



THE IMPACT OF A CURRICULAR INNOVATION ON PROSPECTIVE EFL TEACHERS' ATTITUDES TOWARDS ICT INTEGRATION INTO LANGUAGE INSTRUCTION

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This paper investigates whether the new EFL teacher training curriculum provides an efficient ICT training or not through both a quantitative and a partially qualitative research methodology. One hundred twenty- four prospective EFL teachers participated in this study and the results of a series of Independent Samples T-tests highlight that the prospective teachers having five ICT-related courses displayed better attitudes in comparison to those not completing this training period by reflecting that the success of technology integration into education varies from curriculum to curriculum, depending on the ways in which it is applied. In this study, parametric analysis such as Independent samples t-Test was utilized to explore any statistically significant differences between prospective EFL teachers' ICT attitudes before and after ICT-interwoven training. Moreover, the qualitative information was analyzed from the transcriptions of the interviews, and synthesized with the results from the quantitative study. A questionnaire made up of nine items and an interview consisting of nine questions were employed as data collection tools.

Key Words: ICT, curriculum, English language teaching, attitudes, curricular innovation, integration, language instruction

INTRODUCTION

In recent decades, technological change has brought inner-connectivity to all aspects of life and everyday living, and accordingly, ICT has constituted an integral part of the learning and teaching process and has had a considerable impact on the characteristics and functioning of education in most countries as the use of technology promotes thinking skills and strategies, from basic recall to higher level skills such as classification and inference (Henderson, Klemes, & Eshet, 2000). In addition, technology is a significant factor in enhancing the quality of education and learning, by making it more accessible to people (Scott & Robinson, 1996).

In our times, raising teacher candidates' ICT awareness is prominent since ICT is transforming how teachers teach and how students learn. Thus, it enables them to meet the demands of schooling today. However, as Jurema, Lima, Dalmau, & Filho (1997) assert, little or no importance has been attributed to the pedagogy of ICT which requires considering the learning and teaching processes, the organisation of the curriculum and reflection on people, machine relationships in the learning community as well as developing students' ability to employ computers competently. Initial teacher training institutions at this point have a key role in equipping and preparing teachers for the classrooms of this digital era. The teachers need opportunities to develop suitable instructional strategies and encounter circumstances where they can practise and reflect on the pedagogy of using ICT in the classroom (Romeo, 1998).

In this respect, no curriculum model is flawless and no curriculum theory is sufficient for all users. Hence, researchers continue to investigate a myriad of curriculum models and benefit from them. However, most of them only describe their positive and negative aspects instead of their impact on student learning and teacher teaching (Heinich, Molenda, Russell, & Smaldino, 2001; Hoffman & Ritchie, 1998). Thus, this study does not propose a new curriculum model. Instead, it investigates the effect of a curricular innovation involving more ICT-related courses on prospective EFL teachers' attitudes toward ICT integration into language instruction and explores how they view the ICT-interwoven training they have received during a four-year teacher training program.

Literature Review

Teachers' Attitudes toward ICT Integration

Research studies have demonstrated that the effective utilization of ICT depends largely on the attitudes of teachers who ultimately decide the way in which it is implemented in the classroom (Beggs, 2000; Mumtaz, 2000). Kersaint, Hornton, Stohl, & Garofalo (2003) succinctly state that teachers who have positive attitudes toward technology feel more comfortable with employing it and usually infuse it into their teaching. Bullock (2004) discovered that teachers' attitudes were a crucial enabling/disabling factor in the amalgamation of technology into teaching. Other related studies on EFL teachers' attitudes towards ICT found significant positive correlations between teachers' levels of ICT use and their attitudes towards ICT (Al-Zaidieyeen, Mei, Fook, 2010; Albirini, 2006).

According to Myers and Halpin (2002), a fundamental reason for studying teachers' attitudes is that it is a significant predictor of prospective ICT

deployment in the educational context. In this respect, much recent research has supported the viewpoint that acceptance and implementation of computer technologies have been strongly affected by the teachers' attitudes (Huang & Liaw, 2005; Van Braak, Tondeur, & Valcke, 2004).

As Baylor and Ritchie (2002) state, "regardless of the amount of technology and its sophistication, technology will not be used unless faculty members have the skills, knowledge and attitudes necessary to infuse it into the curriculum" (p.398). That is, teachers should become effective agents for using ICT tools in the classroom, which is only possible via a positive teacher attitude; thereby adopters feel more comfortable with using them and usually integrate them into their teaching (Bullock, 2004; Kersaint, Hornton, Stohl, & Garofalo, 2003).

Positive attitudes often stimulate teachers with less technology knowledge to learn the required skills for employing ICT-based tasks in the classroom setting. Otherwise, a lack of technology knowledge and skills may give rise to anxiety and lack of confidence; consequently, teachers may feel uncomfortable with technology (Finley & Hartman, 2004; Groves & Zemel, 2000). In brief, for teachers to take the initiative in curricular change and to effectively apply technology for meaningful instruction, teachers' attitudes are one of the most significant internal factors described by researchers (Ertmer, 1999; Fabry & Higgs, 1997).

Curriculum Innovation and ICT Integration

Ever since the invention of information and communication technologies (ICT), teacher education programs have dealt with the question of "how to teach" so as to advance human potential and boost teaching with available technologies. Similarly, teacher education programs have also been involved in the question of "how to prepare prospective teachers" since it is fundamental for teachers to have appropriate ICT training during their pre-service education to address their students' needs and expectations in an information society (Yildirim, 2000).

Adelsberger, Collis, & Pawlowski (2002) and Yildirim (2000) stress that the best way to stimulate teachers to deploy ICT in the classroom is to maximise their level of competency. This can be realized via appropriate training and by the provision of ICT related courses designed according to the individual's competency level. By training prospective teachers to employ ICT, it is assumed that they will transfer the knowledge and the skills to their future classrooms (Brush, Igoe, Brinkerhoff, Glazewski, Ku, & Smith, 2001).

Most teacher education programs have been restructuring their curricula so as to make prospective teachers proficient users of new technologies when they

become teachers. In most countries, ICT specific courses (e.g., computer literacy, fundamentals of ICT, and educational technology) are becoming compulsory courses within the curricula of teacher education programs (Yildirim, Kynigos, Potolea, Dumont, & Aufenanger, 2003). As a common strategy, all countries attempt to develop compulsory courses for teachers and to move to a standardized curriculum, which specifies required skills and competences in ICT training in teacher education courses. Although integration strategies in different countries vary depending on the level of development, the main idea underneath these strategies is to keep educational systems up with the technological and global improvements for the future information society.

In Turkey, the Council of Higher Education (CHE), which is responsible for the planning, coordination, and supervision of higher education, restructured the curricula of teacher education programs to develop the quality of education and to infuse ICT into these programs in 1998. ICT was embedded into the new curricula and 'Computer' and 'Instructional Technologies and Materials Development (ITMD)' courses became compulsory in both primary and secondary teacher education programs to meet the requirements for teaching credentials. The contents of these courses were as follows:

1. *Computer I and II*: The emphasis of these courses is on the application of computers. Topics to be covered include decision support systems, data management, desktop publishing electronic data interchange, artificial intelligence and expert systems, communications and negative effects, prevention of the negative effects of the computer and internet on the children/teenagers.

2. *Instructional Technologies and Material Development (ITMD)*: Special technical features of various education, teaching technology by means of using and developing assorted quality material (eg. work/study plates, transparent slides, video, computer-based materials) with constructions and evaluation methods (CHE, 1998).

These courses would be a national guide for education faculties in terms of integrating ICT into teacher education programmes. Although these courses provided a framework to teacher educators concerning what should be taught regarding ICT, they did not specify how it should be taught to prospective teachers to make them deploy ICT for pedagogical purposes in the classrooms.

The curriculum of English teacher education departments was further reshaped to be in line with the altering social necessities and educational improvement in Turkey (Grossman, Onkol, & Sands, 2007). This recent English teacher education program was put into practice by CHE in the 2006-2007 Academic

Year. Despite all these changes, Turkish Teacher Education Institutions still suffer from lack of appropriate integration of ICT into their programmes. Although courses related to computers were included in ITE programs by CHE, teachers' lack of experience and competence in the pedagogical use of ICT is the main constraint at the moment. Altun (1996, 2002) states that computers are often locked in rooms and waiting for professional users and trainees.

The Research Context

Cyprus had been a British Colony until a bi-communal Cyprus Republic, made up of Turkish and Greek Cypriots, was founded in 1960. English had remained as one of the three official languages of the new republic together with Turkish and Greek. Today, the two communities are separated each having administrations and foundations of their own both in the Northern and Southern parts of the Island. Since there has been no interaction between the two communities for more than thirty years, young generations of the two communities are not familiar with each other's mother languages at all. Hence, it is the English Language which remains the only shared tool for communication and cooperation between the Turkish Cypriots and Greek Cypriots. In our times, English is accepted to be a lingua franca, however, both the history and the present situation in Cyprus specially maximize its prominence for those residing on the island (Yaratan, & Kural, 2010).

In recent years, the education system in North Cyprus has been reshaped and has obtained a new perspective. Broadly speaking, the traditional teacher-centered education system has been replaced by a learner-centered education system with the major aim of presenting suitable contexts for individuals, educating generations who are open to new ideas and obtaining self-confident individuals who can express their views independently. (Department of Educational Planning and Program Development, 2005). Moreover, it has been emphasized that students should be able to deploy the information technology effectively (Yaratan, & Kural, 2010).

At this point, technologically-furnished rooms to be deployed for language teaching and for other subject areas are planned to be established to meet the requirements of the contemporary education system. This type of techno-classrooms have already been structured in a few schools in North Cyprus and are being built in some other schools on the island (Yaratan, & Kural, 2010).

This study was conducted in a higher education context in North Cyprus which is coordinated with both the Council of Higher Education (CHE) and the Council of Higher Education Planning, Evaluation, Accreditation, and Coordination (CHEPEAC) in a centralised structure. Six universities offer

higher education opportunities for the students who are, in the main, from Turkey. Thus, the aforementioned councils operate collaboratively to meet the needs and expectations of the students. As one of the six universities in North Cyprus, the European University of Lefke (EUL) was founded in 1990 by the Cyprus Science Foundation and the university today offers 6 Associate, 28 Undergraduate and 10 Postgraduate programs.

The Department of English Language Teaching (ELT) was the context in which the research was conducted. In the department, all courses are instructed in English in technologically-furnished classrooms. Upon investigating the curriculum of the ELT department developed by the Council of Higher Education and adopted with additional changes, one can view that three courses are relevant to ICT, namely Computer I, Computer II, and Instructional Technology and Materials Design. In addition to these three compulsory courses, the department offered elective ICT courses such as Video Technologies in Language Teaching and Learning, Computer Assisted Language Learning, and Internet Skills in Language Teaching.

To put it differently, we conducted an ICT-interwoven training to prepare prospective EFL teachers to be competent in designing and conducting classroom lessons (guided by CHE content and technology standards) that effectively amalgamate technology in the teaching process so that all teachers could use technology in reaching their course objectives. The goals of ICT-related courses offered by the department were to help prospective EFL teachers develop better attitudes toward ICT integration into their language instruction and better prepare prospective EFL teachers to develop and deliver technologically-designed lesson plans.

As to the teachers' roles in these courses, the lecturers were expected to increase prospective EFL teachers' motivation for teaching and learning and alter the social organizations of classrooms to be more student-centered by the integration of a variety of ICT tools (Skype, google talk, MSN (Microsoft Network), e-mail, blogs, podcasts, wikis, Youtube) into the lesson. Moreover, the teachers were expected to develop prospective EFL teachers' basic ICT skills (e.g., interacting by utilizing a variety of media and formats, accessing and exchanging information in a variety of ways, collaborating and cooperating in team efforts, being self-directed learners). The teacher utilized a number of instructional delivery methods to provide the prospective EFL teachers with hands-on experience utilizing the emerging technologies that are available for the classroom. The technology-rich lesson plans designed during ICT-interwoven training were to provide the teacher candidates with useful models that they could transfer to their classrooms.

The design of the ICT-interwoven training provided for teachers in this research study was worth viewing as a curricular innovation since the ICT-related courses in the curriculum are unique to the ELT Department of EUL as almost none of the universities in our area offer such extra ICT-related courses which provide prospective EFL teachers with technology training in software applications, Internet resources and technology-rich activities that they could easily transfer to their campus classrooms.

Research Questions

The research questions comprising the central basis of the concurrent study are as follows:

1. What are prospective EFL teachers' attitudes toward ICT integration into language instruction before ICT-interwoven training?
2. What are prospective EFL teachers' attitudes toward ICT integration into language instruction after ICT-interwoven training?
3. Is there any significant difference between prospective EFL teachers' ICT attitudes before and after ICT-interwoven training?
4. What are prospective EFL teachers' views on the ICT-related courses in the ELT curriculum they have received during four years?

METHOD

The research methodology applied in this study is mixed-method, including both quantitative and qualitative methods whereby the strengths of one method can compensate for the weaknesses of the other. While the strategy of enquiry used in the quantitative part is a questionnaire, the strategy utilized in the qualitative part is an interview.

Sample

The study was conducted with the participation of 124 prospective EFL teachers at different grades of the ELT department at EUL. The participants were randomly selected among the first (n=38) and the fourth-year (n=86) students. The rationale for choosing samples in Year 1 (n=38) and Year 4 (n=86) to participate was that Year 1 comprised the students not receiving ICT-interwoven training but Year 4 involved the students having successfully completed ICT-related courses in the curriculum. The researcher aimed to explore whether there was a statistically significant difference between prospective EFL teachers' ICT attitudes before and after ICT-interwoven training. The reason there was a difference in number of participants in the

freshman year (n=38) and the senior group (n=86) was that there were only 38 students officially registered in the Year 1 group, whereas there were 86 students officially registered in the Year 4 group. Their participation in the study was voluntary. Demographic properties of the participants are presented in Table 1.

Table 1. Demographic properties of the participants

		Frequency	Percentage (%)
Year	Freshmen	38	31
	Senior	86	69
Gender	Male	29	23
	Female	95	77
Age	18-20	30	24
	21-23	34	27
	23+	60	49
TOTAL		124	100

Instruments

A questionnaire was developed by the researcher to gather data needed for the study rather than using an existing instrument. The questionnaire consisted of two parts. The first part asked about personal information such as gender, age and year of education to endure the maximum control of variables (Gay & Airasian, 2000). The second part of the questionnaire contained fifteen items based on 5-point Likert scale (from 1=strongly disagree to 5= strongly agree). Six experts in the field were invited to review the items on the questionnaire for comprehensiveness, acceptability and clarity of the questionnaire (Dillman, 2000). In accordance with the experts' recommendations the questionnaire was redesigned and, with the panel of experts' approval, a pilot study was conducted on a number of prospective EFL teachers (n=28) as a further step for developing the questionnaire (Gall, Gall, & Borg, 2003).

Hence, only nine items receiving the experts' consent level of 80% were included; however, six items including issues leading to problems were excluded. To check the reliability, the instrument was analyzed through the Cronbach's Alpha Coefficient $\alpha = 0.90$, which showed a high level of reliability. In the meantime, interview questions asking for prospective EFL teachers' views on ICT-related courses in the ELT curriculum were also prepared and reviewed by the same board of experts. After revisions were made based on the feedback obtained from the experts, the interview protocol was also prepared.

Data Collection and Analysis

To conduct a quality study, the paper questionnaires were distributed to the selected sample and 18 of the participants were interviewed consecutively. Nine open-ended questions (e.g., Do you feel ready to use ICT tools in your subject teaching?) were asked. These interviews lasted from forty-five minutes to one hour. The qualitative data were statistically analyzed utilising the Statistical Package for Social Sciences (SPSS. 16). The minimum, maximum and mean score on each item of the questionnaire was calculated to determine prospective EFL teachers' attitudes toward ICT integration into language instruction before and after ICT-interwoven training. Parametric analysis such as Independent samples t-Test was administered to explore any statistically significant differences between prospective EFL teachers' ICT attitudes before and after ICT-interwoven training. Moreover, the qualitative information was analyzed from the transcriptions of the interviews, and synthesized with the results from the quantitative study.

RESULTS

Prospective EFL Teachers' ICT Attitudes before ICT-interwoven Training

Table 2 presents the minimum scores, maximum scores, mean scores, the standard deviations, and range with respect to 38 prospective EFL teachers' ICT attitudes before ICT-interwoven training. These 38 prospective EFL teachers scored low on all the items in the questionnaire. All the mean scores on all the items were lower than 3 points on the five-point scale.

Table 2. Prospective EFL teachers' ICT attitudes in freshman year

Items	Minimum	Maximum	Mean	Std. Deviation	Range
1	1,00	5,00	2,86	1,18	1-5
2	2,00	5,00	2,94	1,03	2-5
3	1,00	4,00	2,52	0,95	1-4
4	1,00	4,00	2,36	0,88	1-4
5	2,00	3,00	2,55	0,50	2-3
6	1,00	3,00	2,02	0,82	1-3
7	2,00	4,00	2,81	0,83	2-4
8	1,00	3,00	2,13	0,74	1-3
9	2,00	3,00	2,34	0,48	2-3
Overall attitude			2,50	0,22	

These outcomes demonstrated that, before ICT-interwoven training, thirty-eight prospective EFL teachers did not have strong opinions about ICT integration into language teaching, that is, they did not have any tendency to (a) enjoy using ICT (M=2,86, SD=1,18), (b) think that using ICT saved time in class (M=2,94, SD=1,03), (c) know that ICT could help them to learn many new things (M=2,52, SD=0,95), (d) know that using ICT did not intimidate or threaten them (M=2,36, SD=0,88), (e) feel very confident when working with technology in class (M=2,55, SD=0,50), (f) want to learn more about using ICT in class (M=2,02, SD=0,82), (g) believe that ICT could really improve their teaching practice (M=2,81, SD=0,83), (h) think that changing the curriculum to integrate ICT was possible (M=2,13, SD=0,74), and (i) think ICT did not break down too often to be of very much use (M=2,34, SD=0,48).

Prospective EFL Teachers' ICT Attitudes after ICT-interwoven Training

Table 3 presents the mean scores and the standard deviations with respect to 86 prospective EFL teachers' ICT attitudes after ICT-interwoven training. Although these 86 prospective EFL teachers scored low on the items numbered 2,3,6,8, and 9, all the mean scores on the items numbered 1,4,5, and 7 were higher than 4 points on the five-point scale.

Table 3. Prospective EFL teachers' ICT attitudes after ICT-interwoven training

Items	Minimum	Maximum	Mean	Std. Deviation	Range
1	3,00	5,00	4,13	0,85	3-5
2	2,00	5,00	3,53	1,12	2-5
3	2,00	5,00	3,80	1,33	2-5
4	2,00	5,00	4,02	0,93	2-5
5	3,00	5,00	4,08	0,89	3-5
6	3,00	5,00	3,94	0,88	3-5
7	3,00	5,00	4,29	0,66	3-5
8	2,00	5,00	3,38	1,05	2-5
9	1,00	5,00	3,81	1,24	1-5
Overall attitude			3,89	0,33	

These outcomes displayed that, after successfully completing all ICT-related courses in the curriculum, 86 prospective EFL teachers reported that they enjoyed using ICT (M=4,13, SD=0,85), ICT saved time in class (M=3,53, SD=1,12), ICT could help a person to learn many new things (M=3,80, SD=1,33), using ICT did not intimidate or threaten them (M=4,02, SD=0,93), they felt very confident while working with technology in class (M=4,08,

SD=0,89). Moreover, these results exhibited that, after ICT-interwoven training, 86 prospective EFL teachers learned more about using ICT in class (M=3,94, SD=0,88), they viewed ICT as improving their teaching practice (M=4,29, SD=0,66), changing the curriculum to integrate ICT was possible (M=3,38, SD=1,05) and ICT did not break down too often to be of very much use (M=3,81, SD=1,24).

Prospective EFL Teachers' ICT Attitudes before and after ICT-interwoven Training

To compare 38 prospective EFL teachers' mean scores for ICT attitudes (i.e. mean scores of prospective EFL teachers without ICT-interwoven training) with 86 prospective EFL teachers' mean scores for ICT attitudes (i.e. mean scores of prospective EFL teachers with ICT-interwoven training), a series of Independent-Samples T-tests were conducted. Among the nine variables examined (exhibited in Table 4), all of them were found to be significantly different ($p < 0.05$).

Table 4. Prospective EFL teachers' ICT attitudes and ICT-interwoven training

Items	Prospective EFL teachers without ICT-interwoven training (i.e. freshman students) (n=38) (Mean, S.D.)	Prospective EFL teachers with ICT-interwoven training (i.e. senior students) (n=86) (Mean, S.D)	t-value
1	2,86 (1,18)	4,13 (0,85)	6,73*
2	2,94 (1,03)	3,53 (1,12)	2,74*
3	2,52 (0,95)	3,80 (1,33)	5,31*
4	2,36 (0,88)	4,02 (0,93)	9,25*
5	2,55 (0,50)	4,08 (0,89)	9,82*
6	2,02 (0,82)	3,94 (0,88)	11,34*
7	2,81 (0,83)	4,29 (0,66)	10,50*
8	2,13 (0,74)	3,38 (1,05)	6,63*
9	2,34 (0,48)	3,81 (1,24)	7,06*

* $p < 0.05$

Using ICT was more enjoyable for 86 prospective EFL teachers with ICT-interwoven training (i.e. senior students) than for 38 prospective EFL teachers without ICT interwoven training (t-value= 6,73). Using ICT saved more time in class for 86 prospective EFL teachers with ICT-interwoven training than for 38 prospective EFL teachers without ICT-interwoven training (t-value= 2,74). ICT can help 86 prospective EFL teachers with ICT-interwoven training to learn many more new things than 38 prospective EFL teachers without ICT-

interwoven training (t-value= 5,31). Using ICT intimidates or threatens 86 prospective EFL teachers with ICT-interwoven training less than 38 prospective EFL teachers without ICT-interwoven training (t-value= 9,25).

86 prospective EFL teachers with ICT-interwoven training feel more confident than 38 prospective EFL teachers without ICT-interwoven training (t-value= 9,82) when working with technology in class. 86 prospective EFL teachers with ICT-interwoven training want to learn about using ICT in class more than 38 prospective EFL teachers without ICT-interwoven training (t-value= 11,34). 86 prospective EFL teachers with ICT-interwoven training believe that ICT can improve their teaching practice more than it can improve 38 prospective EFL teachers' teaching practice (t-value= 10,50). Changing the curriculum to integrate ICT is more possible for 86 prospective EFL teachers with ICT-interwoven training than for 38 prospective EFL teachers without ICT-interwoven training (t-value= 6,63). Lastly, 86 prospective EFL teachers with ICT-interwoven training believe that ICT breaks down less frequently to be of very much use than what 38 prospective EFL teachers' believe.

Prospective EFL Teachers' Views on the ICT-related Courses in the Curriculum

In response to the open-ended questions asking the fourth year prospective EFL teachers (n=86) about their views on the ICT-related courses and ICT training that they received, they stated that ICT integration into the curriculum at their university was more sufficient than planned and expected and that if they had more ICT-related courses, they could improve their competency and pedagogical skills in ICT realm to a great extent. They also stressed that it was possible to herald better ICT attitudes by increasing the number of ICT courses in the curriculum. Moreover, they asserted that the ELT curriculum somewhat failed to sensitize them to the challenges of teaching English as a foreign language through ICT and flawed in a certain number of ways. To illustrate, comments illustrating these views were as follows:

'There should be more time allocated to the practical aspects of teaching English as a foreign language through ICT and the dissemination of related teaching skills.'

'The infrastructure should be in sufficient numbers so that each student can use one computer on his/her own. Also, all computers are to be connected to the Internet.'

' Teachers should focus more on how we can use ICT tools to teach EFL to our students by making us prepare Internet- based lesson plans.'

' We need to witness some technologically- conducted lessons in actual computer laboratories to improve our classroom management skills in virtual settings.'

' I know how to use a computer and the Internet. Actually, what I need is how to use ICT in teaching English to my students, so the pedagogical training should be emphasized.'

These comments are the summary of all views made by prospective EFL teachers and imply that ICT training provided at EUL has optimised a substantial effect on prospective EFL teachers' ICT attitudes as an overarching concept in language teaching; however, they cannot exert sustainable improvement in terms of teaching via ICT tools. These comments contribute to diagnosing prospective EFL teachers' future expectations about ICT training which would augment credentials for ICT-assisted language teaching.

DISCUSSION AND CONCLUSION

The results of the present study indicated that, before ICT-interwoven training, 38 prospective EFL teachers scored low on all the items in the questionnaire, that is, they exhibited negative attitudes towards ICT integration into language teaching. However, 86 prospective EFL teachers provided an ample range of ICT-related courses scored high on most of the items in the questionnaire, that is, they exhibited positive attitudes towards ICT infusion into their language teaching.

The results further indicate that there was a statistically significant difference between prospective EFL teachers' ICT attitudes before and after ICT-interwoven training, which sheds light on the importance of including more ICT-related courses in the curriculum. To put it another way, this study provided evidence for the assumption that ICT-interwoven training is closely connected with prospective EFL teachers' increasing positive attitudes towards ICT integration into language instruction. In the literature, a plethora of research studies exhibiting the success of ICT deployment in the educational contexts largely rely on teachers' attitudes towards ICT deployment (e.g., Albirini, 2006; Aral, Bütün-Ayhan, Ünlü, Erdoğan, Ünal, 2006; Huang & Liaw, 2005; Paraskeva, Bouta, & Papagianni, 2008), yet there are limited research studies that investigate prospective EFL teachers' ICT attitudes before and after ICT-interwoven training. Similarly, very few research studies in the literature

reveal that integrating more ICT-related courses in the curriculum maximizes prospective EFL teachers' positive attitudes towards ICT integration into their future teaching practices.

Related to the ICT-related courses in the ELT curriculum, 86 prospective EFL teachers participating in this study stated that ICT infusion into the curriculum at their university was more adequate than planned and anticipated and that they could develop their competency and pedagogical skills in ICT use in the language teaching realm if they were provided with more ICT-related courses. The results of this study were in line with certain studies in the literature (e.g., Göktas, Yıldırım, & Yıldırım, 2008; Molebash, 2001; Sahin, 2003) which evaluated the effectiveness of ICT related courses. For instance, Molebash (2001) discovered that ICT-related courses can play prominent roles in preparing prospective teachers to infuse ICT into their teaching and suggested the view that constructivist philosophy and teaching practices of the instructor had a pivotal role in the effectiveness of ICT related courses.

Furthermore, Sahin (2003) found a similar outcome that stressed the deployment of the constructivist approach to promote the powerfulness of the 'ITMD' course. The findings of the study showed that prospective teachers were willing to be active in the process of the 'ITMD' course and that the participants thought individual materials design and feedback provided to the designed material were very prominent.

Göktas et al. (2008) investigated 111 teacher educators', 1330 prospective teachers', and 1429 K-12 teachers' opinions about the effectiveness of ICT related courses and how to develop the courses in pre-service teacher education programs in Turkey by using both quantitative and qualitative research approaches. Although a majority of the participants felt that ICT related courses were effective, most participants suggested that these courses should be restructured to be more useful in practice. Accordingly, to provide powerful ICT training for prospective teachers, it was emphasized by Göktas et al. (2008) that:

- 1) ICT training should be embedded in the whole teacher education program so that powerful ICT amalgamation is shaped for pre-service teachers;
- 2) training should integrate ICT with the curriculum;
- 3) training should present hands-on practice so that teachers find it appealing; and
- 4) training should be comprehensive.

Related to the ICT training provided in the ELT curriculum, the 86 prospective EFL teachers in this study also stressed that the ELT curriculum had some drawbacks relevant to ICT-interwoven training such as lack of time allocated to practical aspects of teaching English as a foreign language via ICT tools, lack of sufficient number of computers, lack of ICT specific technical and pedagogical knowledge and training. The results of this study were also in harmony with the findings of many other research studies in the literature which emphasize these barriers (e.g., Brush, Glazewski, Rutowski, Berg, Stromfors, & Van-Nest, 2003; Goktas, Yildirim, & Yildirim, 2009). For example, Brush et al. (2003) indicated that prospective teachers were not satisfied with ICT integration courses and that they required further training and support for powerful ICT amalgamation into their future classrooms.

Similarly, Göktaş et al. (2009) investigated the main obstacles and possible enablers for integrating information and communication technologies (ICTs) in Turkey's pre-service teacher education programs. The findings displayed that lack of in-service training, lack of suitable software and materials, and lack of hardware were the main obstacles for infusing ICTs into pre-service teacher education programs.

Moreover, prospective teachers emphasized that conceptual or theoretical elements of the courses were unnecessary and the course as a whole together with the exams should be conducted hands-on in computer laboratories, and computer facilities should be provided for each student in the laboratory. These findings can be related to the guidelines articulated by Thompson, Bull, & Willis (2001) as follows:

- ICT should be infused into the entire teacher education programs.
- ICT should be introduced in context.
- Students should experience innovative ICT supported learning environments in their teacher education programs.

At this juncture, researchers (e.g., Hew & Brush, 2007, Tondeur, Coenders, Van Braak, Brummelhuis, Vanderlinde, 2009) stress that teachers need adequate technical support so as to facilitate their use of ICT. Beyond technical support, ICT support further needs to be comprehended as a form of pedagogical support that teachers need when amalgamating ICT into their classroom (Mumtaz 2000; Tondeur, Keer, Van Braak, Valcke, 2008). Strudler and Herrington (2008) emphasize that ICT support is important since it has been empirically exhibited that the availability of quality ICT support affects the frequency, variety and increased use of ICT in the classroom context.

Finally, it can be stated that the updated curriculum is successful in maximizing prospective EFL teachers' positive attitudes towards ICT integration into their teaching despite having certain flaws related to ICT-interwoven training (e.g., lack of time allocated to practical aspects of teaching English as a foreign language via ICT tools, lack of sufficient number of computers, lack of ICT specific technical and pedagogical knowledge and training). As Fishman and Pinkard (2001) indicate, the ELT curriculum should be subject to on-going renewal if it is to remain dynamic and be more responsive to the current and future needs of the students. Otherwise, teachers are inclined to restrict their thinking about ICT to 'boxes and wires' or isolated computer skills.

Limitations and Future Directions

First, this study is limited to prospective EFL teachers at the ELT Department of the European University of Lefke. The results of the study cannot be generalized to other prospective EFL teachers in other ELT departments in North Cyprus universities as each university offers different elective courses which may not be related to ICT use in language instruction. Second, the study is based on self-administered questionnaires and interviews. If observation could be used as another technique, more direct and distinct data would be gathered to further realize prospective EFL teachers' problems. Accordingly, to have a more general picture of the case, more qualitative studies should be conducted to investigate the attitudes of prospective EFL teachers in other curricular areas, and the problems underlying their disparaging attitudes should be explored in depth by employing observational methods properly and extensively.

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