Mobilizing Learning:
Using Moodle and Online Tools via Smartphones

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ABSTRACT

The emergence of smart devices such as smartphones (e.g., iPhone) and tablets (e.g., iPad) may enhance e-learning by increasing communication and collaborative learning outside the classroom. These devices also facilitate the use of online technologies such as Facebook. However, the adaptation of Learning Management System (LMS) services to mobile devices took longer than social networks or online tools such as Facebook and Twitter have already been long used via smartphone. The main purposes of this study are to explore students' skill levels of LMS (Moodle) and their knowledge of online tools or technologies and then examine if there is a correlation between smartphone use and using of online tools and Moodle in learning. The study conducted among 173 students in the Department of Information Studies (DIS) in Oman, using online survey. The study found that most students demonstrated high levels of accessing course/subject materials and regularly engaging with studies of using LMSs. YouTube, Wikipedia and Facebook were clearly recorded as the most popular sites among students while LinkedIn and Academia.edu were two online tools that had never been heard of by over half of the 142 participants. Emailing and searching are recorded the most popular online learning activities among students. The study concluded that students prefer to use smartphone for accessing these tools rather than using it to access LMSs, while a positive correlation was found between the use of these tools and smartphones, but there was no correlation between smartphones and using LMSs.

1. Introduction

Most of the world's learning institutions have adopted and used Learning Management Systems (LMS) in order to help academics to organize their courses and allow students access to online learning services. Sultan Qaboos University (SQU) is the first public university in Oman, which officially opened in 1986. It is located in the capital of Oman, Muscat, and it is the only state

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university in the Sultanate of Oman with nine colleges. The internet was made available to SQU late in 1997. The Centre of Information System (CIS) in SQU supports academic and research activities, administrative needs and clinical and diagnostic work. The use of the internet facilitates learning processes for students. It has become a main resource for students with respect to learning. The advancement of technology is one of the most apparent trends affecting education at SQU. SQU has used the internet to increase e-education. LMSs such as Blackboard, WebCT and Moodle are used for teaching and learning in higher education institutions around the globe. E-learning using WebCT was implemented at SQU in 2001. Two years later, the number of online courses increased from eight to 40, and the number of students enrolled in these courses increased from 981 to 3,001 (Al Musawi & Abdelraheem, 2004). Over that time, the Centre of Educational Technology (CET) at SQU conducted many workshops in order to demonstrate the functionality of the WebCT package and how to use it to design online teaching materials. Two negative points were reported by students regarding e-learning instruction, as indicated by Al Musawi and Abdelraheem (2004): Internet delays and interruption of WebCT service, and difficulties encountered in using onscreen materials for learning. These factors can be connected to a lack of technical support and the lack of quality of the internet connection.

WebCT was replaced by Moodle, which supports teaching and learning processes. Since 2005, Moodle has become a major technology used in SQU by educators to create quality online content and to present course materials. It has gained the interest of some researchers at SQU. For example, Ahmed and Al-Khanjari (2012) explored the effect of Moodle on students learning in a particular course at SQU, and they found that the students were comfortable using Moodle overall. Students reported that Moodle helped them in better understanding and learning the course material, however they preferred face-to-face approach. In 2012, the University introduced the new version of Moodle, which has new characteristics (wikis, YouTube, blog, chats, forums, etc.) and additional features. In addition, the CET at SQU offers many workshops each year for all academic staff in order to introduce new technologies in education.

The emergence of smart devices such as smartphones (e.g., iPhone) and tablets (e.g., iPad) may enhance e-learning by increasing communication and collaboration between students and help them to learn outside the classroom. These devices facilitate the use of various online tools such as Facebook. According to statistics data found on the Internet World Stats site (2012), there are 1,367,220 Facebook users on Dec 31/11 in Oman, representing 33.0% penetration. In 2014, there were more than 2 million subscribers and Oman currently has more than 600,000 Facebook users (Master, 2015). It can be observed that Omani people tend to use these tools or similar online tools such as s-oman.net and omaniaa.net, which are local online forums. YouTube, Facebook, and Google are the most popular sites among Omani people as reported by International Telecommunication Union ITU (2012). YouTube was the most popular site in Kuwait, the second most popular in Oman and Kingdom of Saudi Arabia (KSA), and the third most popular in Bahrain and Qatar. Facebook was the second most popular site in Bahrain and Qatar and the third most popular in Kuwait, Oman, and KSA as provided by ITU.

According to the Arab Social Media Report, ASMR (2011), there are 36 million Arab Facebook users and a quarter of those users come from Egypt. The most active populations on Twitter are found

in Kuwait, KSA, Egypt, the UAE and Bahrain. The largest numbers of bloggers in the Gulf were found in KSA and Kuwait (Alqudsi-ghabra et al., 2011). Additionally, in 2015 Arab Social Media Report stated that around 87% of all social media users covered by the survey are currently subscribed to Facebook and vast majority (89%) of current Facebook subscribers access the channel on daily basis. It also showed that "Whatsapp and Facebook were also the top used social media channels among Arab countries, as Facebook was the top used social media channel in 10 Arab countries" (p. 4) includes UAE, Qatar, Oman, Jordan, Palestine, Iraq, Yemen, Libya, Egypt, and Morocco.

Smartphones like iPhone and BlackBerry have been increasingly used in the GCC. These contribute to utilising the internet for different purposes; however, according to Alqudsi-ghabra et al. (2011):

> Today, over 500,000 people in the UAE use BlackBerrys. Restricting these BlackBerrys tarnishes the modern image that the UAE works hard at maintaining and projecting to the outside world. Yet the fear of these smartphones' potential in mobilizing dissatisfied citizens and masses has grown in the area, particularly in the aftermath of the Arab Spring movement ⋯Reporters Without Borders' report section on Internet Enemies (2011) state that, in Saudi Arabia, where BlackBerry phones are popular, pressures from authorities threatening to block the BlackBerrys' instant messaging service led RIM, the BlackBerry manufacturing company, to agree in August 2010 to install a server in Saudi Arabia. This was done to enable Saudi authorities to gain court-ordered access to certain messages, a fact that worries users of these smartphones. (p. 65)

According to ASMR (2011), most news/information on the events during the civil movements in Egypt and Tunisia came from social media sources (e.g., Facebook, Twitter, etc.). According to statistics found on the Internet World Stats site (2012), the number of Facebook users in the (GCC) including Oman shows significant increase. It also showed that Facebook is very popular among Arabs; KSA and the UAE have the largest number of users, more so after the introduction of the site's Arabic landscapes.

In terms of mobile networks, the Social Media Report (2015) illustrated that the majority of Arab respondents "(83%) access or use social media via their smartphones most of the time, compared to 11% who use their laptops most of the time to access/use social media" (p. 23), "the majority (84%) of social media users in Arab World visit Facebook through their smartphones and/or tablets" (p. 26). In the recent years, mobile penetration has continued to grow in Oman. According to Callanan & Dries-Ziekenheiner (2012), mobile networks are the preferred delivery method for content. They provide statistical information on mobile phone as a follows: there is around 4,809,248 mobile services subscribers in Oman, and 1,226,442 active mobile broadband subscribers which is around 25% of all mobile phone subscribers in the country. Almost 92% of internet users "owned a smartphone and there is widespread use of the latest smartphone handsets". Callanan & Dries-Ziekenheiner (2012) also reported that smartphones especially Samsung smartphones are becoming increasingly popular in Oman. The total numbers of SMS messages are continuing to grow. The internet-based messaging services for mobile messaging application for iPhone, BlackBerry, Android are becoming increasingly popular in Oman, for example, WhatsApp is popular internet-based messaging services among Omani People.

On other hand, the adaptation of LMS services to mobile devices took longer than social networks, and online tools such as Facebook and Twitter have already been long used via smartphone. It is important to mention that they are attempts/initiatives that describe a way to integrate mobile devices and educational applications with a LMS such as Moodle through web services (e.g., Forment & Guerrero, 2008; Casany et al., 2012). LMSs mobile learning applications are now available on a variety of devices including Android, BlackBerry, and smartphones such as iPhone. However, online tools such as Facebook, Twitter and LinkedIn can be downloaded, installed and used easily through smartphones. Technology devices like smartphones (e.g., Galaxy and iPhone) and tablet devices (e.g., iPad and Galaxy Tab) easily access such applications or online tools, and facilitate students' participation and discussions on platforms that will be available to them after graduation. Very few studies have examined online, and any such studies have had a very broad focus, rather than paying specific attention to the actual use of online tools and the Moodle via smartphone by students. This may reflect the various issues related to students: the correlation between smartphone use and using of online tools and Moodle in learning has not been investigated.

2. Objectives of the study

The main objectives of this paper are to:

- explore students' skill levels of an LMS (Moodle),
- explore students' knowledge of online tools or technologies and their online usage for learning activities, and
- examine if there is a correlation between smartphone use and usage of online tools and usage of Moodle for learning

3. Review of the Literature

Learning with smartphones or so-called M-learning has discussed recently by number of authors and researchers (e. x, Looi et al., 2011; Norris, Hossain, & Soloway, 2011; Cochrane, 2011a; Cochrane, 2011b; Wong, 2012; Sha, Looi, Chen, & Zhang, 2012; Cochrane, Antonczak, & Wagner, 2013; Kearney & Maher, 2013; Williamson & Parolin, 2013; Looi & Toh, 2014; Looi, 2014; Seifert, 2016). For example, Kim and Kwon (2012) pointed out that "mobile learning enhances the mobility of individual learners. Learners usually take the advantage of their learning to facilitate productivity and effectiveness, allowing them to be more flexible, accessible, and to personalize their learning activities" (p. 33-34). Therefore, the adapting of Moodle services to mobile devices or smartphones in e-learning environments has been considered by many institutions. Casany et al. (2012), for example, concluded in their study of Moodle Services to Mobile Devices: and the Moodbile Project that "M-learning enhances collaborative learning and increases learning flexibility by allowing it to be more personalized and student-centred. But on the other hand, m-learning faces interoperability problems with LMS (the

basic e-learning infrastructure of many educational institutions)" (p. 27). Another recent study by Bogdanović, Barać, Jovanić, Popović & Radenković (2014) highlighted the problem of using and delivering educational content from the Moodle LMS to mobile devices found that the mobile and desktop tests can be equally used in the learning process within LMS. However, two problems were reported by the students regarding the use of LMS within mobile which are: content visibility and readability on the small screen and lack of understanding content delivered on mobile phones which was fairly complicated.

The problem not only involves of using mobile within LMS, but also with online tools and technologies such as Facebook. For example, a study by Gabarre, Gabarre, Din, Shah and Karim (2013) which conducted in two French language courses to identify the impeding factors of using a social networking sites (SNSs) on smartphones with the replacement of the faculty's LMS by a unified platform. The study identified several issues with the use of SNSs via smartphones: the lack of privacy, the lack of stimulation to connect with others and the diverging notions of online and offline friendships. Another study by Wang, Woo, Quek, Yang and Liu (2012) intended to explore the use of the Facebook group as an LMS and the students' perceptions of using it in their courses. The study was conducted among students in two elective courses at a teacher education institute in Singapore, using online survey. A total of 14 participants from each course completed the survey. The study found that Facebook group has many potential benefits as an LMS such as sharing resources and online discussions. The study concluded that the use of the Facebook group has several limitations, for example, Facebook did not support other format files to be uploaded directly, and the discussion was not organized in a meaningful structure, as well as privacy concerns about their personal information. However, "the integration of the mobile web 2.0 technologies into lecturers' daily workflow and integration into course activities and assessment are critical success factors, as is the establishment of a collaborative learning environment" (Cochrane, Bateman, Cliffin, Henderson, & Holloway, 2009, p. 4).

E-learning platforms available both commercial products and non-commercial open-source solutions such as Moodle support students learning either in a classroom or in a distance learning configuration. As such, the popularization of various online tools or so-called Web 2.0 applications such as Twitter and Facebook also influences the learning of students. Gartner (as cited in Walczak, Wiza, Rumiński, Chmielewski, & Wójtowicz, 2011, p. 1) pointed out that "By 2013, the number of mobile devices, such as smartphones and browser-equipped enhanced phones, used to access the Web is expected to exceed the number of PCs". According to Titcomb (2016) "Statcounter, a research company that tracks internet use across 2.5m websites, said 51.3pc of pages were loaded on mobile devices in October, the first time they have surpassed desktop and laptop computers" (par 2). The emergence of online tools has opened new opportunities for leaners to communicate efficiently and effectively. The internet has transformed into a platform providing people with collaborative access to a wide range of media and services that they now use on a daily basis. These services and media have been used in different sectors and purposes including business and education. The use and development of smart devices contribute in using and adopting such applications and tools which also facilitate learning and teaching.

In Oman, a number of studies were conducted regarding smartphone and eLearning technologies

such Facebook; examples of these studies are Al-Emran, Elsherif, and Shaalan (2016), Al-Emran and Shaalan (2015), alkindi (2014), Vinu, Sherimon, and Krishnan (2011), Sarrab, Elgamel, and Aldabbas (2012), Sarrab and Elgamel (2013), Khan, Al-Shihi, Al-Khanjari, and Sarrab (2015). Additionally, some studies were discussed the use of online tools such as Facebook via smartphones in more details. A study by Masters (2015) aimed to measure SNS addiction rates among health sciences students (141 medical and laboratory science students) at Sultan Qaboos University (SQU) in Oman, found that YouTube was most commonly used (100%), followed by Facebook (91.4%) and Twitter (70.4%). Mehmood and Taswir (2013) conducted a study among 100 undergraduate students at the College of Applied Sciences (CAS), Nizwa, Oman to investigate pedagogical impacts of social networking sites as e-learning technologies. The study found that all the students (100%) used one or the other social networking site. This is included YouTube, Google plus and Facebook, using in academics purposes. Google Plus was used as much as Facebook. Twitter was the least used of all the websites. The study also found that 80% of students reported that they used a social networking site on phone and 72% students agreed that Social networks were an effective e-learning tool, and 72% who were in favour felt that e-learning saved time. Another study by Al-Harrasi and Al-Badi (2013) conducted among a sample of 179 students at different universities and higher education institutes in the Sultanate of Oman aimed to explore the usage of social networking via Smartphones. The study found that the majority of students (96%) were using their smartphones to access the social networking sites. The study also found that 85% of students found easy access a vast quantity of materials related to the curriculum, 73% improved the academic experience in general, 92% found using smartphones useful for clarification of homework assignments, 72% found useful to keep in touch with professors, 83% useful for sharing video tutorials and 92% found useful for finding information and sharing feedback with other students. Another recent study by Lane-Kelso (2014) using mobile devises for learning with the flipped-mastery delivery method aimed to explore the potential roles of mobiles in Omani education, found that all students agreed that m-learning was important for education and "most (85.71%) agreed they and their students enjoyed learning new technology skills but only 71.43% agreed students should be allowed to use mobiles in class" (p. 71). The study concluded that mobile will play important roles in teaching and learning.

4. Methodology

The methodology selected for this study is quantitative (Online survey) technique which conducted among 173 students in DIS in three academic programs in Oman (Table 1).

Table 1. Total Number of Respondents from DIS

	F	M	Total
Bachelor's degree	108	36	144
Master's degree	18	9	27
PhD	2	0	2
Total	128	45	173

There are critical reasons for choosing DIS as a target for this study. Most academics at DIS seek to provide a meaningful educational experience that prepares IS students for productive roles in modern information environments. Therefore, academics are seeking to establish programs and curricula that prepare students for work environments in which digital technologies are continually emerging. They provide training on information sources and services that now can be facilitated by using various Internet applications, including Web 2.0 applications. Another reason for selecting DIS is the applicability of the research outcomes to similar teaching areas such as knowledge management, information systems, information technology, mass communication, Internet studies, etc. Another reason for selecting one LIS department rather than several departments are that the intention of the study is to explore the study's problem deeply rather than just obtaining a general overview.

Questionnaires are the most widely used data collection method (as a quantitative approach). "Surveys help identify important beliefs and attitudes of individuals, such as college students' beliefs about what constitutes abusive behaviors in dating relationships" (Creswell, 2012, p. 376). Questionnaire also has some advantages as mentioned by Wright (2005), for example, access to unique populations, time saving for researchers in regards to ability to reach thousands of people and time needed for data collection and low cost saves money. For this reason, questionnaires were chosen as a technique for obtaining quantitative data regarding the use of online tools by students at the Department of Information Studies. Many studies used questionnaires in order to investigate the students' attitude towards these applications (e. x, Majhi & Maharana, 2011; Smith, 2010; Al kindi & Alhashmi, 2012).

The questionnaire was developed based on the existing literature and research objectives. The researchers used various information resources to locate material relevant to the study in order to design the questionnaire. A careful review of the literature related to the use of online tools and smartphones in Oman, were conducted with respect to the social context of Oman, and provided a good foundation upon which to support the design and construction of the questionnaire. The structure of the questions included multiple choice responses and five/seven Likert-type scales and all participants were required to tick the appropriate *box* in response to the question. Building and structuring questions in this way was allowing the researchers to code, analyse and interpret data efficiently and effectively. Data was analysed and stored in electronic format for easier manipulation using SurveyMonkey software.

The questionnaire was piloted before it was sent to the participants, and it was checked and reviewed by three academics at DIS, and SPSS was used to calculate Cronbach's alpha reliability coefficient in order to measure of questionnaire reliability. Cronbach's alpha is 0.91, which indicates a high level of internal consistency for questionnaire scale with this sample. The questionnaire was pre-tested by first sending it to a small group of actual survey respondents who are IS students (10 students) to ensure data will be collected as expected. All comments and feedback reported by respondents to the pilot study was considered and all required changes were made to the questionnaire.

The questionnaire was distributed in October 2012. The semester started on 15th of September 2012. The total started survey was 151, total finished survey was 139 (92.7%), discarded was 4, total of actual number (valid) was 147 and the response rate was 85%.

The data was encoded, managed and collated using SurveyMonkey and then automatically down-loaded into SPSS. Descriptive analysis included frequencies and percentages for the multiple responses,

ranges, means, and standard deviations for the numeric variables. To determine whether there were differences between the dependent variables and independent variables, Spearman correlations tests was performed. The data of the study is mostly categorical. Hence, the use of Chi-square is acceptable and does not need an investigation of normality because Chi-square does not assume normality. In regards to the Spearman correlations tests, the type of relationships or the strength of a relationship is determined by the correlation as a follow: .70-1.00 is strong, .30-.69 is moderate and .00-.29 is none (.00) to weak as identified by Jackson (2009).

5. Findings

5.1 Internet Use

The respondents were asked six questions regarding their internet use. The first question assessed the internet skills of the respondents as Illustrated in Table 2. They were asked to classify themselves according to five scales as shown in Table 2. More than half of the respondents described their skills as "Good" (61.2%, n=90), while 20.4% (n=30) were "Average", and 17.7% (n=26) were "Excellent". Only 0.7% (n=1) classified themselves to be at the "Poor" level. None of them believe themselves to have "Very Poor" skills. The mean score calculated for this response was 3.9592, which shows that the mean self-assessed score for internet skill received from respondents was very high. This is likely to be explained by the nature of Library courses, which focus more on ICT.

Table 2. Internet Skills of Respondents- *self-assessed*

	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1. Very Poor	0	0	0	3.9592	.63975
2. Poor	1	.7	.7		
3. Average	30	20.4	20.4		
4. Good	90	61.2	61.2		
5. Excellent	26	17.7	17.7		
Total	147	100.0	100.0		

Table 3 illustrates the frequency of usage for four types of devices in accessing the internet according to a five point scale; 0 = "Never used", 1 = "Occasionally", 2 = "Sometimes", 3 = "Often", and 4 = "Very Often". The majority of respondents (99.3%, n=146) reported that they use a personal desktop computer or laptop computer to access the internet either "Occasionally", "Sometimes", "Often", or "Very Often", and of this 61.9% (n=91) selected "Very Often". The mean score calculated for this response was the highest (4.4218) in the survey. Smartphones are also popular devices used to access the internet, with a mean score of 3.6531. A considerable number of respondents (87%) use smartphones to access the internet, and 40.1% (n=59) of these access the internet "Very Often" using the device. Tablet devices (e.g., iPad, Xoom, Galaxy Tab, Galaxy Note, etc.) were recorded less than other devices used to access the internet (mean score = 1.23042). However, more

than half of respondents use tablet devices to access the internet (56%, n=82) compared to 44% (n=65) who had never used tablet devices to access the internet.

Table 3. Frequency of Using Four Categories of Devices in Accessing the Internet

	Frequency and Percentage					Total	Mean
	Never use	Occasionally	Sometimes	Often	Very Often		
Personal desktop computer or laptop computer	0.7% (1)	4.1% (6)	9.5% (14)	**23.8% (35)**	**61.9% (91)**	147	4.421
Smart phone (e.g., iPhone, Blackberry, Galaxy, etc.)	12.9% (19)	10.2% (15)	15.6% (23)	**21.1% (31)**	**40.1% (59)**	147	3.653
Mini-laptop, Netbook, or handheld computer	**33.3% (49)**	**21.8% (32)**	17.0% (25)	13.6% (20)	14.3% (21)	147	2.537
Tablet device (e.g., iPad, Xoom, Galaxy Tab, Galaxy note, etc.)	**44.2% (65)**	19.0% (28)	**24.5% (36)**	5.4% (8)	6.8% (10)	147	2.115

The results reported in Table 3 indicate that personal desktop computers or laptop computers and smartphones (e.g., iPhone, Blackberry, etc.) are commonly used by respondents to access the internet. Smartphones have increased Omani society's dependence on technology, and many people use smartphones in their daily life for entertainment purposes, to enjoy apps, videos, group games, movies, and music (Arab Social Media Report, 2015). As indicated in the introduction, almost 92% of internet users own a smartphone and there is widespread use of the latest smartphone handsets. With regard to the number of hours that they use the internet, 42% (n=61) of respondents spend around 0-10 hours using the internet per week; 28% (n=41) spend around 11-15 hours per week; and 22% (n=32) spend around 16-15 hours per week. Only 9% (n=13) spend more than 20 hours per week on the internet. Most respondents (44.2%, n=65) used a laptop computer with a mobile internet connection as their main way to access the internet; 27% (n=39) used a mobile phone or a tablet device with an internet connection (Wi-Fi over ADSL); 12% (n=17) used either a desktop or laptop computer with an ADSL internet connection and a mobile phone or tablet device with a mobile internet connection. Only 6% (n=9) used either a desktop or laptop computer with a dial-up internet connection. As mentioned in the introduction, mobile networks are the preferred delivery method for content in Oman, and 91% of internet users having mobile internet connection.

5.2 Learning Management Systems Use

Respondents were required to indicate whether they taken a class that used LMSs (such as WebCT, Blackboard, or Moodle). Nearly three quarters (74%, n=109) of the respondents had used an LMS, whereas 26% (n=38) reported that they have not used an LMS. Thus the majority of respondents have taken a class that used an LMS. The university encourages all academics to use Moodle for teaching, and it offers many workshops for updating their information regarding Moodle. In order to measure the respondents' skill levels regarding an LMS (Moodle), respondents were

requested to report their skills (self-assessed) according to eight activities as shown in Table 4. The purpose of these activities was to evaluate the respondents' familiarity and skills with the use of LMSs in learning.

Table 4. Respondents' skill Levels Regarding LMSs-ranked

	Very Poor	Poor	Average	Good	Excellent	Total	Mean
Accessing course/subject materials	2.8% (3)	1.8% (2)	14.7% (16)	33.0% (36)	**47.7% (52)**	109	4.211
Regularly engaging with studies	2.8% (3)	11.0% (12)	34.9% (38)	**38.5% (42)**	12.8% (14)	109	3.477
Accessing external links & resources (outside LMS)	8.3% (9)	11.0% (12)	27.5% (30)	**33.0% (36)**	20.2% (22)	109	3.458
Collaborating with students	3.7% (4)	12.8% (14)	**32.1% (35)**	**37.6% (41)**	13.8% (15)	109	3.449
Engaging in discussions (through posting and reading)	2.8% (3)	14.7% (16)	**34.9% (38)**	**34.9% (38)**	12.8% (14)	109	3.403
Having a sense of community with other students	6.4% (7)	14.7% (16)	**31.2% (34)**	**29.4% (32)**	18.3% (20)	109	3.385
Communicating with students	8.3% (9)	19.3% (21)	**28.4% (31)**	**22.0% (24)**	**22.0% (24)**	109	3.302
Doing quizzes	**33.0% (36)**	**25.7% (28)**	16.5% (18)	16.5% (18)	8.3% (9)	109	2.412

As indicated in Table 4, the activity which respondents reported having the higher skills with was 'Accessing course/subject materials' with 80.6% (n=88) out of 109 respondents describing themselves as either "Good" or "Excellent". More than half of the respondents described themselves as either "Good" or "Excellent" in regards to the statements: 'regularly engaging with studies' (51.3%, n=56), 'accessing external links & resources outside LMS' (53%, n=58), and 'collaborating with students' (51.4%, n=56). This might also indicate that academics use LMS basically for uploading course materials. It is important to note that half of the respondents (58.7%, n=64) explained their skills in "doing quizzes" as either "Poor" or "Very Poor". This might be due in part to having less cause to undertake this activity, as most academics tend not to use LMSs for doing quizzes or examinations. In other words, in students' answers to questions related to the first five activities, they were positive overall about their skills in using LMS, but not quite as positive about online quizzes. As indicated in Table 5, more than half of the respondents (58.7%, n=64) described themselves as either "Good" or "Excellent" in using LMSs, while only 13.8% (n=15) described themselves as either "Poor" or "Very Poor" in using LMSs. This suggests that many students have high skills in using LMSs.

Table 5. Overall Skills in Using LMSs

	No opinion	Very Poor	Poor	Average	Good	Excellent	Response
Overall skills in using LMS	1.8% (2)	2.8% (3)	11.0% (12)	25.7% (28)	**48.6% (53)**	10.1% (11)	109

5.3 Online Technologies and Smartphone Use

Respondents were also provided with a list of seven online tools and asked to identify their level of knowledge of these tools. A scale of five values was used to measure the respondents' responses: (1) "not heard of it"; (2) "know about it but don't do it"; (3) "have done it but don't anymore"; (4) "do it, but it is not a major aspect of my internet use"; and (5) "do it, and it is a major part of using the internet". Among the seven online tools that are listed in Table 6, YouTube was reported to be used by more than half of the 147 participants as a "major part" of the internet (53.5%, n=76). The mean score calculated for this response was 4.4437. LinkedIn and Academia.edu were two online tools that had never been heard of by over half of the 142 participants (51.4% of the 142 participants reported that they had never heard about LinkedIn, 52.1% for Academia.edu).

Table 6. Knowledge of Online Tools (Frequency and Percentage)

Online Tools	not heard of it	know about it, but don't do it	have done it, but don't anymore	do it, but it is not a major aspect of my internet use	do it, and it is a major part of using the internet	Total	Mean
YouTube	0.0% (0)	2.8% (4)	3.5% (5)	40.1% (57)	53.5% (76)	142	4.4437
Wikipedia	4.9% (7)	20.4% (29)	5.6% (8)	38.0% (54)	31.0% (44)	142	3.6972
Facebook	2.1% (3)	26.8% (38)	19.7% (28)	23.2% (33)	28.2% (40)	142	3.4859
Google Docs	14.1% (20)	14.1% (20)	15.5% (22)	21.8% (31)	34.5% (49)	142	3.4859
Twitter	3.5% (5)	58.5% (83)	12.0% (17)	14.1% (20)	12.0% (17)	142	2.7254
LinkedIn	51.4% (73)	28.2% (40)	8.5% (12)	6.3% (9)	5.6% (8)	142	1.8662
Academia.edu	52.1% (74)	28.9% (41)	6.3% (9)	7.0% (10)	5.6% (8)	142	1.8521

It seems that the students fail to utilise professional social networking and this might be due to the nature of these tools in terms of their form, design and purpose. Professional SNSs are largely designed for people in professional occupations, and are intended to assist in finding jobs, communicating with professionals in different fields, sharing and following research. They are not the same as Facebook and other SNSs in terms of their users (e.g., audiences). YouTube, Wikipedia, and Facebook were used by the majority of the 147 participants either as a "major part" or "not a major aspect" of the internet (over 50%). It is unsurprising that YouTube and Facebook come high on the list of these applications. As indicated in the introduction to this study, YouTube, Facebook, and Google are the most popular sites among Omani people as reported by ITU (2012).

Respondents were also asked to indicate their frequency of online learning activities, as reported in Table 7. The goal here was to explore their frequency of use for learning activities. A frequency scale was used to measure the respondents' practice of each of these activities. The scale used

to measure these activities was: (0) "never used"; (1) "occasionally"; (2) "sometimes"; (3) "often"; and (4) "very often".

The results reported in Table 7 indicate that 83.8% (n=119) of respondents 'use the web to browse or search for information' either "Often" or "Very Often" with a mean score of 4.3944, followed by 'use the web to send or receive email' (75.4%, n=107), and 'use the web to access a portal, learning management system' (69%, n=98). The Table also indicates that 66.2%, (n=94) of respondents have never used Twitter for 'finding and following people's activities' for the purpose of learning, and 70.4% (n=100) of respondents reported that they had never used Academia.edu and/or LinkedIn for collaboration (e.g., following the latest research in their field, updating, communicating with other professionals) for the purpose of learning. This indicates nearly the same percentage of use as Twitter and Academia.edu and/or LinkedIn regarding online personal activities. Professional SNSs are not a preferred learning tool for students and it is indicated in Table 6 that the majority of students were unaware of these tools - more than half had not heard of them. It can be concluded from Table 7 that the first two items were recorded to have the highest level of activity by students for learning activities. This suggests that most of the students are primarily consumers, not producers, of web content. It is also can be noted that the majority of students use LMS for the purpose of learning and the reason for this that Moodle was use by academics in teaching.

Table 7. Online Learning Activities of Respondents (ranked)

	Never used	Occasionally	Sometimes	Often	Very Often	Total	Mean
Use the web to browse or search for information (e.g., news and events)	1.4% (2)	5.6% (8)	9.2% (13)	19.7% (28)	64.1% (91)	142	4.394
Use the web to send or receive email (e.g., Hotmail, Yahoo, Gmail)	0.7% (1)	7.0% (10)	16.9% (24)	27.5% (39)	47.9% (68)	142	4.147
Use the web to access a portal, learning management system	5.6% (8)	9.2% (13)	16.2% (23)	22.5% (32)	46.5% (66)	142	3.950
Use the internet for watching/ sharing video (e.g., YouTube)	12.7% (18)	21.1% (30)	24.6% (35)	20.4% (29)	21.1% (30)	142	3.162
Use the web for instant messaging/chat (e.g., MSN)	26.8% (38)	24.6% (35)	19.7% (28)	11.3% (16)	17.6% (25)	142	2.683
Use the internet for resources making and sharing with other (e.g., delicious, wikis, blogs, etc.)	22.5% (32)	26.8% (38)	29.6% (42)	12.7% (18)	8.5% (12)	142	2.577
Use the internet for social networking (e.g., Facebook and MySpace)	35.9% (51)	19.0% (27)	19.0% (27)	11.3% (16)	14.8% (21)	142	2.500
Use the internet for sharing photographs or/and digital materials (e.g., Flickr)	31.7% (45)	26.8% (38)	17.6% (25)	14.1% (20)	9.9% (14)	142	2.436
Use the internet in collaborating in ideas (e.g., wikis and blogs)	26.1% (37)	33.1% (47)	20.4% (29)	14.8% (21)	5.6% (8)	142	2.408
Using Facebook to communicate with and collaborate in ideas with others	40.8% (58)	13.4% (19)	23.2% (33)	13.4% (19)	9.2% (13)	142	2.366
Use the internet for contributing and developing content (e.g., wikis, Wikipedia, blogs)	30.3% (43)	29.6% (42)	22.5% (32)	14.1% (20)	3.5% (5)	142	2.309

	Never used	Occasionally	Sometimes	Often	Very Often	Total	Mean
Using Twitter for finding and following people activities	66.2% (94)	10.6% (15)	10.6% (15)	7.0% (10)	5.6% (8)	142	1.753
Using Academia.edu or/and LinkedIn for collaboration (e.g., follow latest research in my field, updating, communicate with other professionals in my field)	70.4% (100)	13.4% (19)	10.6% (15)	2.1% (3)	3.5% (5)	142	1.549

Correlation analysis was performed to examine if there was a correlation between smartphone use and using of online tools in learning. Table 8 presents the result of the correlation analysis of Spearman tests. Interestingly, the results reveal that there is a positive correlation at the significant level of 0.05 between smartphone use and use of Facebook, Twitter and YouTube applications. This strongly suggests that students use smartphone to access and use these applications. They typically favour the use of Facebook and YouTube via their smartphones.

Table 8. Spearman's rho Correlations 'Smart phone' versus 'Seven Online Tools'

			Smart Phone (e.g., iPhone, Blackberry, Galaxy, etc.)
Spearman's rho	Facebook	Correlation Coefficient	.579**
		Sig. (2-tailed)	.000
		N	142
	Twitter	Correlation Coefficient	.287**
		Sig. (2-tailed)	.001
		N	142
	Wikipedia	Correlation Coefficient	.096
		Sig. (2-tailed)	.254
		N	142
	Google Docs	Correlation Coefficient	.158
		Sig. (2-tailed)	.060
		N	142
	LinkedIn	Correlation Coefficient	.093
		Sig. (2-tailed)	.272
		N	142
	Academia.edu	Correlation Coefficient	.018
		Sig. (2-tailed)	.829
		N	142
	YouTube	Correlation Coefficient	.275**
		Sig. (2-tailed)	.001
		N	142

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 9 presents the correlations of smart phone and online learning activities, using the Spearman test. The main purpose of performing this test was to find out if there any association between smartphone, online tools and LMS in learning. It is interesting to note that there is a positive, significant correlation

of 0.05 between smartphone and online learning activities. Of the thirteen items listed in the questionnaire that measure the frequency of learning activities on the web, nine items were found to be statistically significant at .05 level between smartphone and learning activities on the web (Table 9).

Table 9. Spearman's rho Correlations 'Smart Phone' versus 'Online Learning activities'

			Smart phone
Spearman's rho	Use the web to browse or search for information (e.g., news and events)	Correlation Coefficient	.116
		Sig. (2-tailed)	.167
		N	142
	Use the web to send or receive email (e.g., Hotmail, Yahoo, Gmail)	Correlation Coefficient	.248**
		Sig. (2-tailed)	.003
		N	142
	Use the web for instant messaging/chat (e.g., MSN)	Correlation Coefficient	.297**
		Sig. (2-tailed)	.000
		N	142
	Use the internet for social networking (e.g., Facebook and MySpace)	Correlation Coefficient	.442**
		Sig. (2-tailed)	.000
		N	142
	Use the internet for sharing photographs or/and digital materials (e.g., Flickr)	Correlation Coefficient	.250**
		Sig. (2-tailed)	.003
		N	142
	Use the internet for resources making and sharing with other (e.g., delicious, wikis and blogs)	Correlation Coefficient	.146
		Sig. (2-tailed)	.084
		N	142
	Use the internet for watching/sharing video (e.g., YouTube)	Correlation Coefficient	.215*
		Sig. (2-tailed)	.010
		N	142
	Use the internet for contributing and developing content (e.g., wikis, Wikipedia, blogs)	Correlation Coefficient	.153
		Sig. (2-tailed)	.068
		N	142
	Use the internet in collaborating of ideas (e.g., wikis and blogs)	Correlation Coefficient	.305**
		Sig. (2-tailed)	.000
		N	142
	Using Facebook to communicate with and collaborate on ideas with others	Correlation Coefficient	.465**
		Sig. (2-tailed)	.000
		N	142
	Using Twitter for finding and following people activities	Correlation Coefficient	.237**
		Sig. (2-tailed)	.004
		N	142
	Using Academia.edu or/and LinkedIn for collaboration (e.g., follow latest research in my field, updating, communicate with other professionals in my field)	Correlation Coefficient	.209*
		Sig. (2-tailed)	.012
		N	142
	Use the web to access a portal, learning management system	*Correlation Coefficient*	*.052*
		Sig. (2-tailed)	*.542*
		N	*142*

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

According to these results, there is a positive association between using online tools in learning such as Facebook, Twitter, Academia.edu and LinkedIn and smartphone use, while there is no association between LMS use and smartphone use. This suggests that the students tend to use smartphone for accessing these tools and applications for learning purposes, rather than using these smart phones for accessing and using LMS or Moodle. This may be related to content visibility and readability on the small screen and lack of understanding content delivered on mobile phones as a study found by Bogdanović et al. (2014).

6. Discussion and Conclusion

In reviewing the Arabic literature on the use of online tools in learning and teaching practice, particularly in Oman, few studies provide statistical data in the use of these tools as well as the level of awareness of online tools in learning, no study attempted to investigate the correlation between these tools and smartphone use and LMS. In the GCC, the recent statistical data as stated by Internet World Stats (2011, 2012) indicates that the use of SNSs has increased consistently in the GCC. As such, the recent statistical data by ITU (2012) also showed that most visited sites by people in the Arab countries are Facebook, YouTube, Google and similar online blogs and forums, whether local or global.

Turning to the results of the current study, main findings from the survey show that students are aware of SNSs. Nearly 66% of the students had a Facebook account. This is consistent with the literature from 2007 to 2011, which reports that SNSs are mostly used by the students. This also accords with previous studies and with statistical data presented in the introduction of this paper, which also reports that the use of SNSs has increased consistently in most parts of the world as well as in the GCC. However, the results from the survey also demonstrate that the most common learning activities on the Web are to browse or to search for information via a search engine and to send or receive emails via services such as Hotmail and Gmail. These two activities still top the list of the most popular online activities for learning purposes. Even with the development of the Web and the internet, the rise of social media or social networks and the availability of smart devices, such as smartphone, which affect and reshape the way Omani students use the internet, searches and email consistently ranked as the most frequent uses among them. This also correlates with statistical data presented in the introduction, which showed that Google search engine, which is used to search and find information, was recorded as the most visited site by people in Oman.

The increasing use of online tools such as Facebook and YouTube among Omani correlates with the availability of communication and smart devices such as smartphones. This correlates with survey results, explicated in several tables: Table 3 showed that the great majority of students (87%) use smartphones to access the internet, and 40.1% of the total students (n=59 out of 147) of them access the internet "very often"; Table 8 (results of the Spearman test) showed a positive relationship between smartphone use and the use of Facebook and YouTube. The majority of students used a mobile internet connection to access the internet as results showed in this study. When

comparing the results of the respondents in these tables with findings by Callanan and Dries-Ziekenheiner (2012), it can be seen that there are similarities between these results. While Callanan and Dries-Ziekenheiner (2012), reported that 91% of internet users in Oman used a mobile internet connection, and almost 92% of internet users in Oman owned a smartphone, with many using the latest smartphone handsets. Taken together, this data suggests that smartphones facilitate the use of these applications and tools. The increasing use of smartphones in the country allows people to download freely applications such as Facebook and Twitter. This is also one of the characteristics of these tools, adapting to smartphones which will be discussed in the next paragraph. All these indications point to the importance of smartphones in increasing the use of these applications in Oman.

As mentioned in the introduction of this paper, the adaptation of LMS services to mobile devices took longer than adaptation to social networks. Online tools such as Facebook and Twitter have already been used via smartphones, which offer the ability to download, install and use easily. There is some consensus on the use of online tools and smartphones as earlier discussed in this paper. Students prefer to use smartphones for accessing Facebook and twitter rather than using them to access LMSs. This study confirms that smartphone use correlates with use of these tools such as Facebook and twitter in learning. Survey results also show a positive correlation between the use of these tools such as Facebook and smartphones, but that there is no correlation between smartphones and using LMSs. The results also showed that there is a positive correlation between learning activities on the Web and smartphones. This correlation provides evidence that these tools and applications better adapt to smartphones rather than to LMS services which are considered as a critical characteristic of these tools. Students can use these tools to learn outside the classroom. These tools were found to be more flexible and accessible than traditional LMS. These results indicate two additional main points, the contribution of smartphones in informal learning and the adaptation of new online tools to mobile devices. The extent of these contributions needs further research.

These findings suggest that the use of emergent online tools via smartphones has created an online environment via an e-learning platform. Therefore, moving outside the LMS to explore various online tools will enhance students learning and will help them to develop and implement these tools such as Facebook and twitter in their career. These tools are expanding the value of e-learning tools such as LMSs. They can be used as an open platform by students for their learning and for expanding their knowledge in their respective fields. Again, the evidence from this study suggests that online tools can provide interactive and customised learning environments through their characteristics for both graduates and future students, there are better adapt to smartphones rather than to LMS services. The current study does not aim to provide answers regarding why LMSs are not attractive for mobile learning rather than investigation the important of using these technologies (Facebook, twitter) via smart devices in learning and teaching. Future Research may focus on examining the contribution of smartphones to informal learning and the adaptation of new online tools to mobile devices.

References

Ahmed, N., & Al-Khanjari, Z. (2012). Effect of Moodle on learning: An Oman perception. *International Journal of Digital Information and Wireless Communications (IJDIWC),1*(4), 782-788.

Al-Emran, M., & Shaalan, K. F. (2015). Attitudes Towards the Use of Mobile Learning: A Case Study from the Gulf Region. *iJIM, 9*(3), 75-78.

Al-Emran, M., Elsherif, H. M., & Shaalan, K. (2016). Investigating attitudes towards the use of mobile learning in higher education. *Computers in Human Behavior*, *56*, 93-102.

Al-Harrasi, A. S., & Al-Badi, A. H. (2013). The Impact of Social Networking: A Case Study of the Influence of Smartphones on College Students. In *The Clute Institute International Academic Conference* (pp. 689-694).

Al kindi, S. S., & Al hashmi, S. M. (2012). Use of social networking sites among Shinas College of Technology students in Oman. *Journal of Information & Knowledge Management, 11*(1), 1-9. Retrieved from http://www.worldscientific.com/doi/abs/10.1142/S0219649212500025

Al-Kindi, S. (2014) Online Tools in Teaching and Learning and the Problem of 'Web 2.0': A Case Study of an Information Studies Department, Oman [Doctoral dissertation]. Retrieved from https://espace.curtin.edu.au/bitstream/handle/20.500.11937/369/200146_Al%20Kindi%202014.pdf?isAllowed=y&sequence=2

Al Musawi, A. S., & Abdelraheem, A. Y. (2004). E-learning at Sultan Qaboos University: Status and future. *British Journal of Educational Technology*, *35*(3), 363-367.

Alqudsi-ghabra, T. M., Al-Bannai, T., & Al-Bahrani, M. (2011). The Internet in the Arab Gulf Cooperation Council (AGCC): Vehicle of change. *International Journal of Internet Science, 6*(1), 44-67.

Arab Social Media Report (2011). Facebook usage: Factors and analysis. *Dubai School of Government, 1*(1), 1-20.

Arab Social Media Report (2015). First rport 2015. retrieved from https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwi_35_24vbVAhXEIlAKHQ5zAIMQFgglMAA&url=https%3A%2F%2Fwww.wpp.com%2Fgovtpractice%2F~%2Fmedia%2Fwppgov%2Ffiles%2Farabsocialmediareport-2015.pdf&usg=AFQjCNE4E-6d-hTZiGhiC55MxO_UnRBVDQ

Bogdanović, Z., Barać, D., Jovanić, B., Popović, S., & Radenković, B. (2014). Evaluation of mobile assessment in a learning management system. *British Journal of Educational Technology, 45*(2), 231-244.

Callanan, C., & Dries-Ziekenheiner, H. (2012). Safety on the line: Exposing the myth of mobile communication security. Freedom House and Broadcasting Board of Governors. Retrieved from http://www.freedomhouse.org/sites/default/files/Safety%20on%20the%20Line.pdf.

Casany, M. J., Alier, M., Mayol, E., Piguillem, J., Galanis, N., García-Peñalvo, F. J., & Conde, M. A. (2012). Extending Moodle services to mobile devices: the Moodbile project. Paper presented at In the Sixth International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies, September, 2012, at Barcelona, Spain.

Cochrane, T. (2011). *Mobilizing Learning: Transforming pedagogy with mobile web 2.0*. Unpublished

PhdDoctorate, Monash University, Melbourne.

Cochrane, T., & Bateman, R. (2010). Smartphones give you wings: Pedagogical affordances of mobile Web 2.0. *Australasian Journal of Educational Technology, 26*(1), 1-14.

Cochrane, T., & Bateman, R. (2013). A mobile web 2.0 framework: Reconceptualizing teaching and learning. *Using network and mobile technology to bridge formal and informal learning*, 57-92.

Cochrane, T., Antonczak, L., & Wagner, D. (2013). Post-Web 2.0 Pedagogy: From Student-Generated Content to International Co-Production Enabled by Mobile Social Media. *International Journal of Mobile and Blended Learning, 5*(4): 1-18.

Cochrane, T., Bateman, R., Cliffin, P., Henderson, I., & Holloway, S. (2009). Mobilizing learning: Mobile Web 2.0 scenarios in tertiary education. Paper presented at the International Conference on Education and New Learning Technologies, June 2009, International Association of Technology, Education and Development.

Cochrane, T. D. (2011). Beyond the Yellow Brick Road: Mobile Web 2.0 Informing a New Institutional E-Learning Strategy. *Journal of Asynchronous Learning Networks, 15*(4), 60-68.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Pearson Education.

Eakle, A. J., & Garber, A. M. (2004). International report on literacy research, Sultanate of Oman. *Reading Research Quarterly, 39*(4), 480-481.

Forment, M. A., & Guerrero, J. C. (2008). Moodbile: Extending Moodle to the mobile on/offline scenario. In *Proceedings of IADIS International Conference Mobile Learning* (pp. 11-18).

Gabarre, S., Gabarre, C., Din, R., Shah, P. M., & Karim, A. A. (2013). Using mobile facebook as an LMS: Exploring impeding factors. *GEMA Online Journal of Language Studies, 13*(3), 212-223.

International Telecommunication Union (2012, March). ICT adoption and prospects in the Arab region. Paper presented at the International Telecommunication Union, Geneva, Switzerland. Retrieved from http://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-AR-2012-PDF-E.pdf

Internet World Stats (2011). Internet users, population statistics, medial east [Data file]. Retrieved from http://www.internetworldstats.com/stats5.htm

Internet World Stats (2012). Internet users, population statistics, Oman [Data file]. Retrieved from http://www.internetworldstats.com/me/om.htm

Internet World Stats (2013). Facebook subscriber growth [Data file]. Retrieved from http://www.internetworldstats.com/facebook.htm

Jackson, S. L. (2009). *Research methods and statistics: A critical thinking approach* (3rd). Belmont, CA: Wadsworth/Cengage Learning.

Kearney, M., & Maher, D. (2013). Mobile learning in maths teacher education: Using iPads to support pre-service teachers' professional development. *Australian Educational Computing, 27*(3), 76-84.

Khan, A. I., Al-Shihi, H., Al-Khanjari, Z. A., & Sarrab, M. (2015). Mobile Learning (M-Learning) adoption in the Middle East: Lessons learned from the educationally advanced countries. *Telematics and Informatics, 32*(4), 909-920.

Kim, H., & Kwon, Y. (2012). Exploring smartphone applications for effective mobile-assisted language learning. *Multimedia-Assisted Language Learning, 15*(1), 31-57.

Lane-Kelso, M. (2014). Mobiles and Flipping in Oman. *Journal of Information Technology and Application in Education 3*(2), 67-77. doi: 10.14355/jitae.2014.0302.03

Looi, C. K., & Toh, Y. (2014). Orchestrating the flexible mobile learning classroom. *Increasing Access,* 161.

Looi, C. K., Sun, D., Wu, L., Seow, P., Chia, G., Wong, L. H., ... & Norris, C. (2014). Implementing mobile learning curricula in a grade level: Empirical study of learning effectiveness at scale. *Computers & Education, 77,* 101-115.

Looi, C. K., Zhang, B., Chen, W., Seow, P., Chia, G., Norris, C., & Soloway, E. (2011). 1: 1 mobile inquiry learning experience for primary science students: A study of learning effectiveness. *Journal of Computer Assisted Learning, 27*(3), 269-287.

Majhi, S., & Maharana, B. (2011). Familiarity of Web 2.0 and its application in learning: A case study of two Indian Universities. *International Journal of Library and Information Science, 3*(6), 120-129. Retrieved from
http://www.academicjournals.org/article/article1379517311_Majhi%20and%20Maharana.pdf

Masters, K. (2015). Social networking addiction among health sciences students in Oman. *Sultan Qaboos University Medical Journal, 15*(3), e357 e363. doi: 10.18295/squmj.2015.15.03.009

Mehmood, S., & Taswir, T. (2013). The effects of social networking sites on the academic performance of students in college of applied sciences, Nizwa, Oman. *International Journal of Arts and Commerce, 2*(1), 111-125.

Norris, C., Hossain, A., & Soloway, E. (2011). Using smartphones as essential tools for learning. *Educational Technology, 51*(3), 18-25.

Pallant, J. (2013). *SPSS survival manual*: McGraw-Hill Education (UK).

Sarrab, M., & Elgamel, L. (2013). Contextual m-learning system for higher education providers in Oman. *World Applied Sciences Journal, 22*(10), 1412-1419.

Sarrab, M., Alzahrani, A., Alwan, N. A., & Alfarraj, O. (2014). From traditional learning into mobile learning in education at the university level: undergraduate students perspective. *International Journal of Mobile Learning and Organisation, 8*(3-4), 167-186.

Sarrab, M., Elgamel, L., & Aldabbas, H. (2012). Mobile learning (m-learning) and educational environments. *International journal of distributed and parallel systems, 3*(4), 31.

Seifert, T. (2016). Pedagogical applications of smartphone integration in teaching: Lecturers, pre-service teachers and pupils' perspectives. In *Human-Computer Interaction: Concepts, Methodologies, Tools, and Applications* (pp. 1822-1839). IGI Global.

Sha, L., Looi, C. K., Chen, W., & Zhang, B. H. (2012). Understanding mobile learning from the perspective of self-regulated learning. *Journal of Computer Assisted Learning, 28*(4), 366-378.

Smith, M. K., Welty, C., & McGuinness, D. (2004). *OWL web ontology language guide, W3C, recommendation*. Retrieved from http://www.w3.org/TR/owl-guide/

Titcomb, J. (1 November 2016). Mobile web usage overtakes desktop for first time. Technology, retrieved from
http://www.telegraph.co.uk/technology/2016/11/01/mobile-web-usage-overtakes-desktop-for-first-time/

Vinu, P. V., Sherimon, P. C., & Krishnan, R. (2011). Towards pervasive mobile learning-the vision

of 21st century. *Procedia-Social and Behavioral Sciences, 15*, 3067-3073.

Walczak, K., Chmielewski, J., Wiza, W., Rumiński, D., & Skibiński, G. (2011). Adaptable Mobile User Interfaces for e-Learning Repositories. Paper presented at IADIS International Conference on Mobile Learning, March 2011, at Avila, Spain.

Wang, Q., Woo, H. L., Quek, C. L., Yang, Y., & Liu, M. (2012). Using the Facebook group as a learning management system: An exploratory study. *British Journal of Educational Technology, 43*(3), 428-438.

Williamson, W., & Parolin, B. (2013). Web 2.0 and social media growth in planning practice: A longitudinal study. *Planning Practice and Research, 28*(5), 544-562.

Wong, L. H. (2012). A learner-centric view of mobile seamless learning. *British Journal of Educational Technology, 43*(1).

Wright, K. B. (2005). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication, 10*(3). doi:10.1111/j.1083-6101.2005.tb00259.x

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