STUDENTS' PERCEPTION OF EMPLOYING SOCIAL MEDIA IN THE EDUCATIONAL PROCESS IN THE LIGHT OF EDUCATION 4.0 REQUIREMENTS

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ABSTRACT

The aim of this study was to discern the students' perception of social media networks integration into the educational process. The study was conducted in seven universities in the Northern region of Jordan. To achieve this goal, authors used the descriptive survey approach. A stratified random sample of 762 students from both genders and different disciplines were targeted. For data collection purposes, a survey tool was designed, which consisted of one polar question, one open question and a questionnaire consisting of fifteen 5-point Likert scale paragraphs. Results indicated that 82.41% of respondents showed constructive attitudes toward the integration of social media to the educational process and indicated their top preferred social media applications. Furthermore, the findings revealed that there was a significant relationship between use behaviour and behavioural intentions, as well as a significant relationship between use behaviour and facilitating conditions. Finally, the results showed no significant statistical difference at $\alpha = 0.05$ between the respondents' statistical means pertaining to students' gender or field of study.

Highlights

- *The students' perception of social media networks integration into the educational process was investigated via a quantitative approach.*
- *82.41% of respondents showed constructive attitudes toward the integration of social media to the educational process.*
- *The findings showed a significant relationship between use behaviour and both behavioural intentions and facilitating conditions.*
- *The results showed no significant statistical difference between the respondents' statistical means pertaining to their gender or field of study.*

INTRODUCTION

In the light of the advancements in ICT, academic institutions leveraged means and tools of managing the educational process. Nowadays, most of institutions' operations are conducted electronically via the Internet. Majority of financial transactions, administrative operations, student-faculty and student-staff interactions are conducted through web-based applications and software means. Most of the long waiting lines, intensive paperwork and face-to-face transactions have disappeared. Some academic institutions have converted to paperless campuses (Abersek and Flogie, 2017; Ciolacu et al., 2017; Hussin, 2018).

Alongside with the administrative operations, academic institutions have invested in electronic Learning Management Systems (LMS) in the administration of the teaching and learning processes. Educators communicate with their students through LMS to set out teaching outcomes, course objectives, policies and syllabi, in addition to learning material. E-learning platforms allow educators to prepare more interactive learning materials, enriched with video, audio and visual demonstrations.

Thus, more life in the learning material rather than the tiresome and gloomy textural textbook. The enormous worldwide web digital library is a few clicks away from the hands of students. As a result, the teacher of today just needs to guide his students and direct them to get to the right information and access it rather than memorize it (Devi, Gouthami and Lakshmi, 2019; Hussin, 2018). However, there sometimes exist some barriers that hinder the effective implementation of e-learning. Jabor et al. (2013) identified two levels of barriers. Teacher level barriers include lack of confidence and competence, and resistance to change and negative attitudes. Whereas school level barriers include lack of time, effective training, accessibility and technical support.

On the other hand, Social Media Networks (SMN) has brought about the transformation of personal and social changes. More specifically, youngsters (13-25 years of age) intensely use social media as a communication tool. This tool enabled its users to collaborate and communicate between each other as if no boundaries ever existed. Such collaboration enriched personal understanding and disseminated knowledge in all aspects of life (Alshurideh et al., 2019). Social Media Networks not only demonstrated to be a pool for making new friends and a source of news and entertainment, rather they evidently proved efficiency when employed in the teaching and learning process. Several education specialists, who employed them in the education process, indicated that SMN had a confirmatory influence among learners, especially among young generations of learners (aged 19-29 years), who typically spend hours interacting on social media (Alshurideh et al., 2019; Faculak, 2012). These tools restructured the relationship between learners and educators and between learners themselves (Ajjan and Hartshorne, 2008; Devi, Gouthami and Lakshmi, 2019).

Several faculty members at Jordanian universities have sought to utilize the widespread of SMN among their students to enrich the means of communication and interaction with the students and enhance the methodologies they use in the teaching and learning process. Usefulness, ease of use and enjoyment were the perceived reasons behind the use of SMN. Instructors clearly stated that SMN were not a replacement of the university LMS or the e-learning platform, rather an enriching environment. University LMS and e-learning platform were still used to provide common educational services. The new cyberspace though SMN is made available to students in a less formal way as compared to the LMS and e-learning space. Nevertheless, some instructors showed reluctance to the use of SMN in the educational process. Institutional constraints, cultural restrictions and pedagogical issues were among the main concerns of those instructors.

To this end, it is important to discern the students' perception of integrating social media network into the educational process. Such knowledge can help decision makers in higher education institutions as well as educators on the means of enriching the learning experience of learners. It helps in establishing and developing the smart learning environments in alignment with Education 4.0 requirements. On the other hand, investigating the reality of SMN use behaviour and students' perceptions can be of a big asset for researchers in the field. As such, this study came to identify the students' perception of SMN employment in the educational process in Jordanian universities. The study further aimed to identify the impact of students' gender and field of study as moderating factors on their responses. More specifically, the goal of this study was to discern the reality of Social Media Networks (SMN) use behaviour in the educational process in Jordanian universities. To have better understanding of society implications, the study also aimed at investigating the impact of two independent variables on students' responses, namely student's gender and field of study. The rest of the paper is organized as follows: the next section presents a literature review of some recent related studies, followed by the research model and developed hypotheses. After that, the methodology of the study is presented. Then the results and discussion section. Finally, the authors conclude with some concluding remarks and recommendation.

LITERATURE REVIEW

In recent years, researchers and educators referred to Education 4.0 as an emerging term ascended as a result of the advents made in ICT in alignment with Industrial Revolution (IR) 4.0, leading to a smart learning environment. This environment allows educators to obtain advanced and open education that is different in means, tools, strategies, and methodologies (Abersek and Flogie, 2017; Himmetoğlu, Ayduğ and Bayrak, 2020; Peters, 2017). Education 4.0 requires revisiting the educational paradigms. Accordingly, information needs to be made accessible to learners, while learners need to be trained and not taught. They need to learn how to find information rather than the teacher offering it to them in a rigid structure (Anggraeni, 2018; Ciolacu et al., 2017).

Learners are not alike, and they do not have the same starting point. They absorb and digest different areas of focus differently. Therefore, both educators and learners need to be guided to develop their skills to cope with the fast-changing world. Educators need to understand their new role and they need to be equipped with skills and capabilities to play their role effortlessly and fluently. Learners, on the other hand, need to be guided rather than taught a set of predefined learning material. Henceforth, alignment of Education 4.0 with Industry Revolution 4.0 is required to prepare learners for the next industrial revolution which will happen in their lifetime (Anggraeni, 2018; Hussin, 2018).

Moreover, several academic institutions employed SMN in the teaching process as a supporting tool in class implementation (Alshurideh et al., 2019; Faculak, 2012). As a result, all learners could achieve class objectives more rapidly due to the use of these technologies and their accessibility (Alvarez and Olivera-Smith, 2013; Çankaya, Durak and Yünkül, 2014). In addition, these technologies could enrich inter-relations between learners, boost group learning (Prieto, 2014; Swang, 2011), and lead to enhancing the dynamicity of participatory social educational style (Hamilton et al., 2016; Prudencio, 2019). Henceforth, this could achieve the connection between the educational process elements (Chen and Bryer, 2012).

The fact that the learner is the core and main pillar of the educational process, continuously necessitates finding the most proper strategies to enrich his or her skills in retrieving, processing, and understanding information, and to develop

learner's creative thinking (Lin et al., 2013). This requires creating new methodologies and means to the ways in which educators communicate with learners. Traditional LMS for communication between educators and learners, such as Moodle and Blackboard, have a hard time keeping up in learner appeal and ease of operations (Mueller, Peruta and Del Giudice, 2014). For this fact, academic institutions have to work for much broader and ambitious transformations.

The diversity of SMN such as Twitter®, Facebook®, Instagram®, WhatsApp, blogs and others can together be a driving force to enable both educators and learners to communicate and participate actively and promptly in educational activities (Menkhoff et al., 2015). Today, universities and institutions are keen to join social media networks. Several institutions worldwide constructed their own pages on Facebook® and Twitter® to ensure publicity and spread. Such pages allow communication with students and local communities. This ensures reach, participation and interaction of human element with the educational process, attract learners and increases their desire to learn. However, from an institutional perspective they are used mostly for one-way communications.

When Social Media Networks are utilized in the management of the educational process, doors are open for students and learners to communicate with each other and with counterparts worldwide. They can explore state-of-the-art knowledge in their fields of study and express their thoughts and concerns without hesitation. This way, more choices are set for participation and interaction (Alvarez and Olivera-Smith, 2013). This contributes to learner's involvement in the educational process with more harmony, as it's closer to his/her natural lifestyle (Prieto, 2014). In this regard, the general goal of SMN is to setup an active social interactive network to disseminate knowledge and increase multipolar human interaction (Anari et al., 2013).

Perhaps, the role of the educator widens more into a guide and facilitator. He or she encourages his/her students to control their learning process by assuming responsibility with enthusiasm and vigour (Zachos, Paraskevopoulou-Kollia and Anagnostopoulos, 2018). The educator assumes responsibility of coordination, instituting rules and policies, setting up the class objectives, initiating and launching inter-groups discussions, and encouraging the most participation (De Laat et al., 2007; Vonderwell, 2003). Educators may explore and switch between different SMN, and different ways and patterns of utilizing these tools. They can establish closed or open groups on Facebook for example or WhatsApp. From within these groups, learners have more opportunities for dialogue and discussion on any curriculum topic without restricting themselves to pages in textbook or course notes (Al-Rahmi et al., 2015). Tweets on Twitter can help learners to obtain experiences and knowledge through even if outside the scope of the course they are studying, which enhances their self-confidence and self-accessing to knowledge and to be more initiative (Peters, Costello and Crane, 2018; Tang and Hew, 2017). Being exposed to such tools enhances positive energy and reduces negative attitudes towards learning and participation. Silence and inactive behaviours are nulled in

such an entertaining environment (Arquero and Romero-Frias, 2013).

In the recent few years, several studies were conducted which addressed the use of social media networks (MSN) in the teaching and learning process. Different aspects of MSN employment were investigated. In this section, some of the key studies are presented.

Roebuck, Siha and Bell (2013) carried out a study seeking to understand the perceptions of professors using social media in the classroom. The authors further found that there were no significant differences in professors' responses regarding advantages and disadvantages of employing social media in the classroom, regardless of gender or rank. In another study by Çankaya, Durak and Yünkül (2014), the authors investigated the reasons behind using the Internet and Edmodo by undergraduate students. It was found that the students expressed positive attitudes towards Edmodo, especially features related to assignment, quiz, poll and announcement/sharing.

Quansah, Fiadzawoo and Kuunaangmen (2016) studied students' engagement in social media in teaching and learning and its significance on their academic performance. Reported results indicated that students preferred mostly Facebook, WhatsApp, and Google+, YouTube and Twitter. In addition, majority of students indicated that social media positively influenced their academic performance. Furthermore, Manca and Ranieri (2016) accomplished a study to identify the uses of social media in teaching practices as seen by the Italian academic staff. Revealed results showed that the use of SMN was still restricted. It was reported that instructors were not much motivated to integrate this technology into their practices for several reasons. Among the reported reasons were cultural resistance, educational issues and institutional constraints. Overall, the results emphasized undecided attitudes towards SMN usage with challenges prevailing over advantages.

Williams and Adesope (2017) carried out a study to investigate the attitudes of undergraduates towards the use of social media for learning purposes in the University of Port Harcourt, Nigeria. It was found that social media were used in educational practices for fast progression in knowledge and information. In addition, it was found that students used online social media to explore topics that they are interested in, and they used Facebook, Twitter, WhatsApp, Skype, YouTube, Opera Mini and WeChat for educational purposes. Sarwar et al. (2019) conducted a study that addressed the students' perception of using social media in the light of the Technology Acceptance Model (TAM) and Constructivism Theory. The reported results emphasized that perceived usefulness, perceived ease of use, and perceived enjoyment have positive impact on social media usage. It was further reported that social media usage enriches the learning environment, enhances cooperation and communication among students, strengthens their learning behaviour, and improves performance. On the other side, the results indicated that the impact of perceived enjoyment on collaborative learning was negative. Furthermore, authors found that Cyberbullying has a negative impact on the relationship between collaborative learning and learner performance.

The abovementioned studies and several others that can be

found in the literature investigated the impact of using social media networks in the educational process. Researchers found several advantages for that usage; however, some drawbacks were reported as well. This ignites the need to study students' perspective toward the use of social media networks in the teaching and learning process in Jordanian universities. Very rare studies have been conducted in Jordan, a conservative society, on the impact of SMN usage in the educational process management. The main goal was to discern the degree of MSN usage and the impact of that usage as seen by the students themselves.

RESEARCH MODEL AND HYPOTHESES

Technology Acceptance Model (TAM) was first proposed by Davis (1989), and it was based on the theory of reasoned action (TRA) by Fishbein and Ajzen (1975). According to TRA, individual's behaviour is driven by behavioural intention. Henceforth, behavioural intention is a function of an individual's attitude toward the behaviour. Therefore, according to TRA, behaviour is a function of attitudes and beliefs.

According to TAM, user's attitude towards using a technology is driven by two factors. Those factors are perceived ease of use and perceived usefulness. User's attitude leads to behavioural intentions, hence actual use. In addition, perceived ease of use has an impact on perceived usefulness of technology (Davis 1989). According to Davis (1989: 320), perceived usefulness refers to the degree to which the user believes that the use of technology improves performance, while perceived ease of use refers to how effortless the user perceives using the technology will be. Furthermore, the author suggested that perceived ease of use hypothetically influences perceived usefulness and attitudes towards using the technology. Such attitude towards using the technology determines the behavioural intention to use that technology. Masrom (2007) proposed a modified model based original TAM specific to e-learning. In the modified model by author, the use behaviour and external variables in the original TAM were eliminated.

Earlier, a more prominent modification on the TAM model was presented in the work by Venkatesh et al. (2003). In this work, the Unified Theory of Acceptance and Use of Technology (UTAUT) was proposed. In which, authors identified the constructs that have impact on the adoption of technology: namely Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. While the first three constructs were considered to be direct determinants of behavioural intention, Facilitating Conditions was considered a direct determinant of user behaviour. The authors studied the impact of several moderating factors on the aforementioned constructs.

In recent years, the TAM model and its modifications have extensively been used by researchers to investigate the attitudes towards technology usage, behavioural use, and the driving factors. An example on these studies that addressed SMN employment in education include but not limited to the study by Dhume et al. (2012), which investigated the adoption of social media by business education students based on TAM model. Another example is the study by Amadu et al. (2018), in which authors used TAM to measure the use of social media for collaborative learning in Ghana. A third example is the study by Arif and Kanwal (2016), in which authors studied the adoption of social media technologies and their impact on students' academic performance in Pakistan. Finally, the study by Alenazy, Al-Rahmi and Khan (2019), where authors validated TAM on social media use for collaborative learning to enhance collaborative authoring.

In the light of this and because of the huge advents made in the broad field of information and communication technology (ICT), instructors in Jordanian universities were inspired to utilize this technology in the educational process. They sought to harness the available technological capabilities in a manner that commensurate with the nature of young students' lifestyle in accordance with Education 4.0 requirements. Exploitation of Social Media Networks (SMN) in the educational process was a viable choice that aligns with formal LMS and e-learning platforms. To achieve the goals of this study, as mentioned in the Introduction section, we proposed the model of the study as shown in Figure 1.
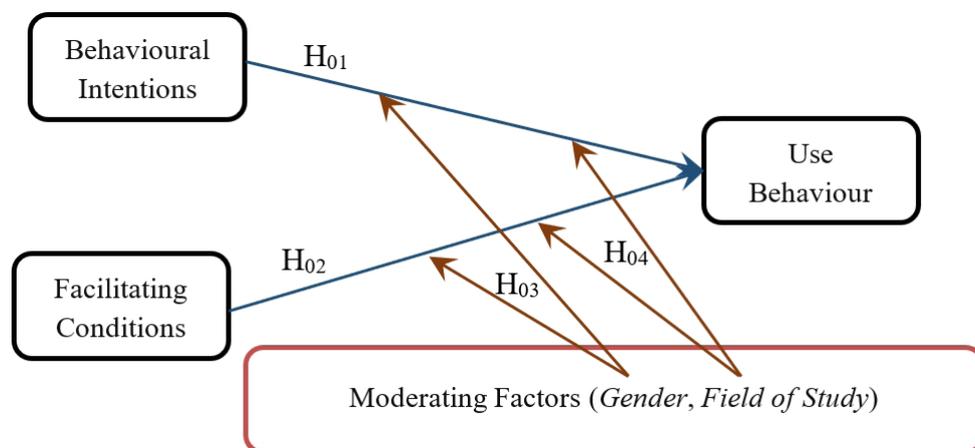

Figure 1: Proposed research model

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According to the proposed model, the *Use Behaviour* is driven by *Behavioural Intention* and *Facilitating Conditions*. Users, students in this case, develop positive attitudes towards the use of social media networks (SMN), and hence build behavioural intentions, if they believe using these networks improves performance (usefulness) and if they believe using this technology is effortless (ease of use). The other factor that drives the *Use Behaviour* is *Facilitating Conditions*. This refers to the organizational role and the technological infrastructure that assists the adoption of the technology. Finally, the proposed model suggests that two moderating factors may have impact on the estimates of the students; namely: student's *Gender* and *Field of Study*.

As such, the study aimed to examine the following hypotheses:

- *H_{01}: There is no significant relationship between Behavioural Intentions and Use Behaviour of social media networks in the educational process.*
- *H_{02}: There is no significant relationship between Facilitating Conditions and Use Behaviour of social media networks in the educational process.*
- *H_{03}: There is no significant difference in Use Behaviour of social media networks in the educational process related respondent's Gender.*
- *H_{04}: There is no significant difference in Use Behaviour of social media networks in the educational process related to respondent's Field of Study.*

Additionally, the study aimed to identify the most preferable social media applications for students. To achieve this goal, the following research question was raised:

- *What are the SMN applications students prefer the most to be used in the educational process?*

MATERIALS AND METHODS

Several faculty members at Jordanian universities have sought to utilize the widespread of SMN among their students to enrich the means of communication and interaction with the students and enhance the methodologies they use in the teaching and learning process. The goal was to make the learning environment more entertaining and fun, and to boost students' interaction and to maximize participation. In other words, usefulness, ease of use and enjoyment were the perceived reasons behind the use of SMN. Instructors started by providing a list of policies and rules for communication between instructors and students through SMN that respect privacy and ethical manners. Allowed behaviours versus prohibitions were clearly stated with clear standards of rewarding and penalties.

Instructors clearly stated that SMN were not a replacement of the university LMS or the e-learning platform, rather an enriching environment. University LMS and e-learning platform were still used to provide common educational services, like objectives and learning outcomes of the courses they teach, syllabi, exams dates, links to course material and supporting materials, and course homework and activities. Yet, SMN were utilized to elaborate on these items, discuss any related topic, communicate, and respond to students' requests and questions. Class groups were created and managed as well as small focus groups for different educational purposes. The new cyberspace is made available to students in a less formal way as compared to the LMS and e-learning space. Some instructors even allowed students' activity submission through social media. SMN were further used to disseminate grades, provide feedback, schedule appointments and process special requests.

Some instructors showed reluctance to the use of SMN in the educational process. Institutional constraints, cultural restrictions and pedagogical issues were among the main concerns of those instructors. To this end, this study came to identify the students' perception of SMN employment in the educational process in Jordanian universities. The study further aimed to identify the impact of students' gender and field of study on their responses. In the light of this and to accomplish the goals of the study and, hence, examine the validity of the proposed hypotheses and answer the raised research question, a descriptive survey approach was used. In this section, the methodology employed in this research is presented.

Population and Sample

The study population consisted of all students in Jordanian Universities in the North region of Jordan. There are seven universities in the Northern region, three public and four private universities. According to the statistics of the Jordanian Ministry of Higher Education in the academic year of (2019/2020), there were around (90,000) students from both genders and in different fields of study (https://mohe.gov.jo/en/list/statistics).

According to the universities' categorization, the fields of studies are divided into two main streams: Scientific Studies and Social Studies and Humanities. Scientific Studies include Engineering Technology; Science; Computer and Information Technology; Medicine; and Pharmaceutical Studies. Social Studies and Humanities, on the other hand, include Arts; Islamic Studies; Business; Fine Arts; Physical Education; Law; Education; Anthropology; Tourism; Communication Media. To guarantee representation, a stratified random sample of (1000) students were targeted from both genders and different fields of study, out of which (762) complete responses were secured within time. Table 1 shows the demographic distribution of respondents according to their *Gender* and *Field of Study*.

Moderating Factor	Categories/Levels	Frequency	Percentage
Gender	Male	290	38.1%
	Female	472	61.9%
	Total	762	100.0%
Field of Study	Scientific Studies	506	66.4%
	Social Studies & Humanities	256	33.6%
	Total	762	100.0%

Table 1: Demographic distribution of the study sample according to moderating factors

Data Collection

The study employed the descriptive survey approach to reveal opinions. To achieve the goals of the study, authors designed a study instrument (tool), which consisted of demographic information about the respondent, a polar question (Yes/No), an open question and finally a questionnaire consisting of fifteen 5-point Likert scale paragraphs. The demographic information includes student's university, field of study, and gender. The polar question was intended to indicate whether the targeted student was in favour of employing SMN in the educational process or not. The third part of the study instrument was an open question intended to reveal the student's favourite SMN applications in the educational process. Finally, the questionnaire part consisted of fifteen 5-point Likert scale paragraphs measuring the Use Behaviour of SMN in the educational process as seen by the students. Those paragraphs were divided into two domains; namely: *Behavioural Intention* and *Facilitating Conditions*, as it was proposed in the study model. To verify the validity of content, the questionnaire was presented in its initial form to a group of (11) experts and specialists in the field. Their opinions on the questionnaire paragraphs in terms of clarity and suitability to the study objectives were taken carefully. The questionnaire was revised to its final form accordingly.

To verify the reliability of the questionnaire and to check its internal consistency, it was applied to a pilot sample of (30) students different from the study sample. When Cronbach's α analyses was performed on the data collected from the pilot sample, the coefficient (α) was found to be in the range from (0.83 – 0.94) with an overall value of (0.88). This indicated that the questionnaire paragraphs were internally consistent with reliable and suitable quality (Nunnally, 1978).

Study Variables

This study considered two independent variables (moderating factors), namely: *Gender (Female, Male)* and *Field of Study*

(Scientific Studies, Social Sciences & Humanities). The classification of the latter variable was based on the Jordanian universities' categorization of the fields of study that agrees to a great extent with world standards.

Data Analysis and Processing

The Statistical Package for Social Sciences (SPSS) was used to perform the statistical analysis. Qualitative analysis was performed to reveal results about students' intentions and preferences. While quantitative analysis was conducted to estimate students' responses to the questionnaire. Linear regression and ANOVA analysis were conducted to examine the validity of the developed hypotheses after verifying that analysis conditions for ANOVA were met. To construct judgements on the means, the 5-point Likert scale (1-5) was divided into two grades (*Low or High)* such that if the mean was equal to (3.0) or above it was considered (*High*), whereas if it was less than (3.0) it was considered (*Low*) (Odeh, 2010).

RESULTS

A stratified random process was used to guarantee participation from all seven universities from both genders and different study disciplines. The study tool was distributed to (1000) targeted students electronically with directions for participation and deadlines. Several reminders and follow up messages were sent to students to guarantee highest participation possible. As a result, 762 complete responses were secured, while 238 students did not respond within time. As such, the subsequent analysis was based on those complete responses, Table 1.

In an aim to reveal results regarding the polar question, which was related to students' attitude toward the use of SMN in the educational process, descriptive frequency analysis was conducted, as shown in Table 2.

Attitude	Frequency	Percentage
Positive	628	82.41%
Negative	134	17.59%
Total	762	100%

Table 2: Students' attitude toward the use of SMN in the educational process

It is obvious from the results shown in Table 2 that a great majority of students have developed constructive attitudes for MSN usage in creating positive learning atmosphere among students. This result can be understood from the fact that SMN have become very widely spread among young generations

in their social communications. Social media is heavily used among peers and friends in almost all aspects of daily activities. Therefore, no wonder that students developed positive and constructive attitudes towards their use in education.

To reveal students' preferences on the SMN applications to be

used in the educational process, they were asked to list his/her preferences. When the responses to this open question were analysed, the frequencies of occurrences and percentages were as portrayed in Figure 2.
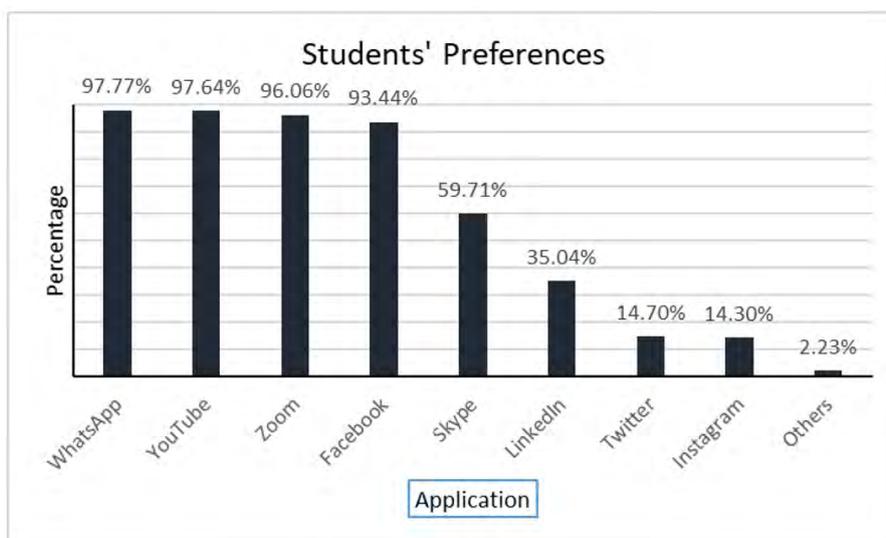
Figure 2: Percentages of students' preferences of SMN applications

To examine the validity of the developed hypotheses, the statistical means and standard deviations of the students' responses to the questionnaire paragraphs were calculated. Table 3 portrays the obtained results.

Paragraph		$\bar{x}$	SD	Degree
Behavioural Intention				
P1	You believe that the use of SMN to disseminate course information eases collaboration.	3.75	0.814	*High*
P2	You believe that the instructor's use of SMN to disseminate policies and rules of conduct eases the burden on you	3.70	0.864	*High*
P3	You believe that the instructor's use of SMN to provide references and supporting material enriches your learning experience	3.25	1.152	*High*
P4	You believe that the use of SMN facilitates answering your queries and questions in a timely manner.	3.64	0.860	*High*
P5	You believe that the use of SMN to exchange practicing exercises improves curriculum understanding	3.34	0.983	*High*
P6	You believe that the use of SMN for posting/submitting assignments eases the burden on you	3.59	0.996	*High*
P7	You believe that the instructor's use of SMN to conducts virtual group meetings enhances the learning experience	3.59	0.974	*High*
P8	You believe that the use of SMN to schedule individual or group face-to-face meetings improves communication.	3.68	1.028	*High*
P9	You believe that the use of SMN does not jeopardize your privacy	3.20	1.028	*High*
P10	You believe that using SMN increases your interaction with the instructor and peers in a less formal and more effective way	3.09	0.942	*High*
	Overall (*Behavioural Intention*)	3.48	0.575	*High*
Facilitating Conditions				
P11	You can always find technical support on SMN	3.77	0.884	*High*
P12	The campus environment supports the use of SMN	3.67	0.898	*High*
P13	Your university administration encourages the use of SMN for educational purposes	3.68	0.884	*High*
P14	Your university conducts training for the use of SMN in education	3.64	1.058	*High*
P15	Using SMN is economically affordable	3.81	0.931	*High*
	Overall (*Facilitating Conditions*)	3.71	0.642	*High*
Overall (*Use Behaviour*)		3.56	0.531	*High*

Table 3: Statistical means (*X*) and standard deviations (*SD*) of students' responses

As can be seen from Table 3, overall students believed that the degree of *Use Behaviour* of SMN in the educational process was *High* with an average of (3.56). Before examining the validity of the developed hypotheses, the collected data must possess a normal distribution. Therefore, it was first required to carry out the normal distribution test, the results are shown in Table 4.

	Shapiro-Wilk		
	Statistic	df	Sig.
Behavioural Intention	0.977	762	0.180
Facilitating Conditions	0.970	762	0.321
Use Behaviour	0.974	762	0.189

Table 4: Normal distribution test using Shapiro-Wilk test

Furthermore, it can be seen from Table 3 the variance values among the groups are very close and range from (0.531) to (0.642), which fairly reflected homogeneity. Lastly, the participants' responses were independent. These findings constitute the basic requirements for performing ANOVA analysis.

To examine the validity of the first proposed hypothesis ($H_0 1$), linear regression and ANOVA analysis were conducted with *Use Behaviour* as a dependent variable and *Behavioural Intention* as an independent driving factor. The results of these analysis are as shown in Table 5.

R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
				R^2 Change	F Change	df1	df2	Sig. F Change
0.941	0.885	0.885	0.17999	0.885	5858.543	1	760	< 0.001

Results of ANOVA Analysis

	Sum of Squares	df	Mean Squares	F	Sig.
Regression	189.803	1	189.803	5858.543	< 0.001
Residual	24.622	760	0.032		
Total	214.426	761			

Table 5: The impact of *Behavioural Intention* on *Use Behaviour*

As can be seen from Table 5, the value of (R^2) was (0.885), which means that (88.5%) of the *Use Behaviour* was highly driven by *Behavioural Intention*. Furthermore, ANOVA analysis showed that the value of the significance was (< 0.001), which means that we reject the hypothesis (H_{01}) at a significance level of ($\alpha = 0.05$) That is, there was a significant relationship between Use Behaviour and Behavioural Intention. These findings emphasized the results reported in Table 3.

To examine the validity of the second hypothesis (H_{02}), the same analysis was carried out with Use Behaviour as a dependent variable and *Facilitating Conditions* as a driving factor. The results were as shown in Table 6.

R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
				R^2 Change	F Change	df1	df2	Sig. F Change
0.795	0.632	0.631	0.32226	0.632	1304.764	1	760	< 0.001

Results of ANOVA Analysis

	Sum of Squares	df	Mean Squares	F	Sig.
Regression	135.500	1	135.500	1304.764	< 0.001
Residual	78.926	760	0.104		
Total	214.426	761			

Table 6: The impact of *Facilitating Conditions* on *Use Behaviour*

It can be noticed from Table 6 that the value of (R^2) was (0.632), which means that (63.2%) of the *Use Behaviour* was driven by *Facilitating Conditions*. In addition, ANOVA analysis showed that the value of the significance was (< 0.001), which means we that we reject the hypothesis (H_{02}) at a significance level of ($\alpha = 0.05$). That is, there was a significant relationship between *Facilitating Conditions* and *Use Behaviour* of social media networks in the educational process.

To examine the impact of the moderating factors (*Gender* and *Field of Study*) on the *Use Behaviour* estimates and hence to examine the validity of (H_{03}) and (H_{04}), the statistical means and standard deviations of the students' responses were recalculated according to those factors. Table 7 summarizes the obtained results.

It can be easily noticed from Table 7 that there were apparent differences in statistical means of respondent opinions related to both *Gender and Field of Study*. As far as gender is considered, those differences were in favour of male students. Whereas the differences were in favour of students in social studies and humanities fields. To evaluate the significance of these differences, two-way ANOVA without interaction was performed. The results of this test are shown in Table 8.

Source	Sum of Squares (Type III)	Δf	Mean Square	F	Sig.
Gender	0.899	1	0.899	3.200	0.074
Field of Study	0.620	1	0.620	2.208	0.138
Error	212.864	758	0.281		
Total	9867.675	762			
Corrected Total	214.426	761			

Table 8: Results of two-way ANOVA analysis of *Use Behaviour* with respect to moderating factors

It is evident from the results in Table 8 that there were no significant statistical differences between the means of students' estimates of *Use Behaviour* related to either *Gender* (Sig. = 0.074) or *Field of Study* (Sig. = 0.138) at a significance level of (α = 0.05). Therefore, we do not reject both hypotheses (H_{03}) and (H_{04}), emphasizing that there were no significant differences in estimates' means with respect to *Gender* or *Field of Study*.

DISCUSSION

The findings reported in the previous section indicated that a great majority of students have developed constructive attitudes for MSN usage in creating positive learning atmosphere among students, Table 2. The widespread usage of SMN among young generations made them viable and attractive tools to use for learning (Alshurideh et al., 2019; Quansah, Fiadzawoo and Kuunaangmen, 2016). The availability of SMN at low cost, their reliability, friendly and informal nature of these tools made them a proper choice (Alvarez and Olivera-Smith, 2013; Çankaya, Durak and Yünkül, 2014; Quansah, Fiadzawoo and Kuunaangmen, 2016; Roebuck, Siha and Bell, 2013). Therefore, no wonder that students developed positive and constructive attitudes towards their use in education. Figure 2 has shown the students preferred platforms like WhatsApp, YouTube, Zoom and Facebook the most to be used in the educational process. These results corresponded with the results reported in (Quansah, Fiadzawoo and Kuunaangmen, 2016).

The findings further indicated that there was a significant relationship between *Use Behaviour* and *Behavioural Intention*, Table 4. In addition, results in Table 5 indicated that there was a significant relationship between *Use Behaviour* and *Facilitating Conditions*.

To this point, we can conclude that students revealed that the *Use Behaviour* of SMN in the educational process was driven by the *Behavioural Intentions* and *Facilitating Conditions*. They saw that SMN could be used effectively and efficiently to enhance their learning experience through dissemination of course information and policies and rules of conduct. The communication and interaction with their peers and instructors could be made more interesting and beneficial though the exchange of enriched multimedia course material and common best practices and exercises. Students believed that this type of interaction never jeopardizes their privacy. Furthermore, the students revealed that the encouragement they receive from the university leaders, and the technical support and training they receive as well as the affordability of SMN usage, altogether played an important role in their decision to use SMN in the educational process.

What eased the use of these less-formal tools was perhaps the wide spread of social media networks usage in everybody's life together with the presence of smartphones and smart devices in the hands of almost everyone. Social media tools give everyone the feeling that everyone else is within reach. These tools are more entertaining and friendlier. Students do not need to set up appointments at certain specific times with their instructors or counterparts. They can contact each other anytime of the day even on weekends and after work hours. Instructors do not have specific times to respond, post a comment, raise a discussion issue, post a class activity or even chit chat with a group of students. Theoretically speaking, the whole group including the instructor are available 24 hours a day and 7 days a week. Dealing with groups through social media reduces time and effort, contributes to creating a friendly and entertaining atmosphere that most instructors and students seek to achieve, and improves students' engagement.

To this end, these results agreed with the theoretical framework presented above. In particular, these results agreed with the original TAM model (Davis, 1989) and the modifications on it. Furthermore, these results agreed with the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). More importantly, these results supported the proposed study model. In addition, these results agreed with most reported previous studies, like Çankaya, Durak and Yünkül (2014) and Roebuck, Siha and Bell (2013).

On the other side, the findings reported in Table 7 emphasized that there were no significant statistical differences between the means of students' estimates of Use Behaviour related to either Gender or Field of Study at a significance level of (α = 0.05). Despite that the initial results indicated apparent differences in favour of male students and those studying social studies and humanities, yet those differences were not genuine. This may be interrelated to the fact that students from different disciplines experienced the same teaching environment in the university and they were subject to the same conditions. Same bylaws and regulations governed their presence, and they were exposed to the same situations regardless of gender or discipline.

Those results align with the proposed study model. In addition, those findings agreed in principle with (Roebuck, Siha and Bell, 2013) from the fact that gender was not a significant cause of differences in the opinions of respondents. On the other hand, the results agreed with (Quansah, Fiadzawoo and Kuunaangmen, 2016), even though the study targeted faculty members rather than students. Yet, both studies agreed that there were no significant differences between means due to field of specialization. Moreover, the results agreed with results reported in (Roebuck, Siha and Bell, 2013) and in (Williams and Adesope, 2017), who studied students from the same specialization or different specializations.

Educators and learners are at the verge of a dawn of a new era, where the pen and textbook will be replaced by a smart device and a virtual information repository. Educators need to understand their new role of being guiders and facilitators. And so, they need to equip themselves with skills and capabilities to play the new role effectively. Learners need to be guided rather than fed with a predefined learning material (Hussin, 2018). Teaching and learning methodologies must change and adapt to the fast-changing technology. Education leaders and administrators ought to review governing legislations to open the doors wide for integrating the latest technological advents and tools in the educational process and to switch from the traditional campus to a smart learning environment. They need to investigate the means to enrich students' as well as instructors' perception of utilizing these tools in the teaching and learning process and improve students' engagement.

The results of this study and similar results reported in the literature should serve as a guide to practitioners as well as legislators to start a reform process of teaching and learning strategies. So, new horizons are opened for students towards obtaining the skills required to indulge into the new era of education that aligns with Industrial Revolution 4.0.

Before last, it is important to mention here that the study's limitations were that the study was conducted during the academic year of 2019/2020 in universities in the Northern region of Jordan. The results were based on the assumption of the objectivity of the respondents. Furthermore, the data was collected under the assumption of the suitability, validity and reliability of the designed questionnaire as described in the methodology section. Therefore, the obtained results are constrained by these limitations.

These findings represent solid evidence to administrators of higher education institutions globally to encourage and convince instructors and students how easy it is to integrate SMN and how useful this technology is for them. Thereby encouraging a diffusion of this innovative technology in their teaching and learning processes. Due to growth in remote learning, together with the fast-changing world, it is important to employ technology to enrich the learning experience of learners. The diffusion of social media networks (SMN) among young generations makes these networks a potential tool for teaching and learning besides socialization.

Finally, the findings can be beneficial to researchers in this field, where they can utilize and build on. The authors highly recommend conducting similar studies taking into account the instructors' perspective of SMN use. In addition, authors recommend addressing the challenges and obstacles facing the diffusion of this technology in higher and general education.

CONCLUSIONS

The results obtained in this study revealed that use behaviour of social media networks in the educational process is highly driven by students' behavioural intentions and learning environmental facilitating conditions. Students developed positive attitudes toward using social media networks in the educational process. In the light of these results, authors highly recommended that university leaders adopt the latest technological advents and tools and incorporate them in the educational process. It is recommended to investigate the means to enrich students' as well as instructors' perception of utilizing these tools in the teaching and learning process and improve students' engagement.

Revision of bylaws and policies could be needed to permit and regulate the implementation of social media in education. This might require conducting training and awareness sessions for instructors as well as students through continuing education and orientation programs in the educational institutions. Finally, authors recommend continuous evaluation of technology employment in the educational process in an aim to develop new teaching and learning strategies, methodologies, and paradigms. Such that, new horizons are opened for students towards obtaining the skills required to indulge into the new era of education that aligns with Industrial Revolution 4.0.

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