AN ANALYSIS OF THE INTEGRATION OF ICT IN EDUCATION FROM THE PERSPECTIVE OF TEACHERS’ ATTITUDES

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Abstract

With the advance of information and communication technology (ICT), people's everyday life, including education as its integral part, has been in a process of dramatic change. Numerous studies have indicated that ICT can improve education outcomes (Barak & Watted & Haick, 2016; Wang & Teng & Chen, 2015; Barrs, 2012; Blattner & Fiori, 2009). The impact of ICT on education can be manifested by the changes related to the teaching form, teaching environment, teaching content and teacher-student interaction, which greatly facilitate teaching and learning. Consequently, government and educational authorities from all over the world have invested a large amount of money into educational settings in the form of ICT aiming to transform traditional teaching. However, we have found out that in many schools and universities, classroom teaching is still dominated by traditional education characterized by textbooks, blackboards, chalk, and talk, as most teachers still do not use computer technologies in classroom teaching. Therefore, it is necessary to discuss the factors influencing this phenomenon so that the substantial funds allocated to education would be used efficiently.

Although there exists a general consensus on the existence of various kinds of factors leading to this phenomenon, the authors of this paper hold the view that teachers’ attitude towards ICT is the main factor affecting the infusion of ICT into instructional practice since, on the one hand, the teacher is the direct implementer of ICT and must play an important role in combining ICT and education. If teachers’ attitude towards ICT is negative, or put in other words, if teachers refuse to use ICT in classroom teaching, the integration of ICT in classroom teaching will come to naught, i.e. simple introducing of ICT does not guarantee its integration into the educational setting; on the other hand, teachers’ attitudes towards ICT will, to a considerable extent, influence students’ attitudes towards ICT. Therefore, this paper will discuss the integration of ICT in the educational setting from the perspective of teachers’ attitudes.

Based on this, the paper will analyze the factors that can affect teachers’ attitudes towards ICT. We divide the factors into two groups: extrinsic factors and intrinsic factors. The intrinsic factors are the so-called uncontrollable factors, including age, gender, teaching experience, school location, grade level of teaching, computer experience, etc; the extrinsic, also called controllable factors, include computer competence, computer training, computer anxiety, school or administration support, teachers’ theory of teaching, etc. By doing so, this paper aims to provide some insights for educators and educational policy-makers on how to construct strategies for minimizing the ill effects of ICT.

Keywords: teachers’ attitude; ICT; education, teaching.

1 INTRODUCTION

The twenty-first century has witnessed unprecedented development in information and communication technologies (ICT). New digital technologies keep emerging in our life every day in an endless stream. Nowadays, mobile phones, laptops, tablets, and multimedia players have become ubiquitously available. Information and communication technology (ICT) has penetrated most aspects of our everyday life and plays a vital role in our work, study, and life. Education, as an integral part of our life, has been undergoing the process of dramatic changes under the influence of ICT. Numerous studies have shown that ICT can make great contribution to the outcome of education (Barak & Watted & Haick, 2016; Wang & Teng & Chen, 2015; Barrs, 2012; Blattner & Fiori, 2009). The impact of ICT on education can be manifested by changes of teaching forms, teaching environments, teaching contents and teacher-student interactivity. With the increasing awareness of the importance of ICT in education, government and educational authorities from all over the world have invested a large amount of funds into educational settings in the form of ICT aiming to transform traditional teaching, even though the costs are high.
However, we have found out that at many schools and universities, classroom teaching is still dominated by traditional education characterized by textbooks, blackboards, and chalk and talk because most teachers still do not use computer technologies in classroom teaching, sometimes even when the subject they teach is closely related to computer science (Dostál et al, 2017). In many cases, computers were introduced into schools “not as a means, but as an end” (Young, 1991). Previous research on ICT and education mainly focused on the effects of ICT on students’ achievement. Studies on teachers’ attitudes towards ICT are few and far between. Recent studies have shown that teachers’ attitudes towards ICT are the primary determinant of successful integration of ICT in the instructional setting, as teachers are direct classroom practitioners who must play a prominent role in applying ICT into classroom teaching. Successful integration of ICT into education requires end-users’ positive attitudes. If teachers’ attitude towards ICT is negative, or put in other words, if teachers refuse to use ICT in classroom teaching, the integration of ICT into classroom teaching will come to naught; and furthermore, teachers’ attitudes towards ICT will, to a considerable extent, influence students’ attitudes towards ICT. Therefore, this paper will discuss the integration of ICT into the educational settings from the perspective of teachers’ attitudes.

In this paper, we will give answer to the following two questions:

1. What kinds of factors can influence teachers’ attitudes?
2. What steps can we take to change negative attitudes or to foster positive attitudes?

2 DEFINITION OF AN ATTITUDE

In psychology, an attitude is a psychological construct, it is a mental and emotional entity that inheres in, or characterizes a person (Richard, 2016). They are complex state acquired through experiences. It is an individual's predisposed state of mind regarding a value, and it is precipitated through a responsive expression toward a person, place, thing, or event (the attitude object) which in turn influences the individual's thought and action.

Gordon Allport (1935) defined an attitude as ‘a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related’.

Fishbein and Ajzen (1975) said an attitude can be described as a learned predisposition to respond in a consistently favorable and unfavorable manner with respect to a given object. According to Fishbein and Ajzen, attitude is typically viewed as a latent or underlying factor that is assumed to guide or influence behavior. The implication of this view is that attitudes are not identical with observed response consistency but can be inferred from an observed consistency in behavior. According to the theory of attitudes, there is a close relationship between attitudes and behaviors within human action. Stated specifically, the intention to perform a certain behavior precedes the actual behavior. This intention is known as behavioral intention, and comes as a result of a belief that performing a particular behavior will likely lead to a specific outcome.

Daniel Katz (1960) defines an attitude is the predisposition of an individual to evaluate some symbol or object or aspect of his world in a favorable or unfavorable manner. According to Katz, attitudes include both the effective and feeling core of liking or disliking, and the cognitive or belief elements, which describe and perceive the object of the attitude, its characteristics and its relationships to others objects.

3 CURRENT SITUATION OF INTEGRATING ICT INTO EDUCATION AND THE IMPORTANCE OF TEACHERS’ ATTITUDES

Although ICT policies have been carried out by educational authorities and governments for many years and substantial funds have been invested through technology into educational settings in order to transform the traditional teaching, we find out that most teachers neither use technology as an instructional delivery system nor integrate technology into their curriculum (Bauer & Kenton, 2005). The national survey conducted by the International Society for Technology in Education (ISTE) in the United States indicated that although ICT is available in schools, most teachers do not use technology in classroom teaching, nor do they work under master teachers and supervisors who can guide them in ICT use (ISTE, 1999). Another investigation conducted by the National Centre for Education Statistics (NCES) showed that although many educators and policy analysts consider educational
technology a vehicle for transforming education, relatively few teachers integrate educational technology into classroom instruction (NCES, 1999). The study by Naser Jamil AL-Zaidyeeen (2010) showed that ICT was only rarely used for educational purpose by teachers. Similarly, Weiss, Nelson, Boyd and Lludson (1989) cited in Borchess et al (1992) found out that only 5% of elementary teachers and 17% of secondary teachers reported that they felt well-prepared to use microcomputers as an instructional tool; conversely, over half of the science teachers at each grade level reported feeling totally or somewhat unprepared to use microcomputers. “There is substantial survey evidence that, almost three decades after the computer was first introduced in schools, it has not brought about a widespread revolution in methods of teaching or in school structure and organization” (Hativa & Lesgold, 1996). In many countries, the situation is quite similar (Albirini, 2006).

Despite the fact that there exists a general consensus on the existence of various kinds of factors leading to this phenomenon, we hold the view that teachers’ attitude towards ICT is the main factor affecting the infusion of ICT into instructional practice since, first of all, the teacher is the direct implementer of ICT who must play an important role in combining ICT and education. If teachers' attitude towards ICT is negative, or if teachers refuse to use ICT in classroom teaching, the integration of ICT in classroom teaching will break down. Many studies have indicated that teachers’ attitude plays a significant role in the successful integration of ICT into education. Technology availability is in most cases mistaken for technology adoption and use (Albirini, 2006). Teachers are the most important agents of change within the classroom area and the successful implementation of educational technologies depends largely on the attitudes of educators (Albirini, 2006). The study by Kim et al (2013) indicated that teachers' belief was significantly correlated with technology integration. Teachers’ belief or attitude can interfere with teachers’ technology integration even when computer software and hardware is available (Ertmer, 1999).

It is reasonable to say that simply introducing ICT in education does not guarantee its successful integration unless teachers and instructors have the computer competence and attitudes essential to integrate it into the classroom teaching, as technology itself cannot bring changes to education, and its impact on education can only take effect through the people who use it, especially the educators or instructors for teachers are the direct classroom practitioners who must play a prominent role in applying ICT into classroom. If teachers resist initiating any attempt of using ICT in classroom, the use of technological integration in the classroom is an empty talk. Attitudes are regarded as key factors in determining whether teachers are willing to adopt computer as a teaching tool in their teaching practices. Teachers with negative computer attitudes were less likely to accept and adapt computer technology in educational setting.

4 FACTORS INFLUENCING TEACHERS’ ATTITUDE TOWARDS ICT

Although it is important to identify that teachers’ attitudes determine integration of ICT into education, more important is to find out the factors that influence teachers’ attitude, as knowing about factors influencing teachers’ attitude can help us to take steps to change or foster desired attitudes. In this paper, we divide the factors into two groups: extrinsic factors and intrinsic factors. Intrinsic factors are generally less controllable factors, including age, gender, teaching experience, school location, etc; extrinsic factors are more controllable, including computer competence, training, school or administration support, teachers’ theory of teaching, etc.

4.1 Intrinsic Factors

4.1.1 Age

People of different ages may have different attitudes towards computer technologies. Different age means different experience. Nowadays the number and variety of computer technology is higher than ever. At many schools and universities many students are now required to take a computer course. Consequently, the younger generation has been exposed to more computer technology than the older generation, which helps them to gain more computer literacy. The more computer literacy and computer skills a person has, the more likely he or she is to use a computer. A study by Sahin-Kizil (2011) indicated that there was a negative correlation between the age and teachers’ attitudes towards ICT. Samak (2006) pointed out that young teachers are more inclined to use ICT than older teachers. These results are in line with a study by Isleem (2003) that indicated a negative predictive value in age.
4.1.2 Gender

There exists a widely held stereotype that men are better with computers than women, but this is not true. The truth is not the ability level, but actually the confidence level. Although young women are quite adept at using social media in their personal life, they are often less confident than young men in their own ability to use unknown computer applications (Shashaani & Khalili, 2001). The study by Sadik (2005) represented that male teachers expressed statistically more positive attitudes towards ICT than female teachers. Chen (1986), as cited in Busch (1995), found that men held more positive attitudes of interest in and confidence with computers, and had lower computer anxiety than women. Despite starting with less confidence, however, the authors have found no studies indicating that women are inherently less capable of learning to use the educational ICT applications, once this initial confidence barrier has been overcome. Women are more inclined to want to maintain a personal relationship with the students, and this would intuitively lead to a lower inclination to use ICT in the classroom, but this prejudice against ICT could be overcome by emphasizing that the teacher will have more time for one-to-one contact with each student if the ICT system could be used for the initial instruction program.

4.1.3 Teaching Experience

Teaching experience is a variable of the years of teaching service. Generally speaking, age is related to teaching experience. That is, elder teachers have more teaching experience than young teachers. As we have analyzed above, age is negatively related to computer use. It is arguable that senior teachers are less likely to use computer technology in classroom. The study by Samak (2006) indicated that teachers with less teaching experience had a more positive attitude towards ICT. Huang (2003), cited in Albirini (2006), found that senior teachers had less positive attitudes towards computers and were less willing to use them in their class than the less experienced fresh teachers did.

4.1.4 School Location

Different areas have various levels of general welfare and incomes of local people, which affects the amount of support from local people that can be given to the local school (Albirini, 2006). As schools need support from local government as well as local people, the more funds a school receives, the more computer technologies may teaching practice be equipped with. The lack of computer technology in teaching practice will definitely influence the use of computers among teachers and their attitudes towards computer technology.

4.2 Extrinsic Factors

4.2.1 Training

It is no doubt that computer training can help improve teachers’ computer competence. However, it is not infrequent to see that some teachers who are skilled at operating a computer nonetheless still do not know how to integrate ICT into authentic classroom teaching. So training should not only emphasize the level of technology but also the integrating of specific pedagogical applications into curriculum activities. A number of studies showed that training was a crucial way to foster the integration of ICT into education. Warschauer (2002) pointed out in his study that an Egyptian university lecturer told him that “we have the hardware, we have the software, but we lack the humanware.” The study by Samak (2006) indicated that the correlation between training and teachers’ attitudes towards ICT was positive, i.e. more training would lead to positive attitude towards ICT. Sadik (2005) indicated that trained teachers expressed statistically more positive attitudes toward ICT than non-trained teachers did. Lewis et al (1999) pointed out that a professional development program focused on training on a specific curriculum and subject area was important to build up teachers’ ability to teach effectively, including integrating technology into the grade or subject taught. As training is vital to the integration of ICT into education, more training should be given to teachers, especially the older generation, including in-service training and pre-service training via workshops, intensive courses, video-based, face-to-face based, or web-based case studies, etc., after computer software and hardware has been introduced into a school. Especially, educational authorities should place great emphasis on helping teachers to increase skills on how to integrate ICT into specific curricula or subjects except for how to use computer technology. When teachers are knowledgeable about how to integrate ICT into classroom to bring about better teaching outcomes, their attitude toward ICT in education will change. It is important that all teachers of a school be trained and
involved in the training because otherwise only the teachers who are already comfortable with ICT would volunteer for the training, and the teachers who need the training most would usually opt out of the program.

4.2.2 Computer Competence

Computer competence is an indicator of how a person has mastered computer literacy and the proficiency in using computer. High computer competence will benefit users’ self-efficacy in using a computer and reduce their anxiety of using computers. Self-efficacy will facilitate positive attitudes towards computer technology and anxiety will lead to less willingness to use computer technology. Gobbo and Girardi (2001) conducted a study of twenty-four teachers from Italy. The result indicated that competent teachers made greater use of ICT in their teaching than less competent teachers did. The study by Isleem (2003) indicated a strong positive correlation existed between computer competence and teachers’ attitudes towards ICT. Honey and Moeller (1990) found high-tech teachers adopt computer-based technologies in their classroom while low-tech teachers are reluctant to use information technologies. A person’s computer competence can be enhanced by computer training.

4.2.3 Teachers’ Personal Theories of Teaching

Teachers’ personal theories of teaching concern what teaching method a teacher adopts in his or her teaching practice. Teachers’ personal theories of teaching determine what to teach and how to teach in the classroom. If a teacher prefers student-cantered learning, ICT will be more easily integrated into classroom use. On the other hand, if the classroom teaching is still teacher-cantered, traditional teaching methods will be dominant. Honey and Moller (1990) interviewed twenty teachers from elementary, middle, and high schools. The study indicated that teachers who hold student-cantered belief tended to use computer-based technologies in their teaching practice; teachers whose belief is teacher-cantered are less likely to use computer technology in classroom. Teachers’ personal theories of teaching can be changed if they are offered more educational training. Where teachers have better understanding of how computer-based technology can benefit their teaching outcomes, with better results without a higher effort level on their part, their attitudes usually change.

4.2.4 School Support

School support must include a technician with installation, training, and maintenance skills. Any lack of such support will decrease teachers’ initiative in using computers. School support should also include activities that can help to foster teachers’ adoption of computer technology. A study by Becker & Riel (2000) suggested that the more frequent teachers were involved in informal substantive communication with other teachers at their school or other schools, the more likely they were to use computer in their teaching practice. It is suggested that schools should organize more professional activities in the form of seminars, workshops, and conferences to encourage professional interaction among teachers.

5 CONCLUSIONS

In this paper, we discuss the current situation of teachers’ attitudes towards ICT and the factors that influence teachers’ attitudes towards ICT in education. We divided the factors into extrinsic factors and intrinsic factors. Intrinsic factors are also called uncontrollable factors and extrinsic factors controllable factors. Through the analysis, we are informed that we can take measures to make an impact on the controllable factors to change teachers’ attitudes, such as providing more training and school support. It is necessary to point out that there still exist other factors, besides those discussed above, that also have an impact on teachers’ attitudes towards ICT. This paper has just outlined the main influential factors.

REFERENCES


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