

# What we know about Computer Literacy in Education

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**Abstract:** *The purpose of this review of literature and studies is to gain insights on how to improve the level of computer literacy among teachers in the elementary school level. After an extensive review of available literature and studies, seven themes emerged reflecting the insights gained.*

**Keywords:** Literacy, Computer, Computer Literacy, Computer Education, Technology in Education, Technology, Information Communication Technology, ICT in Education, ICT

## 1. Introduction

This paper presents a comprehensive review of current global and local literature and studies to provide an understanding of what we know about computer literacy in education. The presentation of the insights from the reading is organized using a thematic approach. The identified and unifying themes are organized one after another and then synthesis is made that provides the grounds to launch this specific study, and its justification.

The themes are: teachers' negative attitudes toward computers prevent them from using ICT in their teaching; training for teachers to develop appropriate skills, knowledge, and attitudes to effectively use computers; lack of technical assistance as a major barrier to ICT use in education for teachers; shortage of computers is a serious repercussion on the potential use of ICT as an aid in the teaching process; senior teachers lack interest and knowledge to use computer technology, teachers do not take initiative to learn and ICT competence means that teachers are competent in three areas of technology proficiency, pedagogical compatibility, and social awareness.

### Teachers' Negative Attitudes Toward Computers Prevent them from Using ICT in their Teaching

The first is *teachers' negative attitudes toward computers prevent them from using ICT in their teaching*. Among the factors that affect the successful use of computers in the classroom are teachers' negative attitudes towards computers (Teo, 2008). One of the observed teacher's negative attitudes towards computer use are unwillingness to attempt the integration and acceptance and usage of technology in teaching and learning (Teo, 2008). Another observed negative attitude of teachers that prevent them from using ICT in their teaching is "lack of confidence" (Habibu, Mamun, & Clement, 2012). The other negative attitude of teachers that prevent them from using ICT in their teaching is "fear of failure" (Habibu et al., 2012). Another observation made about teachers' negative attitude is that they do not consider themselves well skilled in using ICT

and therefore feel anxious about using ICT in front of a class (Habibu et al., 2012).

### Training for Teachers to Develop Appropriate Skills, Knowledge, and Attitudes Is Not Enough

The second is *training for teachers to develop appropriate skills, knowledge, and attitudes are not enough*. One of the important ways to overcome barriers related to teachers' perceptions and attitudes towards ICT is the provision of training (Singhavi & Basargekar, 2019). According to Bingimlas (2009), some initial training is not enough needed for teachers to develop appropriate skills, knowledge, and attitudes regarding the effective use of computers to support learning by their students. He argued that this also requires the continuing provision of professional development to maintain appropriate skills and knowledge (Bingimlas, 2009).

The teachers did not receive any ICT training at the teachers' training colleges or universities where they trained and therefore, they did not get chances to understand the significant roles of the ICT tools (Raman & Yamat, 2014). Another related problem is that the training given about ICT is mostly for general knowledge and skills (Mulhim, 2014). Interviewed teachers state that the in-service training they received did not include generally ICT-based methods and approaches for teaching social studies (Mulhim, 2014). Within the scope of in-service training only general skills of using ICT equipment were emphasized, without relating them to teaching methods and content knowledge (Mulhim, 2014).

### Lack of Technical Assistance is a Major Barrier to ICT Use in Education for Teachers

The third is *lack of technical assistance as a major barrier to ICT use in education for teachers*. In the view of primary and secondary teachers, one of the top barriers to ICT use in education was lack of technical assistance (Bingimlas, 2009). According to Bingimlas (2009) without both good technical support in the classroom and whole-school resources, teachers cannot be expected to overcome the barriers preventing them from using ICT. Technical

problems were found to be a major barrier for teachers (Bingimlas, 2009). These technical barriers included waiting for websites to open, failing to connect to the Internet, printers not printing, the printing, malfunctioning computers, and teachers having to work on old computers (Ghavifekr, Kunjappan, Ramasamy, & Anthony 2016). Furthermore, Ashiono, Marunggi and Mwoma (2018) noted that lack of technical support frustrated teachers resulting in their unwillingness to use ICT in teaching.

#### **Shortage of Computers is a Serious Repercussion on the Potential Use of ICT as an Aid in the Teaching Process**

The fourth is *shortage of computers as a serious repercussion on the potential use of ICT as an aid in the teaching process*. It was found that some institutions support computer applications and provide trainings to their teachers but they remain unsuccessful because of shortage of computer availability (Hassan & Aziz, 2019). The shortage of computers and educational software may have serious repercussions on the potential use of ICT as an aid in the teaching process (Zyad, 2016). Inaccessibility or unavailability of ICT, a school-level barrier, has been identified as a key obstacle that impedes teachers from using it in teaching (Mulhim, 2014). A teacher may want to use more technology in their teaching process, but the school may not have the facilities (Aminullah, Loeneto, Vianty, 2019).

#### **Senior Teachers Lack Interest and Knowledge to Use Computer Technology**

The fifth is *senior teachers lack interest and knowledge to use computer technology*. According to Mazoya, Ismail, and Manyilizu (2015) found that age is in a positive relationship with the attitude towards technologies, where older teaching staff were more adoption prone than younger teaching staff. It was declared that younger teaching staff were found to have more positive attitudes towards the use of ICT (Mazoya, Ismail, & Manyilizu, 2015). Age factor also proved to be important because young teachers have the interest to use computer technology related to their subject but senior teachers have shown a lack of interest and knowledge. Sometimes students know more than their teachers about computers (Chuhan & Abbas 2018). They remain shy and careless about the use of technology in the class of foreign language learning (Chuhan & Abbas 2018). According to Raman and Yamat (2014), three teachers (25%) indicated that their age and teaching experiences were the barriers to adapt to the ICT integration into their lessons. The older teachers with more experience in teaching did not prefer to use ICT tools in their English classes Raman and Yamat (2014).

#### **Teachers Do Not Take Initiative to Learn and Improve ICT Competence**

The sixth is *teachers do not take initiative to learn and improve ICT competence*. It has been observed that the teachers were lacking in the knowledge and skills; and they were reluctant about the changes and incorporation of extra learning associated with computers into their teaching practices. Hence there is a problem of teachers' acceptance and adoption of ICT (Habibu, Mamun, & Clement, 2012). The teachers do not take any initiative to learn and improve their ICT competence (Raman & Yamat, 2014). The

teachers who do not have ICT competence could not integrate the ICT tools in their teaching (Raman & Yamat, 2014). Accordingly, teachers who do not use computers in classrooms claim that a "lack of skills" is a constraining factor preventing them from using ICT (Habibu, Mamun, & Clement, 2012). It was also found that teachers' lack of knowledge and skills in teaching was a serious obstacle of using ICT in technical and higher educational institutions (Habibu, Mamun, & Clement, 2012).

#### **ICT Competence Means that Teachers are Competent in Three Areas of Technology Proficiency, Pedagogical Compatibility, and Social Awareness**

The seventh is *ICT competence means that teachers are competent in three areas of technology proficiency, pedagogical compatibility, and social awareness*. According to Instefjord and Munthe, (2015) teachers' digital competence comprises three knowledge areas: technology proficiency, pedagogical compatibility, and social awareness.

Technology proficiency means effective adaptation to digital citizenship, future-oriented, having a more complex view of knowledge, embracing knowing, doing, and being will become an effective and responsible user of technology to the native level of proficiency (Sampa, 2017).

Pedagogical compatibility is the ability to redefine the teaching-learning experience, modify learning to improve upon traditional learning exercises, to serve as a direct tool for further functional improvements, and to use technology for a task that could be accomplished without technology that contributes to the design (Sampa, 2017).

Social Awareness is the state of being aware of having full electronic access in society, understanding electronic responsibility for action and deeds, possessing electronic precautions to guarantee safety, and ability to understand digital literacy in the process of teaching and learning (Sampa, 2017).

#### **Synthesis**

From this presentation of a comprehensive review of current global and local literature and studies about computer literacy in education, we have learned that the matter is complex, and more work is needed. Consideration up to be made on multiple aspects; teachers' attitudes toward computers; training for teachers; availability of computers; teachers' technical assistance; senior teachers' interest and knowledge to use computers; teachers' initiative to learn and ICT competencies; and that being ICT competent means having technology proficiency, pedagogical compatibility, and social awareness.

## **2. Recommendations**

Based on the insights presented in this study, the following are the basic recommendations to teachers for improving computer literacy as part of their lifelong learning.

- 1) Teachers must take initiative to learn and improve ICT competence technology proficiency, pedagogical compatibility, and social awareness. This can be

through self-learning using YouTube videos and other available resources.

- 2) Teachers must develop appropriate skills, knowledge, and attitudes of openness towards ICT. Skills and knowledge in the use of ICT resources and applications such as Microsoft package (Word, Excel, PowerPoint) and appropriate social media platforms and applications.
- 3) Teachers must seek computer technical assistance within and outside the schools. Fellow faculty members and some students can provide some technical assistance.

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