

Mobile Technologies for Training Teachers

Abdu Ahmed Al Nashrey

School of Education, Communication and Language Sciences, Newcastle University, England

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Abstract:

In order to analyse the use of mobile technologies in the training of teachers, I have reviewed nine articles based on the two themes of benefits and limitations. Qualitative, secondary data were collected from nine articles on the subject of training via mobile technologies. The data were analysed by conducting thematic analyses with the support of NVivo 12. The results of these analyses showed that there are many benefits to the use of mobile technologies by teachers: convenience, engagement, collaboration, communication and interaction. However, many limitations were also demonstrated, such as poor internet connection and the lack of resources and participants in mobile training. This study suggests further research should be conducted in relation to the lack of training on the use of mobile technologies, such as iPads, iPods and mobile phones as the use of mobile training would enable lifelong training at any time and in any location.

Keywords: Mobile training, mobile technologies, mobile learning and training.

I. INTRODUCTION

As technology has developed dramatically, education has mushroomed. Teachers must follow this revolution by using modern technology in their teaching and including materials and tools for the creation of knowledge, such as software and hardware. Mobile technologies are a part of the advanced technologies that intelligently allow for information extraction with an internet connection.

This paper is a literature review regarding the use of mobile technologies to train teachers and improve their teaching skills, focusing on the benefits and limitations. I discuss the gap in the research on the use of mobile technologies to assist teachers, in particular, those who teach chemistry in secondary schools in Saudi Arabia. Teachers need training that is more accessible, rather than having to travel from city to city, and technology has the capability to provide access to any information that students and teachers need to know. A benefit of mobile training is defined as the advantages that mobile technologies present to teachers for training purposes. A limitation is defined as a restriction that researchers cannot control during the study. The systematic review attempts to answer the following questions:

- 1- What are the benefits of using mobile technologies to train teachers?
- 2- What are the limitations of using mobile technologies to train teachers?

II. DESIGN OF THE STUDY

The process of the systematic review was as follows: 1) define the research questions, 2) conduct the literature review, 3) collect data and 4) conduct analysis. Data were organised in a systematic manner to obtain knowledge about the limitations and benefits of implementing mobile technologies in the training of teachers. The nine articles, which concentrate on implementing mobile technologies to train teachers, were gathered from website *Google Scholar*. A systematic review is defined as gathering studies for providing evidence, based on education. Positivism is the paradigm to organise thinking about research [1].

III. SYSTEMATIC REVIEW

Table.1 shows that many more benefits were found than limitations in the systematic review. Four of the nine articles agree that engagement attracts trainees with texting, chatting and sharing voice calls and videos [2], [3], [4], [5]. Collaboration is the other benefit that has been gathered in mobile

training through the use of many tools, such as social media [2], [6], [7], and [8]. Seven articles mentioned that mobile technologies are convenience [2], [4], [5] [6], [9], [7], [8]. Five of those studies mentioned that mobile technologies are easier to use. On another word sample of training through mobile technologies [3], [4], [8], [9], [10]. Three of the nine articles mentioned that mobile training enhances communication between trainees with better quality and more effective connection [4], [7], [9]. In the same context, three of those articles founded that mobile training saves time [4], [8], and [10]. Other benefits were mentioned separately, such as interaction and feeling. Reference [8] indicated that interaction between trainees form one hand and between them with platform and blackboard through mobile technologies. Reference [7] showed that trainees have strong feelings about using mobile technologies in their class lessons.

Regarding the limitations of mobile technologies, one of them is limited data, as reference [6] mentioned. Only six megabytes of data were received and sent without any payment but the trainees paid for any calls they made. Reference [8] encountered mobile phones' limitations, specifically small screens, poor sound quality, insufficient memory and weak internet connection. In the same context, weak Wi-Fi connections and intermittent disconnections limited usage. Reference [7] added that using a mobile phone for watching a video limited the users to only watching the video once due to the price of data. Reference [10] gathered the data via observation and the limitation in this study was that it used only mobile devices between participants that had wireless access to the network. Reference [5] discussed many limitations related to the weakness of knowledge contained in the design of apps that covered only 36 of the over one hundred atoms in the periodic table and that did not illustrate the conditions for chemical reactions between atoms to produce compounds.

2	Engagement Collaboration Convenience Sample	Few Participation Technological Devices
3	Engagement	Weak Of Content Knowledge
4	Engagement Communication Confidence Convenience Sample Time	Lack of training
5	Engagement Convenience	Understanding Lack of visualization Weak Of Content Knowledge
6	Collaboration Confidence	Technological Devices Time consumption
7	Collaboration Communication Confidence Convenience Feeling	Weak of Internet
8	Collaboration Convenience Sample Interaction Time	Weak of Internet Lack of resources Lack of visualization Technological Devices
9	Communication Confidence Convenience Sample	Weak of Internet Lack of resources Technological Devices
10	Convenience Sample Time	Weak Of Content Knowledge

Table 1. Systematic review

IV. COLLECT DATA

Secondary data is the method of data collection from nine articles that are numbered from one to nine to make it easier for review. Consequently,

The study	Benefits	Limitation
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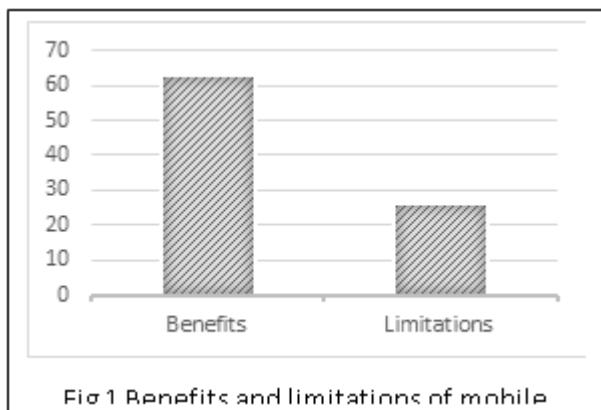
thematic analysis gathered data in two themes – the benefits of mobile training and the limitations of using mobile technologies in training. NVivo 12 is a system used to collect qualitative data for analysis. Two themes were created using two nodes in NVivo 12. Only the data that this review focuses on (the benefits and limitations of the use of mobile technologies to train teachers) were analysed. For three months, a systematic review was conducted deductively on the two themes but all of them were organised in NVivo 12.

V. DATA ANALYSIS

Computers assisted in analysing data using NVivo 12, which organised the data into two themes and then many sub-themes. Overall, 63 benefits were gathered from the articles, and 26 limitations.

VI. RESULTS

Figure 1 compares the benefits and limitations and shows that the use of mobile technologies to train teachers has more benefits than limitations.



A. BENEFITS

The study concludes the nine benefits of using mobile technologies to train teachers. These are split into nine categories:

- 1- Convenience: seven of the nine articles mentioned that teachers take the opportunity with mobile training to conduct experiments without any dangerous equipment, such as checking the reactions of toxic elements.
- 1- Ease: five of the nine articles concluded that mobile technologies are easier to use due to

their portability and accessibility. A platform for training is available for teachers to use. In addition, it is easier to obtain feedback from any member of the group using mobile technologies.

- 2- Time saved: using mobile technologies can save time rather than travelling from city to city.
- 3- Engagement: mobile training provides engagement between trainees with texting and chatting, such as mobile augmented reality (MAR).
- 4- Collaboration: trainees collaborate in an e-environment, as reference [6] concluded, and through the use of a 'virtual learning environment' (VLE) they share knowledge [2]
- 5- Confidence: mobile training builds confidence and information technology (IT) skills between teachers or learners.
- 6- Communication: trainees effectively communicate in a digital environment without any restriction or bias with the improvement in the quality of communication. In addition, mobile technologies help teachers to connect between themselves and others.
- 7- Interaction: mobile devices can stimulate interaction between peers.
- 8- Feeling: mobile technologies promote a strong feeling for trainees to use mobile technologies in their future careers.

B. LIMITATIONS

- 1- The limited function of technological devices: many devices have poor audio function, limited memory and low battery power.
- 2- A weakness of content knowledge: many sites and platforms present weak content.
- 3- Internet connection: many areas, such as rural areas, have poor internet connection and subscription prices are expensive.

- 4- Lack of visualisation: mobile devices have small screens and weak cameras.
- 5- Lack of resources: lack of documents and training support in mobile technologies.
- 6- Lack of understanding: many concepts, such as MAR are not understood.
- 7- Lack of participants in mobile training.
- 8- Increased time: to mentor participants during training with mobile technologies devices is time-consuming.

VII. DISCUSSION

Despite the benefits of mobile training, there are limitations that discourage the implementation of mobile technologies in training. On the one hand, the most controversial argument concludes that technologies in training save time to train online [4]. On the other hand, reference [6] reports that mobile technologies take more time to design. The other argument is confidence. Reference [2] are concerned with teachers' lack of confidence when they use technology for training and learning because there is a lack of ICT teachers' knowledge in the classroom. However, four of the studies refute confidence as a limitation in their studies [3],[4], [6] [7] as there are two kinds of communication and connection – synchronous and asynchronous, rather than online and offline. According to these studies, no method of training has yet been found that is able to be implemented at any time and in any location.

VIII. CONCLUSION

In the nine articles reviewed in this report, people who use mobile technologies for training purposes need to be more conscious of the limitations. Due to their portability, mobile technologies are used to easily build a bridge between users and information at any time, in any location through synchronous and asynchronous learning. Many limitations were observed in the literature review, one of them regarding teachers' criteria, such as confidence and skills. The second was the design of mobile phones, including screen size, quality of sound and limited battery charge. Furthermore, many applications and

platforms have weaknesses in knowledge and content. However, despite the limitations of using mobile technologies to train teachers, many benefits are gained, such as time saved and reduced travelling for trainees. In summary, there is a lack of studies in the use of mobile technologies to train secondary school teachers, especially those who are teaching in Saudi Arabia. Furthermore, nothing seems to have been found so far with regard to training that can be accessed at any time and in any location.

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