Raising engagement and motivation through gamified e-portfolio in Kolej Profesional MARA (KPM), Malaysia: A Preliminary Survey

Monisa Abdul Wahab, and Mike Joy

Department of Computer Science, University of Warwick,
Coventry, CV4 7AL, United Kingdom
{M.Abdul-Wahab,M.S.Joy}@warwick.ac.uk

Abstract. The gamification of e-portfolio is an educational approach to motivate students to learn by using game elements in online portfolios. The goal is to increase enjoyment and engagement through capturing the interest of learners and encouraging them to continue learning. This preliminary survey is important to better understand the intended users in a Malaysian institution, find out their readiness, and identify the infrastructure and facilities currently in place. The work in progress investigates students' demographics information, students' current styles in organizing their learning material, their prior experience with portfolio creation and development, their prior experience in using game applications and their current knowledge of 'gamification'. The outcome of this survey shows that there are currently acceptable levels of current infrastructure and facilities provided at the institution with a satisfactory knowledge of portfolios and game elements. However, there is an interesting misconception of what 'gamification' is from the student's perspectives.

Keywords: e-portfolio, higher education, gamification, gamified e-portfolio, user engagement, motivation.

1 Introduction

Majlis Amanah Rakyat (MARA), or the Council of Trust for the People is an autonomous body under the purview of the Ministry of Rural and Regional Development in Malaysia. The Council is responsible for facilitating economic and social development in the federation, particularly in rural areas. MARA can be divided into four main sectors: Entrepreneurship, Education, Management Services, and Investment. The Higher Education Division (HED) – one of five within the MARA Education Sector – is responsible for controlling, planning and supervising the activities carried out by the Ministry of Education (MOE) and four HE institutions including Kolej Profesional MARA (KPM). KPM, previously known as Institut Perdagangan MARA (IPM), has been established since May 1977, and now has six campuses in Beranang (KPMB), Bandar Melaka (KPMBM), Indera Mahkota (KPMIM), Seri Iskandar (KPMSI), Bandar Penawar (KPMBP), and Ayer Molek

(KPMAM), which are currently populated with young adults aged 17-26. Each of the colleges offers a range of different courses from preparatory level to diploma level.

The e-portfolio is an emerging technology solution for assessing student achievement and showcasing learning evidence that gives significant benefits to the students and educators. However, e-portfolios suffer from user engagement issues. To engage users in the application is a challenging task for many education institutions and there is still no specific solution which has been identified to solve the problems. Continuous user engagement is important to ensure the success of the e-portfolio implementation.

Computer games have long been known for their success in modeling behavior and engaging users. Despite the disadvantages of using computer games in classrooms, such as ineffective use, losing focus on the content, causing addiction, too much time spent playing computer games, and time required for playing games being educationally inappropriate [1], players seem to like the game-based approach to learning and find it motivating and engaging [2]. Games put learners in the role of decision-maker, pushing them through ever-harder challenges while engaging them in experimenting with different ways of learning and thinking [3]. Following the success stories of user engagement in computer games, educators and researchers are still trying to explore ways to engage users by trying to integrate game elements in education and learning [4, 5]. 'Gamification' is the use of game mechanics and game design techniques, such as the awarding of points, rewards or other incentives, in non-game contexts, in order to change behavior [6, 7], and gamification has been used as a tool to increase engagement in e-learning platforms [8], however integration of game mechanics in e-learning needs further exploration.

A difference between a developed country such as the United Kingdom (UK), and a developing country such as Malaysia, is the degree to which people have access to computers and the Internet. In developing countries, access to desktop or laptop computers and to the Internet is limited while in western countries these are considered as primary ICT devices and services. For example, in 2013, only 65.1% of households in Malaysia had computers compared to 88.2% in the UK, and only 64.7% of Malaysian households had Internet access compared to 88.4% in the UK [9]. Hence, it is important to identify, quantify, and evaluate the level of technical background of KPM students to ensure the success of the e-portfolio implementation.

2 Methodology

The framework for gathering the research data was a mixed mode, based on the use of online questionnaires carried out in two phases (preliminary survey and post survey) for quantitative data, and supported with qualitative data in the form of comments and interviews. This paper reports the outcome of the first phase of the research work.

This preliminary survey has been conducted at three KPM colleges: KPMB, KPMIM, and KPMBM. These findings are based on online pre-survey of 174 students from these colleges aged 17 to 26 enrolled in three different courses: Higher National Diploma in Computing (Software Development) (HND SD), Diploma in Computer Networking (DCN), and Diploma in Entrepreneurship (DEn). The survey

was conducted in autumn 2014, and the questions were prepared in both English and Malay languages in order to ensure all respondents would understand the questions.

3 Main Findings

In this section, the demographics of the participants are summarized, followed by subsections focusing on students' current styles in archiving and organizing their learning material, their prior experiences with portfolio creation and development, their prior experiences in using technology, games, gamification and their perceptions towards game elements in e-portfolios.

3.1 Demographics

A total of 174 respondents aged between 17 and 26 participated in the online pre-survey. The mean age value is 19.42 and the standard deviation is 1.407.

There are more male students (67%) than female students (33%) in the target population. A suitable approach that takes gender distribution into account may be used. Interesting results from previous research regarding effects of video games has identified that video games are liked more and played more by males than by females [10], therefore it might be interesting to find out the results of gamified e-portfolios for this particular target group.

Table 1. Internet usage duration, frequency, and internet skills satisfaction

Items	**In percentage (%), n=174**		
	KPMB (n=29)	**KPMIM (n=126)**	**KPMBM (n=19)**
How long have you been using the Internet?			
Less than 6 months	3.45	3.17	5.26
6 months to less than 1 year	0	0	5.26
1 year to less than 3 years	6.90	10.32	15.79
3 years to less than 5 years	0	31.75	21.05
5 years and more	89.66	54.76	52.63
How often do you use the Internet?			
Occasionally	3.45	8.73	5.26
Monthly	0	2.38	5.26
Weekly	3.45	6.35	0
Daily	93.10	82.54	89.47
How satisfied are you with your internet skills?			
Very satisfied - I can do everything that I want to do	24.14	27.78	63.16
Satisfied - I can do most of the things that I want to do	51.72	54.76	31.58
Neither satisfied nor unsatisfied	20.69	13.49	0
Unsatisfied - I can't do many things that I want to do	3.45	3.97	0
Very unsatisfied - I can't do most of the things that I want to do	0	0	5.26

In Table 1, we see that most of the students have been using the Internet for 5 years and more and use it daily. This suggests that they are very comfortable with the Internet service and there would not be a problem to introduce an e-portfolio application to these students. This is to be expected because younger generation unsurprisingly shaped by technology. Hence, an e-portfolio application can be beneficial for them.

For Internet skills satisfaction, the majority of the students said that they are satisfied and very satisfied with their Internet skills. These students are very confident of their Internet skills which give a good indicator to the researcher.

The top three used devices to access the Internet are smartphones (35.4%), followed by laptops (34.2%) and desktop computers (22.5%). Thus, more than 60% of the used devices are mobile devices (smart phones and laptops). This shows that students prefer using mobile devices to access the Internet compared to fixed terminals.

The distribution of locations where students usually access the Internet shows that most of the students usually access the Internet from home (49.4%) and college (44.9%). Only a small number of students access the Internet from public terminals and cyber cafés (5.86%).

More than half of the students said their Internet speed changes from time to time (77%), with a range of connections some of which drop frequently, some of which are reliable. The majority of the students rate their Internet connection speed as acceptable, which indicates the Internet service provided by the college is acceptably good.

Most of the students pay for themselves (59%), which reflect the students' affordance to pay the Internet fee. Otherwise, the Internet services would be paid by their parents (33%) followed by school (7%) and others (1%).

75% of the students agree that their current Internet service does not restrict the way they use the Internet while more than half of the students (62%) agree that their Internet connection speed ranges from acceptable to excellent level. This means the students do have good Internet services supported by the acceptable infrastructure for Internet services at home and at the colleges.

The target users are comfortable using computers and have good Internet skills and experience. Furthermore, they have acceptable Internet connections and do access the Internet regularly.

3.2 Student's current style in archiving and organizing their learning materials

Most students regard their learning materials as important, and 97% keep their learning materials either in general or selectively. There is no significant difference between keeping any materials or just selected materials which suggest that all materials are valuable to the students. 91% of the students admitted that they keep their learning materials properly (in a file).

Nearly all of the students (95%) like to refer to their previous work in order to complete new tasks and 92% like to keep their learning materials for future use.

However, 80% of the students reported that some of their artefacts have gone missing. This shows that a paper based evidence were hard to save.

Most of the students do share (93%), like to share (87%), and like their friends to share (90%), their learning materials. The majority of the students also like to receive feedback on their completed work (94%). Most of the students (61%) like to receive feedback from their peers and lecturers compared to peers only (36%), lecturers only (14%) or family only (2%). This shows students trust their lecturers and friends to give feedback on their completed work and value the feedback highly.

3.3 Prior experiences with e-portfolios

Table 2. Prior knowledge and experience of e-portfolios

No.	Item	Student Response (%)		
		Yes	Yes - through given text	No
1	I have already heard of the "e-portfolio" concept	58.05	-	41.95
2	I already know what "e-portfolio" means	15.52	52.3	32.18
3	I already know what should be included in an e-portfolio	13.22	51.72	35.06
4	I have already had a paper-based portfolio of my learning	45.98	-	54.02

Roughly half of the students know what an e-portfolio is (Table 2) because nearly half of the students already have a paper-based portfolio of their learning experiences. 58% of the students who already have a paper-based portfolio spend at least 1 hour daily updating their portfolio.

Many students update their portfolio daily (38%) while 21% update weekly, 19% monthly, and 23% less than monthly, suggesting that students try to keep their portfolios up-to-date.

In Figure 1, the profile page is the most selected content that they like to be included in an e-portfolio followed by resume, coursework, work experience, other skills, and multimedia materials, each of which selected after the profile page. Other than that, autobiography, extra-curricular, second language, and recommendations are also considered important as e-portfolio content. The least selected content are awards, notification of last update, link to social networking sites, link to other systems, link to a personal blog, and notification of inactivity.

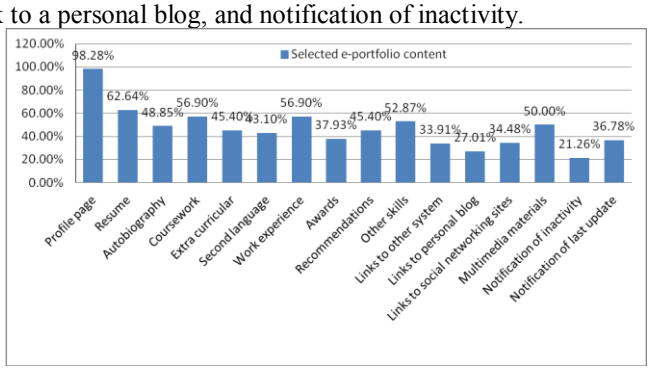

Fig. 1. Preferred e-portfolio content

3.4 Prior experiences in technology, games, and gamification

A significant number of students think the Internet and computers play a vital role in teaching and learning and in completing their assignments. 88% of the students like to play computer games, and this show the students are comfortable with game play elements and applications. However, there is a misconception of what a game is and what gamification is from the students' point of view because more than half of the students think that games are the same as gamification. Nearly half of the students said they already heard of gamification in education and half of the students said they know what game elements and game dynamics are. This tells us that the students don't really understand the differences between games and gamification, and this would be interesting to explore further.

Table 3. Perception and prior experiences of games and gamification

No.	Item	Student Response (%)	
		Yes	No
1	Do you think that Internet plays a vital role in teaching and learning process?	99.43	0.57
2	Do you think computers play important role in completing assignment?	99.43	0.57
3	Do you like to play computer games?	87.93	12.07
4	I spend more than 1 hour daily playing computer games.	62.64	37.36
5	I have already heard of "gamification" concept	50.57	49.43
6	I think that games is the same as gamification	68.97	31.03
7	I have already heard of gamification in education	47.7	52.3
8	I know what game elements and game dynamics are	55.75	44.25

In Figure 2, the preferred features to be included in e-portfolios are points followed by feedback, status, and levels. Badges, notification of current status/ranking, and levels are equal while bonuses, progression maps, and notifications of inactivity are the least selected features. Many students like receiving points because it shows their level of achievement and motivates them to collect more. It would be more motivating if the points can be changed to a voucher or coupon or to something beneficial to the students like extra marks.

4 Discussion and Conclusion

This preliminary study was conducted in order to get the KPM students' perception of the implementation of e-portfolios and understanding the target users' requirements for e-portfolio content and functions. The prospective users of the e-portfolio application (KPM students) were expected to have a hint of what are portfolios, e-portfolios, and gamification in education. The students were encouraged to give suggestions of what should be included in an e-portfolio, and what game-like features that they want to be included in a gamified e-portfolio.

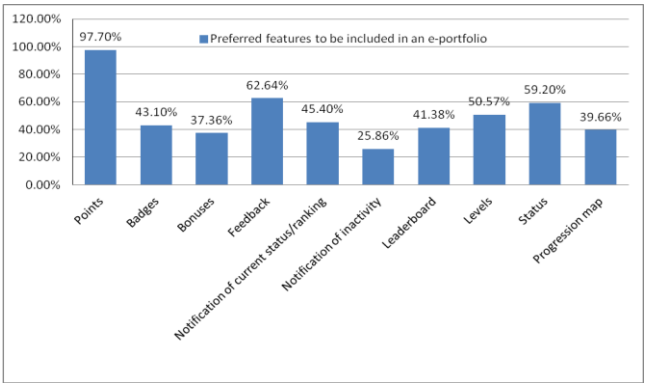

Fig. 2. Preferred features to be included in an e-portfolio

From the results gained through the pre-survey, we can learn about KPM students' demographics information (Section 3.1). Some of the significant results show that KPM is currently populated with generation Z, and gender distribution shows a majority of male students. This information will help in identifying suitable e-portfolio features. If a gamified e-portfolio would be implemented in these colleges, it would be an advantage because previous research has proven males are more likely to be attracted to a game-like application [11]. For the current status of students' computer skills, Internet skills, devices used to access the Internet and current Internet services status, we can see no visible constraints for the students in these areas because currently, they have a quite good infrastructure and Internet/computer skills.

From the students' current learning styles in archiving and organising their learning materials (Section 3.2), this pre-survey show that most of the students keep their learning materials appropriately, like to share them, like to receive feedback on them, and like their friends to share their learning materials with them. The main point to consider from the result in this section is that the majority of the students have experienced missing file and previous work. So an e-portfolio would be a solution for them to keep them safe and available when they need it.

Section 3.3 shows that, half of the students have prior experience and knowledge with portfolios and e-portfolios. For e-portfolio content preferences, the profile page is the most preferred content while other items have the same level of importance to students with a slight difference in numbers.

Section 3.4 shows students do perceive the Internet as an important technology in the teaching and learning process as well as computers. Other findings in this section are that many students like to play computer games, which reflect the male and female distribution and preferences at the beginning of the survey. Half of the students know what gamification is. Half of the students also have a misconception of games which they perceive is the same as gamification. About half of the students also knew what game elements and game dynamics are. This shows a partial understanding of games and gamification.

The result of this pre-survey confirmed the assumptions of the researcher that the students are likely to use the e-portfolio application if it is available without major constraints in terms of existing infrastructure and available facilities in each of the

colleges to be worried about. Furthermore, the students' current computer and Internet skills are sufficient.

References

1. Bakar, A., Inal, Y., Cagiltay, K.: Use of Commercial Games for Educational Purposes: Will Today's Teacher Candidates Use them in the Future? World Conference on Educational Multimedia, Hypermedia and Telecommunications 2006. 2006, 1757–1762 (2006).
2. Connolly, T.M., Boyle, E. a., MacArthur, E., Hainey, T., Boyle, J.M.: A systematic literature review of empirical evidence on computer games and serious games. Computers & Education. 59, 661–686 (2012).
3. Kim, B., Park, H., Baek, Y.: Not just fun, but serious strategies: Using meta-cognitive strategies in game-based learning. Computers & Education. 52, 800–810 (2009).
4. Silva, E. (2016). *Gamifying Learning – Enzo Silva blog*. [online] Enzosilva.com. Available at: http://enzosilva.com/blog/2010/10/14/gamifying-learning/ [Accessed 1 Jul. 2016].
5. Simões, J., Redondo, R.D., Vilas, A.F.: A social gamification framework for a K-6 learning platform. Computers in Human Behavior. 29, 345–353 (2013).
6. Domínguez, A., Saenz-de-Navarrete, J., De-Marcos, L., Fernández-Sanz, L., Pagés, C., Martínez-Herráiz, J.-J.: Gamifying learning experiences: Practical implications and outcomes. Computers & Education. 63, 380–392 (2013).
7. Deterding, S., Sicart, M., Nacke, L., O'Hara, K., Dixon, D.: Gamification. using game-design elements in non-gaming contexts. Proceedings of the 2011 annual conference extended abstracts on Human factors in computing systems - CHI EA '11. 2425 (2011).
8. Muntean, C.: Raising engagement in e-learning through gamification. Proc. 6th International Conference on Virtual Learning ICVL. (2011).
9. ITU: Measuring the Information Society Report 2014, http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2014/MIS2014_without_Annex_4.pdfttp://www.itu.int/ITUD/ict/statistics/Gender/index.html.
10. Lucas, K., Sherry, J.L.: Sex Differences in Video Game Play: A Communication-Based Explanation. Communication Research. 31, 499–523 (2004).
11. Graner Ray, S.: Gender Inclusive Game Design: Expanding the Market. 350 (2003).