Exploring English as a foreign language (EFL) teacher trainers' perspectives on challenges to promoting computer literacy of EFL teachers

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Computer literacy is a significant component of language teachers' computer-assisted language learning (CALL) knowledge. Despite its importance, limited research has been undertaken to analyze factors which might influence language teachers' computer literacy levels. This qualitative study explored the perspectives of 39 Iranian EFL teacher trainers on possible challenges to EFL teachers' computer literacy development. The findings suggest that the teacher trainers considered the role of computer literacy as important in EFL teachers' professions. The teacher trainers reported a couple of challenges to EFL teachers' development of computer literacy as well as measures to eliminate the effects of these challenges. In addition, the trainers did not have sufficient computer knowledge to prepare EFL teachers for teaching in CALL courses. The findings further indicated that the participants perceived that EFL teachers need to be trained for developing their computer literacy. However, the trainers did not have consensus on including computer literacy training for teachers in mainstream teacher training programs. Finally, computer skills related to using the Internet and language teaching software tools were regarded as necessary for EFL teachers to acquire. The study would have implications for the improvement of mainstream teacher training programs in Iran and other countries.

Keywords: Teacher training; computer literacy; CALL; challenges; EFL

Introduction

Even though the advent of technology and its use in education has offered a wide range of merits and affordances for all educational

Forum

139

stakeholders, it has created certain challenges for those who are involved in the processes of teaching and learning. Accordingly, teachers are expected to adapt their pedagogical approaches to responding to these new technological demands. Specifically, one dimension of successful use of technology in education is teachers' knowledge of computers and their high confidence in the use of technology for their teaching purposes (Atkins & Vasu, 2000; Son, Rob, & Charismiadji, 2011). In language teaching contexts, Son et al. (2011) define computer literacy as "the ability to use computers at an adequate level for creation, communication and collaboration in a literate society" (p. 27). Son et al. (2011) argue that a wide range of teachers' computer skills should be improved and included in teacher training/education programs. As a consequence of this, teacher training/education programs should not be involved in improving teachers' pedagogical and teaching skills exclusively. They should also take into account teachers' confidence, competence and belief in the use of technology for teaching and improve their attitudes toward these considerable variables of the implementation of CALL.

Considering the central role of teachers in society and educational contexts, a limited number of teachers might be competent in using computers and technology efficiently (Kpai, Joe-kinanee, & Ekeleme, 2012). To meet the needs of students in educational contexts and teach more effectively, teachers should strive to promote their computer literacy levels (Yanik, 2010). Milton and Vozzo (2013) point out that the nature of computer literacy is constantly changing. The changing nature of computer literacy might imply that teachers should improve their computer literacy levels continuously. When teachers have high levels of computer literacy, they can provide their students with appropriate computer literacy instruction and computer-assisted learning activities. Therefore, developing teachers' computer literacy skills will provide opportunities for both teachers and students to improve the quality of their teaching and learning.

Research has revealed that teachers' computer perspectives and literacy are two important factors which occupy a considerable role in the successful implementation of CALL in EFL contexts (Milbraith & Kinzie, 2000). Admittedly, teachers who have higher levels of computer knowledge might be more confident in the use of technology for their teaching (Kessler & Plakans, 2008). Corbel and Gruba (2004) suggest that language teachers should be able to teach computer literacy skills to their students. This issue would create a challenge for teacher educators and trainers. Today, EFL teacher trainers and educators should take pre-service teachers' levels of computer knowledge into consideration and take measures to encourage language teachers to promote their computer literacy. More importantly, as Hong (2010) argues, "the ultimate goal of CALL teacher education is to enable L2 teachers to integrate CALL technology into their classroom with confidence and knowledge" (p. 53).

To date, there is a paucity of research on teachers' improvement of their computer literacy and CALL knowledge in teacher training/education programs. For instance, Lam (2000) explored factors which influenced teachers' use/nonuse of technology. The findings of the qualitative study suggested that teachers' nonuse of technology was mainly related to their limited competence level to use computers and lack of CALL teacher training programs. Similarly, Peters (2006) assessed the effectiveness of a CALL training course to improve teachers' computer knowledge. He reported that the training course improved teachers' computer literacy and the teachers held positive attitudes toward it. In Turkey, Aydin (2013) assessed language teachers' perceptions of the implementation of CALL in EFL courses. Although the teachers adopted positive attitudes toward the use of computers in language teaching, they had very limited knowledge of how to use computers and

software programs effectively. Fuchs (2006) analyzed German language teachers' perspectives on their electronic literacy skills. Computer-mediated peer collaboration was used to promote their electronic literacy. The findings showed that the teachers had different levels of electronic literacy. In general, the teachers showed different perspectives on technology use in language teaching.

Rationales for conducting this study

This research study was conducted for two main reasons. The first reason for undertaking this study is that previous research has emphasized that computer literacy training for EFL teachers should be incorporated in teacher training/education programs (Hong, 2010; Hubbard, 2008; Peters, 2006; Kessler & Plakans, 2008). Therefore, teacher trainers/educators should take the responsibility for assisting EFL teachers to foster their computer literacy. This issue would imply that teacher educators/trainers should have high levels of computer literacy and be aware of the obstacles and challenges to improving EFL teachers' computer literacy levels. Surprisingly, very scant attention has been directed toward investigating teacher educators'/trainers' perspectives on the issue of computer literacy in EFL instruction. Consequently, it appears that further research is required to explore how computer literacy training can be incorporated into EFL teacher education/training programs from the perspective of EFL teacher trainers/educators.

In addition, Hubbard (2008) believes that one significant barrier to the inclusion of CALL teacher training/education programs is lack of experienced and skillful educators and trainers. In order to normalize the implementation of CALL in EFL instruction, it is essential that teacher educators/trainers enjoy high competence in the use of computers. In terms of the aims of this study, the teacher trainers' ability to promote EFL teachers' computer literacy was investigated. Therefore, it can be concluded that for the normalization of CALL, both EFL teachers and teacher educators/trainers should strive to eliminate current barriers to the implementation of CALL (Dashtestani, 2012). Therefore, this study was conducted to contribute to this uninvestigated area of research. Specifically, this study examined Iranian EFL teacher trainers' perspectives on the role of computer literacy in EFL instruction. Furthermore, the possible challenges to computer literacy instruction for EFL teachers in teacher training programs were identified and discussed. To achieve this aim, the following research questions guided the study:

1. What are the perceptions of Iranian EFL teacher trainers of the role of teachers' computer literacy in language teaching and EFL teachers' current levels of computer literacy?
2. What are the perceptions of Iranian EFL teacher trainers of challenges to improving Iranian EFL teachers' computer literacy and measures to remove possible challenges?
3. What are the perceptions of Iranian EFL teacher trainers of computer literacy skills required for EFL teaching and their abilities to train EFL teachers to improve their computer literacy?
4. How should computer literacy training for EFL teachers be implemented in Iranian EFL courses?

Methodology

To develop in-depth insights into participants' perceptions, qualitative research paradigms were employed and adopted (Merriam, 1998). According to Mackey and Gass (2005), in the **141**

field of second language research there has been increasing interest in the use of qualitative research. Best and Kahn (2006) categorize qualitative research into three methods, including in-depth-interviews, direct observation, and written document. In interviews, direct quotations of participants are shown to reveal their beliefs, perceptions, and knowledge. Conducting in-depth interviews was regarded feasible and suitable for the specific purposes of this research.

Several steps were taken to develop the questions of the interview. First, the relevant literature on CALL teacher education and computer literacy issues in language teaching was reviewed and analyzed to develop a list of questions. Afterwards, eight teacher training programs were observed to collect some information on the current computer-related practices in those programs. In addition, 10 EFL teachers and six teacher trainers were interviewed to focus the questions on the specific context of the study. The questions were then evaluated by a jury of six senior university professors of applied linguistics who had the experience of teacher education for several years. The content of the questions was validated after holding several evaluation sessions with the jury of experts. Of the following questions regarding the participants' demographic information, eight questions were used for the interviews:

1. What is your opinion about the role of teachers' computer literacy in their teaching profession?
2. What are possible challenges which might impede the improvement of EFL teachers' computer literacy?
3. What do you think of Iranian EFL teachers' current level of computer literacy? Do you think it is adequate for language teaching?
4. Do you think that Iranian EFL teachers should receive computer literacy training? Why do you think so?
5. What do you think of computer literacy training for EFL teachers in mainstream language teacher training programs?
6. What do you think of your ability to train teachers on computer literacy skills required for language teaching?
7. What kinds of computer literacy skills are necessary for teachers to know in order to implement computer-assisted language learning successfully in Iran?
8. What measures should be taken to facilitate EFL teachers' improvement of their computer literacy levels?

Since Persian is the native language of the participants, the interviews were conducted in Persian. Prior to conducting the interviews, the purposes of the study were explained to the participants and they were invited to take part in the interviews voluntarily. Permission was gained from the participants to record the interviews. The data were then transcribed and translated into English. The interview data were analyzed through conducting thematic content analysis. First, to prepare the data, they were transcribed into written text. The themes were analyzed based on the main interview questions of the study. For ensuring inter-rater reliability of the interview data, they were coded by two coders. Based on the interview questions and the relevant emerging themes, the coders agreed on the common themes which could be used for answering the interview questions. Direct quotations from the participants were reported for each emerging theme.

Sample

The participants of this study were 39 teacher trainers who had an average of 5.4 years of teacher training experience in different language teaching institutions in Iran. All participants were male. The majority of participants (n = 31) were MA holders of teaching English as a foreign language (TEFL) while 8 were PhD holders of TEFL. These teacher trainers hold teacher training courses for the employment of pre-service teachers and provided on-the-job training for language teaching institutions in Iran. The participants had an average age of 35.2 years. Those teacher trainers who had more than two years of training experience were included in the sample. The teacher trainers had an average of 9 years of computer use and 7 years of Internet use. To gain access to the participants, the researcher contacted different language teaching institutions and requested their supervisors to provide him with the contact information of their teacher trainers. Then the researcher contacted the teacher trainers and invited them to participate in the study. The interviews were conducted either on the phone or face-to-face with regard to the preference of the participants. Each interview lasted 30 to 45 minutes. The convenience method of sampling was employed in this study.

Results

Teacher trainers' perceptions of the importance of teachers' computer literacy in their teaching profession

All language teacher trainers believed that computer literacy is an important component of teachers' teaching knowledge. Most participants stated that using computers in language learning and teaching is inevitable nowadays and as a consequence of this EFL teachers should be able to use computers for EFL teaching effectively.

> I don't think you can find a person who denies the role of computer literacy in people's lives at the present situation. Language teachers, as individuals who are supposed to teach languages to the younger generations, must have high levels of computer literacy. (Trainer 8)

> Well, we expect educated people to have the required levels of computer literacy and English proficiency. It's my opinion that educated people who don't have the required levels of these two knowledge types cannot be promoted educationally and professionally. (Trainer 24)

> Computer literacy does play a very important role in EFL teaching. How can we expect computer illiterate teachers to take the responsibility of teaching something like a foreign language? (Trainer 11)

Teacher trainers' perceptions of possible challenges which might impede the improvement of EFL teachers' computer literacy

The participants pointed out several challenges in the interviews. Most teacher trainers reported that one major obstacle to improving EFL teachers' computer literacy is that EFL teachers are not required to use computer technology in their classrooms. They mentioned **143**

othat EFL teachers would justify that since they do not have to use computers in their teaching, they are not concerned about their computer literacy levels.

> I have seen teachers who assert that they do not need to improve their computer literacy simply because they are not supposed to use technology for their teaching. This is definitely a false conception. The use or nonuse of technology in the EFL classroom has nothing to do with teachers' attempt to improve their computer literacy. (Trainer 13)

> The first challenge is an obvious one and that is our traditional teaching approaches. Traditional approaches which are mainly technology-poor do not create any motivation for EFL teachers' to improve their computer literacy. (Trainer 6)

> In my view, teachers should make use of computers and technology in order to improve their computer literacy otherwise they won't be able to further their computer knowledge. (Trainer 32)

Another significant challenge to teachers' improvement of computer literacy was perceived to be the age differences and generation gap of EFL teachers. The participants pointed out that it is not easy to convince older teachers to improve their computer literacy since it is hard for them. It was suggested that younger and less experienced teachers are more flexible toward improving their computer literacy.

> This is my belief that it has always been a challenge for us to persuade experienced teachers to accept changes or improvements. By the way, they will do whatever they believe is right. Regarding computer literacy, the older teachers are usually incompetent in the use of computers. I have even seen teachers who have problems with sending emails. So we should find a way to encourage these groups of teachers to improve their computer literacy. (Trainer 36)

> Unfortunately, in our society the generation gap is really troublesome. I am sure that for teachers of different ages and generations, specific approaches should be taken to improving their computer literacy. This issue is complicated though. (Trainer 25)

Some participants believed that there is not any standard or localized framework for improving EFL teachers' computer literacy skills. They deemed that this problem would have an influence on teachers' computer literacy improvement.

> As you might know, computer literacy covers a wide range of skills if I am not mistaken. We do not know which skills can help Iranian EFL teachers and improve their quality of teaching. I suppose first we should make language teachers aware of some computer skills which are useful for our specific EFL context, and then expect them to master those skills. At present, we have no idea about this issue. (Trainer 29)

> Let me tell you something. Determining the skills and levels of computer literacy is dependent on the process that is in question. In our field , have we defined computer literacy and its desirable levels? Let us solve this problem first. (Trainer 3)

Some participants stated that teaching has been routinized for most Iranian language teachers. This routinization of teaching makes language teachers indifferent about improving different literacies and competencies. In other words, computer literacy is one of those skills which have been overlooked by most EFL teachers.

> When new teachers are going to be employed and take part in teacher training courses, they are very eager to improve different skills required for their teaching. This interest in improving their skills will decrease gradually and they will try to just do their jobs. (Trainer 20)

> Honestly speaking, EFL teachers should update their computer, English, and teaching skills periodically and continuously. This does not happen in our context of language teaching and I am not sure why it is so. Perhaps the teachers are not motivated to do so. (Trainer 27)

Teacher trainers' perceptions of Iranian EFL teachers' current level of computer literacy

In response to this question, the teacher trainers reported that Iranian EFL teachers do not have the high levels of computer literacy required for language teaching and the implementation of computer assisted language learning. They mentioned that the EFL teachers should improve their computer literacy.

> Based on what I have seen, I think most Iranian EFL teachers do not have the proficiency of different computer skills. They know some basic operations and functions which any individual must know. I think language teachers should know more about computers since it's an important part of their profession. (Trainer 18)

> This is a difficult question to be answered. Actually, we expect teachers to have high levels of computer literacy while I guess their levels of computer literacy are not that high. However, you can find very few teachers who enjoy high levels of computer literacy. (Trainer 15)

> I'm quite sure that our language teachers lack knowledge of different computer skills. Having high levels of computer literacy implies that the teachers receive some specific training while we are not concerned about training our language teachers regarding their computer literacy skills. (Trainer 4)

Teacher trainers' perceptions of considering computer literacy training for EFL teachers

All teacher trainers provided an affirmative response to this question. They believed that the most important approach to improving EFL teachers' computer literacy is to offer specific training for them.

> My response is "yes." The reason is crystal clear. For learning any skill, people should

145

be trained and prepared. This is also true for computer literacy as a series of skills to be learnt. (Trainer 25)

In fact, Iranian EFL teachers may need training on different computer literacy skills. I believe most of them do not know about the application of the Internet for EFL teaching. (Trainer 14)

Continuous computer literacy training is a component of any kind of profession. Language teaching is not exceptional and teachers should have access to suitable training programs from time to time. (Trainer 17)

Teacher trainers' perceptions of including computer literacy training for efl teachers in mainstream language teacher training programs

While 19 teacher trainers agreed that computer literacy training can be included in mainstream teacher training courses, 20 teacher trainers stated that it is not a feasible measure to be taken. The participants who disagreed asserted that teacher training courses are short and different topics should be covered and computer literacy training cannot be included in teacher training courses. Also, it was stated that computer literacy is a broad issue and separate computer literacy courses should be allocated for improving EFL teachers' computer literacy.

It seems to be a good idea. However, we need more extended teacher training courses to include computer skills related to EFL instruction in them. (Trainer 22)

I am not optimistic about this issue. First of all, institutions and teachers might not be patient if computer literacy training becomes a part of teacher training programs. It might take a long time to do so. Second, it will place a lot of demands on newly-employed teachers and I believe this is not a suitable decision. (Trainer 3)

This approach may be functional, but I am not sure how it can be implemented. In any teaching training course, we have to present a lot of issues to language teachers and this makes the task a burdensome one. I have a question though "do we have a certain framework for teaching computer skills to language teachers?" To be honest, I haven't seen such a framework yet. (Trainer 37)

I agree that the issue of computer literacy is a significant one while I don't understand why it should be included in mainstream teacher training programs. If this is the case, I recommend including other skills in teacher training courses as well. Do you think it is possible though? (Trainer 39)

Teacher trainers' perceptions of their ability to train teachers on computer literacy skills required for language teaching

The majority of teacher trainers (n = 28) reported that they were not sure or confident whether they possess the ability to improve EFL teachers' computer literacy levels. Some

participants (n = 8) believed that they should provide computer literacy training for teachers through having cooperation with computer and educational technology experts and instructors. Some teacher trainers also mentioned that they should know more about computer literacy skills required for language teaching and CALL implementation and improve their knowledge prior to including computer literacy training in mainstream teacher training programs.

> Well, I am not an expert in computers but I know how to use some common applications and software programs which are necessary for my profession and personal life. When you talk about teaching these computer skills, it is a bit different. Using something and teaching something are two different issues. (Trainer 23)

> I'm not quite sure of my ability to teach computer literacy skills to EFL teachers' as I haven't tried teaching computer literacy to them but I think if I knew which computer skills were required for language teaching, I would try to learn them in a good way and teach them to EFL teachers. (Trainer 6)

> Don't you think that we'd better ask experts of educational technology to train teachers how to improve their computer literacy? As EFL teacher trainers, we should teach them issues related to pedagogical aspects of computer use. (Trainer 30)

> To tell you the truth, I don't have the ability to teach teachers computer literacy skills. I even doubt most teacher trainers can teach computer literacy skills. This is a demanding task for teacher trainers. (Trainer 16)

Teacher trainers' perceptions of computer literacy skills necessary for teachers to know in order to implement computer-assisted language learning successfully in Iran

Of all teacher trainers, five asserted that they did not know what computer literacy skills are required for language teaching and the implementation of CALL. However, the majority of participants had consensus that EFL teachers should be able to use the Internet and online tools professionally. Some teacher trainers stated that EFL teachers should know how to find and use software programs required for language teaching.

> What I guess is that the Internet is a very useful resource for learning and teaching English. Unfortunately, most EFL teachers do not know how to use the Internet effectively for their teaching purposes. Thus, teachers should improve their knowledge of the use of the Internet for language teaching. (Trainer 19)

> In fact, in the near future we will have to implement online language courses. It is essential that language teachers be ready for these sorts of courses in the future. So I believe that EFL teachers should try to learn about various online systems and tools which might be useful for their profession. (Trainer 2)

> At present many computer software tools are available to language teachers while I haven't seen Iranian EFL teachers make use of them. There are two problems. One is

147

that they do not know how to find these software tools and the other one is that they lack competence in how to use these software tools. (Trainer 26)

Teacher trainers' perceptions of measures to facilitate efl teachers' improvement of their computer literacy levels

Almost all teacher trainers reported that teachers' knowledge of computers should be updated periodically through holding workshops and on-the-job training.

One significant measure is to let teachers improve their computer literacy from time to time. This can help them be informed of new breakthroughs and achievements in the field of technology.(Trainer 34)

To improve EFL teachers' computer literacy, we can hold some workshops on the use of various newly-developed technologies for language teaching. Of course, I not sure whether language teaching providers and supervisors would agree to meet the costs of these workshops. (Trainer 9)

Some teacher trainers mentioned that a certain level of computer literacy should be a requirement for the employment of EFL teachers.

Nowadays computer literacy tests are available to EFL supervisors and employers. Prior to hiring teachers, EFL employers can give tests to evaluate teachers' computer literacy levels. These tests can help us employ teachers who are more efficient and ready for the language teaching profession. (Trainer 21)

Providing we identify what computer literacy skills are useful for language teaching, we can put teachers' knowledge of computer skills necessary for language teaching to the test. Obviously, specific tests should be developed for the purposes of language teaching. (Trainer 17)

The participants pointed out that EFL authorities should encourage the implementation of CALL in Iranian EFL courses. They asserted that if teachers use different technologies for their EFL teaching, they will have to improve their computer literacy.

I think traditional EFL teaching should be changed and teachers should use technology for their teaching. This use of technology will help them improve their computer literacy. (Trainer 1)

Discussion and conclusion

This qualitative research study sought Iranian EFL teacher trainers' perspectives on the importance of computer literacy for language teachers. The findings indicated that teacher trainers perceived computer literacy as an important component of teachers' teaching knowledge. Teacher trainers occupy a significant role in preparing EFL teachers for the successful implementation of CALL in the Iranian EFL context. It is essential that other

EFL authorities perceive the role of computer literacy for EFL teachers as important accordingly. Without considering computer literacy as an integral part of teachers' knowledge, it would not be possible to improve EFL teachers' computer literacy levels. As Milbrath and Kinzie (2000) argue, computer literacy is one of the pivotal factors in the efficient implementation of CALL in EFL courses. It is also essential that other EFL authorities, including course designers, supervisors, and providers, pay specific attention to the issue of teachers' computer literacy. Teacher trainers are often under the influence of the limitations of educational policies of language teaching institutions. Obviously, they cannot implement changes in their training programs when they are not supported or funded by EFL authorities.

In addition, developing teachers' computer literacy levels is not without challenges. Lack of obligation to use computers and technology in the classroom is an important obstacle based on the findings. The implementation of CALL in the Iranian EFL courses might encourage teachers to use technology and improve their computer literacy and confidence to use computers. Traditional approaches to teaching languages would be a considerable impeding factor regarding teachers' computer literacy development. Therefore, in Iran, a change in traditional language approaches to language teaching should occur so that teachers become able to use computers for teaching efficiently and competently. As the participants pointed out, different workshops and training courses can be considered for teachers of different age groups. Younger generations of teachers would be more computer literate compared to the older ones since they are more involved in the use of technology. Further research is required to gain insights into Iranian EFL teachers' computer literacy needs and frameworks on how to improve teachers' computer literacy. As Dashtestani (2012) argues, barriers and impediments to the implementation of CALL in Iran should be eliminated to facilitate the integration of technology into EFL courses. At present, due to the presence of various barriers, including lack of facilities, lack of teacher training and education, rigid curricula, and lack of teachers' knowledge of CALL, the implementation of CALL would not be feasible. EFL authorities and providers in Iran should strive to improve the conditions and remove these barriers to CALL implementation and teachers' development of computer literacy.

As the participants reported, EFL teachers' computer literacy should be updated periodically since EFL teachers should be informed of new innovations and skills related to computers and their use in language teaching. The nature of computer literacy is constantly changing with the advent of new technologies, and EFL teachers should be equipped with appropriate and up-to-date computer literacy skills to be able to make use of newly-emerged technologies. Experts of educational technology believe that language teaching organizations should hold continuous workshop sessions on the use of technology in EFL courses (Desjardins & Peters, 2007; Peters, 2006; Hong, 2010). Moreover, as the teacher trainers suggested, EFL authorities can test teachers' computer literacy levels prior to their employment in language teaching organizations. Definitely, EFL teachers should have certain levels of computer literacy to be able to teach in CALL courses.

Even though the majority of teacher trainers perceived that the EFL teachers needed training for the improvement of their computer literacy, there was not general consensus among them regarding including computer literacy training in mainstream teacher training courses. In order to include computer literacy training in mainstream teacher training courses, teacher trainers should strive to have high levels of computer literacy. Further, teacher training courses should include more sessions in order to train EFL teachers on their computer literacy. It appears that one serious barrier to computer literacy training **149**

in teacher training courses is that teacher training courses are under time limitations and there is no time to focus on teachers' computer literacy levels. The participants believed that the levels of Iranian EFL teachers' computer literacy were not that high. Furthermore, the teacher trainers pointed out that EFL teachers should have sufficient knowledge to use and language teaching software programs and Internet-based resources for their teaching. It is important to take these perceived technology-based skills into account and strive to improve them from time to time. Iranian EFL authorities are recommended to take EFL teachers' low computer literacy levels and required computer skills into consideration and pave the way for improving teachers' computer literacy levels.

Lastly, as teacher training programs can have a significant impact on EFL teachers' motivation for improving their computer literacy, it appears that further research should be undertaken to examine the issues related to teacher training and teachers' levels of computer literacy. Apparently, future research on computer literacy in EFL should explore factors which impede the inclusion of computer literacy training in mainstream teacher training programs as well as new computer literacy skills that teacher trainers and EFL teachers should acquire. Computer literacy is a context-based concept which may from context to context. Therefore, it is essential to define and investigate the components of computer literacy with regard to the specifications of each specific context and participants.

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