

A review of the internal and external factors affecting teachers' ICT use in Classroom

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ABSTRACT

This paper is to review the internal and external factors that may prevent teachers from using ICT in classrooms for educational purposes. This review is based on a wide range of studies conducted in different contexts which help understanding whether those factors are common in those studies. To better understanding the hindering factors, the review begins with a highlight on the motivational factors that research found can affect teachers towards the usage of ICT in classroom. To conclude, this review stresses that all factors are intertwined and meaning that all factors need to be addressed if teachers' use of ICT to be effective in the educational process as it should be.

INTRODUCTION

In every country, the use of information and communication technology (ICT) has witnessed several barriers that affect its use by teachers in the real practice. This most likely, based on research, have resulted in the lack or even absence of the use of ICT in classrooms. However, some research only list barriers in one group, whilst others divide the factors into different groups. Such distinction is very useful to understand how every factor plays its role in the whole context. Therefore, this paper classified the hindering factors into two different categories, namely internal and external factors. However, it was necessary to briefly highlight the motivating factors before moving on to the barriers.

MOTIVATING FACTORS

Teachers seem to believe in the potential benefits for the educational process, but they still face challenges in the integration of ICT in their teaching in classrooms (Balanskat et al., 2006). For instance, despite the many initiatives considering the importance of ICT in the teaching and learning process, schools in Saudi Arabia still fail to integrate ICT into the educational process. Bingimlas (2009) interprets this failure as overweighting barriers compared to advantages. Therefore, there is a significant need to identify and determine ICT obstruction in schools as this is the first step towards change in ICT use in education. This review seeks to understand the issues affecting teachers' use of ICT in their classrooms. However, before addressing the factors that affect the use of ICT by

teachers in education, it is important to highlight some reasons why teachers use ICT in their teaching. Therefore, these reasons will be briefly presented below.

According to Altınay-Gazi & Altınay-Aksal (2017), the advantages that ICT offers for teachers in education include freedom and flexibility regarding what, how, where, and when to practice it in their teaching, and this is a motivating factor towards ICT use. In addition, teachers are motivated to use ICT in their classroom for the more interesting facilitation that ICT can offer during lesson instruction, resulting in more effective learning, such as making use of easy storage, speed, and fast movement among various resources (Roblyer & Edwards, 2000, and Beauchamp, 2012).

In their study of teachers' ICT use in education, Wasserman & Millgram (2005) state a number of reasons causing teachers to use ICT, such as the students' motivation, independent learning, strengthening low achieving students, and teachers' ability to apply different methods of teaching, thus expanding knowledge.

Baek et al. (2008) indicate a number of reasons for teachers to use ICT in their teaching, such as the social request for the necessity of teaching students with ICT; the benefits that ICT can offer teaching and learning process; and the comfort and ease ICT can offer teachers in terms of lesson preparation. Another significant motivating factor is related to both teachers' and students' access to massive online resources and thus the ability of sharing views and knowledge with other people, even communicating with them directly (Bhattacharya and Sharma, 2007).

HINDERING FACTORS

Literature has stressed that teachers' related hindering factors, especially personal ones, depend on the external factors or even the internal support factors. For example, according to Becta (2004) as soon as teachers are supported with appropriate ICT resource provision, effective professional development training and adequate time, their personal factors can improve. However, Becta (2004) found that both categories are interrelated when affecting teachers' ICT use.

Research shows a number of hindering factors in this regard. According to Ertmer (1999), these factors can fit within two central categories. The first group is related to *internal factors*, while the second category is linked to *external factors*. Factors related to the first category can be barriers related internally in school, such as attitudes of teachers and management, support of management and school related resources, teachers' time, and workload. External factors are those associated with barriers outside of the school as any support (technical, resources, strategies and policies, maintenance, training, continuing professional development programmes) coming from the educational authorities including the Ministry, and associated educational authorities.

Internal factors

One of the personal factors that affect teachers' use of ICT is related to teachers' culture. Culture can be related to language, belief, religion, etc. For example, concerning the huge differences between the use of educational electronic resources between Arab countries and the US and UK, Ahmad et al., (2007) provide a number of facts which make this distinction. They indicate that only 0.5% of people using the internet around the world are users living in Arab countries; and in terms of owning PCs there are only 20 of them for each 1000 people in Arab countries, whereas there are 200 PCs for each thousand people living in more-developed countries. They refer a number of reasons for this, such as the high cost of internet use imposed by governments in Arab countries, and in terms of personal reasons; culture is a factor because the use of internet is sometimes restricted to avoid aggression towards the country's values and traditions.

This is also confirmed in the Saudi study conducted by Alreem (2008) on female teachers where culture was one of the factors affecting teachers' ICT use. This study conducted on female teachers in the Eastern region of the Kingdom explored the challenges faced in regard to ICT usage, in particular, teachers lacked awareness of the significance of ICT in the educational process. For cultural and religious reasons, they avoided internet use completely so that they could guarantee never being mistakenly navigated to bad websites.

Another factor is related to lack of confidence, experience, motivation, and attitude. Hennessey et al. (2005, p.9), based on their review of various research, state a number of personal related factors that can be barriers to teachers' ICT use, such as lack of confidence, experience, motivation, and attitude. In contexts such as Arab states where ICT usage rates are lower, confidence and experience are likely to be low. According to the study conducted by Cox et al. (2003), reveals that teachers who have been motivated to use ICT were successfully able to accept this change and teach with the use of ICT, since they were confident of its educational benefits.

Teachers' positive attitudes toward the use of ICT is required if it is to be used in the teaching and learning process. According to Mumtaz (2000), when teachers' views toward ICT use in education are positive, they are more likely to apply ICT in their teaching, and even more learn to have ICT skills if they are not skilled yet. According to Ertmer (2005), a small number of teachers are not welcoming the use of ICT in their teaching although the available resources, including their related support, are increasingly provided. Therefore, he asserts that teachers themselves have the choice for deciding whether or not to use ICT in actual practice.

Ng & Gunstone (2003) explored teachers' attitudes toward the use of ICT in their teaching in a city in Australia. 79 questionnaires were returned to researchers and 22 teachers were interviewed. Although they found a large portion of the teachers had a positive attitude, they rarely used ICT in their teaching practice. This indicates that even if their perception in terms of the use of ICT is positive, there might be other factors to address that might affect their use of ICT.

Given the importance of attitudes, teachers' awareness of ICT in the teaching and learning process must be raised and nurtured during their training programmes. Attitudes of people towards any action can be affected by different factors such as their previous experiences, beliefs, values and their abilities and skills for practicing that action. This relationship is confirmed in the study by Usta & Korkmaz (2010). It is also supported in the study on 129 teachers in Finland and Serbia, where teachers' interest can be positive when their attitudes are also positive, which requires experience in terms of the use of technology (Haapasalo & Kadjevich, 2008).

In 2008, Holden et al. conducted a survey in USA to examine teachers' attitudes and use of ICT. It was found that teachers preferred to use the technology for lesson preparation rather than its explicit use in lessons. This could indicate a lack of confidence in using technology their students may be better acquainted with. Although it does show that teachers see the benefit of ICT for lesson planning. Moreover, before that in 2001, Sheunmaker et al. found that poor training opportunities accounted towards teachers' negative attitudes towards ICT use in education. A lack of support for ICT resources was found to contribute to the lack of ICT acceptance by secondary schools' teachers in Greece (Demetriadis & Barbas, 2003)

In a Saudi study conducted by Alshowaye (2002), participating teachers revealed that one of the issues affecting their ICT in classrooms is the load of the managerial job, which is not part of their work. Indeed, they revealed that, as a result of this, they do not have enough time to learn about ICT. In a more recent study, Alsulaimani (2012) aimed to find out what prevents teachers from using ICT in Saudi schools by using questionnaires sent to 309 teachers; 90% of teachers revealed the lack of time as a crucial factor, especially when committed to family affairs (Amoudi & Sulaymani, 2014).

Another issue is associated with the intensity of subject content as teachers are responsible for prioritising finishing and completing all the units of the subjects they teach. This, together with lack of time, creates difficulties in using ICT in the face of competing pressures. Teachers report that such factors prevent them from the use of ICT (Waite, 2004). Some studies (Becta, 2009; Jones, 2004; Ertmer et al., 1999; and Rogers, 2000) have found that teachers need more time in order to prepare lessons that apply ICT in the education process.

Teachers are also affected by the workload and other tasks that they are not responsible for; these tasks in school are related to the responsibility of school management. For example, allocation of extra classes impedes a teachers professional development (Mumtaz, 2000; Pelgrum, 2001). Solutions have included suggestions of giving teachers more time for training, and supplying teaching assistants, as well as professional incentives (Becta, 2009).

Lawless & Pellegrino (2007) indicates that many perceive unsuccessful ICT use in education as due to the lack of teachers' time. This is also supported in the findings of the Jordan report in 2012 where teachers were not happy being offered an ICT training programme after their working hours

without being rewarded for attendance (Ministry of Information and Communication Technology in Jordan, 2012). This is also supported by the American survey that was conducted on 47 teachers in one city in America, which explored those teachers' current usage of ICT. The teachers indicated time to be one of the major factors affecting their ICT usage in education (Holden et al., 2008).

Another barrier is related to students' access to ICT. The number of students benefiting from the advantages of ICT could be minimised if their schools' management restrict access to ICT resources within the school. As learning is the most important aspect in education where ICT can facilitate and support, the school management should assure that access to ICT is available for all students to benefit from. One of the reasons causing students learning to be at a low level is their non-use of ICT, as their head teachers do not allow it; and another reason over-crowded classrooms (Yesilyurt, 2006, cited in Yesilyurt and Celik, 2013).

External factors

The other category of hindering factors affecting teachers' ICT use in the process of teaching and learning is external factors.

In their Australian study, Dakich et al. (2008) aimed to reveal the barriers and facilitators of effective ICT use in primary schools via questionnaires distributed to 350 teachers in these schools. The finding of this study shows a number of barriers relating to support, such as the lack of appropriate ICT resource infrastructure, where ICT should be used, and lack of technical support.

One significant factor affecting teachers in relation to their use of ICT in education is educational and ICT policies. For example, an extensive analysis conducted by Kozma (2008) demonstrates how supportive ICT policy has positively affected ICT use by teachers in a number of countries.

One of the issues related to ICT policies in education is the lack of clarity when making statements. One common example of this is ICT policy including its aims and objectives but lacking the provision of details assisting and guiding the targeted people in how to use ICT. This is confirmed by (Blamire & Balanskat, 2005), who criticise ICT policy in UK education, as the policy regards computers as a tool which can be used for learning, however, the policy misses how this tool can be used. Another study before this by Watson (2001), related the failure of ICT in education compared to the success of ICT use in other sections of business around the world to particular issues; the main issue was related to the clarity of ICT policy made by governments, with the UK's ICT policy used as an example of this.

Since ICT Initiatives are a significant approach towards the development of ICT integration in the educational process, departments of education must pay attention to their policies development to avoid any problems may hinder the effective ICT integration in classrooms. Examples of that

include the ICT national framework of the education department in Australia, which aims to change the teaching and learning process effectively and prepare learners to be familiar with an ICT world environment in their future (Alhawiti, 2013). In particular, the framework takes into account a number of goals such as encouraging independent learning in and outside schools, enhancing students' achievement, keeping ICT capabilities developed and monitored, and ensuring technical and maintenance support for the process of learning and teaching.

ICT provision support is another external barrier affecting teachers' ICT integration. A lack of funding and a lack of ICT resources have been found to be inadequate in Saudi schools, hindering their successful integration (Alshowaye, 2002; Addandani, 2011; Shabat & Baneamah, 2009). Based on the findings published by Alshowaye (2002), it is reasonable to conclude that the degree to which ICTs resources are effective in classroom teaching is adversely affected by limited availability. In the following year, the comparative study conducted by Almohaisen (2003), which collected data from secondary schools in several countries (KSA, USA, Japan, and UK), arrived at the same conclusion. Furthermore, the author reported that it constitutes a key obstacle that many teachers have difficulties in overcoming, and concluded that limited resources availability is a comparatively severe concern in the KSA when considered in relation to the problem in other countries. In addition, since the Internet is a fundamental educational resource (Al-Obaid, 2002), an especially critical issue in Saudi schools is that of Internet access (Almosa, 2002). At the same time, the availability of relevant software is imperative when selecting ICT resources for educational environments, not least because of the motivational benefits they offer to both educators and learners (Wasserman & Millgram, 2005; Alsaif, 2006). As such, without software, teachers are hindered significantly in achieving their aims. This is to say, the literature is clear in demonstrating that even when computers are available in educational settings, a lack of relevant educational software and other ICT resources, including the Internet, detrimentally impacts the value computers can bring to the learning experience.

Languages in software is another connecting issue. For example, in Saudi Arabia where Arabic is its official language, most teachers in Saudi are not bilingual, and since their first language is Arabic, their ability to utilise software, which is primarily operable only if one speaks English to a high level of proficiency, is negatively affected (Al-Obaid, 2002; Alsaif, 2006). In this way, limited language skills have an adverse impact on the ability these teachers have to utilise software, even in the event that specialised educational software is available in the school. Consequently, the degree to which options are available for these teachers to employ computers without Arabic-language software is severely hindered.

Insufficient support provided to teachers is an additional obstacle hindering using of ICT in education. Topp et al. (1995) and Finger et al. (1999) demonstrated that an absence of ongoing technical and maintenance support of ICT in practice has a severely negative impact on the degree to which teachers are successful in their utilisation of technology with respect to student learning

outcomes. Failure to provide ICT support in classrooms was also identified as a major hindrance in Saudi schools in relevant studies such as (Al-Rashed (2002), Al-Alwani (2005).

Another piece of research from KSA conducted by Almosa (2002) revealed lack of technical support for ICT resources, the implication being that it is crucial to ensure that targeted forms of support are available. ICT resources always need to be technically supported, checked up and maintained. Teachers refer the lack of such support to be one of the factors affecting their use of ICT in classroom (Waite, 2004).

As already noted, one of the major issues that hinders teachers' use of ICT is related to the lack of training provided for teachers, which is an external factor leading to an internal problem. The Saudi study conducted by Alsahli (2012) on teachers in secondary schools in the Saudi Arabian city of Jeddah aims to explore the training features that secondary school teachers need. The study found that teachers lack both knowledge about ICT and how to use ICT, which reflects on the lack of training they have undertaken. Effective learning with ICT is likely to fail if students' teachers are not skilled enough in ICT and ICT pedagogy. Thus, as revealed by Blackmore et al. (2003), the first prerequisite for underpinning the successful ICT into education is teachers with high quality training. In particular, as highlighted by Ortega (2000) and Almosa (2002), training opportunities must be offered pre-service and in-service. Otherwise, as highlighted before, the lack of effective training might result in the rejection of ICT in education. In addition, because of the fast development of technology, teachers' awareness of new ICTs and their uses in education is significantly important. In this sense, the literature underlines the fact that the absence of ICT training for teachers contributes to the emergence of a knowledge gap (Guha, 2011). Therefore, as noted by Holden et al. (2008), the available studies emphasise the criticality of ongoing training not only for teachers but also for students. Alkanani (2012) investigates the issues and actual use of ICT in intermediate schools' teachers in a city of the southern region of the Kingdom of Saudi Arabia. The finding indicates that teachers rarely use ICT in their classrooms. He concludes that this failure of teachers' use of ICT is because of the inefficient training they receive.

CONCLUSION

To conclude this review, all of the discussed factors are interrelated, or may even be affected by each other (Becta, 2004). For example, Celik & Yesilyurt (2013) argue that teachers' attitudes towards ICT use in classrooms could be influenced by other barriers. Becta (2004) clarifies this, stating that as soon as teachers are supported with external factors, or organisational factors, (such as appropriate ICT resources provision, effective professional development training and adequate time), their personal factors can improve afterwards.

So, if ICT integration is to be successful, any affecting factors need to be determined and dealt with. Policy makers must recognise these barriers and address them in strategy so that the results of

overcoming such issues are reflected in education reform, policies, and teachers' professional programmes (Celik and Yesilyurt, 2013).

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