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Mobile-based assessment: Investigating the factors that influence behavioral intention to use



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ABSTRACT

Acceptance and intention to use mobile learning is a topic of growing interest in the field of education. Although there is a considerable amount of studies investigating mobile learning acceptance, little research exists that investigates the driving factors that influence students' intention to use mobile technologies for assessment purposes. The aim of this study is to provide empirical evidence on the acceptance of Mobile-Based Assessment (MBA), the assessment delivered through mobile devices and technologies. The proposed model, Mobile-Based Assessment Acceptance Model (MBAAM) is based on the Technology Acceptance Model (TAM). MBAAM extends TAM in the context of MBA by adding to the Perceived Ease of Use and Perceived Usefulness, the constructs of Facilitating Conditions, Social Influence, Mobile Device Anxiety, Personal Innovativeness, Mobile-Self-Efficacy, Perceived Trust, Content, Cognitive Feedback, User Interface and Perceived Ubiquity Value and investigates their impact on the Behavioral Intention to Use MBA. 145 students from a European senior-level secondary school experienced a series of mobile-based assessments for a three-week period. Structured equation modeling was used to analyze quantitative survey data. According to the results, MBAAM explains and predicts approximately 47% of the variance of Behavioral Intention to Use Mobile-Based Assessment. The study provides a better understanding towards developing mobile-based assessments that support learners, enhance learning experience and promote learning, taking advantage of the distinguished features that mobile devices may offer. Implications are discussed within the wider context of mobile learning acceptance research.

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1. Introduction

The rapid growth of mobile and wireless technologies resulted in an increasing use of mobile devices in education. This trend opens new opportunities to mobile learning and assessment. Research provides evidence that mobile devices have become a learning tool with a great potential in education (Sung, Chang, & Liu, 2016).

However, effective implementation of any information system depends on user acceptance (Davis, 1989). The acceptance and adoption of mobile learning is a topic of growing interest in the field of education and it is still evolving (Briz-Ponce, Pereira, Carvalho, Juanes-Méndez, & García-Peñalvo, 2016; Cheon, Lee, Crooks, & Song, 2012; Liu, Han, & Li, 2010). Many

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scholars have investigated the acceptance of mobile learning from the students' perspective (Abu-Al-Aish & Love, 2013; Mac Callum, Jeffrey, & Kinshuk, 2014; Park, Nam, & Cha, 2012) and teachers' perspective (Uzunboyly & Ozdamli, 2011) as well. Research also exists about the acceptance of computer-based assessment (Terzis & Economides, 2011). However, to the best of our knowledge, no study exists to provide evidence regarding the driving factors contributing to the acceptance and intention to use Mobile-Based Assessment (MBA), the assessment that is delivered with the use of mobile devices and wireless technologies. MBA related research have been focusing so far only on students' perceptions and attitudes in general and not specifically on acceptance issues and intention to use. Moreover, even users' perceptions about MBA are still inconsistent (Bennett, Dawson, Bearman, Molloy, & Boud, 2017); there are several unresolved issues relating to usability (Cheon et al., 2012; Huff, 2015) and user perspectives (Wang et al., 2009). Since there is a gap in the literature regarding the acceptance of Mobile-Based Assessment, the current study is aiming at filling this gap by providing empirical about the factors that affect students' intention to use MBA. The spinning off knowledge and experience about MBA acceptance can be essential for education professionals to design, implement and deliver more engaged and effective mobile-based assessments.

The organization of the study is as follows. The next section provides a literature review. The review first draws on mobile learning and mobile-based assessment, then introduces the Technology Acceptance Model and continues by considering the more limited studies focusing on the acceptance of mobile learning and mobile-based assessment. After explaining the rationale for investigating MBA acceptance, the study presents the research model with the hypotheses to be tested. Methodology section (participants, instruments and procedure) follows with the data analysis and results section to come afterwards. Discussions and conclusions for the impact in education follow along with the limitations of the study and future work.

2. Literature review

2.1. Mobile learning

Mobile learning is an emerging trend in education. In the definition of mobile learning by Kukulska-Hulme (2005), learners are able to engage in educational activities without being tied to a tightly-delimited physical location. There is a growing body of literature about developing mobile learning systems to assist students in learning and also highlighting the positive impact of mobile learning on learners' performance (Wu et al., 2012). According to the UNESCO Policy Guidelines for Mobile Learning (West & Vosloo, 2013), mobile learning provides numerous benefits to education: it facilitates personalized learning, supports situated and context-aware learning, enhances seamless learning, bridges formal and informal learning and improves communication and collaboration among members of the learning communities. Due to the technological affordances of mobile devices (Sharples, Taylor, & Vavoula, 2007), their utilization in education opens up new windows of opportunities both in learning and assessment.

2.2. Mobile – based assessment

Mobile-Based Assessment (MBA) is a relatively new mode of assessment that is delivered through wireless technologies and mobile devices. MBA, much like paper-based or computer-based assessment, gathers and reviews empirical data about student learning in order to evaluate students, the learning process itself or both, aiming at improve learning. Furthermore, mobile technologies provide new and enhanced functionalities and opportunities to assess learning. Mobile learning and assessment spans from curriculum-led classroom instruction to informal highly mobile learning on the move (Sharples, 2013). There are many successful implementations of mobile-based assessments inside the classroom boundaries replacing paper-based or web-based tests (Romero, Ventura, & De Bra, 2009). Mobile devices replace computer labs needed for computerized assessments, with the quizzes to be administered using a web browser on students' handheld devices, offering this way a cost saving solution. Mobile devices replace clicker technologies for classroom polling (Stowell, 2015; Sun, 2014). Assessments can be blended into learning management systems (Bogdanovic, Barac, Jovanic, Popovic, & Radenkovic, 2013) or Massive Online Open Courses (MOOCs) (Dahlstrom, Brooks, Grajek, & Reeves, 2015) and can easily be accessed through mobiles. Also, mobile devices can support ubiquitous and seamless learning and assessment outside the classroom boundaries. With the use of Radio Frequency Identification (Chu, Hwang, Tsai, & Tseng, 2010), geo-location features (Santos, Pérez-Sanagustín, Hernández-Leo, & Blat, 2011) or QR-coding technology (Nikou & Economides, 2015a, 2016), mobile devices facilitate student assessment in authentic contexts (Chao, Lan, Kinshuk, Chang, & Sung, 2014; Miyasawa & Ueno, 2013), providing at the same time appropriate learning guidance in situ (Hwang, & Chang, 2011). Beyond high-stakes summative testing (Arthur, Doverspike, Muñoz, Taylor, & Carr, 2014), mobile devices can support a wide range of different assessment types such as self- and peer-assessment (Chen, 2010), formative assessment (Hwang, & Chang, 2011), performance-based (Campbell & Main, 2014) and competency-based assessments (Coulby, Hennessey, Davie, & Fuller, 2010), providing immediate, adaptive and personalized feedback (Triantafillou, Georgiadou, & Economides, 2008). Mobile devices have the potential to assess competences related to real-world tasks as well as higher-level skills, the so-called 21st century skills, such as problem-solving, creativity and collaboration. The majority of the aforementioned studies about using mobile technology for assessment report positive student experiences, increased learning interest and improved learning outcomes (Nikou & Economides, 2013; Wu et al., 2012).

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