



Investigating the influence of the most commonly used external variables of TAM on students' Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) of e-portfolios



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ARTICLE INFO

Article history:

Received 10 December 2015

Received in revised form

28 April 2016

Accepted 5 May 2016

Keywords:

E-portfolios

E-learning

Technology adoption

Technology Acceptance Model

ABSTRACT

Engagement with e-portfolios has been shown to improve students' learning. However, what influences students to accept e-portfolios is a question that needs careful study. The purpose of this study is to investigate the influence of Self-Efficacy, Subjective Norm, Enjoyment, Computer Anxiety and Experience on students' Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) of an e-portfolio system and their Behavioural Intention (BI) to use the system for learning. To do this, the study tested and used the General Extended Technology Acceptance Model for E-Learning (GETAMEL) in the context of e-portfolios. Valid data were collected from 242 UK undergraduate students who had been introduced to e-portfolios. The data set was analysed using SPSS software. Results showed that the best predictor of student's Perceived Ease of Use of the e-portfolio is Experience, followed by Enjoyment, Self-Efficacy and Subjective Norm. The best predictor of student's Perceived Usefulness of the e-portfolio is Perceived Ease of Use followed by Enjoyment. Both Perceived Ease of Use and Perceived Usefulness predict student's Behavioural Intention to Use the e-portfolio. The findings improve understanding regarding acceptance of e-portfolio systems and this work is therefore of particular interest to researchers, developers and practitioners of e-portfolios.

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1. Introduction

Computers and the Internet has unavoidably changed the way in which people work, communicate, shop and learn. Education in particular has benefited greatly from these new technologies. Being economical, flexible and accessible without constraints of time and distance, technologies such as electronic learning (e-learning) systems are becoming increasingly relevant in Higher Education (Lin, Lu & Liu, 2013). An e-learning system is defined by Lee, Hsieh and Ma (2011, p. 355) as "an information system that can integrate a wide variety of instructional material (via audio, video, and text mediums) conveyed through e-mail, live chat sessions, online discussions, forums, quizzes and assignments". E-learning systems such as Moodle and Blackboard have become an important part of delivering the modern university curriculum (Lin, Persada & Nadlifatin, 2014; Paechter, Maier & Macher, 2010, p. 222, p. 457),

supporting teaching and learning in higher education through delivering information and instructions to learners via the Internet (Lee, Hsieh & Chen, 2013, p. 173).

Alongside these e-learning systems, e-portfolios are becoming popular and used in universities to support students' learning (Kahn, 2014, p. 4; Tzeng & Chen, 2012, p. 163).

1.1. E-portfolios

E-portfolios evolved from paper-based student portfolios in the mid-1980s (Lorenzo & Ittelson, 2005, p. 3) and have attracted significant interest from educators (Chen, Chang, Chen, Huang & Chen, 2012; Gerbic, Lewis & Northover, 2009). An e-portfolio is defined as "a collection of digital artefacts that demonstrates what a person knows and can do. It is used in academic assessment, career planning, and for documenting and demonstrating students' learning and growth over time" (Xuesong, Olfman & Firpo, 2011, p. 1).

The Dearing Report (Dearing, 1997) and the Leitch Report (Leitch, 2006) are the two leading reports after which e-portfolio gained value in UK higher education. These reports emphasised the

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need to facilitate extended learning experiences for students, through personal development, and to provide students with a platform to record their skills and achievements for accreditation and job applications. This led to a significant increase in interest in e-portfolios amongst higher education institutions in terms of providing a platform for students to engage with their personal development, and to support their graduate employability. Now many universities use e-portfolio systems, and it is predicted that most educational institutions will use them in the near future (Gerbic et al., 2009, p. 327; Tzeng & Chen, 2012, p. 163).

1.1.1. Benefit of e-portfolio use in education

Abrami and Barrett (2005) categorised e-portfolios into three main types: progress, showcase and assessment. The purpose of a progress e-portfolio is to demonstrate a student's learning and growth over a period of time (Beresford & Cobham, 2010; Xuesong et al., 2011), enabling learners to see their own progress clearly, and identify areas where they need to develop. It also provides visible and tangible evidence of how students are progressing, allowing others to monitor student learning and provide feedback accordingly (Driessen, 2008, p. 9). The purpose of a showcase e-portfolio is to present a student's competencies and achievements, assisting students with academic accreditation and job applications (Papp, 2014). The purpose of an assessment e-portfolio is to evaluate student's achievements. It emphasises the process of change or development, at multiple points in time. Assessment e-portfolios are particularly useful in evaluating programmes that have flexible or individualised goals or outcomes, as it allows for the possibility of assessing complex and difficult-to-understand constructs that are often impossible in conventional assessments (McDonald, 2012, p. 345). These different types of e-portfolios can be combined together to facilitate student learning and personal development.

If e-portfolios are accepted and used by students they can have many positive impacts on their learning, including the following:

E-portfolios facilitate self-directed learning through critical reflection.

E-portfolios persuade students to reflect on their learning needs, errors, interests, challenges and goals so that they can improve and correct them accordingly (Wade, Abrami, & Slater, 2005). They encourage learners to think critically and become active, independent and self-regulated learners (McDonald, 2012; Meyer, Abrami, Wade, Aslan, & Deault, 2010, p. 85, p. 337).

E-portfolios enable communication and feedback anytime/anywhere between the e-portfolio users and those who have access to the e-portfolio.

E-portfolios provide remote access and therefore overcome the time-space limitations (Hwang, Tsai, Yu & Lin, 2011, p. 247), allowing students to share their work with others such as peers, teachers, parents and employers remotely and asynchronously via the internet (Papp, 2014; Wade et al., 2005). E-portfolios can therefore facilitate a student-centred and personalised approach to learning in a connected world (Beresford & Cobham, 2011, p. 273).

E-portfolios provide an effective means of storing, organising and showcasing evidence of learning.

E-portfolios enable students to digitally produce a more enriched learning experience (Lopez-Fernandez & Rodriguez-Illera, 2009, p. 609), giving e-portfolio users the power to integrate multimedia materials such as images, videos and sounds (Meyer et al., 2010, p. 84). This is very important, as it allows students to better demonstrate the process and evidence of their learning and achievement (Quynh, 2012, p. 54).

E-portfolios can demonstrate a student's learning and growth over time.

(Barrett, 2005; Beresford & Cobham, 2010, p. 2; Xuesong et al., 2011, p. 1, p. 2). They provide visible and tangible evidence of

how students are progressing and allow others to monitor, discuss and assess student learning (Driessen, 2008, p. 9).

E-portfolios are considered an important tool for student learning and personal development (Hsieh, Chen & Hung, 2015, p. 838; Joint Information Systems Committee, 2008), for professional development in vocational higher education (Lim, Lee, & Jia, 2016; Winberg and Pallitt, 2016) and for student assessments (Buyarski & Landis, 2014; Contreras-Higuera, Martinez-Olmo, Rubio-Hurtado & Vila-Banos, 2016). Studies such as Attwell (2007), Barrett and Garrett (2009), Meyer et al. (2010), Posey et al. (2015) and Trevitt, Macduff and Steed (2014) also have shown that positive benefits can be derived from the use of e-portfolios in education both as multimedia containers and as tools to support learning and personal development. E-portfolios enable students to become independent, self-directed and reflective learners (Beresford & Cobham, 2011; Meyer et al., 2010, p. 85, p. 273), and therefore it is important that universities understand how e-portfolios may be of value.

1.2. The purpose of the study

Because of the potential advantages of e-portfolios, e-portfolio implementation in higher education is growing (Gerbic et al., 2009, p. 327; Tzeng & Chen, 2012, p. 163). The increase in the use of e-portfolios in education has raised the importance of e-portfolio acceptance issues. E-portfolio systems cannot enhance student learning and development if students do not accept they should use the systems (Tosh, Light, Fleming & Haywood, 2005). Current literature on e-portfolios has mainly focused on the potential benefit of e-portfolios in education (Attwell, 2007; Barrett & Garrett, 2009; Becta, 2007; Lim et al., 2016; Meyer et al., 2010; Wakimoto & Lewis, 2014), which helps with understanding the importance of e-portfolios for teaching and learning. However, little current literature studies the factors that affect undergraduate student acceptance or rejection of e-portfolios. To ensure e-portfolios are effective teaching and learning tools in education, they need to be accepted by students. More investigation is therefore required to both identify and better understand the factors that affect student acceptance or rejection of e-portfolios.

The purpose of this study is to investigate the factors that might influence students' Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) of e-portfolios and their Behavioural Intention to Use (BI) e-portfolios for learning and personal development.

Based on 107 e-learning adoption studies Abdullah and Ward (2016) have developed a General Extended Technology Acceptance Model for E-Learning (GETAMEL), which hypothesises relationship between the most commonly used external variables (Self-Efficacy, Subjective Norm, Enjoyment, Computer Anxiety and Experience) of Technology Acceptance Model (TAM) and PEOU and PU of e-learning. This study validates and uses the GETAMEL to identify the relationships between the most commonly used external variables of TAM and PEOU and PU of e-portfolios. It adopts a positivist approach in testing the research hypotheses, using a deductive survey-based research approach (testing hypotheses) and quantitative methods of statistical analysis to support or reject the hypothesised links between the factors. The study involved a survey of existing questions, distributed to 292 undergraduate students who had been introduced to the e-portfolio. Valid data collected from 242 students (205 males and 37 females) were examined using Structural Equation Modelling (SEM) within SPSS.

In summary, this study uses the GETAMEL to investigate the relationships between the external variables and students' PEOU and PU of e-portfolios to identify what external variables should be considered in enhancing undergraduate students' e-portfolio adoption.

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