

UNDERSTANDING IN-SERVICE TEACHERS' LEARNING EXPERIENCE WHILE DEVELOPING AN ELECTRONIC PORTFOLIO

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Abstract

Electronic portfolios have become popular in teacher education programs as they allow learners to document and reflect upon their work and learning process. This cross-sectional study examines data gathered from 19 primary and secondary EFL teachers enrolled in a postgraduate program. The study aims at understanding these teachers' learning experiences while developing an electronic portfolio. A survey questionnaire with Likert-type, checkboxes-type and open-ended questions were used to collect data. The results indicated that teachers valued e-portfolios as an authentic and process-oriented assessment tool that involves reflection, documentation, and dissemination of their work.

Keywords: assessment; e-portfolio; reflective practice; teaching

1. Introduction

Nowadays, studies on e-portfolios in teacher education programs have focused on the way portfolios have been implemented to provide pre-service teachers with the technical competence required in the current information age. Thereby, much of this work has aimed at describing e-portfolios and their use in teacher education (Wolf & Dietz, 1998; Barrett & Knezek, 2003; Lind, 2007; Strudler & Wetzel, 2011; Boulton, 2014, Barberà, Gewerc & Rodríguez, 2016).

Concerning pre-service teacher education, literature (Karsenti, Dumouchel, & Collin, 2014) has highlighted four main purposes: exposure, reflective, social and assessment. Likewise, a study conducted by Forawi, Almekhlafi and Al-Mekhlafy (2012) showed that pre-service teachers perceived documentation of work, improvement of creative thinking skills, improvement of information technology skills, assessment of own progress, and understanding of future classroom technology, as the main benefits of e-portfolios.

On the other hand, regarding teachers' knowledge of technology, literature shows "that most current teachers were not prepared in their teaching education programs to integrate technology into their teaching" (Shwu-Meei, 2005, p. 1). Notwithstanding, little research concerning in-service teachers has been carried out (Beka & Gillareva, 2016). In this context, the purpose of the present study is to understand in-service teachers' learning experience while developing an electronic portfolio in a Teaching English with Technology module in a postgraduate program. Besides, it also intends to explore the advantages and disadvantages of e-portfolios, as well as the impact this experience might have on their future practice. Subsequently, this study seeks to find answers to the following three questions:

1. What are teachers' perceptions of developing an e-portfolio?
2. What did the teachers learn from developing their e-portfolios?
3. How would developing an e-portfolio contribute to their future teaching?

2. Literature review

An electronic portfolio (EP) is a collection of works, which, according to the Joint Information Systems Committee of the United Kingdom (JISC), corresponds to "a production created by the apprentice, a collection of digital artifacts that articulate their experiences, performances and learning" (Joyes, Gray & Hartnell-Young, 2010, p. 16). The purpose of this procedure is to save a series of the learner's activities on the web, a mobile device or to the cloud, from which he/she can demonstrate some skills in a particular context.

The EP allows the generation of a collection of students' works (evidence) that can account for their development over time, and which is supported on the web or other types of digital devices. According to Bryant and Chittum, "the use of web interfaces makes the electronic portfolio more flexible and dynamic, allowing learners to make changes in their portfolios that are immediately accessible to the instructor" (2013, p. 189).

Another favorable aspect of the use of EP is interaction since learners can not only show their work to an audience but also interact with it. Barrett (2011) argues that interactive portfolios have the following characteristics: they reflect learning through various formats, they display work online for multiple audiences, they allow dialogue and reflection regarding learning artifacts, and they support the provision of feedback to improve learning.

2.1. Types of electronic portfolios

An EP must have a clear objective. The type of portfolio used is directly related to the said purpose, as it is presented in the literature with four main types of EP (Fernsten, 2009):

- a) Development or process (developmental): this type of portfolio aims to demonstrate the progress of an activity, including self-evaluation and reflection, and to approach the portfolio as a process that emphasizes reflection.
- b) Presentation (showcase): the purpose of this type of portfolio is to show exemplary work based on the selection of the best that has been done. This portfolio illustrates the student's experience and achievement and focuses on the portfolio as a product.
- c) Evaluation (evaluation – assessment): this portfolio is used by teachers to evaluate students' work in a developmental or presentation portfolio format. It consists of the systematic collection of their work in which they are expected to demonstrate achievement of certain competencies or standards.
- d) Hybrid: this kind of portfolio combines the process portfolio and the presentation portfolio. The objective is to include the process and the product of achieved learning. Students include evidence of both the process and the product of learning. In this type of portfolio there is some reflection regarding their learning and about the selection of the best work carried out by the student.

In general, the use of the hybrid electronic portfolio is recommended as it is expected to combine both process and product. This is what Barret (2011) calls “balance”, referring to the need to calibrate the different possibilities that EP offers between the process (learning and reflection) and the product, which is mediated by the interaction (student-tutor or student-student). Another point to consider is evaluation, which can be formative, through feedback processes (to achieve learning), and summative evaluation that corresponds to learning.

Now, the constituent elements of the electronic portfolio can be varied, however, Benito and Cruz (2005, p. 118) state that there are six basic elements in the creation of an EP:

1. Students' presentation, which can include a welcome message, their photo, academic and professional curriculum, an explanation of what the portfolio means, etc.
2. Formative objectives, which make up the learning map that students take on and which are the basis of their evaluation.
3. Products, which are the documents of the different activities developed in the subject.
4. Reproductions, which include any type of information that has been used by the student for the realization of the products (teacher's email, web page links, etc.).
5. Field diary, where the students write down reflections on their learning process and carry out their self-evaluation of the products and the usefulness of the portfolio.
6. Teacher's comments, which include both the instructions for developing the products and comments that have guided the student's learning process.

2.2. The electronic portfolio as a learning experience

The portfolio is considered a method to help students access learning because it enables them to systematize information, reflect on what they are learning and evaluate the whole process. Benito and Cruz (2005) and Barberá (2005) claim that the reflection process is central in EP. Concerning reflection, Zubizarreta posits that this method “provides a structure for students to systematically reflect on the learning process and develop aptitudes, abilities and habits that come from critical reflection” (2004, p. 15).

Armengol et al. (2009) argue that EP favors students’ self-regulation because through reflection they can take charge of the way they do their work, can organize their time and articulate activities in relation to contents, activities, readings, and assessment processes. Therefore, this procedure is a useful mechanism to favor students’ learning experiences, whether at the basic, intermediate, undergraduate, or graduate level.

Finally, the potential that EP has in relation to the learning process refers to the management and distribution of materials as well as to feedback (Gathercoal et al., 2002). Likewise, Monereo (2005) proposes that this procedure enables the development of basic socio-cognitive skills in the digital environment through the interaction between teachers and students since it is possible to work with feedback mediated by technology. Another favorable aspect refers to the continuous and detailed monitoring of the student's work (Area, Gros & Marzal, 2008).

Following these characteristics, we can add that the EP has its base on the interaction and communication between student and tutor in technological contexts, resulting in the development of digital competencies that can facilitate students’ successful insertion in academic contexts mediated by technology, especially in current contexts where classes have moved on to online platforms in the new era of virtuality (Rubio et al., 2020).

3. Method

This study is quantitative and inductive in nature. First, the quantitative method was used to count the percentages of the established categories. Then, the content analysis technique was applied using an inductive approach. This method allows us to advance in knowledge by obtaining more information than the initial data provided, which enables finding relationships between the CALL module, technological skills, integration of technology in future teaching, evaluation tool, sharing of learning, appropriation and reflection with learning, contribution to teaching and future plans to implement ICT.

3.1. The aim of the study

This study aims at answering these research questions:

1. What are teachers' perceptions of developing an e-portfolio?
2. What did the teachers learn from developing their e-portfolios?
3. How would developing an e-portfolio contribute to their future teaching?

To do this a cross-sectional survey research design was used in this study. This design can examine subjects' current attitudes, beliefs, or opinions (Creswell, 2012).

3.2. Participants and the context

19 primary and secondary EFL teachers enrolled in a postgraduate program at a university in Chile participated in the study. All participants were part of a 46-hour Teaching English with Technology (CALL) module, and they were required to create an e-portfolio in Google Sites to evidence their work during the course.

3.3. Module organization and portfolio characteristics

The objective of the module was to provide teachers with technological tools and strategies that allow them to plan thematic units based on the fundamental principles of the use of technologies in the second language teaching-learning process.

The module lasted 50 hours and took 5 weeks. Table 1 shows the module organization, the contents and some of the tools used.

Table 1. Module organization

Week	Contents	Tools used
1	Introduction to ICT tools (5 hours) Teaching vocabulary with technology (5 hours)	Mindomo Quizlet- Vocabulary games
2	Teaching grammar with technology (5 hours) Teaching pronunciation with technology (5 hours)	Screencasting- Wordprocessors Speech recognition software
3	Teaching reading with technology (5 hours) Teaching listening with technology (5 hours)	Storyboardthat- Word it out- Storyjumper Videos- Podcast- Digital storytelling
4	Teaching speaking with technology (5 hours) Teaching writing with technology (5 hours)	Voki- Blabberize- Powtoon Storybird- Storyjumper- Wikis
5	Using games in the EFL classroom (5 hours) Assessing students with technology (5 hours)	Kahoot- Flipquiz- Memrise Google forms- Socrative- Quizizz- Zipgrade

This CALL module included the following elements (see Figure 1).

- The participant's introduction

- Activities for teaching vocabulary, grammar, pronunciation, listening, reading, writing, speaking, games and assessment
- A PowerPoint presentation of an oral report
- The design of a didactic unit using technology
- A reflection on the work carried out during the module



Figure 1. Evidence of students' e-portfolios

3.4. Instrument

The instrument that was used in this study was a survey adapted from Shwu-Meei Chen (2005). It included a brief description of the purpose of the study at the beginning of the questionnaire and 3 sections (see appendix A):

- a) 15 Likert-type scale questions that ranged from strongly disagree to 6 strongly agree);
- b) 5 checkboxes question type;
- c) 3 open-ended questions.

Sections A and B asked participants about their perceptions on the use of e-portfolios in the module and its pedagogical value; while Section C asked them to reflect on the contribution of e-portfolios to their professional development.

3.5. Data collection

Data were collected during the last class of the CALL module. The researcher administered the survey after explaining the purpose of the study to the participants and inviting them to participate on a voluntary basis. Students were assured that there would not be any negative repercussions to their grades or otherwise if they chose not to participate.

3.6. Data analysis

The data were analyzed as follows:

Question from Sections A and B were analyzed using a quantitative method involving the use of percentages. In addition, questions from Section A were grouped into 7 categories: CALL module, technological skills, integration of technology in future teaching, assessment tool, sharing learning, ownership, and reflection.

Questions from Section C were analyzed through a general inductive process with a content analysis technique (Creswell, 2012). For this analysis 3 categories were used: learning, contribution to teaching, future plans to implement ICTs.

4. Findings and discussion

4.1. Likert-type scale questions

Based on the 7 categories established (see Table 2), results show that teachers, in general, felt that the e-portfolio was an important aspect of the CALL module (84% strongly agree) and that they enjoyed the process of developing the portfolio (53% strongly agree and 37% agree).

In terms of technological skills, the participants reported they acquired sufficient technical skills to develop an e-portfolio both during and after the module (100% strongly agree and agree). Considering the integration of the technology learned in future teaching, the participants reported having learned how to use technology to enhance their teaching (68% strongly agree and 32% agree).

Teachers also indicated that they value the e-portfolio as an assessment tool, which is due to the fact that it is authentic (74% strongly agree) and process-oriented (84% strongly agree). As one of the purposes of portfolios is to share experiences, participants, in general, declared they felt comfortable uploading their work (53% strongly agree) and sharing it with others (63% strongly agree). In addition, teachers felt ownership of their portfolios (74% strongly agree) and were proud of their work (53% strongly agree and 37% agree). Finally,

participants expressed that the e-portfolio helped them to reflect on the learning process (68% strongly agree) and their teacher identity (47% strongly agree).

Table 2. Percentage of teachers' perception of e-portfolios

	SD N (%)	D N (%)	U N (%)	A N (%)	SA N (%)
CALL Module					
The e-portfolio was an important aspect of the CALL module.	0	0	3(16)	0	16(84)
I was interested in developing my e-portfolio in the beginning.	1(5)	0	2(10)	3(16)	13(68)
I enjoyed the process of developing my electronic portfolio.	2(10)	0	0	7(37)	10(53)
Technological skills					
I learned sufficient technical skills to develop my e-portfolio in the technology module	0	0	0	5(26)	14(74)
I know how to create an e-portfolio in the future.	0	0	0	2(10)	17(89)
Integration of technology in future teaching					
I acquired sufficient technical skills to help my teaching.	0	0	0	7(37)	12(63)
I learned how to use technology to enhance my teaching and learning.	0	0	0	6(32)	13(68)
Assessment tool					
I understood e-portfolio is a tool for process assessment.	0	0	0	3(16)	16(84)
I value the e-portfolio as an authentic assessment.	0	0	1(5)	4(21)	14(74)
Sharing learning					
I was comfortable to upload my work in my e-portfolio.	0	1(5)	1(5)	7(37)	10(53)
The e-portfolio helped me be open-minded to share my learning experience with others.	0	0	2(10)	5(26)	12(63)
Ownership					
I feel ownership of my e-portfolio.	0	0	0	5(26)	14(74)
I was proud of my work of e-portfolio.	0	0	2(10)	7(37)	10(53)
Reflection					
The e-portfolio helped me to reflect on my learning process.	0	0	1(5)	5(26)	13(68)
The e-portfolio helped me to be aware of who I am as a teacher.	0	0	2(10)	8(42)	9(47)

4.2. Checkboxes question type

Teachers stated the three most important purposes for developing e-portfolios (see Figure 2) were documenting/collecting their learning experience (100%), self-reflecting upon my teaching and learning (68.4%) and completing the CALL module requirements (57.9%).

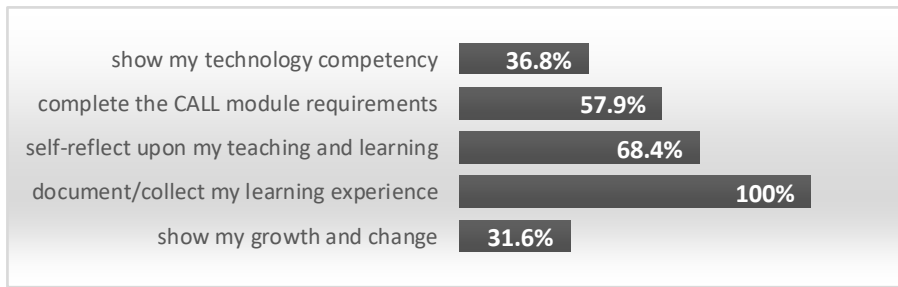


Figure 2. The most important purposes for developing e-portfolios

Teachers pointed out the three most important things learned from developing the e-portfolio (see Figure 3) are the acquisition of specific technological skills (100%), knowledge of technology integration (84.2%) and knowledge of e-portfolio (63.2%).

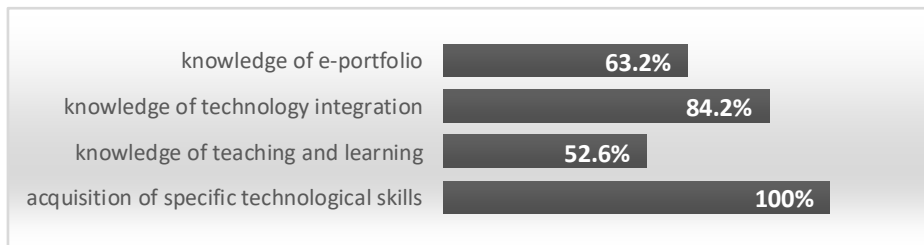


Figure 3. The most important things learned from developing the e-portfolio

As Figure 4 shows, the most important advantages of developing the e-portfolio, according to participants, were learning about technology (63.2%), useful tool/assessment approach in my future teaching (52.6%) and portable and easy to access and update (47.4%).

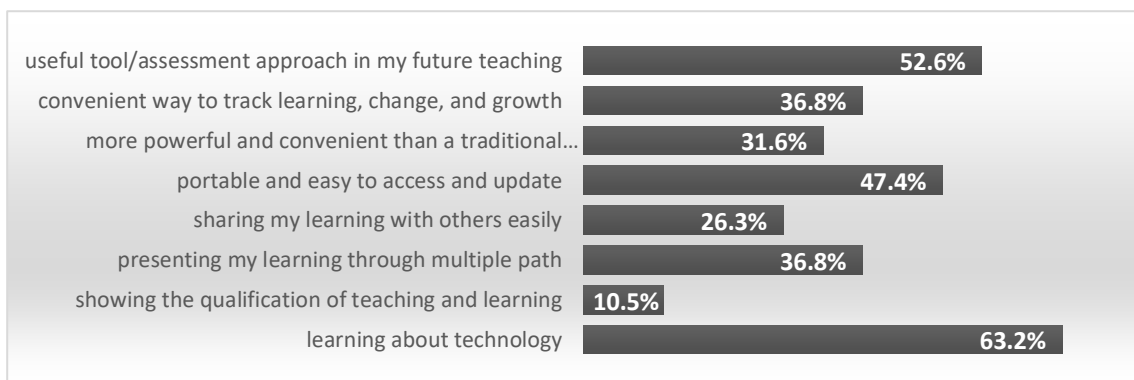


Figure 4. The most important advantages of developing the e-portfolio

Figure 5 presents the most important disadvantages of developing the e-portfolio, which, according to participants, were time demand (94.7%), lack of technology skills (63.2%) and server space limitations (52.6%).

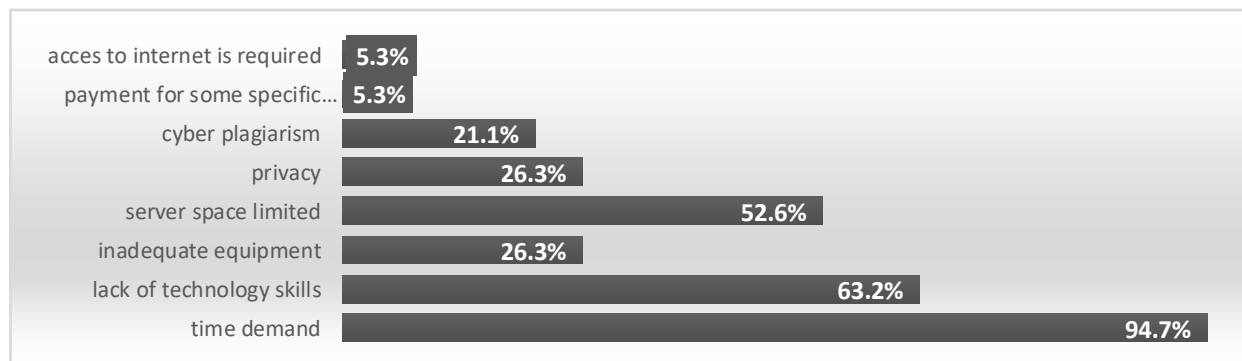


Figure 5. The most important disadvantages of developing the e-portfolio

Interestingly, when asked about the people they shared e-portfolios with, teachers reported having shared them with the instructor (100%), peers (78.9%), family (26.3%), and friends (26.3) most.

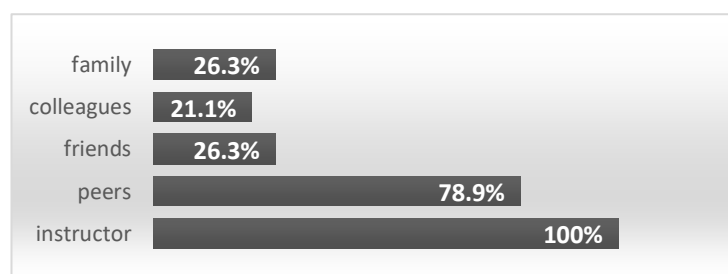


Figure 6. The people teachers shared e-portfolio with

4.3 Open-ended questions

Results from the open-ended questions will be organized into 3 categories: learning, contribution to teaching, future plans to implement ICTs.

a. Learning

When asked about what they learned from developing an e-portfolio, teachers indicated that they learned new technological tools for teaching (14), how to integrate technology into the language learning process (9), how to use the e-portfolio to reflect and keep track of the learning process (4), as exemplified by the excerpts below.

I learned a wide variety of tools and activities which I could effectively apply with my students. In addition, it made me reflect on what way I could integrate this knowledge into my classes, in order to benefit from technology and its educational tools. (Participant 7)

I improved my knowledge of technology for teaching. I was able to explore different webpages and a wide range of different activities. Uploading those activities to my portfolio helped to track my learning and to have a bank of ideas. (Participant 11)

b. Contribution to teaching

When asked about how the experience of developing an e-portfolio will contribute to their teaching and learning, teachers mentioned that it would help them incorporate more technology into their teaching practices (8), improve their technology competency and be updated with the use of technology (5), incorporate new ways to assess students' learning (5) and promote their professional development (4), as exemplified by the excerpts below.

It makes me a more integral professional, since I am capable of managing technology being updated with nowadays educational needs. (Participant 5)

Before this module, I didn't know what an e-portfolio was. Thus, through this experience I realize how important is to manage ICT and that you can use it not only for academic purposes, but to save and promote your own professional development as a teacher too. (Participant 16)

c. Future plans to implement ICTs

When asked about how they plan to apply the knowledge and skills learned from developing e-portfolios into their future teaching, teachers expressed the hopes to integrate technological tools in their classes as much as possible (10), create a webpage with activities for students (7), implement students' portfolio as an assessment tool (5) and keep using the portfolio to upload their work (4), as exemplified by the excerpts below.

I'm planning on using my portfolio so my students would visit and find materials that could help them reinforce their knowledge. (Participant 1)

I am planning to use an e-portfolio as an evaluation of process during a semester. Thus, students will have to upload certain activities on it per month and by the end of the semester they will get a mark for it. (Participant 16)

In general, these results show that most teachers enjoyed the process of developing an e-portfolio (Wenzlaff & Cummings, 1996; Borko et al., 1997). Also, teachers were proud of their e-portfolios and demonstrated their growth to themselves and others, for example, colleagues, family, and friends (McKinney, 1998). However, they believed this activity was time-consuming (Cunningham, 2002; Pecheone, Pigg, Chung, & Souviney, 2005; Lind, 2007).

Regarding technological skills, teachers expressed having improved their technological competence (Milman, 1999; Gatlin & Jacob, 2002; Sherry & Bartlett, 2005) and being ready to develop a new portfolio on their own in the future and to integrate what they have learned in their future teaching (Barrett & Knezek, 2003; Berg & Lind, 2003; Forawi, Almekhlafi & Al-Mekhlafy, 2012).

One of the advantages teachers mention when using e-portfolio was the fact that they are portable and easy to access and update (Quinlan, 2002; Garrett, 2011). In addition, with respect to reflection, teachers mentioned that the e-portfolio helped them reflect on their learning process (Orland-Barak, 2005; Ma & Rada, 2006) and promoted their professional growth (Wolf & Dietz, 1998; Zeichner & Wray, 2001; Lam, 2015). Finally, in relation to teaching practices, teachers referred to the potential e-portfolios have as an alternative assessment when evaluating students' work (Boulton, 2014).

5. Conclusion

The aim of this study was to understand teachers' learning experience while developing an electronic portfolio in the Teaching English with Technology module of a postgraduate program. Based on the findings, it was possible to arrive at some conclusions. Firstly, using an e-portfolio provided teachers with new tools that allowed them to improve their technical skills and enhance their language teaching practices. Next, teachers valued e-portfolios as a tool to document learning experiences, reflect and keep track of learning processes. Finally, teachers felt ownership of their e-portfolios and were proud of their work. This led them not just to share their e-portfolios with the instructor but also with colleagues, family, and friends.

Understanding how teachers experience the use of e-portfolios is important to keep on implementing this tool in teacher education programs and exploring new ways to enhance reflection and professional growth in future teachers. Despite this, before generalizing these findings, it is necessary to pinpoint two limitations of this study. First, given the fact that participants were taking part in a postgraduate program, the sample size was small and not representative. Second, the instrument used in the study collected mostly quantitative data through a structured questionnaire, which limited options of responses and might not fully represent teachers' views.

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Appendix A. Electronic Portfolio Survey
Adapted from Shwu-Meei Chen (2005)

The purpose of this study is to collect evidence regarding your overall learning experience and perception of electronic portfolio as a postgraduate student. The comments are voluntary. Your effort in providing as much as detail insight as you can, will be greatly appreciated.

Section 1.

Please respond to the following statements based on whether you: Strongly Agree (SA)- Agree (A) - Undecided (U) - Disagree (D) - Strongly Disagree (SD)

As a student who developed the electronic portfolio in the post graduate program:

Statement	SD	D	U	A	SA
The e-portfolio was an important aspect of the CALL module.					
I was interested in developing my e-portfolio in the beginning.					
I acquired sufficient technical skills to help my teaching.					
The e-portfolio helped me be open-minded to share my learning experience with others.					
I learned how to use technology to enhance my teaching and learning.					
I was comfortable to upload my work in my e-portfolio.					
I know how to create an e-portfolio in the future.					
I understood e-portfolio is a tool for process assessment.					
I learned sufficient technical skills to develop my e-portfolio in the technology module.					
The e-portfolio helped me to reflect on my learning process.					
I feel ownership of my e-portfolio.					
I value the e-portfolio as an authentic assessment.					
The e-portfolio helped me to be aware of who I am a teacher.					
I enjoyed the process of developing my electronic portfolio.					
I was proud of my work of e-portfolio.					

Section 2.

Please select according to what you think.

a. The 3 most important purposes for developing my e-portfolio were:

	show my growth and change.
	document/collect my learning experience.
	self-reflect upon my teaching and learning.
	complete the CALL module requirements.
	show my technology competency.
other	

b. The 3 most important things I learned from developing my e-portfolio were:

	acquisition of specific technological skills.
	knowledge of teaching and learning.
	knowledge of technology integration.
	knowledge of e-portfolio.
other	

c. The 3 most important advantages of developing an e-portfolio were:

	learning about technology.
	showing the qualification of teaching and learning.
	presenting my learning through multiple paths.
	sharing my learning with others easily.
	portable and easy to access and update.
	more powerful and convenient than a traditional portfolio (paper-based).
	convenient way to track learning, change, and growth.
	useful tool/assessment approach in my future teaching.

other	
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d. The 3 most important disadvantages of developing an e-portfolio were:

	time demand.
	lack of technology skills.
	inadequate equipment.
	server space limited.
	privacy.
	cyber plagiarism.
other	

e. I shared my e-portfolios with:

	instructor.
	peers.
	friends.
	colleagues.
	family.
other	

Section 3.

In the following questions, please give your comments as detailed as you can.

- a. What did you learn from developing your e-portfolio (in terms of technology skills, multimedia, knowledge of integration, and reflection)?
- b. How will the experience of developing your e-portfolio contribute to your teaching and learning (in terms of technology integration and professional competency)?
- c. How do you plan to apply the knowledge and skills that you learned from developing e-portfolios into your future teaching?