reflect on a lot of the assignments that I've done throughout my education and it has been very helpful," "I feel the professional portfolio is invaluable resource to have when I am looking for a job, and gathering the artifacts for each standard made me realize the college has prepared me well for the teaching profession," "I think that the course was very well planned so that the amount of work was evenly distributed throughout the course of the semester. I also liked the opportunity to see the work produced by other students, because doing so provided me with ideas. It was also really great to have learned such a practical skill," "The portfolio will be very important when trying to find a teaching job, but more importantly, the portfolio showed me what I have done so far as a teacher, and what I need to do in the future to continue my professional development," "I am pretty confident that I put together a comprehensive portfolio. And I already have ideas for improving it before the end of class," "Loved it. Given enough freedom to make our own mistakes, yet the instructor was there for you.

We were given an idea and allowed to make it our own. All too often, professors are too strict with what they want and do not let the students make it their own. That was not a problem with this assignment."

Table 2. Respondents' self-efficacy

	Fall (n = 16)		Spring (n = 11)	
	M	*SD*	*M*	*SD*
Self-efficacy for performance				
Knowing the difficulty of this project, the teacher, and my skills, I think I can do well on this project	4.44	.51	4.73	.47
I expect to do well on this project	4.56	.51	4.82	.40
I believe I will receive an excellent grade on this project	4.63	.50	4.82	.40
Self-efficacy for learning				
I'm confident I am learning the basic ideas in this project	4.69	.48	5.00	.00
I'm certain I'm learning the skills necessary for this project	4.69	.48	5.00	.00
I'm confident I am understanding the most difficult material in this project	4.69	.48	4.73	.47
I know which mental techniques would best meet the needs of this project	4.38	.62	4.64	.67

5 Discussion and Conclusions

The findings of this study lead to a couple special considerations for increasing self-efficacy on professional electronic portfolio development.

Firstly, as Bandura [7] indicated, "the most effective way of creating a strong sense of efficacy is through mastery experiences." It is important to balance well- and ill-structured tasks for developing complex and individualized projects such as the professional electronic portfolio development. We find that instructors can build up students' beliefs and skills on developing electronic portfolios through five-stage blended learning process in F2F and CML environment: (1) scaffolding; (2) self-directed learning; (3) formative assessment and transaction; (4) reinforcement; and (5) presentation and reflection. This five-stage integrates student voices into the dialogue of electronic portfolios, as well as fosters intrinsic interest and deep engrossment in activities. As a result, students with high assurance in their capabilities approach the professional electronic portfolio development like as challenges to be mastered rather than as threats to be avoided [7].

Secondly, in order to build stronger self-efficacy through educational programs/courses, an innovative form of student-oriented electronic portfolio development with Web 2.0 applications such as a Weblog, which has enormous capacities of teaching and learning with technology, should be considered and

implemented. The effectiveness of the blogfolio development on self-efficacy for performance and self-efficacy for learning has been confirmed in this study.

It should be noted that the sample size of participants in our study was relatively small and the pretest of STPQ was not conducted. We suggest that larger population with pretest and posttest design to be investigated for further research. It should also be note that this study mainly focused on the effects of the five-stage blended learning process for weblog-based portfolio development on students' self-efficacy. We suggest further research should focus on other related topics. For instance, what are the effects of such a blended learning process for developing electronic portfolio on students' learning style and cognitive preference in terms of introversion-extroversion, intuition-sensation, thinking-feeling, and judging-perceiving [28]?

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