



Students' Characteristics Influence Readiness to Use Mobile Technology in Higher Education

Las características de los estudiantes influyen en la disposición a utilizar la tecnología móvil en la enseñanza superior

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ABSTRACT

The purpose of the current study was to explore students' characteristics that influence student's readiness to use mobile technology at An-Najah National University in Palestine. The researchers used a mixed- methods approach to achieve the purpose of the study. 214 students from different schools were participated in the study. A descriptive and one-way ANOVA to test the hypotheses were used in data analysis stage. The findings of the study revealed that the availability of technology is an important factor to use mobile technology in higher education, as well as the student's capability to use mobile technology for her study. Furthermore, student's attitudes towards mobile technology integration play crucial role in student's readiness to use it. Higher education institutions could benefit from the findings of the study through designing capacity building programs for students to encourage them to use the mobile services inside and off campus. One of the limitations of the study was collecting data from one higher education institutions in Palestine. Furthermore, it depends on only on students' perspectives without including instructors' perspectives about students' readiness to use mobile technology.

RESUMEN

Palabras clave:

Preparación,
Educación superior,
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El propósito del presente estudio era explorar las características de los estudiantes que influyen en su disposición a utilizar la tecnología móvil en la Universidad Nacional An-Najah de Palestina. Los investigadores utilizaron un enfoque cuantitativo para lograr el propósito del estudio. Participaron en el estudio 214 estudiantes de diferentes escuelas. En la etapa de análisis de los datos se utilizó un ANOVA descriptivo y unidireccional para poner a prueba las hipótesis. Los resultados del estudio revelaron que la disponibilidad de la tecnología es un factor importante para el uso de la tecnología móvil en la educación superior, así como la capacidad del estudiante para utilizar la tecnología móvil para su estudio. Además, las actitudes de los estudiantes respecto a la integración de la tecnología móvil desempeñan un papel crucial en la preparación de los estudiantes para utilizarla. Las instituciones de educación superior podrían beneficiarse de los resultados del estudio mediante el diseño de programas de creación de capacidad para los estudiantes, a fin de alentarlos a utilizar los servicios móviles dentro y fuera del campus. Las limitaciones del estudio dependían únicamente de un instrumento de reunión de datos de una universidad, lo que podría plantear dudas sobre la generalización de las conclusiones a otro contexto.

1. Introduction

Globalization of all life spheres especially knowledge and economy necessitate rethinking of educational establishments practices in terms of quality education, continuing education, and equal opportunities. Such practices become the priority of decision makers both nationally and internationally with special interest to higher education sector which is the mainstream feeding the world of business. UNESCO which considers this sector the central to socio-economic development, and vital to competitiveness in an increasingly globalizing world, urged countries to work on inclusive and equitable quality education and lifelong principles guiding the Education 2030 Agenda (UNESCO, 2016). The Arab League Educational, Cultural and Scientific Organization (ALECSO) confirms that the transformation of the global economy from industrialization to a knowledge economy requires a whole different set of skills and competencies of the workforce. As current education systems in Arab countries are unable to cope with the contemporary changes of the global economy, ALECSO confirms that "... it is necessary to re-formulate education systems in accordance with the concepts and principles of the knowledge economy in order to be able to provide the student with the 21st century skills and knowledge and apply them in their future careers. (p. 3)". Such skills and knowledge are extremely connected to information and communication technology (ICT) which become the basis of business in all walks of life.

Therefore, educational policymakers have been considering ICT as a vital component within their policies of educational reform for more than a couple of decades. This trend is informed by several international plans, strategies and reports like; The Millennium Development Goals Report of the United Nations (2015), World Summit on the Information Society (2003, 2005) and its action plan (2015), Education Development Plan in the Arab World (ALECSO, 2008). This interest in ICT stems from the role it plays in all walks of life. According to ALECSO (2008), education is the context which is mostly affected by ICT tools and application among other contexts through providing reliable means of communication, collaboration and interaction. In addition to accessibility to knowledge repositories and facilitation of instruction delivery and learning modes.

Huang and Yu (2019) have suggested that mobile computing devices in all their forms have not only been a viable platform to carry out various tasks, but also being rapidly improved in terms of usability, processing power and connectivity, and the flexibility advantage of mobile learning could be a key factor to help students to learn new knowledge. Students are the primary determinant of benefiting from such a sophisticated technology. Therefore, the aspects to decide the readiness of benefiting from ICT in educational institutions such as universities could represent students' readiness, and when explored explicitly, assist decision makers in informing their policies and plans of integrating new technologies in their universities. As mobile devices are becoming common in our daily life practices, they become the well noted agent of ICT.

1.1. Purpose of the study

The current study explores students' characteristics that influence their readiness to use mobile technology at An-Najah National University in Palestine. In addition, to measure their attitudes towards mobile technology.

1.2. Problem statement

Higher education institutions in different countries started adapting mobile technology in their educational system to assure the equity and quality of education (Crompton & Burke, 2018). One of these countries is Palestine which is located in the heart of the Middle East region. Higher education institutions in Palestine invested a huge budget for developing and maintaining infrastructure for mobile technology. Furthermore, some universities developed applications for students in order to facilitate accessing to different services such as enrolling in courses, sending assignments, and getting their grades (Shraim & Crompton, 2015). Despite these services, there is a lack of mobile technology integration in higher education for academic purposes. To the best of our knowledge, there is a lack of studies exploring students' readiness to use mobile technology for academic purposes in the Palestinian universities. Therefore, the purpose of the present study is to explore the factors influencing the students' readiness on individual levels to use mobile technology for academic purposes in higher education. The findings of the study could help the decision-makers in higher education institutions to develop a policy for assisting students to use mobile technology on campus.

1.3. Contribution of the study

Exploring students' characteristics that impact students' readiness for mobile technology integration might help the decision-makers at higher education institutions to be aware about students features and their needs to use mobile technology and which could help to improve the infrastructure and the services that meet students' needs at these universities. In addition, students will be aware about their needs to use mobile technology integration for their courses. Therefore, the study seeks to answer the following two research questions:

1. What is the students' readiness to use mobile technology at An-Najah National University?
2. Are there any statistical differences at ($\alpha=0.05$) in students' readiness to use mobile technology at An-Najah National University due to Gender?
3. Are there any statistical differences at ($\alpha=0.05$) in students' readiness to use mobile technology at An-Najah National University due to academic level?

2. Related studies

Nowadays, mobile devices are one of the leading innovative technological tools of communications and are considered a part of the lives of the young generation including students (Shaour, 2014). The advent of these devices is accelerating and enhancing the trends of integrating such devices in education which provide flexibility in the overall education system. The emergence and prevalence of mobile learning helps flexibility in delivering education, meeting learners' needs, and supporting learning activities without confining to physical locations or time (Huang, 2014). Salha et al. (2019) pointed out that technology integration enhanced learning in higher education institutions and consider as a strategic institutional policy. The findings of their study suggested to improve the technological tools and understanding in all educational levels.

Boticki et al. (2013) found that students are encouraged using mobile technology learning and they were motivated to use the devices and to communicate. Traxler et al. (2019) showed that the use of technology and social media improved the communication between learners and teachers. In addition, Ahmad (2019) pointed out that mobile phones were indispensable tools inside and outside the classroom environment even in hard economic and social conditions.

The potentiality of mobile devices stems from supporting different forms of education, "... four types of learning approaches can be supported by mobile devices, including individualized learning, situated learning, collaborative learning, and informal learning" Cheon et al., 2012; pp. 1059–1061). According to Huang and Yu (2019), several researchers have revealed that flexibility advantages of mobile learning could play a key role in facilitating learners not only to adopt mobile learning, but also to acquire knowledge anytime and anywhere. Mobile devices, such as mobile phones provide teachers and students with the benefits traditionally found in 1:1 computing and more. Moreover, Sharples et al., (2009) pointed out a major opportunity of mobile learning which is to "support a person through a lifetime of learning, providing young children with tools to capture and organize their everyday experiences, to create and share images of their world and to probe and explore their surroundings".

In order to benefit from the potential of these devices, efforts from the educational institution should be made informed by its students' capabilities and readiness. These efforts which are considered as facilitating conditions, according to Mutlu (2017), are measured as direct determinants of behavioural intention and use behaviour of innovations which affect both aspects. They are the degree of belief in the fact that individual's organizational and technical infrastructure system is available/ready to support the use of innovation (Mutlu, 2017).

Sánchez-Prieto et al. (2019), explained the main two groups of factors that prevent instructors from incorporating a given technology in their teaching practice: external barriers, relate to availability of resources, i.e., equipment, training, time, technical support and content, and internal barriers related to how instructors regard their own teaching practices and the specific technology which are associated with motivational aspects, teaching styles or social influence.

Huang (2014) indicated that "user perceptions and perceived acceptance of mobile learning by students can provide information needed by universities and educators to make better decisions regarding mobile learning implementation. In their study, Ibrahim et al. (2016) found a relationship between the qualities of technical systems (usability, fast response, security system, multiple functions, user interface etc.), which are provided by the institution, that influence the choice of mobile learning applications. In addition, these factors also affect

students' satisfaction of the technical aspects. Some researchers indicated that quality technical aspect of mobile learning affects students' satisfaction and use of mobile learning (Affouneh et al., 2020; Ibrahim et al., 2016; Shaqour, 2014).

In spite of the communality of mobile devices among students, it is worth saying that their use is not informed by educational contexts. Although it is believed that the understanding of the drivers to motivate the use of new technologies could enhance the quality of learning process, allow students benefit their potential pedagogical and instructional uses (Briz-Ponce et al., 2017). Pedro et al. (2018) claimed that the majority of m-learning published research were in the context of informal education lacking the perceptions and attitudes of teachers. They added; it is curious that apparently only a few studies report the results of the use of these devices in the context of class-activities such as a lecture, for instance. In our Palestinian case, there is no clear policy nor systematic planning among universities to integrate such devices in the teaching learning process. Students use them for social communications as social media, Facebook, twitter, Instagram and WhatsApp are among other applications are communal. In spite of this, one can find some faculty members integrate such media in their practices for delivering learning materials, discussing assignments, carrying out group works, and collaborating. Attitude towards mobile technology refers to students' general feeling as favourable or unfavourable toward technology integration in the teaching and learning process. Beliefs about usefulness and difficulty associated with technology integration have been studied by many researchers, for example (Inan & Lowthers, 2010a; Khlaif, 2018b). Previous studies have confirmed that teachers' integration of ICT into classroom instruction is impacted by teacher's attitudes towards technology (Inan & Lowthers, 2010b; Mei et al., 2018). Student's value beliefs concerning the usefulness of technology has been strongly linked with their intention to integrate technologies into teaching (Joo et al., 2018; Khlaif & Salha, 2020; Mei et al., 2018). In their literature review, Al-Gayer found that students' attitudes and beliefs about what generates "good education" influence selection of technology applications (p.3). In their quantitative study, Bas et al., (2016) mentioned that if teachers have positive attitudes towards the use of educational technology, they can easily adopt and integrate ICT into teaching and learning processes. Khlaif (2018b) carried out a qualitative study about adopting and accepting mobile technology in Palestine. The findings reveal that users have positive attitudes towards adopting and accepting mobile technology in higher education.

In another study, Khlaif (2018a) found that students' attitudes influence by different factors such as institution infrastructure, the availability of technical support, and previous experience as well as the family economic situation.

3. Research design

A mixed methods approach was used to achieve the purpose of the study. The researchers developed an interview protocol to interview faculty members to talk about their lived experience with students who are using mobile technology for academic purposes. The researchers developed a survey as a tool for quantitative data collection.

3.1. Data collection

3.1.1. Qualitative approach

Semi-structured interviews with eight instructors have been conducted for 20 minutes to deepen the understanding of students' characteristics when using mobile learning. The interview manual consisted of five main questions about the instructor experience in mobile learning, the infrastructure, tools, applications and programs used by students, the students' communication, engagement and participation in mobile learning, and types, examples, reflections and cases of mobile learning that characterize students. A consent form has been signed to record the interviews. All the interviews were conducted on campus. The criteria for recruiting the instructors were the instructors are using mobile technology for teaching and communicating with their students, using mobile technology in teaching four courses at least, and willing to have interview.

3.1.2. Quantitative approach

The researchers developed a survey tool based on the findings of the qualitative part and previous studies related to the current study. In the beginning, the researchers created a pool of items that were related to the

present study from the qualitative findings and previous studies. The second step was to arrange the items into categories. After building the survey, four experts were invited to review the tool to ensure the clarity of the items and their wording.

The questionnaire consisted of two sections; the first section consisted of personal data about student's gender and academic level, while the second section consisted of 18 items, of five-point Likert scale items consisting of responses "strongly agree", "agree", "neutral", "disagree" and "strongly disagree". The items formed four themes namely: availability (5 items), capability (3 items), attitudes (6 items), and application (3 items). This variation in the number of items of each theme was an attempt to ensure that the diverse aspects of each of the themes were covered by the questionnaire.

The questionnaire was presented to four experts in education and higher education to validate the content of the survey and the clarity of the items. In addition, the questionnaire reliability coefficient was calculated by using Alpha Cronbach and it was (0.83) which is suitable for scientific research purposes.

3.2. Population of the study

The population of quantitative part consisted of all the students at Faculty of Educational Sciences and Teachers preparation, for the scholastic year 2016/2017. The total number of students was (612) according to deanship of registration and admission.

3.3. Study Sample

The sample of the study was random. It consisted of (214) students from the whole population (12). The percent of students' sample was (35%) from whole population. Tables (1- 2) show the sample distribution in accordance with students' independent variables.

3.4. Data analysis

3.4.1. Qualitative data

All the recordings were transcribed by the researchers and send back to the instructors to edit or add more information. A thematic analysis used for data analysis from all instructors' responses. Through thematic analysis the researchers analyse, classify, and designed patterns of the data collected by a qualitative approach. Therefore, the researchers followed the Braun and Clarke procedures in data analysis.

Table 1. Distribution of sample according to Gender

Gender	Frequency	Percentage %
Male	35	16.4
Female	179	83.6
Total	214	100

Table 2. Distribution of sample according to Academic level

Academic level	Frequency	Percentage %
1st year	17	7.9
2nd year	36	16.8
3rd year	40	18.7
4th year	121	56.5
Total	214	100.0

Based on the literature review, the researchers were categorized the findings in into four categories which were used to develop the quantitative instrument. 612 invitations were sent to the students, and 214 responds were received.

3.4.2. Quantitative analysis

SPSS 23 was used in the statistical analysis of the data after finding the validity of the items of each dimension of the survey. Means, frequency, percentages, and the standard deviations to estimate the students' responses and total score of each item were calculated to describe the four themes' characteristics of students' readiness to use mobile technology as follows; T-Test for Independent samples to test the hypotheses of gender, and one-way analysis of variance (ANOVA) were calculated to test the hypotheses of the academic level.

3.4.3. Trustworthiness

A version of the transcribed audio was sent to the participants to read, edit, and add, but nothing has been edited. The researchers analysed the data from the instructors' responses individually. Each one of the researchers shared the themes with each other. the researchers discussed to achieve agreement on the final themes. The agreement ratio among them was 85%.

3.4.4. Reliability and validity of the instruments

A pilot study was conducted with 40 students to check the reliability and validity of the tool. The research design was a descriptive and analytical design as it suited the study purposes. Emails were sent to the students inviting them to participate in the study and an attached letter was sent to the students to inform them about the purpose of the study, participating in the study was voluntary, students could withdraw from the study any time, and the participation in the study was anonymous.

Table (3) shows the reliability coefficients for study domains and the total degree

Table 3. Reliability coefficients for study domains and the total degree

Dimensions	Reliability coefficients
Availability	0.78
Capability	0.73
Attitudes	0.79
Application	0.74
Total degree	0.83

4. Findings

4.1. Findings Qualitative findings

Eight instructors from different faculties were interviewed to identify university students' readiness to use mobile learning. The interviews focused on the infrastructure of internet in the university, the students' engagement in mobile learning and the types of mobile learning at the university. The instructors reported that internet is available for students in all the places and the students used their laptops, smart phones to access Zajel, social media and databases. Students submit some of their tasks and homework through Moodle easily and the teachers provide the feedback by the same way. The students participated and engaged highly in mobile learning as they discussed the instructors and each other in Moodle forums and social media closed groups. The social media maximize the level of communication among students as they react to every instructions and comments posted by their instructor or their colleagues. Instructors from the faculty of Engineering stated, "students used different software in programming in addition to the familiar cases of mobile learning, this software are available on the university intranet". Different interviewees

mentioned the students use databases for learning and research. An instructor said "Now it is easy for students to download from famous international publishers like Springer and Sage, they keep themselves updated and fresh"

4.2. Quantitative findings

Research question 1: What is the students' readiness to use mobile technology at An-Najah National University?

4.2.1. Availability of mobile technology

Table (4) shows the results of the first theme; the availability of mobile technology, it indicates that (42.1%) of respondents reported that they can access internet inside the university, while (4.7 %) of the respondents face difficulty in accessing the internet inside the university. While university's students support for using educational application was ranged between the availability of such support and unavailability, according to students' respondents. This result might be an indication of using educational application informally by students. On the other hand, both university library and teachers' support in providing students of learning resources were admitted by about half of the respondents. But respondents didn't clearly confirm that their university assisted them in having free applications. Such results are normal in cases of using new technologies independently without clear strategies and planning. The above results confirmed the researchers' claim about the lack of clear policy and systematic planning among universities in Palestine to integrate mobile technology in the teaching learning process. The results are also similar to what Pedro et. al. (2018), claimed about the majority of m-learning published research which were in the context of informal education context lacking the perceptions and attitudes of teachers.

Table 4. Frequencies & percentages of the availability of mobile technology

Item	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
I can access internet easily inside the university.	10	4.7	21	9.8	33	15.4	60	28.0	90	42.1
The university supports students in using computer applications for learning	26	12.1	57	26.6	68	31.8	43	20.1	20	9.3
I depend on learning resources provided by university library	23	10.7	46	21.5	66	30.8	49	22.9	30	14.0
I depend on learning resources provided by teachers	55	25.7	58	27.1	72	33.6	22	10.3	7	3.3
I benefit from free programs and applications provided by the University	19	8.9	49	22.9	68	31.8	43	20.1	35	16.4

4.2.2. Students' capability to use technology

The following three item table (Table 5), of students' capability to use mobile technology indicates that almost half of the respondents didn't agree of additional costs caused by using internet. This is due to the continuous reduction of internet services fees of provided companies, and higher education institutions should benefit from this low cost of services in their technology integration. For students' capability of learning new applications by themselves, about 66% of the respondents agree that they could independently learn to use new applications, and about half of the respondents (45.3%) agree that their teachers help them in developing their technological

skills. Such results should be considered as “facilitating conditions” (Mutlu, 2017), for higher education institutions to integrate mobile technology in their practices.

Table 5 . Frequencies and percentages of students’ capability to use mobile technology

Item	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Using internet is additional financial issue.	20	9.3	27	12.6	66	30.8	55	25.7	46	21.5
I don’t face any difficulties in learning new computer applications	77	36.0	65	30.4	40	18.7	22	10.3	10	4.7
University teachers help me in developing my technological skills	36	16.0	61	28.5	63	29.4	29	13.6	25	11.7

4.2.3. Students’ attitudes towards using technology

As shown in (Table 6), Self-confidence in both using social media tools (item 1), and following up application updates (item 2), indicate respondents’ positive attitudes towards mobile technology applications as 63.1% of these respondents consider themselves as good users of social media tools, which are the predominant tools of mobile technology. And about 38.3% of respondents consider themselves as good followers of application updates. The respondents (58.8%) admitted that computer applications enhance communications, this is justified as university students as well as other individuals of the same age digital generation using technology in a regular basis. In addition, about half of the respondents claim that the use of technology increases students’ self-confidence. And lastly, more than half of the respondents consider the use of computer applications essential for both their daily lives and for their university lives. These results justify Shaqour’s claim (2014), which considered mobile technology as a part of the lives of the young generation including students.

Table 6. Frequencies & percentages of students’ attitudes towards using mobile technology

Item	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
I consider myself a good user of social media tools	61	28.5	74	34.6	54	25.2	12	5.6	13	6.1
I consider myself a good follower for any updates of computer applications domain	34	15.9	48	22.4	84	39.3	37	17.3	11	5.1
Computer application provides active social means of communication	51	23.8	75	35.0	63	29.4	22	10.3	3	1.4
Using computer applications increase my selfconfidence	34	15.9	81	37.4	71	33.2	22	10.3	7	3.3
Using computer applications is essential in my daily life	52	24.3	66	30.8	69	32.2	19	8.9	8	3.7
Using computer applications is essential in my university life	66	30.8	59	27.6	67	31.3	16	7.5	6	2.8

4.2.4. The nature of technology applications

Table (7) includes the responses of 4 items of the nature of technology applications. 40.5% of the respondents had not decide whether computer applications are social and economic means or not, while 38.8% agreed that they are. Students were also meant to follow-up university news and announcements and to be updated of their study programs, these were clear through their responses of the two other items related to following university website as 55.6 % of respondents agreed that they followed this website, and 72.4% agreed the followed-up the university portal and Zajel.

Research question 2: Are there any statistical differences at ($\alpha=0.05$) in students’ readiness to use mobile technology at An-Najah National University due to Gender?

Table 7. Frequencies & percentages of the nature of technology applications

Item	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Computer application provides means of social and commercial communication	37	17.3	46	21.5	87	40.5	28	13.1	16	7.5
Computer applications assist me in having additional learning resources	81	37.9	74	34.6	44	20.6	9	4.2	6	2.8
I follow university website	53	24.8	66	30.8	58	27.1	22	10.3	15	7.0
I follow Zajel (AnNajah University Academic Portal)	94	43.9	61	28.5	40	18.7	11	5.1	8	3.7

The researchers used T-test to examine the hypothesis. Table (8) shows the results.

Table (8) shows that there are statistical differences at ($\alpha=0.05$) in students' readiness to use mobile technology due to Gender, in favour of females.

Table 8. Means, standard deviations and t-test of students' readiness to use mobile technology due to Gender.

Gender	N	Mean	S. D	D.F	T- value	P.
Male	35	3.49	0.84	212	2.4352	0.016
Female	179	3.91	0.95			

p<.05

Research question 3: Are there any statistical differences at ($\alpha=0.05$) in students' readiness to use mobile technology at An-Najah National University due to Academic level?

The researchers used One Way ANOVA the hypothesis. Table (9) shows the results.

Table (9) shows that there is no statistical differences at ($\alpha=0.05$) in students' readiness to use mobile technology due to academic level.

Table 9. One Way ANOVA of students' readiness to use mobile technology due to Academic level

Source of Variation	Sum of Squares	D.F	Mean Square	F- value	P.
Between groups	0.120	3	0.040	1.166	0.324
Within groups	7.219	210	0.034		
Total	7.339	213			

p<.05

5. Discussion

This study investigated four themes, which the researchers believe to influence mobile technology readiness to use in higher education, namely the availability of this technology, their capability to use it, their attitudes towards using it, and the nature of this technology applications. In order to explore the factors influencing the students' readiness on individual levels to use mobile technology for academic purposes in higher education in accordance to the above four themes, participants answered a questionnaire developed by the researchers.

Although mobile technology is common among Palestinian adults especially students of higher education, it is still in its infant stage in Palestinian education system which is congruent with Shraim's study (2014). These students' usually use their mobile devices for communication rather than for educational purposes. According to the Palestinian Central Bureau of Statistics (2017), that the majority of households in Palestine have a mobile phone with a percentage of 96.6%, while 51.7% of households in Palestine have internet access.

Students' responses to the four themes' items explained that the road of benefitting from mobile technology in their university study is almost paved which consistent with Huang (2014). Moreover, Zhang et al. (2020) confirmed that university students tend to have more diverse information needs and use their mobiles in various learning related activities.

Students in the study showed their capabilities to use this technology, as they could learn new applications on individual bases, they are willing to follow-up technology updates and they continued using mobile applications independently which is partially consistent with the study of Lai and Hong (2015). Although there was no planned technology integration in the academic life of students, they showed their interest in following up their teachers' announcements and their university's news through the university website and portal. This study showed respondents had personal innovativeness and were ready embrace mobile technology as an integral part of their learning process.

This is a positive indication that enables the university administration to move the context of using mobile technology from personal, independent and informal form to a more formal one. This move requires the university administration to plan strategically to integrate such technology in its practices (Kaliisa et al., 2019).

5.1. Limitations of the Study

The current study has two limitations. The first one is related to the design of the study specifically recruiting the participants, since it depends only on one university. In addition, the study depended on self-reported tools for data collection. It should have different tools and to take the lecturers at the university into consideration. One of the other tools is focus group sessions for students, parents and staff from different universities. The study should be replicated in different context and use different tools for data collection, different contexts, and recruit many participants from different backgrounds as much as possible in order to allow results for generalization.

5.2. Conclusions

The current study presented students in higher education institution perceptions about the characteristics influencing readiness to use mobile technology integration in higher education. A quantitative approach was used to explore to what extent the students are ready to use this advance technology in their university life. The findings of the study revealed four dimensions including availability of technology, capability, attitudes, and applications that use for technology integration.

Students use technology to support their classroom activities through communicating with colleagues and look for additional resources as well as to communicate with the instructors.

The findings of the recent study could guide the decision-makers in the higher education institutions in Palestine to design workshops and programs to encourage students to register at universities. He relationship officers at the higher education institutions should arrange field trips to the schools and meet the high school students to talk about the life of higher education. In addition, the administrations of the higher education institutions should encourage students to bring their own devices to use on campus to access to different services that are related to their program of study.

References

- Affouneh, S., Salha, S., & Khlaif, Z. N. (2020). Designing Quality E-Learning Environments for Emergency Remote Teaching in Coronavirus Crisis. *Interdiscip. J. Virtual Learn. Med. Sc.*, *11*(2), 1–3. <https://doi.org/10.30476/ijvlms.2020.86120.1033>
- Ahmad, T. (2019). Undergraduate mobile phone use in the Caribbean: Implications for teaching and learning in an academic setting. *J. Res. Innov. Teach. Learn.*, *13*(2), 191–210. <https://doi.org/10.1108/jrit-01-2019-0001>
- ALECSO. (2008). Plan for the development of education in the Arab countries. Education Development Plan in the Arab world. The Arab League Educational, Cultural and Scientific Organization, Tunisia, Tunis.
- Bas, G., Kubiak, M., & Murat, A. (2016). Teachers' perceptions towards ICTs in teaching-learning process: Scale validity and reliability study. *Comput. Hum. Behav.*, *61*, 176e185. <https://doi.org/10.1016/j.chb.2016.03.022>
- Boticki, I., Barisic, A., Martin, S., & Drljevic, N. (2013). Teaching and learning computer science sorting algorithms with mobile devices: A case study. *Comput. Appl. Eng. Educ.*, *21*(S1), E41–E50. <https://doi.org/10.1002/cae.21561>

- Briz-Ponce, L., Pereira, A., Carvalho, L., Juanes-Méndez, J. A., & García-Peñalvo, F. J. (2017). Learning with mobile technologies – Students' behavior. *Comput. Hum. Behav.*, *72*, 612–620. <https://doi.org/10.1016/j.chb.2016.05.027>
- Cheon, J., Lee, S., Crooks, S. M., & Song, J. (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behavior. *Comput. Educ.*, *59*(3), 1054–1064. <https://doi.org/10.1016/j.compedu.2012.04.015>
- Crompton, H., & Burke, D. (2018). The use of mobile learning in higher education: A systematic review. *Computers & Education*, *123*, 53–64. <https://doi.org/10.1016/j.compedu.2018.04.007>
- Huang, Y. (2014). Empirical analysis on factors impacting mobile learning acceptance in higher engineering education (doctoral dissertation). University of Tennessee.
- Huang, R. T., & Yu, C. L. (2019). Exploring the impact of self-management of learning and personal learning initiative on mobile language learning: A moderated mediation model. *Australas. J. Educ. Technol.*, *35*(3). <https://doi.org/10.14742/ajet.4188>
- Ibrahim, N., Ayub, A. F. M., & Khambari, M. N. M. (2016). The Predictors of Habitual Behavior in Using Mobile Phone among University Students. *Int. J. New Technol. Res.*, *2*(8), 9–15.
- Inan, F. A., & Lowther, D. L. (2010a). Factors affecting technology integration in K-12 classrooms: A path model. *Educ. Technol. Res. Dev.*, *58*(2), 137–154. <https://doi.org/10.1007/s11423-009-9132-y>
- Inan, F. A., & Lowther, D. L. (2010b). Laptops in the K-12 classrooms: Exploring factors impacting instructional use. *Comput. Educ.*, *55*(3), 937–944. <https://doi.org/10.1016/j.compedu.2010.04.004>
- Joo, Y. J., Park, S., & Lim, E. (2018). Factors influencing preservice teachers' intention to use technology: TPACK, teacher self-efficacy, and technology acceptance model. *J. Educ. Technol. Soc.*, *21*(3), 48–59. <https://doi.org/10.1080/14759390400200188>
- Kaliisa, R., Palmer, E., & Miller, J. (2019). Mobile learning in higher education: A comparative analysis of developed and developing country contexts. *Brit. J. Educ. Technol.*, *50*(2), 546–561. <https://doi.org/10.1111/bjet.12583>
- Khlaif, Z. (2018a). Teachers' perceptions of factors affecting their adoption and acceptance of mobile technology in K-12 settings. *Comput. Sch.*, *35*(1), 49–67. <https://doi.org/10.1080/07380569.2018.1428001>
- Khlaif, Z. N. (2018b). Factors influencing teachers' attitudes toward mobile technology integration in K-12. *Technol. Knowl. Learn.*, *23*(1), 161–175. <https://doi.org/10.1007/s10758-017-9311-6>
- Khlaif, Z. N., & Salha, S. (2020). The Unanticipated Educational Challenges of Developing Countries in Covid-19 Crisis: A Brief Report. *Interdiscip. J. Virtual Learn. Med. Sci.*, *11*(2), 130–134. <https://doi.org/10.30476/IJVLMS.2020.86119.1034>
- Lai, K. W., & Hong, K. S. (2015). Technology use and learning characteristics of students in higher education: Do generational differences exist? *Brit. J. Educ. Technol.*, *46*(4), 725–738. <https://doi.org/10.1111/bjet.12161>
- Mei, B., Brown, G. T. L., & Teo, T. (2018). Toward an understanding of preservice English as a foreign language teachers' acceptance of computer-assisted language learning 2.0 in the People's Republic of China. *J. Educ. Comput. Res.*, *56*(1), 74–104. <https://doi.org/10.1177/0735633117700144>
- Mutlu, M. H. (2017). Unified theory of acceptance and use of technology: The adoption of mobile messaging application. *Megatrend Revija*, *14*(1), 169–186. <https://doi.org/10.5937/MegRev1701169M>
- Pedro, L. F. M. G., de Oliveira Barbosa, C. M. M., & das Neves Santos, C. M. (2018). A critical review of mobile learning integration in formal educational contexts. *Int. J. Educ. Technol. High. Educ.*, *15*(1), 10. <https://doi.org/10.1186/s41239-018-0091-4>
- Salha, S., Affouneh, S., & Khlaif, Z. N. (2019). Palestinian perspective in digitalization of teacher professional development (TPD). *Comenius Journal*, *28*, 41–43.
- Sánchez-Prieto, J. C., Olmos-Migueláñez, S., & García-Peñalvo, F. J. (2017). MLearning and pre-service teachers: An assessment of the behavioral intention using an expanded TAM model. *Comput. Hum. Behav.*, *72*, 644–654. <https://doi.org/10.1016/j.chb.2016.09.061>
- Shaqour, A. Z. (2014). Students' Readiness towards M-Learning: A Case Study of Pre-Service Teachers in Palestine. *J. Educ. Soc. Res.*, *4*(6), 19–26. <https://doi.org/10.5901/jesr.2014.v4n6p19>
- Sharples, M., Milrad, M., Arnedillo, I., & Vavoula, G. (2009). Mobile Learning: Small devices, Big Issues. In N. Balacheff, S. Ludvigsen, T. d. Jong, A. Lazonder, & S. Barnes (Eds.), *Technology Enhanced Learning: Principles and Products* (pp. 233–249). Heidelberg: Springer. https://doi.org/10.1007/978-1-4020-9827-7_14
- Shraim, K., & Crompton, H. (2015). Perceptions of Using Smart Mobile Devices in Higher Education Teaching: A Case Study from Palestine. *Contemp. Educ. Technol.*, *6*(4), 301–318. <https://doi.org/10.30935/cedtech/6156>

- UNESCO. (2016). *Incheon declaration and Framework for action for the implementation of Sustainable Development Goal 4. Towards inclusive and equitable quality education and lifelong learning opportunities for all. Education 2030*. UNESCO. <https://bit.ly/3rY0bwE>
- Traxler, J., Khaif, Z., Nevill, A., Affouneh, S., Salha, S., Zuhd, A., & Trayek, F. (2019). Living under occupation: Palestinian teachers' experiences and their digital responses. *Res. Learn. Technol.*, 27. <https://doi.org/10.25304/rlt.v27.2263>
- Zhang, X., Lo, P., So, S., Chiu, D. K., Leung, T. N., Ho, K. K., & Stark, A. (2020). Medical students' attitudes and perceptions towards the effectiveness of mobile learning: A comparative information-need perspective. *J. Librariansh. Inf. Sci.*, 53(1), 116–129. <https://doi.org/10.1177/0961000620925547>