# Pre-Service English Teachers' Perceptions and Practice of Electronic Portfolios

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**Abstract**
The use of electronic portfolios (e-portfolios) in teacher education programs has become popular (Clark & Eynon, 2009). E-portfolios can be used to foster transformation in teacher beliefs through critical reflection and ownership of their learning (Stansberry & Kymes, 2007). This study focused on 16 pre-service English teachers' perception and practice of e-portfolios in a teacher education university in Taiwan. The data in this study included class syllabus, e-portfolios, observation notes, and reflective notes. The study concludes that the participants created blogs as a type of e-portfolio and they regarded their blogs as showcases of their learning and collections of useful multimedia resources. Reflections and critical thinking were neglected in their e-portfolios. The major problem they had in making e-portfolios was to take time to regularly maintain their blogs. Suggestions on effective implementation of e-portfolios in teacher education programs and for teachers' reflective practice are provided.

**Keywords:** blogs, electronic portfolios, pre-service English teacher, teacher education programs

## INTRODUCTION

The use of electronic portfolios (e-portfolios) in teacher education programs has become popular (Clark & Eynon, 2009; Ntuli, Keengwe, & Kyei-Blankson, 2009; Granberg, 2010). Electronic portfolios are considered to be a manageable system for collecting, organizing, storing or displaying all of the writing, videos, presentations, project and artwork learners produce (Fahey, Lawrence, & Paratore, 2007; Barrett, 2007). E-portfolios can be used to foster transformation in teacher beliefs through critical reflection and ownership of their learning (Stansberry & Kymes, 2007; Ntuli et al., 2009). Stansberry and Kymes (2007) claim that "e-portfolios are strategies of reflection both in the selection of artifacts and development of the portfolio, and in the statements of reflection imbedded with the artifacts and examples of learning" (p. 488).

E-portfolios have been used in teacher education. However, studies on e-portfolios conducted in Taiwan focus more on their effects on students' learning (Du, 2009; Huang, 2011; Lin, 2009; Zhuo, 2010) and less on pre-service or in-service teachers' learning and professional growth (Sung, Chang, Yu, & Chang, 2009). This study aims to focus on 16 pre-service English teachers' perception and practice of e-portfolios in a teacher education university in Taiwan. The data in this study included class syllabus, e-portfolios, observation fieldnotes and reflective notes. Suggestions on effective implementation of e-portfolios in teacher education programs are

provided.


## LITERATURE REVIEW

In the literature review, the researcher first explains the definition, contents, and types of e-portfolios. Steps in developing e-portfolios, use of e-portfolios in pre-service teacher education, and benefits of e-portfolios are discussed.

*Definition of E-Portfolios*

Barrett (2007) defines e-portfolio as follows: "An electronic portfolio uses technologies as the container, allowing students or teachers to collect and organize portfolio artifacts in many media types (audio, video, graphics, text)" (p. 438).

*Contents of E-Portfolios*

Scholars suggest that title, table of contents, samples of work, short résumé, students' reflective notes, letter to reviews and viewer comments box should be included in e-portfolios (Ali, 2005). Students can make their learning public to the entire classroom community by uploading papers, drafts, analyses, pictures and videos (Fahey et al., 2007).

*Types of E-Portfolios*

There are different types of electronic portfolios. Barrett (2000) recommends six levels of electronic portfolio software as in Table 1.

Table 1
*Six levels of E-portfolio software*

| Levels | Content |
|---|---|
| 1 | No digital artefacts. Some video tape artefacts. |
| 2 | Word processing or other commonly used files stored in electronic folders on a hard drive, floppy diskette or LAN server |
| 3 | Databases, hypermedia or slide shows (e.g. PowerPoint), stored on a hard drive, Zip, floppy diskette or LAN server |
| 4 | Portable Document Format (Adobe Acrobat PDF files), stored on a hard drive, Zip, CD-R/W, or LAN server |
| 5 | HTML-based web pages created with a web authoring program and posted to a WWW server |
| 6 | Multimedia authoring program, such as Macromedia Author ware or Director, pressed to CD-R/W or posted to WWW |


*Steps in Developing E-Portfolios*

Scholars define different steps in developing e-portfolios. Ali (2005) recommends eight stages: (1) define aim of the portfolio, (2) get students' consent for portfolio development, (3) define an audience for the portfolio, (4) empower students, (5) involve students in peer correction or review, (6) incorporate feedback mechanism into student portfolio, (7) encourage reflective practice, and (8) evaluate the presented portfolio. Barrett (2000) suggests five stages: (1) defining the portfolio context and goals, (2) the working portfolio, (3) the reflective portfolio, (4) the connected portfolio, and (5) the presentation portfolio.

*Use of E-Portfolios in Pre-Service Teacher Education*

Hyndman, Wirtz, Pierce, and Erickson's (2007) study discovered that the introduction of an e-portfolio to 120 participants in a single education course at Eastern Kentucky University could be effective. However, the gain in skills and attitude during only one course is minimal. Shen (2008) surveyed 120 principals of high schools and special education schools in Taiwan regarding their perspectives on using e-portfolios for job interviews. Her study found out that teacher candidates should include teaching philosophies, courses they took, reflective practice, learning activities and practicum, and a personal résumé in the e-portfolios. Moreover, it was more beneficial to display dynamic media types (audio, video) for teaching demonstrations.

*Benefits of E-Portfolios to Teachers*

Dhonau (2005) identifies the benefits of using CD-ROMs as part of an e-portfolio in pre-service teacher education, particularly in second-language method courses, because CD-ROMs can be used to demonstrate teacher candidate competency and to represent the teacher candidates' performance related to the American Council on the Teaching of Foreign Languages (ACTFL)/National Council for Accreditation of Teacher Education (NCATE) standards in terms of language, literature and culture. E-portfolio is also a dynamic reflection of the pre-service teacher's accomplishments and an organized documentation with tangible evidence of growth and achievement as a pre-professional (Lyles & Ryan, 2003). Moreover, e-portfolios can foster transformation in teacher beliefs through critical reflection, ownership of learning and personal agency. In-service teachers in K-12 schools in Stansberry and Kymes' (2007) study experienced a transformation in their perspectives and understandings of teaching with technology from "being inept" in the e-portfolio to building confidence, and then planning actions of implementing and designing e-portfolios. E-portfolios encourage pre-service teachers to process more reflection (Park & Ryu, 2004; Queirós, Silva, Martins, & Matos, 2010). However, 26 in-service teachers in Wickersham and Chambers' (2006) study failed to see how e-portfolios were connected to their master's degree program. More importantly, they did not view e-portfolio as a method of alternative assessment individually in their classrooms.

Studies on e-portfolios conducted in Taiwan have focused more on their effects on students' learning (Du, 2009; Huang, 2011; Lin, 2009; Zhuo, 2010) and less on pre-service or in-service teachers' learning and professional growth (Shen, 2008; Sung, Chang, Yu, & Chang, 2009). Elementary school teachers gained rich experience about the purpose, contents and forms of electronic teaching portfolios from the process of establishing electronic teaching portfolios (Wu,

2011). Shen's (2008) study focuses on high school teacher selection examiners' opinions on formulating an electronic portfolio system among pre-service junior high school teacher education program. Shen's (2008) study concludes that educational belief, self-reflection and growth, learning activities, and education practices should be included in e-portfolios and be shown in teacher selection.

In order to help pre-service elementary school English teachers to be equipped with professional abilities to be prospective teachers through the establishment of e-portfolios, this study aims to discuss the perception and practice of pre-service English teachers on using e-portfolios. This study aims to discuss the following issues: (1) What did the participants mostly include in their e-portfolios? Were their e-portfolios just the collections of their projects or tasks completed in the classes? (2) How did the participants use the e-portfolios to demonstrate their learning and foster their reflection practice? (3) What challenges did pre-service English teachers encounter when keeping these e-portfolios?

## METHODOLOGY

This is a qualitative case study. The study was conducted for one semester from late February to June 2012. The participants included 16 pre-service English teachers in a Multimedia in English Language Teaching class in a teacher education program. The class met for two hours per week from mid February through June 2012.

The major data in this study included (1) class syllabus, (2) e-portfolios, (3) observation fieldnotes, and (4) reflective notes. On the first class, the instructor explained the assignment on e-portfolios as follows:

"In order to help you prepare for class and be engaged with the course material, you are responsible for keeping records of your learning and post online. Choices are: (1) main points of the readings, (2) keywords and definitions, (3) implications, (4) tasks completed in classes, or (5) notes taken in classes. Include your personal reflections. The instructor will check your blog on Week 8 and 16. You will present your e-portfolios to the class on Week 18."

The e-portfolios count for 30% of the class grades and the rubric is revealed in Table 2.

Table 2
*Assessment Table*

| Criteria: 6 = well fulfilled   4= good   2=satisfactory   0=insufficient | |
| --- | --- |
| __ | E-portfolios include projects and notes completed and taken in class. |
| __ | E-portfolios include personal reflections. |
| __ | E-portfolios are submitted within required time. |
| __ | Organization is simple and clear. |
| __ | Give an oral presentation on e-portfolios. |

On Week 18, the participants presented their e-portfolio to the whole class. The researcher observed these participants' presentation and took the field notes.

Participants were asked to reflect on their practice of e-portfolios by writing down their answers to the following questions: (1) What makes your e-portfolio unique? (2) What else would you like to include in your e-portfolio? (3) What's the biggest take-away experience in making your e-portfolio? and (4) What challenges have you faced when making you make your e-portfolio?

Qualitative researchers build their patterns, categories and themes by organizing the data into more abstract units of information (LeCompte & Schensul, 1999; Creswell, 2009). Once the data were coded, tables were constructed to summarize the data and allow the researcher to check for patterns.

Guided by the research questions, data were categorized into units of information (Creswell, 2009; LeCompte & Schensul, 1999), such as components (i.e. class projects, class PowerPoint slides, class presentations), learning, critique, reflection, or challenges. Trustworthiness was performed through triangulation. Qualitative researchers typically gather multiple forms of data, such as interviews, observations, and documents, rather than rely on a single data source (Creswell, 2009; LeCompte & Schensul, 1999). In this study triangulating multiple sources of data can add texture, depth, and multiple insights to an analysis and it can enhance the validity or credibility of the results.

## ANALYSIS AND RESULTS

The analysis and results are discussed in terms of the components of the e-portfolios, lessons learned from making e-portfolios, and challenges teachers faced when making e-portfolios.

*Components of the E-portfolios*

These 16 pre-service English teachers registered on different free-charge blog servers and posted class projects, presentations and class PowerPoint slides on the blogs. Of the six levels of electronic portfolio software recommended by Barrett (2000), these 16 teachers used Level 5, "HTML-based Web pages created with a Web-authoring program and posted to a WWW server." These teachers chose free-charge blogs rather than creating their own HTML-based web pages, because they responded, "I know nothing about HTML language. The free-charge blogs can be easily accessed and uploading my collections to the free-charge blog is handy."

While all the pre-service English teachers included the pictures of the class projects and class PowerPoint slides, 11 of them included pictures of their class presentations as in Table 3. With regard to the class projects, the pre-service English teachers just uploaded pictures on their blogs.

Table 3
*Components of the E-portfolio*

|  | Class projects | Class PowerPoint slides | Class presentations |
|---|---|---|---|
| Pictures | 16 | 16 | 11 |
| Explanations | 3 | 2 | 2 |
| Critiques | 2 | 0 | 0 |
| Reflections | 5 | 0 | 0 |

Only three pre-service English teachers wrote explanations under the pictures as examples from 1 to 8. Example 1 was the description of the score this teacher had in a class activity.

*#1: Score of the review game.*

The below three examples showed teachers' likeness of class activities such as the Gallery Walk and Wrap-up activity.

*#2: I enjoyed this game a lot! i learned few [I learned a few]chat acronyms from my foreign friends also, such as ttyl (talk to you later).*

*#3: I love to do Gallery Walk! [I love doing Gallery Walk]*

*#4: This wrap-up activity was fun and challenging. I was so nervous.*

In Examples 5 and 6, teachers shared their opinions about using Microsoft Word and its implications on English teaching.

*#5: I have never thought of using Word as a tool of teaching [a teaching tool], except for using it to type test paper, but we designed this activity by using the tools we can think of.*

*#6: I use Microsoft Word quite often, but there are some functions that I seldom use. The gallery walk on Microsoft Word activities help [helps] me get ideas on integrating Microsoft Word into teaching English.*

In Example 7, a teacher shared her ideas on using A to Z relating to multimedia resources. She thought J was the most difficult to come up with a term.

*#7I think "J" is the most difficult one to come up with the related terms!!!!*

In Example 8, this teacher posted a picture of her dream classroom that she designed. She described it and praised how wonderful her future classroom would be.

*#8 My dream classroom is such a luxury. My future kids will have a comfortable room for studying and having fun. I also include an area for students to play [play with] Taiwanese toys. I*

*will sit in the center of the classroom to monitor my skids [kids].*

Only two teachers wrote critiques on their class projects as in the three examples below. These teachers were asked to evaluate websites and CD-ROMs in class. After they shared their evaluation and posted the class projects on their blogs, they also wrote more critiques in Examples 9, 10 and 11.

*#9: though [Though] this practice is good, but it cost [it costs]too much money to do it. but [But] it can be changed into another way. for [For]example, can [you can]do it in a computer room, or even simply with a piece of paper.*

*#10: this website has many weird-colored pictures. but I think it can also grab children's attention in the other way. [This website has many weird-colored pictures but I think it can also grab children's attention in other ways]*

*#11: I love the animation the most! It really can grab children's attention! I'll [I'd] say it would be better if we can [could] type, in order to search [search for] the word rather than using the mouse to click on the alphabet on the website.*

Five wrote their reflections on the class projects in the following examples from #12 to #14. The rest of these pre-service teachers were taken points away [deducted points]from the evaluation criteria "E-portfolios include personal reflections." In Example 12, this teacher reflected on how he would use MySpace for his junior students and teenagers, rather than for elementary school kids.

*#12: After doing the evaluation, I came to know that there are quite a lot things [a lot of things]to use on the internet [Internet]but teachers need to design what is good for students' learning. For example, my space [MySpace]might be suitable for teens or college students. However, elementary or junior kids are not appropriate [However, it is not appropriate for elementary or junior kids] because some porn/adult content is shown in [on] the website so that teachers [so teachers] should take care about this one.*

In Example 13, this teacher was motivated to organize her blog after watching the class video.

*#13: After watching this video, I should spend time on organizing my projects and uploading them to my blog. I can use these pictures to review my learning.*

In Example 14, this teacher particularly reflected how she would use email as a fun activity for her future students.

*#14: Email should be used in the class. Kids can write emails to their teachers. In addition to typing words, kids can add pictures or music. Sending emails to teachers can be a fun activity for kids, more than just an assignment.*

While all the pre-service English teachers included the pictures of the class PowerPoint slides,

only two of them added explanations of the pictures as in the following two examples. These teachers appreciated the resources their instructor provided on the class PowerPoint slides.

*#15: these [These]are GREAT resources!!!!!!!!!!!!!*

*#16: the [The] difference between blog and wiki. (:  i [I'd] like to know this at the beginning of the class. :P*

Eleven pre-service English teachers uploaded the pictures of their class presentation on their blogs and only two of them added explanations of the pictures as in the following examples. In Example 17, the teacher complained about Kevin who knew a lot about multimedia. She suggested that Kevin should be the last one to present and share in class. In Example 18, this teacher just wrote "Our group members" next to the picture of their group presentation.

*#17 Next time, Kevin should be the last one to share his idea. Otherwise, he shared all the thoughts and I didn't have anything else to add.*

*#18 Our group members.*

When being asked the question "What else would you like to include in your learning blog?" teachers wrote, "websites, videos, articles, their learning, their reflections, or books" as in Examples 20 to 24.

*#19: Other information like websites, videos, article, book [articles, books] related to the lesson.*

*#20: other resource about the topic from Internet [Other resources about the topic from the Internet].*

*#21: pictures [Pictures], learning tips, conclusions.*

*#22: I would like to include everything related to English I touch in my daily life. Also, in the future, I would like others to commend [comment]to my blogs or my sharing.*

*#23: If I could have more time to manage my blogger, I'd the former data (in wretch, pixnet…) into my blogger and classify the files into proper tags so that I could easily search what I want and share with those who have the same interests.*

These 16 pre-service teachers posted their pictures of class projects, class presentations and PowerPoint files on their learning blogs. The learning blogs and e-portfolios should not be the only collections of these pre-service teachers' class projects. Rather, the learning blogs should be used to help these teachers think about what they were doing and why (Templer, 2004). Sharing, peer review and peer evaluation became [have become]an expected, predictable and inescapable routine in e-portfolios and bulletin board systems such as in the Timilty Community Forum and the Salem Education Forum (Fahey et al., 2007). Therefore, through the use of e-portfolios, teachers can not only collect and organize data but change the ways they think about, talk about

and use data. Templer (2004) encourages teachers to hold up mirrors on their own practice, making more conscious what [making them more conscious of what] is beneath the surface. Templer (2004) further suggested that teachers can ask themselves questions such as "What worked well and why?" or "What didn't work well and why?"

*Lessons Learned from Making E-Portfolios*

E-portfolios can be used to demonstrate learners' learning process. When being asked the question "What's the biggest take-away experience in making your learning blog as e-portfolios?" these pre-service teachers held three particular types of attitude toward their e-portfolios. First, this e-portfolio is considered as a collection of resources.

*#24: I can regard this blog as my learning diary. When I need some resources of this topics [for this topic] or something related to it, I can easily find them.*

*#25: I can use these resources as my teaching materials. I don't have to spend much time to prepare [preparing] the related topics.*

The pre-service English teachers in this study regarded the e-portfolios as collections of their resources. Their concepts were in accord with teacher educators' perceptions of portfolios as archives because of their accessibility and the collection of resources in Granberg's (2010) study. Chaung (2010) suggests that teachers should organize their posts into clusters either chronologically or thematically so they can search or review them later.

Second, teachers used this learning blog to share their learning and ideas with other learners.

*#26: We can share our opinions with teacher [teachers], classmates, or other online learners. They can have comments on blog. Maybe we can have discussion online.*

*#27: When writing my blog, I'll try to find out the note we jot [notes we jotted] down in class, the picture taken by friends or myself, and the slides we learned in class, the process of re-thinking ability helps me to think deeply about the teaching ideas. Sometimes I could put some ideas into practice in my cram school or in other teaching class [classes]. These brought me confidence and happiness when I come to comprehend I'm able to teach in elementary school and handle the difficulties which encountered before, I could be a good teacher in the future. [These have brought me confidence and happiness and I realize I can teach in elementary school and handle the difficulties which I had previously encountered, and that I could be a good teacher in the future]*

E-portfolios are wonderful resources for people to share their ideas and knowledge. Sharing may cause the persons involved to reconstitute a more complex and synthetic understanding (Irvine, 2002). In this study, the 16 pre-service English teachers were also given class time to browse through each others' blogs and give each other comments and feedback. Ali (2005) strongly suggests that peer correction or review should be included in portfolio development, because learners can learn through their peers' comments on their work and through their own comments

on someone else's work.

Third, teachers recorded their learning in their learning blogs and they regarded the learning blogs as ways to demonstrate their learning as follows:

*#28: lots [Lots] of useful vocabularies and phrases to learn from my blog.*

*#29: I can record what I've learned in this class. What I recorded in class helped me review what I've learned in class.*

*#30: I can record what I've learned this semester, and also can evaluate & [and] review things that I've learned in the class.*

Therefore, e-portfolios are a type of showcase for learning. Herman and Winters (1994) state that "Portfolios are being heralded as vehicles that provide a more equitable and sensitive portrait of what students know and are able to do" (p. 48). E-portfolios can help learners understand their own learning and provide a richer picture of learners' work to document growth over time (Barrett, 2007).

*Challenges from Making E-Portfolios*

These pre-service teachers faced two major challenges in making e-portfolios. First, making blogs as their e-portfolios was time-consuming. The teachers needed to patiently keep records of what they learned in class and some of them felt that they had difficulties in keeping an update of their learning.

*#31: It takes time to keep the blog, because I will ask myself to arrange them well. [I take a lot of time and care in arranging them well.]*

*#32: Lazy [Too lazy] to update it right away, so sometimes it's hard to think of the exact content of that course.*

*#33: My biggest challenge is that to collect [collecting] the work that we learn from the class.*

It takes time to make an electronic portfolio. Portfolios are both a product and a process. For those who make electronic portfolios for their profession, Heath (2005) cautions them as follows: "If sufficient time and thought is not devoted to the process, the final product will suffer as a result" (p. 68).

Second, these teachers registered on the blogs and posted their pictures on their blogs. However, they found that some of the blogs are not user-friendly. It took a while for them to get used to the designs of the blogs. Uploading pictures took longer time [a long time].

*#34: pictures [Pictures] can't upload or upload slowly. The blog is hard to control. The processes are complex therefore I'm lazy [I'm too lazy] to finish it.*

*#35: When I faced [I faced] trouble when designing the layouts of my blog. I had to make sure the sizes of words are the same or make each picture the same size. Some blogs have word number limitations and the sizes of the pictures.*

E-portfolio development takes technology skills (Heath, 2005). In this study, pre-service English teachers uploaded only class PowerPoint slides and pictures of class projects and presentations on their blogs as e-portfolios. However, six levels of electronic portfolio software are suggested by Barrett (2007), from Level I, "Video tape", to Level VI, "Multimedia authoring program". Therefore, e-portfolios should not be limited to blogs or pictures alone. Graphics, photos, clip art, scanned images, videos and sound are encouraged to be saved for E-portfolios to demonstrate these teachers' learning (Ali, 2005).

The capability of software is the key criterion for software selection when making e-portfolios. Barrett (2000) compared and contrasted different types of software tools in terms of their development tools, structure and links, player availability, advantages, disadvantages, ease of use, technology required and cost. With these options, teachers can find the best software to meet their audience, goals, technology skills and available equipment for making their own e-portfolios. In terms of the interactive features of e-portfolios, Clark and Eynon (2009) recommend social networking sites like Facebook and Twitter, and Web-authoring platforms like Blogger, TypePad, and WordPress.

## DISCUSSION AND IMPLICATIONS

Teachers can collect, organize, store or display their materials, videos, presentations, projects and artwork in their e-portfolios. Teachers can be fostered to transform their beliefs about teaching through reflection and they can also have the ownership of their learning through collecting and organizing their e-portfolios (Stansberry & Kymes, 2007). E-portfolios are considered as an archive, for assessment, and for learning (Granberg, 2010, p. 316).

In this study, the 16 pre-service teachers demonstrated their learning by uploading pictures of class PowerPoint slides, class presentations and class projects on their blogs as e-portfolios for classroom assignments. However, self-reflection was neglected in the e-portfolios. This study was in accord with Sung et al.'s (2009) study that most teachers demonstrated moderate levels of reflection in their journals but only one-third of them showed the highest level of reflection. Freeman (2002) suggests that reflective practice must become a central pillar in teacher education.

Reflective practice provides different opportunities for teachers to reflect through a range of different activities, builds in some ground rules for the process and into each activity, makes provisions for different kinds of time, provides external input for enriched reflection, and provides for low affective states (Farrell, 1998; Fiszer, 2004; Curtis & Szestay 2005). Reflective practice can be conducted in different formats. Fiszer (2004) suggests that reflective dialogue can facilitate teachers' professional development by building rapport, because teachers feel that they

are supporting one another through the process; therefore, more opportunities should be created for reflective dialogue (Fiszer, 2004; Osterman & Kottkamp, 2004).

Reflective writing in diaries and journals plays an important role in teachers' professional growth, not only for initial teacher preparation but also for in-service teachers. Therefore, reflective notes should be included in e-portfolios because "reflective notes tell us how the learners feel about the learning process" (Ali, 2005). Reflective practice offers practical options to encourage teachers to generate and share their insights and theories about teaching.

In addition to reflective notes, pre-service English teachers should present what they know about language, literatures and cultures, and what they are able to do with the knowledge in the classroom. So such e-portfolios will be useful tools for preparing these teacher candidates for their future careers.


**CONCLUSION**

This study focused on 16 pre-service English teachers' perception and practice of e-portfolios in a teacher education university in Taiwan. The study has the following findings. First, these 16 pre-service English teachers created blogs as a type of e-portfolio and their e-portfolios included pictures of class PowerPoint slides, class presentations and class projects. They wished to include more useful websites on their blogs. Second, most of the teachers uploaded only the pictures onto their blogs. Reflections and critical thinking were neglected in their e-portfolios. Only two teachers wrote critiques on their class projects, such as "It would be better if we can [could] type, in order to search [search for] the word rather than using the mouse to click on the alphabet on the website." Only five teachers wrote their reflections on the class projects, such as "After watching this video, I should spend time on organizing my projects and uploading them to my blog." Third, these pre-service English teachers regarded their blogs as showcases of their learning and collections of useful multimedia resources, such as "I can regard this blog as my learning diary." or "I can use these resources as my teaching materials." Fourth, the challenges they faced in making e-portfolios included having difficulties in regularly maintaining their blogs and having problems with using commercialized blogs such as Wretch (*http://www.wertech.com*) or Blogger. One teacher responded, "It takes time to keep the blog," and another teacher complained, "[Pictures] can't upload or upload slowly."

Four suggestions are provided to make e-portfolios effective tools in language teacher education programs. First, the 16 pre-service English teachers in this study created blogs as a type of e-portfolio and they uploaded pictures of class PowerPoint slides, class presentations, and class projects to their blogs. E-portfolios should not be limited to blogs or websites alone, but can be demonstrated in multimedia. Pictures should not be the only elements in e-portfolios, but other formats such as videos or audios should be included. Second, only two teachers wrote critiques on their class projects and only five teachers wrote their reflections on the class projects. Critical thinking and reflection should be fostered in e-portfolios. Shen's (2008) suggests that educational belief, self-reflection and growth, learning activities, and education practices should be included in pre-service teachers' e-portfolios during their teacher education program and be shown in

teacher selection. Third, these 16 pre-service teachers complained that the commercialized blogs are not user-friendly. User-friendly blogs or multimedia should be introduced to pre-service teachers so teachers can use these multimedia resources to demonstrate their learning as e-portfolios. Most universities in Taiwan have their own server where teachers can upload class materials and communicate with their students online. In addition to upload assignments to the server, such server should provide sufficient space for learners to develop their e-portfolios systematically. Fourth, these sixteen participants felt that they had difficulties in keeping an update of their learning because of their busy schedule or laziness. Rather than grading students' e-portfolios at the end of the course, teachers should regularly check students' e-portfolios as their learning performance and progress. By doing so, students will regularly maintain their e-portfolios.

This study focused on 16 pre-service English teachers' perception and practice of e-portfolios in their language teacher preparation program. The small number of participants limits the study's findings by preventing them from being generalizable to larger English teacher populations. Based on the class syllabus, e-portfolios, observation field notes and reflective notes, however, the instructional procedure and suggestions for implementing e-portfolios as reflective practice do have practical implications for future language teacher preparation.

If the language teacher education programs in universities in Taiwan can provide sufficient space for pre-service language teachers to develop their e-portfolios systematically as suggested in the previous paragraph. Pre-service language teachers should be mandated to regularly maintain their e-portfolios to demonstrate their pedagogical competence, cultural competence, linguistic competence and technical pedagogical content knowledge. University instructors can regularly check and monitor pre-service language teachers' learning and performance through e-portfolios. A further study could focus on how these pre-service teachers in Taiwan could use their e-portfolios to demonstrate their learning and competence in language teacher preparation programs for future job applications. Moreover, these 16 pre-service teachers regarded their e-portfolios as the collections of teaching materials. The pre-service language teachers are required to do practicum for half a year in the local elementary schools in Taiwan. Another study could focus on these teachers' implementations of e-portfolios among elementary school students and discuss how their knowledge and learning of e-portfolios in pre-service education could be transformed and practiced in elementary school classrooms.

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