

PEN/PAPER AND ELECTRONIC PORTFOLIOS: AN EFFECTIVE TOOL FOR DEVELOPING REFLECTIVE THINKING OF TURKISH EFL STUDENT TEACHERS?

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Abstract – *This study investigates the role of portfolio development on the improvement of the reflective thinking ability of five Turkish EFL (English as a Foreign Language) student teachers from a University in Turkey. In this case study, participants' reflective papers written for their pen/paper and electronic portfolios and their interviews were analysed. The results showed that the process of preparing a pen/paper portfolio provided a useful approach to enhancing professional development, with a few negative comments regarding the time involved in keeping the portfolio, positive comments regarding the support and collaboration that peers provided, as well as its contribution to their professional development in terms of reflective thinking and self-confidence. The results of the interview analysis also supported the notion that student teachers generally responded favourably to the development of a written portfolio. On the other hand, the process of preparing an electronic portfolio did not enhance reflective thinking since the student teachers were more concerned about the technicalities and the layout of the electronic portfolios rather than the content of the artefacts.*

Introduction

In the last two decades, the ability to engage in reflective practice has been widely addressed in the literature as one of the most important activities associated with teaching and teacher formation (Hatton & Smith, 1995; Zeichner & Liston, 1996; Rodgers, 2002; Griffin, 2003; Lee, 2005). The concept of reflective practice dates back to John Dewey's (1933) notion of reflection as 'an active, persistent, and careful consideration of any belief or supposed form of knowledge in light of the grounds supporting it and future conclusions to which it tends' (p. 6). Donald Schön (1983, 1987) further developed Dewey's concept of reflection, and explained that teachers improve their teaching through continuous reflection on their practice and through their interactions with students; thus, he linked reflection to action. He indicated that through these reflections teachers could begin to develop a level of understanding about what they are as teachers.

The importance of reflective practice in pre-service teachers is a constant theme in teacher education literature (Yost & Sentner, 2000; Brownlee, Purdie & Boulton-Lewis, 2001). Posner (2000) argues that without critical reflective skills, the knowledge and skills gained in a pre-service teacher training programme may be quickly and easily forgotten. Therefore, teacher education programmes have explored various approaches to support student teachers' reflection such as reflective journals (O'Donoghue & Brooker, 1996; Lee & Loughran, 2000), writing activities (Ferguson, 1989; Hatton & Smith, 1995; Richards & Ho, 1998), teacher narratives (Canning, 1991) and portfolios. Among them, portfolios are 'logical vehicles for this type of activity because they provide a systematic, continuous way of planning, supporting and monitoring a teacher's professional advance' (Bird, 1990, p. 244).

Portfolios in teacher education

Although portfolios have been used extensively in arts and architecture, they have been introduced to education in the 1980s (Lyons, 1998). Since then, educational researchers and practitioners cite the increasing use of portfolios as a learning tool in teacher education programmes (Barton & Collins, 1993; Loughran & Corrigan, 1995). A portfolio in teacher education could simply be defined as a collection of information about a student teacher's abilities gained in different contexts over time. Wolf & Dietz (1998) described the essential features of portfolios:

'A portfolio is a structured collection of teacher and learner work created across diverse contexts over time, framed by reflection and enriched through collaboration that has as its ultimate aim the advancement of teacher and learner learning.' (p. 13)

When learners are engaged in portfolio development, a battery of benefits has been proposed in a number of sources (Dutt-Doner & Gilman, 1998; Georgi & Crowe, 1998). These benefits are: (i) receiving support and guidance from those involved in the portfolio process; (ii) being able to share ideas about portfolios with peers; (iii) improving communication with faculty; and (iv) developing organisational skills.

The potential of portfolios to enhance reflective thinking has been of special interest to teacher educators and researchers. Several studies (Winsor & Ellefson, 1995; Wade & Yarbrough, 1996; Tillema & Smith, 2000; Davies & Willis, 2001; Zubizaretta, 2004; Cardona, 2005; Orland-Barak, 2005) have reported that developing portfolios promote reflective thinking because 'with reflection, the

portfolio can become an episode of learning; without reflection, the portfolio may be little more than an exercise in amazing papers' (Wolf & Dietz, 1998, p. 14). Therefore, for educational purposes, it is essential that the written narratives in a portfolio does not become a mere scrapbook of descriptions, but should contain reflections on learning and teaching experiences.

Reflection involves analysing, comparing, synthesising, clarifying and choosing, which manifests itself in reflective writing. Since 'purposeful writing is internalized into one's ongoing thinking' (Roland, 1995, p. 122), by reflective writing, the students can move from the specific to the general as well as develop a habit of reflection (Griffin, 2003). Therefore, the educational literature has focused on the medium of writing (journal writing and portfolio writing) as potentially beneficial to making explicit the implicit or 'tacit' (Schön, 1987).

In sum, with the introduction of the portfolio and guided support throughout the portfolio preparation period, student teachers not only develop their abilities to think reflectively but also raise their enthusiasm for learning about themselves, peers and the process of teaching. However, while the use of portfolios is becoming popular, research on this issue is still in its infancy in the area of second/foreign language (L2) teacher education.

Jadallah (1996) and Antonek, McCormick & Donato (1997) conducted case studies to examine reflective thinking of EFL/ESL (English as a Second Language) student teachers by analysing their portfolios developed during teaching *practicum*. Jadallah (1996) argued that providing students with teaching experiences and subsequent reflective analysis resulted in opportunities 'to construct meaning about teaching and learning on the basis of their own particular experiences within the context of a specific classroom' (p. 74). Similarly, Antonek, McCormick & Donato (1997) emphasised that portfolios allowed student teachers 'to select and document activities and behaviours in their classroom,' which would also develop 'decision-making skills' (p. 16). The researchers concluded that portfolios 'are highly appropriate' tools to 'mediate teacher development that is comprehensive, individualistic and reflective' (p. 24). These studies were conducted on the use of traditional pen/paper portfolios, and they highlighted the potential of portfolio development for developing reflective practice. Consequently, the demand of implementing portfolio writing in teacher education programmes has been seen favourably and thus accepted (Rodgers, 2002). However, several studies (Dutt-Doner & Gilman, 1998; McKinney, 1998; Stone, 1998) have shown some limitations of using portfolios in teacher education. These include: (i) storage; (ii) maintenance; and (iii) accessibility. Student teachers collect a variety of artefacts – such as evaluations from supervisors and co-operating teachers,

reports of observations of teaching, lesson plans, learner work samples, and photographs of teaching experiences – in their portfolios. Most portfolios that are being used in teacher education programmes are printed mainly and compiled in a three-rings binder (i.e., paper portfolios). As Georgi & Crowe (1998) argued, these storage, maintenance and accessibility problems can be solved through the use of technology, that is through developing electronic portfolios.

Electronic portfolios

An electronic portfolio, sometimes referred to as ‘multimedia portfolios, electronic portfolios, e-folios, webfolios’ (Kilbane & Milman, 2003, p. 7) is similar to pen/paper portfolio; however, the medium used to present and organise the portfolio artefacts is different. It is organised by using a combination of media tools such as audio/video recordings, multimedia programmes, database, spreadsheet and word processing software, as well as CD-ROMs and the World Wide Web with hypermedia links connecting that evidence to the objectives of the course and programme. According to Barrett (2000), an electronic portfolio includes the use of electronic technologies that allows the portfolio developer to collect and organise artefacts in many formats. MacDonald et al. (2004) define electronic portfolios as ‘multimedia environments that display artefacts and reflections documenting professional growth and competencies’ (p. 1) with several benefits for teacher education, such as: (i) increase in the technology knowledge and skills; (ii) facility in distribution; (iii) storage of many professional documents; and (iv) increase in accessibility (Heath, 2002; Norton-Meier, 2003; Williams, Wetzel & Wilhelm, 2004; Barrett, 2005; Milman, 2005; Strudler & Wetzel, 2005). With the creation of electronic portfolios, student teachers not only can display the best work as a professional, but also exhibit the knowledge and skills in using technology.

On the other hand, Wetzel & Strudler (2006) also discussed the following disadvantages of electronic portfolios: (i) issues of programme implementation; (ii) access and reliability of the technology; and (iii) the amount of time and effort needed to develop portfolios. However, despite such disadvantages, teacher education programmes have begun to explore the use of technology as a tool in the development of portfolios because of following reasons: (i) electronic portfolios enable them to distribute their work relatively easily and the multimedia possibilities make the work seem more sophisticated; (ii) electronic portfolios are more portable and accessible than pen/paper portfolios and require less or no physical storage space; and (iii) writing in the electronic portfolios can be viewed not only as computer-

mediated textual literacy, but also as a new form of art with its own written discourse and way of thinking.

In sum, teacher educators have reported that the process of developing portfolios can help student teachers better understand the complexities of teaching, make connections between classroom learning and teaching experiences, and become reflective practitioners. With this understanding in mind, it is then necessary that a teacher education programme need to put portfolios into practice in order to meet the challenges and needs of current educational practices, to keep with the technological innovations and to investigate the quality of reflection in the portfolio development. In doing so, as Orland-Barak (2005) suggests, it is essential to ‘examine further the “taken-for-granted” assumption that the portfolio constitutes an effective tool for enhancing the type of reflective practice as espoused by educational theorists’ (p. 28). Therefore, the purpose of this study was to explore the following research question: ‘In what ways does preparing pen/paper and electronic portfolios influence EFL student teachers’ reflective thinking?’

The Turkish context

Major change in the Turkish teacher education system took place in 1981 with the Higher Education Reform, through which all teacher training institutions of the Ministry of Education were transferred to the university system (Simsek & Yildirim, 2001; Saban, 2003). Before 1981, the responsibility for training high school level teachers lay mainly with the Faculties of Arts and Sciences in universities, and with four-year Higher Teacher Schools governed by the Ministry of Education. Today, out of 98 universities, 65 (60 state and 5 private) have Faculties of Education, which follow an obligatory curriculum (Tercanlioglu, 2004). For English language teacher education programmes, all Faculties of Education follow a standardised curriculum prescribed by the Higher Education Council (YÖK) with a knowledge base drawn from linguistics and learning theory (YÖK, 1997; cited in Cakiroglu & Cakiroglu, 2003). YÖK requires a three-semester field experience as part of the teaching *practicum* during the four-year teacher education programme: one during the second semester of the first year and the other two in the first and second semesters of the fourth year. Students are required to do actual teaching only in the last session. The aims of teaching *practicum* are: (i) to develop student-teacher confidence in the teaching endeavour; (ii) to enable them to develop some practical skills needed in their future role as teacher; and (ii) to enable them to be active and familiar with forthcoming professional responsibilities.

The research method

This study was carried out in a large public university in Turkey, which had an enrolment of around 11,241 students for the 2006-2007 academic year. Its Faculty of Education was first established in 1982. During the 2006-2007 academic year this faculty had over 1500 student enrolments in both undergraduate and graduate level programmes related to preschool, elementary and secondary education.

The present study was conducted in the Department of Foreign Language Education, which offers a four-year undergraduate programme in English Language Teacher Education. The basic components of this programme consist of English language development, linguistics and field-specific courses such as foreign language teaching methodology. The *practicum* courses consist of observation and practice teaching. During the first semester of their fourth year, student teachers are given opportunities to observe EFL classes in primary and secondary schools. During the second semester of their senior year, student teachers get engaged in teaching. Even though YÖK does not require the development of portfolios as part of assessment in teacher education programmes, this department asks student teachers to develop teaching portfolios as one of the requirements of the teaching *practicum* component of the programme.

The participants

Five senior EFL student teachers (one male and four females) participated voluntarily in the present study while they were carrying out their teaching practice. All these student teachers were graduates of State Teaching Schools for teacher candidates. The age range of the group was between 20 and 22. They had been learning English for approximately 12 years, mostly in the classroom setting in Turkey.

In the study, the researchers were simply the facilitators who trained the participants on how to prepare their pen/paper and electronic portfolios, solved their technical problems and provided comments on their artefacts.

Data collection procedures

The portfolio project acted as a supplementary learning tool to *practicum* course assignments. It added an extra 20% to the participants' final grade. The data collection procedures continued for approximately 27 weeks. The data collection instruments were ten (five pen/paper and ten electronic) portfolios (with around 80 entries) and semi-structured interviews.

Portfolios

All portfolios were written in English since the participants were future English language teachers, and their proficiency level was sufficiently high for them to express themselves in English. The portfolio tasks aimed to develop student teachers' reflective skills, not language skills.

The student teachers developed pen/paper portfolios during the first semester, and electronic portfolios during the second semester of their senior year. In the first two weeks of the first semester, the researchers explained to the class the purpose of the study and selected volunteer student teachers to participate in the present study. Afterward, they trained the whole class, including the participants, on how to develop pen/paper portfolios. It was explained to them why it is important to reflect on experiences and they were trained on how to write reflections. Moreover, they were shown Hatton & Smith's (1995) reflective criteria. Developing pen/paper portfolios was the *practicum* requirement in which they were required to carry out some tasks that encouraged them to reflect on their teaching. These tasks included writing journals, making lesson plans and presentations, writing self- and peer-evaluations, and engaging in written dialogues with co-operating teachers and university supervisors. The participants created their pen/paper portfolio artefacts from the third week onward of the first semester.

Electronic portfolio development was not a *practicum* requirement. Student teachers developed an electronic portfolio on a voluntary basis, and with the purpose of examining whether it enhances reflective thinking. While the participants started to develop their electronic portfolios in the second semester, the rest of the class continued to develop artefacts for their pen/paper portfolios. In the first two weeks of the second semester, the participants were trained on how to create portfolios by using the Hyperstudio authoring tool, and on how to upload their artefacts to their portfolios. From the third week of the second semester, the participants started to do assignments similar to the ones they were required to do in the first semester, and uploading them onto their electronic portfolios.

For both pen/paper and electronic portfolios, the participating student teachers were required to do the same three tasks, namely: (i) written class reflections on classroom observation tasks, expressing how they reacted to a particular class activity; (ii) evaluation papers; and (iii) written narratives of everyday events. Thus, these two types of portfolios were different versions of the same material, written at different times. They were also allowed to add self-chosen artefacts to their portfolios. The organisation of the portfolios was left in the hands of the participants. At the end of the year, after the portfolio project, they presented their portfolios to the rest of the class.

Content of the portfolios

(a) ***Classroom observation tasks.*** The student teachers were required to attend the co-operating schools to which they were assigned during their senior year. While observing the lessons, they were required to perform certain tasks from a list of a variety of tasks included in Wajnryb (1992). These focused observation tasks required the student teachers to analyse a specific aspect of a lesson. Therefore, the participants wrote about the learning environment (task 1), managing error (task 2) and giving instructions (task 3).

(b) ***Evaluation papers.*** The student teachers were also required to carry out self- and peer-evaluations after each microteaching session. They were asked to reflect on the most and least effective aspects of their own and peer's teaching to gain a deeper understanding of their experiences.

(c) ***Student teacher narratives.*** This activity gave the student teachers a chance to express some of their thoughts and feelings about the teaching profession to develop a deeper understanding of themselves (such as why and how they see themselves as future teachers) and gain insights into the complexities of a teacher's day.

Semi-structured interviews

Merriam (1988) indicated that it is important to collect data through interviews when the researchers are interested in past events and experiences that are impossible to replicate. Since the purpose of the study was to investigate the participants' experiences and perceptions of the portfolio development process, the study employed semi-structured face-to-face interviews conducted before (pre-interview) and after (post-interview) the portfolio project. These interviews were conducted and recorded by one of the researchers. All the interviews were conducted in either Turkish or English, depending on the participants' preferences. Some of the interview questions were:

- (i) What role do you see the portfolio playing in your life as a student teacher?
- (ii) Do you think you will develop any new skills as a result of preparing a portfolio?
- (iii) Do you think preparing a portfolio will make you more reflective than before? How?
- (iv) What would be the advantages/disadvantages of preparing an electronic portfolio over a pen/paper portfolio?
- (v) Will you use your pen/paper portfolio and electronic portfolio in the future?

Data analysis procedures

The portfolios were examined to identify the levels of reflective thinking. For this purpose, Hatton & Smith's (1995) framework (see Appendix A) was used. This framework views reflection as a hierarchical developmental sequence, 'starting the beginner with the relatively simplistic or partial technical type, then working through different forms of reflection-on-action to the desired end point of a professional able to undertake reflection-in-action' (p. 45). Within this framework, Hatton & Smith (1995) developed an instrument to measure different stages of reflectivity: (i) descriptive writing (mainly descriptive reports of events or literature – not reflective); (ii) descriptive reflection (providing reasons based on personal judgments); (iii) dialogic reflection (a type of discourse with oneself and exploration of possible reasons); and (iv) critical reflection (involving reasons given for decisions or events which take account of the social, cultural or political contexts). Their four levels of reflective writing was an appropriate tool to analyse the various levels of reflection because, as suggested by Orland-Barak (2005), they are 'practical, ethical, critical and transformational' (p. 33).

After the data were organised, the researchers began coding the data into categories by using a reflection-coding scheme, again based on Hatton & Smith's (1995) framework. Depending on the type of reflection found in the portfolio artefacts, each idea unit was coded according to the following scheme: dw – descriptive writing; dr – descriptive reflection; dre – dialogic reflection; and cr – critical reflection. The frequencies of these codes were counted; then, in order to check for statistical difference between pen/paper portfolios and electronic portfolios in terms of reflective thinking, the Friedman 2-related samples test was conducted. Thus, the analysis of single reflective units provided the answer to how the participants' levels of reflection differ in their pen/paper and electronic portfolio writing. In addition to quantitative data, descriptive data was also presented by giving quotations from the written artefacts. The researchers analysed each portfolio separately and then conducted a cross-case analysis.

In addition to that, the researchers were also interested in the perspectives of the student teachers regarding the impact of portfolio preparation on their reflective thinking. Therefore, the interviews were transcribed to identify and analyse emerging recurrent patterns and themes. After the interview data were divided into thematic categories, the researchers counted, coded and classified each category and made a list of themes and patterns for each participant. This was followed by analysis across cases.

Findings and discussion

The levels of reflective writing

The reflective papers (e.g., student teacher narratives, reflection papers on the classroom observation tasks, and the evaluation papers) in the student teachers' pen/paper portfolios, as expected, showed evidence of their development in reflective thinking (see Table 1).

TABLE 1: Mean ranks between the portfolios

Stages of Reflectivity	Pen/Paper Portfolio		Electronic Portfolio	
	Mean rank	<i>p</i>	Mean rank	<i>p</i>
Descriptive writing	1.60		4.00	.05*
Descriptive reflection	1.90		2.80	
Dialogic reflection	2.70		2.00	
Critical reflection	3.80	.031*	1.20	

* $p < .05$

Their pen/paper portfolios exhibited descriptive reflection at the beginning, then dialogic reflection, and at the end of the first semester these became more critical in nature. For instance, while examining the language teaching approach of the co-operating teacher, one of the student teachers mainly used descriptive writing in her first task because it provided her with a way to illustrate the classroom actions. She did not use any comments of her own, but just descriptions:

'She opens class every day with having a short discussion section. She asked whether they did their homework. Then she checked their homework and continued with the lesson.'

When writing the reflective essay on one of the classroom observation tasks (i.e., 'the learning environment'), another student teacher engaged in descriptive writing only in the context of the high school classroom, since it was the first time she observed an actual classroom. As she examined the nature of the language learning environment, she mainly used descriptive writing because it provided her with a way to illustrate the interaction among the various social components of the school (i.e., the teachers, the students, the parents, and the school administration):

'My co-operating teacher was talking to me the other day about her experiences when they give bad grades to students. She was concerned. She said she may receive a lot of pressure from both the administration as well as the students' parents to give the student a more acceptable grade.'

This student teacher used descriptive writing to relate her co-operating teacher's dealings with the administration and parents over the issue of student grades.

The second category of reflection used was 'dialogic reflection' which is a form of discourse with oneself where the student teacher seeks possible reasons for his/her actions (Hatton & Smith, 1995). For instance, in one student teacher's written narrative in her pen/paper portfolio, she exhibited dialogic reflection as she examined her beliefs on language learning and teaching based on both her experiences as a language learner and as a language teacher. Her reflection on her beliefs was characterised by the use of dialogic reflection:

'I believe that language means communication and therefore language should be taught communicatively. I feel that students learn best when they learn by doing.'

Dialogic reflection enabled another student to learn from her teaching experiences by rethinking her teaching methods and choice of materials and activities. Her writing revealed a stepping back from the experience of planning and presenting the lesson, as she evaluated the lesson and suggested possible changes:

'In general, I think I achieved what I wanted. The only thing that I would have changed was making the format for the adjective exercise more open-ended.'

In the portfolio entries written at the end of the first semester, there was evidence of 'stepping back' from the events to examine their actions by taking into consideration the social, historical and political contexts (Hatton & Smith, 1995) that influence the actions and events. The entries thus exhibited 'critical reflection'. A case in point of more critical thinking is the following quotation, in which one student teacher moved from describing a teaching approach used by the co-operating teacher, to linking this approach to its social consequences in her future classroom:

'It's personalised. I think that one of my goals in my future class would be to create a small community where students participate to the classroom discussion. You need to consider your students' interest and learning styles while making them participate in the class activities.'

By sharing personal information, she not only captured students' attention and participation, but also created a social environment or 'small community' in her classroom. For example, in his reflective paper on 'managing errors' another student teacher used critical reflection. While addressing the social nature of the classroom, he commented on the effects of teachers' approaches to error correction:

'In order to be effective, teachers should be careful while they correct the students. Students will be discouraged if they are corrected for every mistake.'

His critical reflection enabled him to examine error correction from the perspective of a teacher's relationship with her or his students.

Overall, in their pen/paper portfolios, student teachers were more aware of reflexivity and how the process of reflective thinking worked. In other words, the student teachers were well aware of what they were expected to do in their portfolios in which they managed to step back from the events and to reflect on their experiences, giving personal judgments and alternatives for the events.

On the other hand, the language and the level of reflective thinking in the electronic portfolios were descriptive in nature, indicating that they were operating at the lowest stage of reflection according to Hatton & Smith's (1995) framework. The predominant category of reflective writing was the category of 'descriptive reflection'. Even though they developed the same materials in the second semester, the entries in their electronic portfolios were not as critical as expected. The example below illustrated one of the descriptive entries a student teacher wrote in his electronic portfolio:

'The teacher explained the vocabulary about theatre. She gave the class a list of 10 words, through which she tried to make it fun by having the students' role play the meanings. They seemed very interested in this activity.'

The reason for this outcome might be that student teachers were very much concerned with the technicality of completing the electronic portfolios so that they might have given importance to the surface elements of their electronic portfolios rather than to the content. The multimedia possibilities of electronic portfolios (e.g., text, audio, graphics, animation and video) allow student teachers to present information from their coursework and their field experiences in various formats. In this case, student teachers added different artefacts which they themselves selected, such as digitised pictures of themselves and their peers, PowerPoint presentations from other courses, videotaped interactions with students, scanned

samples of their work, short animated graphics, and so on. They opted to add these artefacts to display their learning and to demonstrate their ability to use integrated technology. They did the same tasks as in their pen/paper portfolios, but they were more concerned with what other documents they might add to make their electronic portfolios more colourful and interesting rather than what they would write:

‘For my electronic portfolio, I decided to videotape the lessons I taught in practice teaching. So I learned how to set up the video cameras. Learning how to do these things helped me to understand more about how technology can be integrated into language teaching. Having video segments in my electronic portfolio was very exciting.’

Like the teachers in Orland-Barak’s study (2005), the student teachers in the present study depicted the experience of having an electronic portfolio as a ‘favourable image’ (p. 36) of their teaching that exhibits their achievements professionally; therefore they focused on presenting a favourable image through their portfolios as a neat and professional collection of their teaching practice.

Even though electronic portfolio preparation did not enhance reflective thinking, the process of creating electronic portfolios supported student teachers’ ongoing professional development because the possibility of using different technological applications aroused teachers’ interest in technology and their motivation to use it. One student teacher stated that:

‘The skills that I learned from developing electronic portfolios have definitely inspired me to learn more new things in using technology, and I will definitely update and improving my portfolio in the future.’

Through the creation of electronic portfolios, therefore, teachers explored and increased their knowledge about the application of technology.

The thematic units in interviews

The results of the interview analysis in terms of the participants’ opinions on portfolio preparation and its impact on the development of their reflective thinking supported the findings discussed above.

In the content analysis of pre-interviews, two themes on early beliefs about portfolio preparation emerged: (i) portfolios are tools that facilitate finding employment; and (ii) portfolio preparation is an overwhelming and time-consuming process.

During the pre-interviews, the student teachers termed portfolios as a ‘tool for job search’. In other words, at the beginning of the project, they saw the portfolio as a tool that served them to search for a job. They felt that it gave them a big advantage over other applicants, since portfolios helped them to showcase to future employers the knowledge and skills learnt during their teacher training. For instance, one student teacher believed that preparing a portfolio *‘is a good idea, but I am sure it would be very useful in finding a job, because at the end, you have a chance to show what you did in your teacher education to prospective employers.’* This finding is consistent with the point made by Hurst, Wilson & Cramer (1998) and Anderson & DeMeulle (1998) who suggested that portfolios would help student teachers obtain a teaching position when they applied for a job.

Student teachers knew that the portfolio preparation process would not be an easy one: they saw it as an ‘overwhelming’ and ‘time-consuming’ process. One of the student teachers expressed her frustration with the time her portfolio would take, especially in writing the student teacher narratives. She stated, *‘writing teacher narrative and journals will be a little bit time-consuming. You need to go in depth, be clear, just writing these reflections will take a lot of time.’* In addition, they also reported that the amount of time they would spend preparing the electronic portfolio would be even more time-consuming, particularly with all the different technologies used. They believed learning the skills needed to develop the electronic portfolio would take extra time away from the academic content. One student teacher indicated that the electronic portfolio should be a part of all classes within the programme so that they could prepare it for the whole year. She said, *‘I think it is really necessary because then we can use different technology in different classes, and also we can prepare the portfolio not only for one course but for the other courses. I think each class should have time to do it.’* This finding is consistent with that reported in the literature (Zidon, 1996; Dutt-Doner & Gilman, 1998; Harris & Curran, 1998; McKinney, 1998; Stone, 1998), namely that time is a limiting factor when preparing portfolios.

In post-interviews, however, student teachers actually expressed pride in their portfolios, especially so with their electronic portfolios. Each student teacher engaged in the portfolio preparation seemed to experience a sense of professionalism as the semester progressed. For these student teachers, the portfolio preparation process provided them with the opportunity to monitor their professional growth:

I prepared items for the course first and put them in the portfolio. But then I realised what I have done is something valuable, I learned from it [portfolio] and it will affect my teaching in the future because I see my growth in it.

In addition, they also mentioned that their portfolio preparation process was a collaborative act with support from each other as well as from faculty members and the researchers. This echoes what Burke, Fogarty & Belgrad (1994) have said about collaboration. These authors argue that ‘though schools usually focus on students working alone, the real world allows and encourages people to talk, ask questions, get help and receive feedback’ (p. xvi). The student teachers in the present study talked to each other, with their co-operating teachers and with the researchers. For instance, one of them explained that the help and support she received from her classmate made an important contribution to her success:

She helped me because I was having problems with the portfolio, especially with the electronic journal. I talked with her, asked her what she wrote. She described what she did and it helped me in writing my reflective statements.

According to the student teachers, collaboration was an important aspect of the portfolio preparation process. This finding reinforces other studies that view collaboration as a productive practice (Routman, 1994; Kieffer et al., 1996).

Even though at the beginning of the project student teachers seemed to be overwhelmed by the idea of preparing an electronic portfolio, at the end they mentioned that preparing it helped them develop their technical skills because they used a variety of multimedia artefacts to present information from their coursework and their field experiences. For instance, as one of them said, ‘*It was just the fear that was holding me back. But now, in terms of benefits from technology, I feel more confident, and I can now say that I can use a computer.*’ All student teachers in this study agreed that they had learned new computer skills in the process of preparing their electronic portfolio. This finding is consistent with the findings of McKinney (1998), Richards (1998), Piper (1999) and Wright, Stallworth & Ray (2002) who also report that student teachers developed a positive attitude toward the use of electronic portfolios in their teaching.

The results of data analysis indicated that student teachers generally responded favourably to portfolio preparation. They looked closely at their strengths and weaknesses. They were actually proud of their portfolios and what they had achieved, especially when they finished their electronic portfolios. In addition, data from the interviews revealed that reflecting on portfolios enabled the student teachers to: (i) examine themselves and their teaching practice; (ii) organise their beliefs and thoughts in theories and practice; and (iii) initiate, reflect and improve their teaching and themselves. For instance, one of them

said that *‘to reflect on yourself as a teacher, you need to think about your beliefs, and on what you were taught during your teacher training.’* He said that his reflections in the portfolio helped him to ‘structure’ his thoughts. He said, *‘it [the reflection] did help me because I learned many things about teaching during my teaching practice period, so it helped me to structure my thoughts about foreign language methodologies.’*

Reflective thinking enabled the student teachers an opportunity to look at themselves as teachers, to articulate the strengths and weaknesses of their performances as teachers as evidenced in their pen/paper portfolios. However, when they talked about reflection in their electronic portfolio artefacts, they were more concerned about the layout of the portfolio. One of them said, *‘I believe it should seem professional and creative; so I gave importance and time to the design of the artefacts, not the content of the narratives.’* They saw their portfolios as a physical product of their own that showed their professional development. They wanted to document their teaching practice in an organised way, and the electronic portfolio provided them with an opportunity to create a professional collection of materials that represented an important period of their training and development as a foreign language teacher. The student teachers stated that the pen/paper portfolio allowed them to be reflective and to make connections between theory and practice. They also stated that they developed their technology skills, not their reflective skills, as a result of participating in the electronic portfolio project.

Conclusion

The findings of the present study indicated that the pen/paper portfolio development process helped student teachers to be reflective and make connections between theory and practice. It also helped them think about their strengths and weaknesses as future teachers. It is clear, therefore, that portfolio development encourage teachers to become more reflective about their teaching practices – an insight that has already been reported by several researchers in diverse national contexts (Vavrus & Collins, 1991). The present findings within a Turkish context also reinforce Hatton & Smith’s (1995) research that presents reflection as a hierarchical developmental process by which the student teachers start with a ‘relatively simplistic or technical type’ of reflection, move through forms of reflection-in-action (descriptive reflection to dialogic reflection to critical reflection) and ultimately reach the stage of reflection-on-action.

On the other hand, the findings of the present study indicated that, contrary to what was expected, although electronic portfolio development enhanced student

teachers' professional development in terms of increased technology knowledge and use, it was not as effective in terms of enhancing reflective thinking. By compiling the portfolios in an electronic environment, student teachers appeared to be more concerned with the technical aspects and the layout of their portfolios, rather than the content of the artefacts. Consequently, critical reflection in the electronic portfolios was mostly absent.

The findings of the present study also support the views expressed by Shulman (1992), namely that portfolios can document the unfolding of teaching and learning over time as well as provide teacher candidates the opportunity to engage in analysing their actions. Nowadays, technology use is widespread in teacher education. However, this study also showed that there is a lack of reflective thinking in developing electronic portfolios. Therefore, it is essential to explore effective ways through which student teachers can practise and develop their reflexivity while writing in an electronic environment.

There are several implications of this study for teacher education. First, as discussed in the literature review, portfolios – whether paper-based or electronic – can be considered to be an effective tool for critical examination of practice. The limited success of electronic portfolios in promoting critical reflection can be overcome, particularly if portfolios are part and parcel of continuing professional development, not just a one-off project in teacher training. Student teachers need to develop and use their portfolios throughout their teaching career. They also need to get support from faculty and their peers, as well as be supportive to others throughout the process.

Second, the findings of this study suggest that for electronic portfolios to be successful, adequate training in technology should be provided to student teachers so that their focus remains on reflection, not on the use of the technology itself. Teacher training programmes that ask their students to use electronic portfolios would therefore do well to provide adequate facilities, equipped with the required hardware and software, so that student teachers develop the proficiency required by electronic portfolios, and become so adept at using it that their attention can focus more effectively on critical reflection and analysis.

Limitations and suggestions for future research

The present study has a number of limitations. Some of these arise from the use of case study methodology: the research outcomes reported here are grounded in information about a specific population, and generate insights about how a particular group of student teachers performed in a specific context. The research did not attempt to generalise the findings and to make claims relevant to all EFL

student teachers, or to predict future behaviour. Therefore, this study is limited to portfolio preparation by five senior student teachers. Additionally, this study was not intended to thoroughly examine all areas of teacher knowledge, but rather focused exclusively on reflective thinking.

Future research needs to be conducted to examine the possible effects of portfolio development on the professional growth of student teachers after the teacher candidates start to teach in regular classrooms. In addition, it is recommended that future research continue to be conducted regarding the use of both paper and electronic portfolios in foreign language teacher education programmes, particularly research with a longitudinal focus. For instance, the researchers suggest conducting this same study in a foreign language teacher education programme over four years, following the teacher candidates from their first semester through their graduation in order to document student growth. A content analysis of each year's portfolio would provide much valuable information.

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APPENDIX A

Hatton & Smith's (1995) Criteria for the Recognition of Evidence for Different Types of Reflective Writing

Descriptive writing (not reflective):

- (i) Description of events that occurred/report of literature.
- (ii) No attempt to provide reasons/justification for events.

Descriptive reflection:

- (i) Reflective – not only a description of events but some attempt to provide reason/justification for events or actions but in a reportive or descriptive way (e.g., 'I chose this problem solving activity because I believe that students should be active rather than passive learners').
- (ii) Recognition of *alternate* viewpoints in the research and literature which are reported (e.g., '... Tyler (1949), because of the assumptions on which his approach rests suggests that the curriculum process should begin with objectives. Yinger (1979), on the other hand argues that the "task" is the starting point').

Two forms:

- (a) Reflection based generally on one perspective/factor as rationale.
- (b) Reflection is based on the recognition of multiple factors and perspectives.

Dialogic reflection:

- (i) Demonstrates a 'stepping back' from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events and actions using qualities of judgment and possible alternatives for explaining and hypothesising.
- (ii) Such reflection is analytical or/and integrative of factors and perspectives and may recognise inconsistencies in attempting to provide rationales and critique (e.g., 'While I had planned to use mainly written text materials I became aware very quickly that a number of students did not respond to these. Thinking about this now there may have been several reasons for this. A number of the students, while reasonably proficient in English, even though they had been NESB learners, may still have lacked some confidence in handling the level of language in the text. Alternatively a number of students may have been visual and tactile learners. In any case I found that I had to employ more concrete activities in my teaching').

Two forms, as in (a) and (b) above.

Critical reflection:

- (i) Demonstrates awareness that actions and events are not only located in, and explicable by, reference to multiple perspectives but are located in, and influenced by, multiple historical and socio-political contexts (e.g., 'What must be recognized, however, is that the issues of student management experienced with this class can only be understood within the wider structural locations of power relationships established between teachers and students in schools as social institutions based upon the principle of control' [Smith, 1992]).