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Exploring E-Portfolio as a new technology tool in Saudi Arabian higher education: A case study

Halah Nasseif^{1, 2}

¹University of Business and Technology, Jeddah, Saudi Arabia

²Department of Educational Research, Lancaster University, Lancaster, United Kingdom

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Abstract

The use of technology in higher education institutions in Saudi Arabia is constantly evolving, especially with the educational-technology support vision called for by the Saudi government. E-portfolios are one of the innovative learning and assessment tools used in many educational institutions worldwide. Stakeholders of one private university in Jeddah, Saudi Arabia were introduced to the idea of e-portfolios, as part of promoting technology use in campus. The purpose of this research is to explore the readiness to adopt an e-portfolio tool and to examine its level of acceptance by students and faculties in a private Saudi university. This case study applies the Technology Acceptance Model (TAM) in examining the willingness of the Saudi campus to accept e-portfolios through collecting quantitative data through questionnaires. The study also conducts a focus group of 20 students who were given the opportunity to learn about e-portfolios and create their first e-portfolios during the research study. Interviews with the university higher management were also conducted to learn more about the university's drivers needed to adopt e-portfolios. The results of the study highlight the critical success factors that are needed to gain students' and faculties' acceptance of e-portfolios. Acceptance factors include technology skills and technology awareness. The study's results also indicate that proper training and support are main drivers needed to adopt e-portfolios at the university. The study also highlights the use of adjusted elements of the TAM model and the TAM-based

questionnaire built specifically for this study. Researching e-portfolios in Saudi campuses is a great opportunity to add to the Middle East and North Africa (MENA) and The Gulf Cooperation Council (GCC) technology enhanced learning research. Skip to main content

1. Introduction

1.1 Saudi Arabian higher education

Saudi Arabian higher education of public and private universities and colleges and other educational institutions located in different geographic regions in the Kingdom. Public universities provide free education for citizens and are funded by the government. Private universities and colleges provide alternate options to public universities and may have new or different programs and courses (Aldiab et al., 2017). All higher education institutions follow the regulations of the Saudi Ministry of Education. In addition, several national and international accreditation bodies are adopted by various institutions to ensure the quality of their programs.

With the 2030 Saudi Arabian vision, the Kingdom has adopted a new vision and strategies for the development of Saudi Arabia to become one of the most advanced countries in the world in both the economic and educational sectors by 2030. Thus, Saudi higher education institutions have adopted this vision and sought to apply the key objectives of research, entrepreneurship, technology and innovation in their strategic plans (Alharbi, 2016). By this, educational institutions work in developing and improving their technology platform including their learning management system, instructional designs, educational tools and more.

1.2 E-portfolios

Adopting electronic tools in higher education, facilitate and enhance the learning and administrative experience in academic institutions. E-portfolios are one of the tools sought by many educational institutions to achieve this enhancement. E-portfolios are a digitized collection of artefacts such as presentations, assignments, assessments, CVs, achievements, rewards, notes, annotations, skills and competencies, images, movies, journals and more (Jwaifell, 2013).

Academic research about e-portfolios varies between highlighting e-portfolios challenges and opportunities and examining the effects of e-portfolios in learning, assessments and more. Examining institutions readiness

and acceptance worldwide to e-portfolios also has a lot of published research. Researching e-portfolios in the Gulf cooperation council (GCC) region, especially in Saudi Arabia is moderate. GCC studies explored e-portfolio and its usage and application among students, faculties, and universities' admin. To add to the research field of the Saudi higher education research, the focus is shifted to explore how university's stakeholders deal with the introductory of e-portfolio as a new tool that has not yet been used. Exploring such innovative technologies in Saudi Arabia's higher education adds to the Technology Enhanced Learning (TEL) field in the MENA and GCC regions and provides an opportunity for development and enhancements in the education sector in the region.

1.3 Research context

The University of Business and Technology (UBT) is a private university in Jeddah, Saudi Arabia. It is located in the city of Jeddah. Jeddah is a centre for money and business in the Kingdom of Saudi Arabia and a major important port on the Red Sea. It is a modern city and gateway for pilgrimages to the Islamic holy cities Mecca and Medina (Municipality, 2020). UBT is a private university in Jeddah, Saudi Arabia with around 5000 students and 250 faculty members. It has 2 main campuses, Dahban (male campus) and Jeddah (female campus), with four colleges (College of Business Administration, College of Engineering, Jeddah College of Advertising and College of Law) (UBT, 2016).

UBT shares similar characteristics with its MENA and GCC peers. UBT employs a face-to-face traditional learning environment with the use of ICT in learning utilizing LMS, online libraries and databases. UBT employs a set of different national and international accreditation bodies to ensure the quality of its programs and international collaboration in research, teaching, partnerships and projects (UBT, 2016). UBT has shifted to online classrooms during Covid-19, like most institutions around the world. This facilitated the use of current online resources and facilitated the addition of other new technological tools.

The researcher is a faculty member in the Management of Information System (MIS) department. The research study was conducted in the academic term of Spring 2017; and was intended to investigate the students and faculties' perception about e-portfolios and their readiness to use e-portfolio as a new tool in campus. Thus, the research intended to highlight the benefits and usage of e-portfolios and to check whether such a technological tool would be accepted amongst the university's students and faculties.

The university always seeks to develop and improve its learning tools. E-learning research is encouraged and supported by the university. The idea to investigate the application of e-portfolios for the first time was initiated by the researcher. The use of e-portfolio has potential appeal to the university as it aims to enhance the learning experience for both faculties and students and helps to highlight the work of graduates to stand out in the Saudi market. In addition, a lot of other benefits for e-portfolios that can be explored related to assessments, reflection and more. Thereby, adding to the Saudi educational research field and fulfilling innovative goals and developments, can all be a result of researching UBT's adoption to e-portfolios.

2. Literature review

2.1 Technology in MENA higher education

The Middle East and North Africa (MENA) regions aim to improve education as a mean for enhancing and increasing economic growth. The MENA regions calls for a change in the education systems, especially the higher education sector. Although, the model for economic evolution in MENA countries varies from country to country, but all share an ancient history and a remarkable cultural heritage (Salah et al., 2015). MENA's higher educational institutions aim to use technology in education to improve the students' education experience and to motivate tutors in their educational role.

The path to the development of technology education in the MENA region was led by the Gulf countries, Jordan and Lebanon (Salah et al., 2015). They were the first in the region to bring modern technologies into their higher education systems. MENA countries established many collaborations with western universities. Increasing such partnership helps to improve education and support research and share expertise in new teaching methods and curriculum development. Examples are New York University in the United Arab Emirate, and Texas A&M University and Carnegie Mellon University in Qatar. Saudi Arabia institutions has established various international partnerships and collaborations. Part of the improvement in educational systems, for example, Saudi institutions focused on development and innovations such as King Abdullah University for Science and Technology. Similarly, Jordan institutions focused on developing evaluation systems, teacher quality, and on the development of students' skills. Such opportunities were supported in the World Bank report in regards of reforms of education and teaching systems in the MENA region as Jordan, Tunisia, and Saudi Arabia) (Salah et al., 2015).

The support for technology in learning in the MENA region has increased part of the educational and economic developments. The recent Covid-19 epidemic global lockdown of the educational institutions worldwide caused a mandatory shift in education from face-to-face to an online platform, forcing universities worldwide to adapt quickly to the necessary technology tools to help them deliver learning to their students. The Saudi Ministry of Education had an emergency educational plan ready for all levels of education. Part of the planning for this involved recommending different assessment methods to help with the emergency online learning platforms and e-Portfolios was one on the approved recommended assessment lists.

2.2 E-portfolios adoption

For institutions that have not yet used e-portfolios, it is important to investigate the factors needed to implement and adopt them. There are a lot of research studies exploring factors related to students and faculties' readiness of adopting e-portfolios. The study of Mohamad et al. (2015) examined students' readiness by studying specific technology constructs such as internet skills and technology acceptance. Though, the authors' approach was more related to the adoption of technology rather than e-portfolios adoption. The study focused on ensuring students having certain basic skills that would allow them to fully utilize online tools in general. But the study did not include constructs specified for e-portfolios as work samples, CVs and certifications. To research the Saudi context, this paper can incorporate examining constructs related to both e-technology and e-portfolios.

Faculties' interest to adopt e-portfolio was examined in Blevins's thesis study (2013). But, compared to other studies, Blevins focused on examining a Diffusion of Innovation Model (DOI). DOI is a complex model. To use a similar model in the Saudi study requires the help of a DOI expertise who will monitor and adjust the framework and add the appropriate variables that best suits its context. For this, a simpler model as TAM (Technology Acceptance Model) can be recommended in this case study.

Other studies focused on determining the drivers that will help in adopting technology. The research thesis of Prescott (2013) examined different drivers that ranged from institutional drivers to individual drivers that can help to adopt technology. Thus, Prescott's (2013) study spent much effort on detailing drivers to accept any e-technology in general. Though, each potential system to be adopted may have different drivers. For example, adopting e-portfolios may require mainly the individual skills, whereas a student-ad-

vising system may require environmental variables as time allocation. The Saudi context can follow a similar approach of examining drivers fit for e-technology and e-portfolios specifically.

Other benefits of adopting e-Portfolios were nurturing creativity and critical thinking abilities for master students in a higher education institution in Ireland. Adopting e-Portfolios helped in enhancing a creative learning process. O'Keeffe and Donnelly (2013) outlined their strategy in e-Portfolio development as this was applied to 14 students. The strategy included showcasing previous e-Portfolios, e-Portfolio software training, training in use of multi-media, reflective writing sessions, peer presentations of e-Portfolios and instructors' feedback. This research case study follows the same path of training and introducing samples of e-Portfolios to highlight the benefits of such tools. UBT's case involves interviewing the university's higher management to provide a wider image on facilitating the adoption of new technology tools.

2.3 E-portfolios acceptance

There are a lot of research studies exploring e-portfolios acceptance. The study of Chen et al. (2012), showed that students are willing to use e-portfolios as they can perceive its usage. The university's admin needs to try to promote students' computer self-efficiency and online and off-line support. The study though used a complex combined theoretical framework of both TAM, and ISSM (Information System Success Model). It also added external variables related to quality as quality of system, quality of information and more. Examining quality elements for a system that is not yet applied may not be applicable. For this, the TAM model can be best applied in this Saudi research study.

Like Mohamad et al. (2015) and Prescott (2013) studies, examining e-technology acceptance in general instead of just focusing on e-portfolios was the aim of the Beresford and Cobham (2010) study. The study's aim was to understand students' acceptance to technology and web2.0 tools. This helped to understand students' perceived usage of e-portfolio by considering their online storage habits and their understanding of e-portfolios artefacts. Though, the study conducted covered only computing students. To fill this gap, The Saudi context can attempt to examine acceptance of e-portfolios using both a focused group and the large body of the university students.

2.4 E-portfolios in MENA, GCC and Saudi Arabia

There are several studies that can help Saudi Institutions

research of e-portfolio as these studies conducted in the neighbouring GCC, and MENA region have examined institutions that successfully implemented and used e-portfolios. A study in Zayed University in the neighbouring United Arab Emirates was conducted in 2009 to examine its own existing e-portfolio system (Tubaishat & Lansari, 2013). The study examined e-portfolios' role in achieving outcome-based education with emphasis on satisfying accreditation requirement of assessing learning outcomes. The study raised questions though on how students got engaged with e-portfolios? What major elements helped the students to accept and use e-portfolios? Achieving learning outcome was a desired goal aimed by the university's admin, accreditation body and faculties, but it was not a common motivator for students. Other evidence is needed to be investigated to test students' engagement. This engagement can be investigated when researching MENA, GCC students and specifically Saudi Arabian students.

Other studies focused on examining e-Portfolios for the first time. Alajmi (2019) examined the use of e-Portfolios in Prince Nora University in Riyadh, Saudi Arabia, where the use of paper e-Portfolio is more widely used. The study examined the need to recognize the association of using e-Portfolios for the developments of professional standards and life skills as the basic skills of communications, analytical skills, and effective skills as career developments. Alajmi (2019) surveyed students about their skills and the strength and weakness and how e-Portfolios helped them.

A study conducted at Sharjah University at UAE examined the use of e-Portfolios in medical education (Elshami et al., 2018). The students used e-Portfolios through the Blackboard Learning Management system. Students were required to submit their learning artifacts and teachers were required to evaluate and assess them. The potential usage of e-Portfolios in clinical training was effective in the reflective and constructive feedback and the use of formative and summative assessments. Students in the study were satisfied and were willing to use e-Portfolios in their next clinical work.

Similar to the objective of this Saudi case study, an earlier study in an English language centre at the Middle East Technical University in Ankara, Turkey, students were introduced to e-Portfolios for the first time (Baturay & Daloğlu, 2010). The study clarified how e-Portfolios can be used as a practical alternative to standardized testing. The study also shed light on the benefits of e-Portfolios as it gave students the chance to self-assess their language developments and think how they can improve their future work.

Figure 1. TAM Model

In regards of examining e-Portfolios using acceptance models as TAM, there were not a lot of research studies exploring acceptance and adoption of e-portfolios in Saudi higher education. Most studies focused instead on examining acceptance of new technologies of learning management systems (LMS).

In a paper by Alharbi & Drew (2014), TAM model was used to examine Saudi students' usage of LMS. The use of TAM framework allowed the researcher to foresee the adoption of LMS in Saudi institutes which can be a base to explore acceptance of other electronic tools. The study had added external variables to their TAM framework as lack of LMS, and job relevance. The study though did not indicate the reasons for choosing these external variables. Knowing what external variables to add in a theoretical framework could help future studies in Saudi institutions which can be helpful in exploring e-portfolios or any other technology in institutes.

There are various e-Portfolios software tools available to allow students and faculties create their e-Portfolios. Matar (2015) from the department of Software Engineering in the Applied Science University in Amman, Jordan conducted an evaluation study of 6 different e-Portfolio tools: Pebble, Mahara, Giunti, Premier IT, PET, and Moodle + Exabis. The survey evaluation examined elements as curricular related features, assessment, publish/share, analysis tools, customization and more. The study found out that both Mahara and Moodle + Exabis are the best two choices for choosing an e-Portfolio system within an educational context. The study helped to set a map for choosing the necessary e-Portfolio system by providing different categories for evaluation. UBT does not have a specified e-Portfolio system. Therefore, the research case study will make use of Microsoft OneNote to explore e-Portfolios.

3. Research questions

- RQ1: How do institutional stakeholders perceive the introduction of an e-portfolio tool in UBT, a private Saudi Arabian university in Jeddah, where a tool of this type has not been used yet?
- RQ1.1: To what extend the students can accept introducing a new technological tool as e-portfolios?
- RQ1.2: To what extend the faculties can accept a new technological tool as e-portfolios?
- RQ1.3: To what extend the university can adopt new technologies such as e-portfolios?

4. Theoretical framework

In order to determine the acceptance of e-portfolios and answer the research questions, data collected will help to examine the e-portfolios acceptance by the university's stakeholders. Based on Chen et al. (2012) and Blevin's studies (2013), a simpler model for theoretical framework is recommended for UBT's Saudi context. For this, the theoretical model of the Technology Acceptance Model (TAM) is used in this research study (Davis, Bagozzi, & Warshaw, 1989). TAM can be used to test the perception of students and faculties of ease of use of e-portfolios, and perceived usefulness, attitude toward e-portfolios and intention to use.

TAM elements are adjusted slightly to best suit UBT since e-portfolios have not been used by any of the university stakeholders yet. There are no external variables, however, each TAM element will be adjusted to include tested variables that fit the Saudi university's context. Below is the explanation of the adjustment in each TAM element.

Figure 2. Research Design Framework

4.1 Perceived potential usefulness of e-Portfolios

This element will explore students and faculties perception of the potential usefulness of e-portfolios. It intends to examine this by highlighting related benefits of e-portfolios as learning benefits, storage and showcasing benefits.

4.2 Perceived ease of use of technology

The approach here is similar to Mohamad et al. (2015), Prescott (2013) and Beresford & Cobham (2010) where I will seek to check students' and faculties' perceived ease of use of e-technologies (not e-portfolios). For example, examining if a UBT faculty can use the internet easily, upload files in Moodle easily, and edit word documents, this may lead to equip them to be ready for e-portfolios.

4.3 Attitude towards using e-Portfolios

This covers the attitudes of the participants who intend to use and adopt e-portfolios, based on its potential benefits.

4.4 Intention to use

This covers the intention to use elements of e-portfolios as storing work online, sharing it, tracking progress and more. If participants have intended to use these elements, then they may have intention to use e- portfolios.

4.5 Research design framework

A model is constructed to build the theoretical model needed to collect the data and analyse the results. Check Figure 2 below. Questionnaires are based on the adjusted

TAM model to test students' and faculties' acceptance of e-portfolios. The focus group is used to check the acceptance of students who actually used e-portfolios for the purpose of this research. The focus group is based on Cousin (2009). Semi-structured Interview questions aimed to the university's admin about e-portfolios adoption are also based on Cousin (2009).

5. Methodology

The research conducts a case study that collects both quantitative data (questionnaires) and qualitative data (focus group and semi-structured interviews).

5.1 Case study

The research study conducts a case study at the University of Business and Technology (UBT) in Jeddah, Saudi Arabia, where e-Portfolios have not been used yet. The research collects both quantitative data through questionnaires and qualitative data through interviews. The research surveys both UBT students and faculty members about their perception of the e-Portfolio tool. The researcher interviews the university's higher management about the potential use of e-Portfolios in campus. During the research study period of the academic term of Spring 2017, the researcher also conducts a focus group consisting of MIS students who were nominated to create and use e-Portfolios for the first time in campus. Participation is voluntarily for all methods.

5.1.1 Questionnaires

Participants of the questionnaire are UBT students and faculties from both the female and male campuses. Survey questionnaires constructed based on the TAM model test perception and expectations of both students and faculties. 2 questionnaires were distributed, one for the university's students sent through the Moodle platform (posted to around +2000 students). The other questionnaire was sent to the university's faculty members (around 100+ faculties) through the university email system. Google forms collected the data.

Since the majority of UBT students and faculties did not use e-portfolio yet and few may not know what it is, the online questionnaire in Google forms started with an introduction paragraph explaining what e-portfolio is. It also contained an embedded YouTube video introductory of e-portfolios. This helped the participant to have general information about e-portfolios before starting to fill the questionnaires.

The survey questions covered perceived usage of technology in general, followed by e-Portfolio perceived usage, attitude and intention to use this new tool. Exploring general use of technology is shared by a lot of studies when exploring e-Portfolio usage. Wuetherick and Dickinson (2015) surveyed the students about technology in general as in: Computers in general, Internet in general, Word processing packages, Graphical and design applications, Presentation software, HTML, Video and Audio editing and Digital photography.

5.1.2 Focus group

Around 20 MIS students have been nominated to use and apply e-portfolios for the first time at UBT. The students are senior MIS students who are upcoming graduates and they agreed to participate. Students were nominated by the researcher because of their advance skills to learn new software. They attended an introductory workshop at the start of the academic term on how to use Microsoft OneNote to create e-portfolios. They were required to build their e-portfolio by adding artefacts from one current course and another previous one. They were asked also to create a CV. After the submission of their e-portfolios task, a group session was conducted to get their feedback about the experience, their opinions of e-portfolios, and the advantages and disadvantage they view in regards of e-portfolios.

Table 1. Focus group participants

Participants	From Course
20 MIS senior students	MIS 440 and MIS 470 taught by the researcher

5.1.3 Semi-structured interviews

Cousin (2009) Interview protocol was used. The participants were the university's senior management who influence decision making in adopting software: 3 senior management admin (Vice Rector, Dean and IT Director). The interview questions focused on finding the perspective of the university's management when dealing with new technology. The interview questions were sent ahead of time to the participants, so they can have a chance to view them before the interview. An appointment was scheduled with each participant soon after. Live interviews were conducted, and follow-up questions were asked for clarifications.

5.2 Ethical approval and limitation

The Dean approved conducting the research in the uni-

versity campus. Students and faculties who filled the survey had a written welcome message explaining the purpose of the survey and that their participation was voluntary. In terms of limitations, the number of survey response was low. Out of thousands of students, only hundreds responded. The same status is also true for the faculties. MIS students participated voluntarily in the focus group, and they were free to withdraw at any time and remove their data. But all were thrilled to try the new e-Portfolio tool and be one of the first creating their online e-Portfolios at the university.

6. Results

6.1 Questionnaires results

Out of UBT's total students and faculties, 215 students answered the questionnaire, 81.4 % were female students, and 18.6 % were male students. 35 faculty members answered the questionnaire in which 65.7% were female and 34.4% were male. The questionnaire's results display descriptive data collected from surveying students about their perceived ease of use of e-portfolios, perceived usability, attitude of usage and intention to use (TAM elements). TAM adjusted elements are listed next to discuss the results.

6.2 Students' questionnaires findings

6.2.1 Students perceived potential usefulness of e-portfolios

The results of the questionnaire indicated the top 3 perceived potential usefulness of e-portfolios viewed by the university's students. They were: be more independent learners, keep track of the learning experience and have an online storage for course work. In contrast to Mohamad et al. study (2015), this research case study examined constructs mainly related to e-portfolios as storage, sharing and learning.

6.2.2 Students perceived ease of use of technology

The ease of use of technology is essential to accept any new software (Davis, Bagozzi, & Warshaw, 1989). Current UBT students are comfortable using the internet, the computers, LMS, and word processing software. Some of them though feel they lack the design and graphics skills needed to be innovative and add creative elements to their e-portfolios. In this case, following the same approach of Mohamad et al. study (2015), the researcher clarified that basic computing skills and internet skills may enable students to use e-portfolios. If UBT students and faculties scored a high

percentage in the use of Moodle and other applications, this means since they can upload files in Moodle, and edit documents, then, it may be easy for them to use e-portfolios (Table 3).

6.2.3 Students' attitude toward usage of e-portfolios

The students were able to have an idea about e-portfolios through answering the questionnaires and viewing the introductory YouTube video in Google forms. So, checking their attitude toward the usage of e-portfolio soon, 64.6 % expressed interest in adopting e-portfolios. 61.9 % wish that UBT would adopt the software. 61.1% intend to use the tool if UBT adopts it. The percentages are reasonable considering that they had not used the tool yet (Table 4).

6.2.4 Students' behavioural intention to use

The questionnaire results showed that the top 3 intentions for the use of e-portfolio by UBT students were to keep records of their assignments, projects and course activities. UBT students displayed disinterest in using e-portfolios for keeping reflective journals. 63% of UBT students displayed interest in using e-portfolios to store their work. "It seems an amazing tool", one student responded. Concerns also were shared among students in the open-ended questions. Their main concerns were about the privacy and protection from hackers and viruses attacking their online content; this was not a concern in any of the provided literatures. The study of Blevins (2013) identified in contrast to the finding of this research, that students favoured using e-portfolios because of availability and security. So, proper awareness can be added to the training of UBT students to ensure awareness of privacy issues and security. IT protection and security can be emphasized.

6.3 Faculties' questionnaire findings

6.3.1 Faculties perceived potential usefulness of e-portfolios

The results of the questionnaire indicated that the top 3 perceived usefulness of e-portfolios viewed by the university's faculties were the ease of transporting course work and the ability to store it online and the ability to add digital content to one's portfolio (Table 5). This is different from Blevins's study (2013), where faculties had different interest in the use of e-portfolios. They were mostly interested in tracking students learning. Therefore, it is important to define Saudi's own context in regards of what variables to examine. Once the tool is used, workshops on e-Portfolio's usage can be explored further.

Table 2. Students perceived potential usefulness of e-portfolios

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Be more effective and independent learner	59.7%	23.2 %	11.8%	2.4%	2.8%
Easy storage of my course work	56.9%	19.4%	17.1%	3.8%	2.8%
Keep track of my learning experience	55%	22.7%	15.2%	5.2%	1.9%
Be easily transport my course work	48.8%	27%	17.1%	4.7%	2.4%
Add digital content to my e-portfolio	46.4%	23.7%	19.9%	6.2%	3.8%
Share my e-portfolio with future employers	42.2%	22.3%	26.1%	6.2%	3.3%

Table 3. Students perceived ease of use of technology

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Internet is easy	70.1%	19 %	5.7%	1.9%	3.3%
Moodle is easy	68.2%	17.1%	9.5%	2.4%	2.8%
Computers are easy	63%	19%	9.5%	4.7%	3.8%
Uploading and downloading files is easy	62.6%	18.5%	11.8%	4.3%	2.8%
Word processing is easy	56.9%	24.2%	11.4%	3.8%	3.8%
Using e-portfolios can be easy	35.5%	28.4%	21.8%	10.4%	3.8%
Graphic design is easy	20.4%	18%	39.3%	14.2%	8.1%

Table 4. Students' attitude toward usage of e-portfolios

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Adopting e-portfolio will be a great idea	35.3%	29.3%	21.4%	10.2%	3.7%
I wish ubt adopts e-portfolios	34.9%	27 %	23.7%	10.2%	4.2%
I intend to use e-portfolio if the college adopts it	32.2%	28.9%	25.1%	7.6%	6.2%

Table 5. Faculties perceived potential usefulness of e-portfolios

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Transport my course work	80%	17.1%	2.9%	0%	0%
Store my course work	77.1%	17.1%	5.7%	0%	0%
Add digital content to my e-portfolio	74.3%	22.9%	2.9%	0%	0%
Try new technology	68.6%	20%	11.4%	0 %	0 %
Place to store sample of course work	62.9%	20%	14.3%	2.9%	0%

Table 6. Faculties perceived ease of use of technology

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Internet is easy	80%	11.4%	5.7%	2.9%	0%
Word processing is easy	74.3%	14.3%	8.6%	2.9%	0%
Computers are easy	68.6%	14.3%	14.3%	2.9%	0%
Uploading and downloading files is easy	62.9%	25.7%	11.4%	0%	0%
Moodle is easy	54.3%	34.3%	8.6%	2.9%	0%
Using e-portfolios can be easy	34.3%	40%	20%	5.7%	0%
Graphic design is easy	20%	14.3%	37.1%	20%	8.6%

Table 7. Faculties attitude toward usage of e-portfolios

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Adopting e-portfolio will be a great idea	42.9%	37.1%	14.3%	5.7%	0%
I wish ubt adopts e-portfolios	34.3%	31.4%	28.6%	5.7%	0%
I intend to use e-portfolio if the college adopts it	34.3%	40%	20%	5.7%	0%

6.3.2 Faculties perceived ease of use of technology

Like the students, faculties shared the same perception of ease of use of the technology (Table 6). Faculties found the use of internet, computers and word processing software easy. They also shared the same perceived lack of skills in design and graphics. These general technology factors can be helpful. Examining LMS for example, helps to define users' acceptance for the use of e-portfolios. 88.6% of all faculties found Moodle easy to use. In Blevins's study (2013), use of LMS (Sakai) was indicated as one of the main resources that supported and assisted faculties in the implementation of e-portfolios.

6.3.3 Faculties attitude toward usage of e-portfolios

The faculties also were able to have an idea about e-portfolios through answering the questionnaires and viewing the same introductory YouTube video in Google forms. Thereby, checking their attitude towards the usage of e-portfolios for future usage 80% expressed interest in adopting e-portfolios, a higher percentage from the students (Table 7). 65.7% wish that UBT would adopt the software. 74.3% intend to use the tool if UBT adopts it.

6.3.4 Faculties behavioural intention to use of e-portfolios

Questionnaire results showed that the top 3 intentions to use e-portfolio by UBT faculties were storing projects, course activities, and presentations. 74.3% of faculty members are interested in using e-portfolio. Though, there were also concerns they shared in the open-ended questions. Concerns such as copy rights of own materials when sharing and collaborating. Also, concerns were about students benefiting from the tool if they did not do the course work themselves and plagiarized. In Belvins's study (2013), faculties concerns were different. Their concerns were mostly about time constraints and lack of support of heads of department.

6.4 Focus group findings

The 20 MIS students submitted the e-portfolios by a specific deadline. The researcher examined all the submitted e-portfolios and provided feedback and some edit suggestions. The students produced very creative, innovative e-Portfolios; sample shown in Appendix. They added their CVs, they highlighted their top projects they have done in the past 2, or 3 years and they made use of the multi-media options of Microsoft OneNote. Soon after the e-Portfolio revision, one meeting was conducted to collect the students'

feedback. One student shared:

Student 1: “I have also added sample of my Artwork using pictures and videos as I needed to share the e-Portfolio with any prospected training opportunity at an innovative company and I wanted to be creative introducing myself instead of relying on regular CV, or even LinkedIn link”.

Based on the collected feedback, a thematic analysis helped to highlight 3 emerging themes: Experience of using e-portfolios, and e-portfolios’ highlights and challenges of e-portfolios.

6.4.1 Experience of using e-portfolios

The entire group agreed that they wished e-portfolios were applied when they first started their freshman year at college. If they have started to use it early on, it would have been very motivating. They felt it was too late for them to build their college e-portfolio because all of them are in their last year and they are expected graduates. For students who have been using e-portfolios for a while as in Chen et al. study (2012), they have experienced the benefits of e-portfolios, that is why they are using it. Some even fear falling behind if they do not use it.

6.4.2 E-portfolios highlights

The availability of sharing and collaborating options was one of the highlights of the experience. All the college work is stored in one place. The students enjoyed some of the features of MS OneNote as time stamps, automatic save and edit history. They liked that they could place their CVs also in the e-portfolios. They also liked the storage space they have as a UBT student has a dedicated 1 TB of space. The students indicated that e-portfolios organize their work, and it is simple to use MS OneNote as it is like MS Word. A main highlight of e-portfolios is the removal of the dependency on a USB and local storage devices and use the online options instead. They also indicated that the use of MS OneNote as online e-portfolios is better than Moodle because Moodle remove access of previous courses; only current courses are active ones. So, they are glad to have access to their course work at any time through the e-portfolios. Another highlight is the use of the creative images and drawing tools that help to showcase one’s work. These highlights are all considered drivers for motivation to adopt e-portfolios, similar to the approach of the study of Prescott (2013) defining drivers helps in adopting new technologies. Figure 3 displays some of the highlights of motivation with the use of images, and URL links to be creative in showcasing the students submit-

ted work as the assignments, displayed in PDF format and JAVA work, displayed as sample screenshots, placed in the e-Portfolio.

Figure 3. Sample e-Portfolio 2

Figure 4 displays one of the students’ screenshots of her decision support application conducted using an Excel spreadsheet. The student was proud of her spreadsheet and wanted to showcase it through the attachment of the actual file and with the screenshots of the home tab. Other samples are displayed in the Appendix.

Figure 4. Sample e-Portfolio 1

6.4.3 E-portfolios challenges

It took a lot of time to make an e-portfolio innovative. The students had problems with the use of online MS OneNote version, as some of the features were not available in the online version. They also had issues in the mobile version. They also displayed concerns if the e-portfolios will still be available even after graduation and if they are going to have access to them as alumni. This is similar to the concerns of the students in the study of Wuetherick & Dickinson (2015) who used e-portfolios embedded in LMS,

and it was inaccessible once courses were concluded. UBT's focus group students also indicated that other applications maybe easier than MS OneNote.

O'Keeffe et al. (2013) also indicated that their 14 students had faced challenges similar to UBT's case where the major challenges were understanding the purpose of the e-Portfolio and understanding what was needed within the e-Portfolio for assessment purposes. The use of technology was a concern for them especially multi-media and how time-consuming the e-Portfolio work is. Similarly, one UBT focus group member shared her input:

Student 4: "Microsoft online OneNote is challenging to use with the images and videos, I face delays, whereas when I design using the off-campus, PC version, it is much faster, and more tools are available. It does though take a very long time to produce an innovative e-Portfolio like the ones we saw in the training".

With such challenges faced by the students, the diversity of different software available can give the students a chance to choose. The university can also adopt an official e-Portfolio platform, similar to Mahara and more, that can be integrated with their LMS. Other LMS systems can have add-on blocks for e-Portfolios, all of these are options to explore. Another solution that can help with the use of multi-media and technology is the availability of support and training. This is what Chen et al. (2012) recommends having to ensure adoption of e-portfolios.

6.5 Semi-structured interviews results

The university senior management were interviewed, senior1, senior2, and senior3. The objective of the interview was to check to what extend UBT can adopt e-portfolios. The interview transcripts were coded for themes (Cousin, 2009). Two themes emerged from the interview analysis: e-portfolio drivers and support and training.

6.5.1 E-portfolios drivers

Senior1 emphasised the importance of employing technology tools in facilitating the learning experience for both students and faculty members.

Senior1: "With the current aim of the university to digitize all procedures and tasks in all the departments, including the academic departments, the need to adopt technology tools is a must. This is to ensure implementing a paperless university as the university is currently working on".

Senior2 perceived the drivers for adopting e-portfolios in campus as enhancing faculties' teaching and students' learning. Senior2 also indicated that enhancing the quality of the system provided and matched the trend in new technologies are all strong drivers for adopting the technology.

Senior2: "A great tool for students to organize their work and record their achievements".

The tool also viewed by Senior2 to be helpful to show-case students' knowledge and skills for their instructors and future employers. Senior2 indicated that the use of e-portfolios may have huge advantages on the academic professional practice.

Senior2: "I believe e-portfolios if used, will make students assessment more authentic".

The need for enhanced teaching and learning objectives of UBT is shared with the study of Tubaishat & Lansari (2013) where the e-portfolio objective was to achieve students learning outcome.

To effectively use a new tool, one needs to understand the tool and use it. Senior2 indicated the 3 enablers that help to adopt e-portfolios: to promote the benefits of using portfolio to students and faculty members, to provide sufficient training on using this tool and to provide special awards to those using this tool. On the other hand, the three barriers that may affect the use of e-portfolios were: not having enough awareness of the benefits and usefulness of e-portfolios, the lack of training and the lack of support. Senior1 emphasized the role of the university in providing the needed support to UBT stakeholders utilizing any new technological tool at campus. Senior1 understands the challenges associated with applying new technology and the resistance users may show to new tools, but, with the proper support and training, such challenges can diminish. challenges and procedures can define the Saudi universities' own procedures in promoting e-portfolios. This is similar to the approach of Chen et al. (2012) in emphasizing the role of university admin and IT in promoting e-portfolios.

6.5.2 Support and training

Support and training are advised by the study of Chen et al. (2012) as its aim is to increase students' positive perception of e-portfolios.

Senior3: "UBT had implemented Microsoft Office 365 and the license of this service is free because UBT is a qualified academic institution from Microsoft that can

| receive Office 365 support and training.”

Senior3 indicated that with any new technology adopted by UBT, a trial period is needed, and an awareness campaign can help to promote the new technology. Senior1 indicated that support is needed to overcome complexity. Effective training sessions, and awareness campaign can help in adopting a new tool into the university system. This is similar to what the study of Wuetherick & Dickinson (2015) called for in terms of support; the implementation of e-Portfolios must be done thoughtfully and with the full suite of support mechanisms in place for students.

6.6 Research questions answers

To answer the main research question RQ1: How do institutional stakeholders perceive the introduction of an-portfolio tool in a private university in Jeddah, Saudi Arabia where a tool of this type has not been used yet, a summary of findings can be used to answer RQ1 and its sub questions.

6.6.1 RQ1.1: to what extent students can accept to use e-portfolios.

Questionnaire results displayed 63.9 % of students perceiving e-portfolios to be easy to use. 64.8% of students believed adopting e-portfolio will be a great idea. 61.9% of students wished that the university adopt e-portfolios and they intend to use it if the university adopts it. The students' adaptability to technology and the use of LMS in campus enabled them to accept considering a new tool in education. The students' awareness of the usage and benefits of the tool as in maintaining course work and showcasing their work help them to see the benefits of the tool, therefor accepting it. The focus group analysis also helped to answer RQ1. Students who tried creating e-portfolios for the first time and who used it for a period of time indicate their acceptance to use e-portfolio as they witnessed e-portfolios benefits and objectives. They did though indicate the need for training and support.

6.6.2 RQ1.2: to what extent faculties can accept to use e-portfolios.

Questionnaire results displayed 74.3% of faculties perceiving e-portfolios to be easy to use. 80% of faculties believed adopting e-portfolio will be a great idea. 65.7% of participant faculties wish that the university adopt e-portfolios and they intend to use it if the university adopts it. The faculties awareness of the benefits of e-portfolios and the importance of having an online portfolio enabled them to

accept considering a new tool in education.

6.6.3 RQ1.3: To what extent the University is ready to adopt e-portfolios.

Interview analysis indicated the role the university admin plays when adopting a new technology. The emphasis on enough training and available support was highlighted strongly in the interview session. Also, recognizing drivers of e-portfolios help in adopting e-portfolios. Learning about the highlights of e-portfolios through the focus group can help to promote adopting the tool. Learning about the challenges and barriers can help in defining what is needed to ensure smooth adoption of e-portfolios at UBT.

7. Contributions

7.1 TAM

What is unique about this study, is that it examined a technology that was not used yet, compared to most technology acceptance studies that examined technology that is already applied. e-Portfolio was not applied yet at UBT. It was only applied through the focus group. UBT stakeholders shared their views and perception about an upcoming technology that was not used yet. That is why TAM was slightly modified in this study. External variables were eliminated from this adjusted model. Each TAM element was adjusted to include tested variables that fit the Saudi university context, or any context that did not apply a new specific technology yet. The TAM usefulness of the technology element was adjusted to Perceived potential usage. What the users perceive about the usage of this new tool, even before using it. In order to do that, the questionnaire started with an explanation of e-Portfolios and the actual usage for them, a short, animated video link was listed in the questionnaire, so evaluators could view the video and understand more about e-Portfolios before sharing their potential thoughts about it. A similar approach was taken with the rest of the TAM elements. The ease of use of technology was adjusted to the Perceived ease of use of the technology. The Attitude toward using e-portfolios was also adjusted to their perceived attitude since the users are introduced to the idea of e-Portfolios. The Intention to use element, explores the users' intention after learning about this tool. So, this adjusted TAM model can be used by any other educational institution that is testing the perception of users introducing a new technology in campus. But a similar approach had to be followed, such as enough information must be introduced first in order for users to evaluate this new technology before using it.

7.2 MS OneNote as an e-Portfolio

With the various e-Portfolio tools available in many campuses around the world as Mahara, Pebble and more, the study helped to highlight utilizing the campus resources and making use of the current Microsoft licenses available and use of MS OneNote as an e-Portfolio tool. All UBT students have a Microsoft UBT email account. With this account, students have access to online MS Office, collaboration tools, Tera byte online storage, and many other communication applications and a free download of office in their PCs and laptops. The focus MIS group members have each built their e-Portfolio using MS OneNote. The availability of text, images, and upload files are the main elements needed to create a creative e-Portfolio. Sharing the e-Portfolio is also an important element that is available with MS OneNote. In the recent Covid-19 period, the Saudi Ministry of Education provided guidelines on the different assessment methods and tools that can be used in emergency learning that shifted face-to-face learning to online during the Spring of 2020. E-Portfolio was one of the tools recommended by the Saudi ministry. With the availability of MS OneNote, the transition to different assessments was not difficult with the current availability of MS OneNote and the availability of video tutorials in the learning resources faculty access.

8. Conclusions

For UBT, a Saudi Arabian higher education institute, introducing e-portfolios for the first time for faculties and students helps to research the Saudi academic context when considering new technologies. The adoption of e-portfolios is examined in this research study by means of questionnaires that were distributed to all students and faculties. A focus group of 20 students were selected to use and apply the e-portfolio tool. The study also examined the university's readiness to adopt e-portfolio as a new innovative tool. The case study of UBT highlights the drivers needed to ensure adoption and acceptance of e-portfolios. The study findings help to highlight guidelines needed to ease the adoption of new technologies. Findings of the study revealed that around 60% of students accept using the new tool of e-portfolio and around 80% of faculties hope to apply the tool at the university. The focus group of students who used MS OneNote to conduct their first e-portfolio indicated the importance to have such a tool from early on. They have also indicated the need to have well detailed workshops to allow them to be innovative to produce creative portfolios. The interviews with the university higher management helped to clarify what is needed to ensure the adoption of the new tool. Proper training and adequate support are key

to guarantee a smooth adoption of the innovative technology. The TAM adjusted model used in this case study can be applied in any MENA and GCC higher education institution that is intending to use a new technology.

Future MENA and GCC research may focus on e-Portfolios as assessment tools examined in this current Covid period or online setup. The size of user trials of e-portfolios can be increased to cover larger population of the students and faculties. Further researched cases may study the impact of the other aspects of e-portfolios as collaboration and reflection. This may provide insight on students' learning behavior and performance.

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About the author

Halal Nasseif is lecturer in MIS in the University of Business and Technology in Jeddah, Saudi Arabia. Her Bachelor of Science degree is in Computer Science from Portland State University and her Master is in Information Technology from Virginia Tech. She has recently earned her PhD in E-Research and Technology Enhanced Learning from Lancaster University. Her PhD thesis is titled: "Learning analytics and dashboards, examining course design and students' behavior: A case study in Saudi Arabian Higher Education". Her research interests include researching Saudi Arabian higher education, technology enhanced learning, e-learning utilization, learning analytics, educational data mining, and Networked Learning.

Email: h.nasseif@lancaster.ac.uk

ORCID: [0000-0001-5669-1953](https://orcid.org/0000-0001-5669-1953)

Twitter: [@halahn](https://twitter.com/halahn)

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Appendix A. Instruments

Table 8. Survey questions

TAM factor	Questions	Participant
Perceived Ease of Use of technology	1 Strongly disagree ---- 5 Strongly Agree <ul style="list-style-type: none"> Using Computers in general is easy Using the Internet is easy Using Word processing is easy Using Graphics design application is easy Using Presentation software is easy Using Moodle is easy Uploading and downloading files is easy 	Faculty/Students
Perceived Usability of e-portfolios	<p>Do you store evidence of your learning including copies of your work, grades, feedback, CV and achievements digitally?</p> <p>Where do you store this content?</p> <ul style="list-style-type: none"> on my PC on the web mobile device USB, external HD Other: <p>What items you are interested to have online?</p> <ul style="list-style-type: none"> Course Activities Projects Assignments Presentations Reflective journals Videos Pictures Reflective journals Personal goals Skills Community services Awards and Certificates Other: 	<p>Faculty/Students</p> <p>Faculty/Students</p> <p>Faculty/Students</p>

Table 9. (cont.) Survey questions

TAM factor	Questions	Participant
Perceived Usability of e-portfolios	What do you think e-portfolios can be used for, check all <ul style="list-style-type: none"> • Reflective practice • Students learning • Assessments • Graduate career show case • Accreditation • Continuous professional development • Evidence of teaching practice • Employment promotions • Performance rereview evidence • Other: 	Faculties
	1 Strongly disagree ---- 5 Strongly Agree	Faculties
	• I think e-portfolios enable tracking students' development	Faculties
	• I think e-portfolios can identify students' weakness and strength	Faculties
	• I think e-portfolio can be an effective assessment tool	Faculties
	• I think e-portfolio can be an effective accreditation tool	Faculties
Attitude toward usage	• I think e-portfolio can enable students find jobs	Faculties
	1 Strongly disagree ---- 5 Strongly Agree	
	<ul style="list-style-type: none"> • I believe e-portfolios sounds like a great idea • I wish UBT adopts e-portfolios • I intend to use e-portfolios if the college 	Faculty/Students
Intention to use	1 Strongly disagree ---- 5 Strongly Agree	
	• I am willing to try a new technology (software) to enhance my learning	Student
	• I want to be a more effective and independent learner	Student
	• I want to keep track of my learning experience	Student
	• I want to demonstrate my learning to others	Student
	• I want to be able to reflect on my learning	Student
	• I want a place to store examples of my course work	Faculty/Student
	• I want the records of my work to be available online	Faculty/Student
	• I want to be able to easily transport my course work	Faculty/Student
	• I want easy storage of my course work	Faculty/Student
	• I want to be able to add digital content as videos, pictures, electronic files to my online portfolio	Faculty/Student
		Faculty/Student

Table 9. (cont.) Survey questions

TAM factor	Questions	Participant
Intention to use	<ul style="list-style-type: none"> I want to share my e-portfolio with future employers 	Faculty/Student
	<ul style="list-style-type: none"> I want to share my e-portfolio with peers, students and university admin 	Student
	<ul style="list-style-type: none"> I am willing to try a new technology (software) for students' assessments. 	Faculties
	Have you created e-portfolio in the past? What did you use?	Faculties
	<ul style="list-style-type: none"> No, I have not Yes, I used Google Docs Yes, I used OneNote Yes, I used WordPress Other: 	Faculties

Table 9. Focus group questions

Questions
Q1. Describe your experience with e-portfolios
Q2. What advantages do you think e-portfolios have?
Q3. What disadvantage do you think on e-portfolios?
Q4. Any other comments?

Table 10. Interview questions

Theme	Questions	Interviewee
E-portfolios Drivers	What do you perceive to be the university's drivers for using technologies in education?	University Management
	What do you think the impact or advantages of e-portfolios are on the students?	
	What do you think the impact or advantages of e-portfolios are on the faculty staff?	
	What do you think the impact or advantages of e-portfolios are on the academic professional practice?	

Table 11. (cont.) Interview questions

Theme	Questions	Interviewee
E-portfolios Drivers	<p>Have new technologies applied recently in the university improved the educational experience in campus?</p> <p>In your opinion, what do you think are the top 3 barriers that would prevent faculties and students from using e-portfolios?</p> <p>In your opinion, what do you think the top 3 enablers are that makes it easy for students and faculties to adopt e-portfolios</p>	University Management
Support & Training	<p>How do you think the university should support faculties and students to adopt technology?</p> <p>Is the university's infrastructure ready to adopt e-portfolios?</p> <p>What are the challenges facing implementing e-portfolios in the university</p>	University Management

Figure 5. E-portfolio sample 1

Figure 6. E-portfolio sample 2

Figure 7. E-portfolio sample 3

Figure 8. E-portfolio sample 4