

ASSESSING E-PORTFOLIO ACCEPTABILITY IN AN ONLINE COURSE

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Abstract

E-portfolios play an important role in the success of online courses in higher education. They help universities to provide a more effective and efficient teaching-learning process by enabling students to track their skills and proceed towards their future career goals. In view of the rapid expansion of e-portfolios in French universities, a challenging problem arises regarding its acceptance and use by higher education students, particularly in the context of online courses. Indeed, using new technology can be considered as a process that implies the evolution of judgment over time. To address this gap, the present study has two objectives. First, it explores the key factors of acceptability (before use) and acceptance (after first use) of the e-portfolio Karuta according to the literature and the Unified Theory of Acceptance and Use of Technology (UTAUT). Second, it aims to generate appropriate assumptions and validate research instruments for a new experiment (e.g., questions, items). This is a quantitative and qualitative survey with a descriptive scope. Data were collected from 10 Master students in pedagogical and digital engineering at Aix-Marseille University, France. The research instrument is a questionnaire consisting of open and closed-end questions including: 41 items using a 7 points Likert Scale, which covers Self-Regulated Online Learning (SRSOL), UTAUT's factors and the perceived enjoyment variable administered before and after use; 2 open questions to gather more explanations from participants about their reasons to continue to (or not to) use the e-portfolio in the future; and 1 question about their feelings regarding the reflexive activity implemented when they completed or used the e-portfolio within the Karuta tool. The results showed that students seem to have the intention to continue to use the e-portfolio as part of their learning process. Besides, it appears that performance expectancy, effort expectancy, social influence predict behavioral intention to use and to continue to use the e-portfolio.

Keywords: *E-Portfolio, acceptability, acceptance, UTAUT, higher education, self-regulated learning.*

1. Introduction

E-portfolios have deeply infiltrated the field of education and are broadly used in higher education institutions to support students' learning (Kahn, 2014). Their benefits include: comprehensive performance assessment, taking advantage of technological developments, professional development, performance improvement, and stimulating creativity and innovation (Mahasneh, 2020; Mailles Viard Metz and Alberne Giordan, 2010). Still, the integration of new technologies into the teaching-learning process raises considerable challenges concerning objectivity and effectiveness in assessing learners' skills. This study explores the factors explaining the acceptance of the e-portfolio Karuta in the context of an online Master's degree in Pedagogical Engineering at Aix Marseille University (AMU), in France.

1.1. State of the art

1.1.1. Reflexivity and e-portfolio. An e-portfolio can be defined as “a collection of digital artifacts that demonstrates what a person knows and can do.” (Zhang et al., 2011, p. 1). It provides an effective way to store, organize, and showcase evidence of students' learning and achievement over time (Abdullah et al., 2016). E-portfolios have become increasingly important in higher education following a paradigm shift regarding the traditional student-teacher relationship. Students take on a central role as new autonomous actors, capable of determining their own objectives where teachers are present to accompany and support them (Boutin, 2004). For students, e-portfolios can be beneficial since they facilitate self-regulated learning through critical reflection by encouraging them to stimulate critical thinking and become independent. Educators use e-portfolios as tools for documenting students' educational performance, promoting their professional development, and encouraging them to think reflexively (Alajmi, 2019).

1.1.2. Self-Regulated Learning (SRL) as a key to success in higher online education. SRL refers to how learners set goals for themselves and then modulate their cognitive and motivational processes and the contextual factors to achieve said goals (Pintrich, 2004). Effective SRL is essential in online education where the responsibility of the learning process is fully transferred to the learner. Online SRL is theorized to consist of four specific features: Control of the learning context (time management and environmental control strategies), Procrastination (conflicts of priorities regarding responsibilities from work and personal life), Learning strategies (unlimited access to the pedagogical content can make essential strategies such as note-taking seem unnecessary) and Seeking peer support (isolation related to the asynchronous nature of online courses can affect students' motivation and thus learning achievement) (Cosnefroy et al., 2020).

1.1.3. E-Portfolios' acceptability to support SRL and Reflexivity. Given the potential advantages of e-portfolios, their implementation, use, and acceptance by higher education learners reveal vigorous challenges. In fact, most studies have focused on the benefits of e-portfolios to improve the quality of the learning-teaching process (e.g., Lim et al., 2016; Wakimoto & Lewis, 2014) but only few studies have considered the factors that affect students' acceptance and rejection of e-portfolios. For instance, Abdullah et al. (2016) have extended the Technology Acceptance Model (TAM) to assess undergraduate students' behavioral intention to use e-portfolios for learning. Results indicate that behavioral intention depends on both Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). Shroff et al. (2011) examined students' behavioral intention to use an e-portfolio system based on the TAM model. Results showed that students' PEOU had a significant effect on their attitude towards usage. Subsequently, PEOU had the strongest significant effect on PU. In this sense, there is a need to carefully design e-portfolios to meet students' preferences, intentions, and purposes. Involving users at an early stage of the design to identify the acceptability factors should be a common step in the developmental process of implementing an e-portfolio.

To identify and explain the factors that affect the acceptability and acceptance of new technology, several theories and models have been developed (e.g., TAM, Model of PC Utilization, etc.). Among these theories and models, current research has focused on the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003) because it integrates several concepts derived from eight models and theories of behavior to explain the intention to use technology. Furthermore, it explains about 70% of the variance in the behavioral intention to use technology and about 50% of the variance in technology use. The UTAUT states that behavioral intention depends on performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). Overall, the UTAUT model has received empirical support by predicting technology acceptance and use in different contexts and by different users (Venkatesh et al., 2016).

1.2. Research questions and assumptions

E-portfolios are recognized tools to promote students' ability to actively and autonomously engage in their learning process. Their acceptability and acceptance is subjected to the evolution of personal judgment over time (Martin et al., 2016). In other words, the use of e-portfolios as evaluation tools promotes SRL and the development of SRL should have an impact on the acceptance of the e-portfolio. The aim of this paper is then to present a preparatory analysis to generate appropriate assumptions and validate research instruments (e.g., questions, items) for a subsequent experiment analyzing the link between these two aspects. The current study explores the key factors of acceptability (before use) and acceptance (after first use) of the e-portfolio Karuta according to the UTAUT (Venkatesh et al., 2003) in fonction of online Master students' reflexive use of the e-portfolio and their level of SRL (Cosnefroy et al., 2020). The feedback generated by this study will be taken into account to better implement the use of the e-portfolio among AMU students.

2. Materials and method

AMUs Pedagogical Engineering Master (curriculum and evaluation processes) has been designed following a competency-based approach where portfolios are considered great tools to assess students' acquisition of skills (Tardif, 2006). The nature of the master's degree and the wish of the university to implement the e-portfolio Karuta on a large scale for all students in the following years create a great opportunity to assess student's expert opinion on the subject.

2.1. Participants

10 out of 12 online master's students in pedagogical engineering completed all phases of this exploratory study. 5 identify as female and 5 as male.

2.2. Material

Karuta is an Open Source Portfolio developed by ePortfolium and Karuta Community. For the course “Getting to know the Pedagogical Engineer profession”, master students were required to have a reflexive practice on the use of Karuta. By using the e-portfolio to give an account of their skills, students were able to get familiar with the portfolio as an evaluation tool to later analyze its utility, usefulness, and limits.

The **Self-Regulation Scale of Online Learning (SRSOL)** is a 7-point Likert type scale consisting of 24 items divided equally into four subscales: Control of learning context (CTXT), Procrastination (PROC), Learning strategies (STRAT), and Seeking peer support (PAIRS). The Index of Self-Regulated Online Learning (ISROL) can be calculated after reversing the procrastination score (PROC(r)). $ISROL = \text{Mean}(PROC(r), CTXT, STRAT, PAIRS)$ (Cosnefroy et al., 2020).

The **Unified Theory of Acceptance and Use of Technology (UTAUT)** is a 7-point Likert-type scale measuring factors determining behavioral intention to use new technology. The questionnaire consists of 5 scales: The performance expectancy (PE) 4-items scale (e.g., I would find Karuta useful in my learning (before use), I found Karuta useful in my learning (after use)). The effort expectancy (EE) 4-items scale (e.g. Learning to operate Karuta would be easy to me (before use)...). The social influence (IS) 3-items scale (e.g., Professors who influence my behavior think I should use Karuta (before use), ...). The perceived enjoyment (PENJ) 3-items scale (e.g., Using Karuta would be fun (before use), ...). And, the behavioral intention (BI) 3-items scale (e.g., I intend to use Karuta in the future (before use), ...). (Venkatesh et al., 2003, 2016).

Additional open questions: For the post-test, our team designed 4 questions to have complementary information on the use of Karuta and the reflexive practice. For example: “Do you plan to repeat this reflexive activity with Karuta even though it is not required for the validation of the next semesters?”.

2.3. Tasks and protocol

The experiment was organized in three phases: pre-test (t1), use of the e-portfolio (t2), and post-test (t3). In the first phase, students had 4 days to complete 2 questionnaires on online SRL, and their intention to use new technology (t1). Then, they had 4 weeks to watch an explanatory video on the use of Karuta and to complete their e-portfolios (t2). Finally, 10 days after submitting their e-portfolios, students had 4 days to complete again the SRL survey, an “after use” version of the intention to use (keep using) new technology questionnaire, plus 4 additional open questions to assess students' opinion on Karuta and their reflexive practice (t3). All participants completed the entirety of the tasks on their personal computers.

Completion of Karuta: Students were asked to use 3 main functionalities of the e-portfolio: Listing the skills they acquired, uploading traces of their development, and answering reflexive questions about the Integrative Evaluative Situation (IES) that assessed their level of competency. For example, for the IES “Designing an e-portfolio”, participants listed “Supporting the implementation of digital education and innovation” as an acquired skill, uploaded evidence such as a “Typology of evaluation practices” and answered 3 reflexive questions (e.g., “What resources do you lack to achieve the competency addressed by this IES? If you had to do it all over again, what would you change?”).

3. Results

We conducted a descriptive analysis to assess students' SRL and Karuta's acceptance before (t1) and after use (t3). Regarding the SRSOL, students believe to have a better control of their learning context over time (CTXT: 6 items, $M(t1)=29.4$, $SD(t1)=3.89$; $M(t3)=34.8$, $SD(t3)=6.00$) and they give more importance to seeking peer support (PAIRS: 6 items, ($M(t1) =24.2$, $SD(t1)=9.04$; $M(t3)=28.3$, $SD(t3)=8.56$). Their views on learning strategies and procrastination remain mostly constant (STRAT: 6 items, $M(t1)=27.6$, $SD(t1)=6.96$; $M(t3)=28.3$, $SD(t3)=8.07$, and PROC(r): 6 items, $M(t1)=30.2$, $SD(t1) =7.64$; $M(t3)=30.5$, $SD(t3)=6.88$). Regarding the UTAUT, students perception of Karuta as useful, enjoyable and easy to use decreased after use (PE: 4 items, $M(t1)=18.4$, $SD(t1)=5.99$; $M(t3)=16.1$, $SD(t3)=6.28$, PNJ: 3 items, $M(t1)=13.1$, $SD(t1)=4.68$; $M(t3)=10.5$, $SD(t3)=5.08$, and EE: 4 items, $M(t1)=21.7$, $SD(t1)=5.31$; $M(t3)=18.3$, $SD(t3)=6.15$). Students gave more importance to the mandatory aspect of completing Karuta overtime based on their teacher's opinion (IS: (3 items, $M(t1)=15.5$, $SD(t1)=3.37$; $M(t3)=17.9$, $SD(t3)=3.03$). In general, students' intention to use Karuta decreased in comparison with t1 (BI: 3 items, $M(t1)=17.6$, $SD(t1)=3.78M(t3)=14.2$, $SD(t3)=5.69$). To examine the differences between t1 and t3, we applied paired t-tests and wilcoxon signed rank because the normality assumptions were not satisfied (Hyde, 2000). Results indicate that the only significant ($p<0.05$) evolution regarded IS (increased) and BI (decreased).

The number of participants in this study was too low to perform any generalizable statistical tests. To counterbalance this, we analyzed not only the available quantitative data but also the answers to the open questions and participants' answers to the reflexive questions on IES. Qualitative data (83 coded quotes) was then interpreted through a predominantly inductive thematic analysis (Braun & Clark, 2012). Participant's answers were organized into 4 main themes: Reflexivity on usability (47% of the data, referring to students' thoughts on how something is able or fit to be used), Reflexivity on utility (30%, enclosing student's thoughts on Karuta's state of being useful, profitable, or beneficial), Reflexivity on reflexivity (14,5%, students reflexion on their own reflexive practice through the use of the e-portfolio) and Reflexivity on learning strategies (8,5%, student's description of their learning practices). These 4 themes may be rearranged into 6 sub-themes including Academics (25% of the data, referring to students' thoughts on academic framework, regulation, and coherence), Karuta's functionality (24%, the reasons and ways to use or not use Karuta), Required effort (24%, the costs of completing the portfolio), User Interface (12%, remarks on Karuta's template as suitable or unsuitable), Support (8,5%, usefulness of support tools or lacks of it), and Opinion about Karuta (6%, personal judgment formed about the e-portfolio Karuta). Based on this double categorization, we calculated which combination of themes and subthemes appeared the most through de data and got the 3 most noticeable nods: Reflexivity on utility and Karuta's functionality (15,5 %), compiling data about student's understanding of Karuta's utility in function of their benefit. For example, "The portfolio activity allowed me to rethink about the expected skills and to make the link between the work that's actually done, the notions studied during the master and the grid of skills seen at the beginning of the courses (and that we tend to put aside.)". Reflexivity on Karuta's usability and Requested effort (14,5%): putting into perspective the correlation between ease of use and actual use of a device. This node mainly evokes the important workload of completing the eportfolio and how time-consuming it may be, one student even refers to it as a "work factory". Reflexivity on usability and User interface (12%), refers to the important link between e-portfolios' layout and components, and students' actual use. From this, we report the fact that various students see Karuta as "incomplete", meaning that they would like to see other functionalities, particularly being to export Karuta's content as a compatible file in the form of a Curriculum Vitae, for example.

4. Discussion

The findings of our preliminary study shed light on the importance of e-portfolios as tools to promote learning and document professional skills in an online education context. Based on the results, students seem to believe that the use of Karuta is beneficial and they understand the importance of a reflexive practice. Abdullah et al. (2016) pointed out a significant relationship between perceived utility and behavioral intention to use e-portfolios. Furthermore, students tend to use Karuta, because it's easy to understand how to use it. These findings are consistent with Abdullah et al. (2016) who suggest that behavioral intention to use an e-portfolio depends on perceived ease of use. Results also indicated that students use Karuta because its use is mandatory in their training. In this sense, students' behavioral intention to use Karuta may be affected by the beliefs of the educational staff (whose opinion is crucial for students) regarding the benefits of e-portfolios (Venkatesh et al., 2003). To go further into this issue, the answers to the open questions can help better understand students' intentions. One student points out that he intends to continue using Karuta during the master's program but he's "more uncertain about its use after the master" because "for the moment Karuta doesn't seem adapted to fulfill" his attents (exporting the e-portfolio and personalizing it). This example shows that judgment on Karuta's utility and usefulness can evolve over time and influence the intention to continue to use it.

Indeed, results also showed that the use of Karuta influenced initial representations with negative judgment for some factors (e.g., PE, EE, PENJ, BI). In this line, (Martin et al., 2016) highlighted that it is crucial to understand factors that lead to the interruption of use. The answers to the open questions and the IES can bring some clues to this topic. As reported by Buckley et al. (2012), students using portfolios often struggle with its realization, the amount of work needed to do it is quite important. It is suggested that the portfolio's completion is carried into teachers' and students' everyday practice so it's not redundant. The use of the portfolio shouldn't be reduced to a single moment at the end of the semester where students need to revisit everything they've done and learned so far. For students to benefit from the reflexive practice, it's important to have time to understand what they're doing and adjust if necessary.

5. Limits and future research

The main limit of this study is the limited sample size (< 30n). From a statistical point of view, no generalizable results were achieved, results were therefore solely interpreted as tendencies. Nevertheless, students' feedback (considered expert because of their field of education) will be taken into account to modify Karuta's current template to better suit the specific needs of AMU.

The direction of the results encourages us to do a confirmatory study with a representative sample size to investigate the relationship between the evolution of SRL and the acceptance of Karuta. As for the method, this preparatory study allowed us to validate our materials and protocol. It also highlighted the benefits of assessing qualitative information, this kind of data allows us to not only study the evolution of students' perception and behavior but the reasons that could explain these tendencies.

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