

SMS as Out-of-Class, Student–Instructor Interaction Tool: A Case Study of Jordanian Graduate Students’ Perceptions and Usage

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Abstract

This study aimed to investigate the Jordanian university students’ perceptions toward and use of Short Message Service (SMS) as out-of-class student–instructor interaction tool. The participants in this study were 33 graduate students who were enrolled in on-campus information technology course at a public Jordanian university. SMS was used in the course as out-of-class student–instructor interaction tool, where the students were encouraged to contact the instructor for any matters via SMS. Case study research approach was selected in the in the current study. At the end of the experiment, Data were collected through survey instrument and semi-structured interviews. In addition, students’ texting activities and frequency were recorded and analyzed. The analysis of the collected data showed that the students had positive perceptions toward the use of SMS as out-of-class student–instructor interaction tool, where the reported advantages of SMS overshadowed the disadvantages.

Students’ positive perceptions toward the use of SMS as out-of-class student–instructor interaction tool in the educational setting were reflected in their actual use of the SMS. All the participants had used the SMS to exchange different type of information with the instructor. Based on the findings, recommendations regarding the implementation of the SMS in the Jordanian higher education were discussed.

Keywords: SMS, SMS-mediated communication, SMS in education, student–instructor interaction

1. Introduction

“One of the most persistent and least assailable assumptions in higher education has been that of the educational/developmental importance of informal student-faculty relationships beyond the classroom” (Pascarella & Terenzini, 1978, p. 183). Being accessible to students outside classroom has been identified as one of the characters of effective and exceptional instructor (Wilson, Gaff, Dienst, Wood, & Bavry, 1975). The students- instructor interactions have great impact on improving students’ life skills such as “acculturation to the world of ideas, interpersonal skills, critical thinking ability, a sense of self and career identity, and values clarification” (Pascarella & Terenzini, 1978, p. 183). Some research studies indicated that there was positive correlation between the frequency and length of students- instructor interaction and the students’ motivation, students’ academic self-concept (Komarraju, Musulkin, & Bhattacharya, 2010); students learning (Lau, 2003); and students’ commitment to the institution (Strauss & Volkwein, 2004).

Mainly, there are two forms of out-of-class, student- instructor interactions: academic and personal. Academic interaction is “primarily intellectual or course-related contact with faculty” (Kim, 2010; p. 166). On the other side, personal interaction is “is typically affective and less course-related” (Kim, 2010; p. 166).

The authors of the current study have observed that there are limited out-of-class interactions between the Jordanian instructors and their students via face-to-face and technology-based communication channels. The limited out-of-class student-instructor interaction can be attributed to several reasons that can be categorized into three types: institutional, cultural, and technological factors. The institutional factors include large class sizes, the spatial distance between lectures place and instructors’ offices, students’ course load, and instructors’ teaching overloads and research commitments. The cultural factors are related to students being shy or reluctant to approach instructor, and the cultural norms that limits the female-male, face-to-face interaction. Technological factors are related to students’ limited access to off-campus computers and internet.

However, mobile phones are very popular among Jordanian citizens, where by 2012 the number of mobile subscriptions went beyond of the number of the Jordanian people and it is expected that the mobile phone penetration to reach 200 percent within few years (Ghazal, 2013). SMS is one of the mobile services that received great attention from the Jordanian people. For instance in Jordan, a country with about six million people, 24 million messages were exchanged during one holiday of Muslims (Eid Al Adha) to send greetings (Mansur, 2010). In addition, the Jordanian Government has initiated the SMS Gateway to provide the Jordanian citizen with a wide range of electronic services such as property tax, water bill, vehicles violation fees, weather forecasts, customs fees enquiry, etc. SMS is also very popular among Jordanian people to participate in TV and radio programs.

The documented benefits of out-of-class student–instructor interaction, the barriers of the traditional forms of the interactions between university students and their instructors, and the popularity of SMS among Jordanian people have raised the questions whether SMS would be accepted by the students to serve as supplementary out-of-class, student-instructor interaction channel.

The purpose of the study was to investigate the Jordanian graduate students' perceptions toward and use of SMS as communication technology and as out-of-class, student–instructor interaction tool.

2. Literature Review

2.1 *The Use of SMS in Higher Education*

“The SMS is a breakthrough communication medium as evidenced by growth year after year” (Omar, Sanchez, & Bhutta, 2009; p.35). Research studies have shown that SMS is very popular among university students. For instance, Leung (2007) conducted a study that aimed to explore university students' motivation to use SMS. For the purpose of the study, the researcher surveyed 532 students from Hong Kong. The findings showed that 353 (66.4%) of the participants were SMS users. The main motivations of using SMS among users were “convenience and low cost” (Leung 2007, p. 126). On the other side, the students complained about the confusing SMS's abbreviations and understanding the intentions of the received SMS.

In another recent study conducted in Malaysia, Balakrishnan and Loo (2012) surveyed 417 university students regarding to their use of mobile phone and SMS. The findings showed that 89.70% of the participants reported sending 6 to 10 SMS a day, while 92.3% of the participants reported receiving 6 to 10 SMS a day. The majority of participants perceived SMS as private, cheap, easy to use, quick, convenient, fun, and stylish mode of communication (Balakrishnan & Loo, 2012), where the most common reported uses of SMS were “to make/cancel appointments, to gossip, to maintain relationships” (Balakrishnan & Loo, 2012; p. 368).

In an international study that aimed to investigate graduate students' uses of mobile technologies in Australia, Hong Kong, Portugal, Sweden, and the United Kingdom. Kukulska-Hulme, et al., (2011) surveyed 270 graduate students, from departments of education, educational technology, engineering, and information technology, regarding their use of Mobile technologies. The researchers found that most popular mobile service among all the students was sending text messages.

The popularity of the SMS among university students has led educators to investigate its applications in higher education. However, the focus of the vast majority of published research, that investigated the applications of SMS in higher education, was on the use of SMS as one-way communication to accomplish educational and administrative purposes. As an educational tool, SMS has been found to be effective tool to deliver, at timed intervals, small amount of educational content, e.g., meaning of English and foreign language words (Thornton & Houser, 2001; Lu, 2008; Kennedy & Levy, 2008; Saran, Cagiltay, & Seferoglu, 2008; Cavus & Ibrahim, 2009; Hayati, Jalilifar, & Mashhadi, 2013) and programming languages codes (Kert, 2011).

Another use of SMS in higher education involved sending different administrative and general information for students, where the high popularity of SMS among young students has made it an effective tool support first year undergraduate students through their transition to the university. Horstmanshof, (2004) presented a study in which the SMS was used as communication tool between instructor and first year students. The researcher reported that the majority of received SMS were related to “apologies for missing or being late for lectures” (Horstmanshof, 2004; p. 425) and “thanks and appreciation to anxious requests for meetings to discuss assignments” (Horstmanshof, 2004, p. 425). In conclusion, the researcher noted that the use of SMS as communication tool between students and their instructor was beneficial in managing students' university life and resolving the issues related to the of the time commitments of the students and instructor and the availability of the instructor on campus.

In the context of using SMS to support students in the process of university transition, Harley, Winn, Pemberton, and Wilcox, (2007) conducted a study that investigated the use of SMS to support a first year university students. The number of participants in the study was 285 first year university students. The experiment involved installing internet-based students' messenger system, which was used mainly to deliver greeting and administrative SMS messages. The administrative messages include reminders of organizational subjects. As a part of the study, students' opinions regarding receiving SMS were measured through interviews. A sample of 20 students was selected for the interviews. The findings revealed that students appreciated the instantaneousness and the ease of access of the SMS compared to other type of electronic communication, where SMS helped the students considering time-sensitive information. Furthermore, the SMS contributed in providing students with a "sense of belonging to the university" (Harley, et al., 2007; p. 236). In a similar research study, Naismith, (2007) conducted a study that aimed to examine the integration of SMS as tool for administrative communication. The SMS trial involved designing email to SMS system that had been used to send 426 text messages over the two terms for eight students, who registered for the system. The type of these messages include "room changes/class cancellations; reminders to submit assignments; reminders to collect assignments; notices of relevant lectures/activities; and individual administration" (Naismith, 2007; p. 164). In addition, the researcher decided to send "instructional messages and thank you messages" (Naismith, 2007; p. 164) to the students. At the end of each term, students' feedbacks were collected using questionnaire. The analysis of the questionnaire's responses showed that the participants appreciated the SMS experiences, where they perceived the SMS service as very useful mean of communication. Despite the limited number of participants in this study, the findings provided indicators of students' positive reactions to the use of SMS to deliver administrative information.

Beside the educational and administrative use of the SMS, SMS was also integrated within classroom to encourage interaction. For instance, Markett, Sanchez, Weber, and Tangney, (2006) presented the PLS TXT UR Thoughts research project that aimed to encourage interaction in the classroom. In this project, the student can anonymously send SMS in class through their mobile phones. The received SMS were transferred into computer software. The instructor can view the SMS on the computer and comment on them in the class. In addition, the SMS was available online after the class, where students can add threaded comments. The project was tested with three classes with a total number of 42 students. The results showed that 47% of the participants sent SMS (Markett et al., 2006). The analysis of the SMS content showed that 76% of SMS were related to the educational content, 6% were related to class administration, and 18% were jokes, greetings, or spurious comment (Markett et al., 2006). Students' reactions to the project were measured through pre and post questionnaires (Markett et al., 2006). The analysis of students' responses to the questionnaire showed that some participants believed that the project helped them to overcome shyness and embarrassment and to ask more questions. In addition, the project allowed the students to provide feedbacks for lecturer, that they would not provide in the normal situation (Markett et al., 2006). The students reported some barriers to send SMS, which included the cost of sending SMS and the difficulties related to texting on small keypad.

Despite the potential of the SMS to improve student-instructor interaction, there are limited numbers of research studies that investigated student-initiated, out-of-class communication via SMS with instructor. The majority of research studies that investigated the use of SMS in higher education focused on the use of SMS with undergraduate students. Reviewing the literature showed scarcity of research studies in Jordan the investigated the potential of SMS to support university students. Therefore, the current research study aimed to explore the perceptions of group of graduate students, at a university in Jordan, toward the use of SMS as out-of-class, student-instructor interaction tool, as well as their actual use of this tool.

3. Purpose of the Study

Given the lack of research that investigated the role of SMS to facilitate out-of-class interaction between instructors and students in the Jordanian higher education as well as the potential of SMS to supplement out-of-class communication, the present study was designed to investigate the Jordanian university graduate students' perceptions toward and use of SMS as communication technology and as out-of-class, student-instructor interaction tool.

The research questions for this study were:

1. What are the students' perceptions of the advantages and disadvantages of SMS as communication technology?
2. What are the students' perceptions of the advantages and disadvantages of the use of SMS as out-of-class, student-instructor interaction tool?

3. What are the patterns of students' use of the SMS when it is integrated in their class as out-of-class, student–instructor interaction tool?

4. Research Methods

The selected research approach in the current study was a case study. Since all the participants were new to the use of SMS as student–instructor interaction tool, the case study was selected to in-depth explore their perceptions and use of this technology. Creswell (2006) noted that “a case study is good approach when the inquirer has clearly identifiable cases with boundaries and seeks to provide in-depth understandings of the cases” (p. 74).

Data was collected from different sources. Data regarding students' demographic characteristics and perceptions toward SMS was collected through survey that contains a set of closed-ended and open-ended questions. More qualitative data, regarding students' perceptions toward SMS, were collected using semi-structured interviews with some participants. Data regarding students' use of SMS was collected from the contents and the timing of the students' SMS.

4.1 Participants

The participants were group of students who were enrolled in graduate diploma program in information technology. None of the participants have used SMS in the educational settings before. All the participants own a mobile phone. All the participants have used SMS before for different reasons that include sending and receiving greetings, religious quotes, jokes to family and friends; and participating and voting in TV and radio programs. The total number of participants was 33 students. Eighteen of them (54.5%) were female, while 15 (45.5%) were male. A little less than half of the participants (n=15) were between the ages of 30 to 34, nine of them were between the ages of 25 to 29, six of them were between the ages of 35 to 40, and only three of them were between the ages of 20 to 24. All the participants were school teachers with different experiences. The majority of participants (n=16) had 6 to 10 years of experience in teaching, nine of them had less than 5 years of experience in teaching, seven of them had 11 to 15 years of experience in teaching, and only one of them had more than 15 years experience in teaching. The great majority of the participants (n=28) holds bachelor degree in Humanities and Social Science disciplines, three students holds bachelor degree in Information Technology, and only two students hold bachelor degree in Science. Table 1 shows summary of participants' characteristics.

Table 1. Descriptive summary of participants' characteristics

Variables	Category	Number	Percentage
Gender	Male	15	45.5%
	Female	18	54.5%
Age	20-24	3	9.1%
	25-29	9	27.3%
	30-34	15	45.5%
	35-40	6	18.1%
Experience	1-5	9	27.3%
	6-10	16	48.5%
	11-15	7	21.2%
	more than 15	1	3%
Discipline	Science	2	6.1%
	Information Technology	3	9.1%
	Humanities / Social Science	28	84.8%

4.2 Instruments

The used instruments in this study was a survey that contains questions in relation to students' gender, age, discipline, and teaching experiences as well as set of open-ended questions regarding students' perceptions of SMS. The survey instrument was developed by the researchers. The validity of the survey instrument was

examined by two faculty members who reviewed the survey items. Reviewers' comments were used to adjust the survey items. To measure students' perceptions of SMS, the survey consisted from ten open-ended questions (Appendix A). In the semi-structured interviews, the same questions, as in the open-ended survey, were asked to the participants as well as some sub-questions that aimed to clarify and understand their responses to the survey questions.

4.3 Procedure

The study took place in the first semester of 2012/2013 academic year. At the beginning of the semester, tutorial meeting was held with the instructor (the first researcher in this study) to inform the students about the purpose and the methods of the study. The participants were clearly informed that SMS can be used to contact the instructor in matters and SMS is used as an extra communication tool beside office hours and email. All the students provided their informed consent to participate in the study. All the participants provided their phone numbers.

In the first week of instruction, the instructor sent welcoming messages to all the participants in order to provide the students with the phone number that they can use to send messages and to trigger the communication. During the whole semester, the instructor was the initiator in sending a total of 6 messages to all the students. Beside the welcoming message, the instructor sent students announcements regarding administrative issues i.e. announcements regarding exam' location, lecture cancellation due to extreme weather condition, instructor' absence, and the instructor' being late to lecture. Otherwise, the instructor limited his use of SMS to reply on students' messages in order enhance student-centered communication. The instructor followed the one hour rule, where he replied on students' messages within one hour of receiving the message. The instructor presented the contents of the received SMS in the beginning of each class. The SMS experiment started at the twenty third of September and lasted till the twelfth of January.

In the last week of the semester, the researchers handed paper-based survey to all participants. The survey consisted from set of questions to collect demographic data about the participants and set of open-ended questions to collect data regarding students' perceptions of the SMS as communication technology and as instructor-student interaction tool. Based on students' responses to the survey's questions, the researchers selected six students to conduct in-depth, semi-structured interviews with them in order to clarify and understand their responses to the open-ended survey questions. Four students were selected from the students who showed highly positive perceptions of the SMS, while the other two students were selected from the students who reported some disadvantages of the SMS. All the interviews conducted by the second researcher.

4.4 Data Analysis

The data collected through the open-ended survey questions were analyzed through qualitative typological analysis. Typological analysis as can be defined as "dividing everything observed into groups or categories on the basis of some canon for disaggregating the whole phenomenon under study" (LeCompte & Preissle 1993, p. 257). Based on the research objectives, the main pre-selected typologies were the perceived advantages and disadvantages of the SMS as communication technology and as student- instructor interaction tool. Students' responses to the interview questions were used to clarify and understand their responses to the open-ended survey questions. All the collected data were coded based on the pre-selected typologies then they were interpreted and represented under each typology. The researchers used pseudonyms to identify the participants in the research findings.

The patterns of students' use of the SMS when it is integrated in their class as student-instructor interaction tool were identified through collecting and coding the students' SMS based on the type of their contents and their timestamps.

5. Results

5.1 Students' Perceptions toward SMS as Communication Technology

The analysis of the students' responses to the set of the open-ended questions showed that students have overall positive perceptions toward SMS as a communication technology. The open-ended questions examined students' opinions and beliefs regarding the advantages and disadvantages of SMS as a communication technology. Table 2 shows student responses to the open-ended questions regarding the advantages and disadvantages of SMS as a communication technology. The majority of the students perceived the SMS as immediate, easy to access, easy to use, and cheap communication technology. A little less than half of the students reported that SMS allow for quiet and private communication. Fathomer, several students reported the advantage of SMS as a way to send multiple messages at once.

Table 2. Student responses to the open-ended questions regarding the advantages and disadvantages of SMS as a communication technology

Responses	Number of times reported
Perceived advantages of SMS as Communication Technology	
Immediate communication technology	22
Easy to access/available communication technology	21
Easy to use communication technology	21
Cheap communication technology	20
Allow for quiet/private communication	14
Sending multiple messages at once	6
Perceived disadvantages of SMS integration as Communication Technology	
Limited number of characters per message	6
Reliability issues of the network/delay in receiving or sending the SMS	5
Compatibility issues between different phone models	4
Addiction problems	3
Distraction problems	2

The number of reported disadvantages of the SMS as communication technology was quite less than the number of reported advantages. The reported disadvantages of SMS as communication technology were related to the limited number of characters that can be sent in one message, reliability issues of the mobile network, compatibility issues of different phone models, addiction problems, and distraction problems.

The analysis of the students' responses in the interviews confirmed and clarified their responses to the open-ended questions regarding their perceptions of the SMS as communication technology. Students' familiarity with the SMS technology made them aware of its capabilities and its popular advantages. Five of the interviewed students reported that one of the main advantages of SMS is being immediate communication technology, where Anan stated that "SMS is fast way to contact people anywhere and anytime". The popularity of mobile phones among Jordanian people was evident in students' responses to the interview questions. Samar noted that "I really cannot function during day without my mobile phone". Such popularity of mobile phone made the access to SMS easy. All the interviewed students noted that SMS is easy to access communication technology. Samar noted that "I always carry my mobile phone; therefore I can send and receive SMS from anywhere and at anytime". All the interviewed students perceive the SMS as easy to use technology, for instance Mera stated that "the use of SMS is straightforward if you can read and write text then you can send and receive SMS very easily". Furthermore, Maher stated that "sending or receiving SMS require a few simple steps".

Four out of the six students' mobile phone plan allow them to send up to 500 hundreds SMS a month for free. The other two participants reported that they can send up to a hundred SMS for free and they pay about 4 ¢ for any additional SMS. However, all the participants perceived the SMS to be cost-effective way of communication. The participants reported that they can receive SMS for free.

Some of the interviewed students pointed to the potential of SMS to facilitate silent communication. Majdi noted that "As school teacher, I spend most of my time among students and colleagues; SMS was great tool to keep private communication with my family". Maher stated that "I love to text message rather than to make a voice call, because I think SMS does not disturb receiver the same way the voice call does". In addition Mera stated that "I love SMS. Either I replied or I did not reply to the SMS, I did receive the information sent via SMS". Furthermore, SMS was received as time efficient communication technology. Mera stated that "when I send blessing message to my friends and family, I can use SMS to send one message to all of them at once instead of calling or texting each one".

Regarding the perceived disadvantages of the SMS, four out of the six students believed that SMS has no disadvantages. However, Anan complained about some technical issues related to SMS, for instance he mentioned a few times he received incomprehensible symbols via SMS because his phone does not support

Arabic languages. In addition, he reported that sometimes problems with mobile networks might delay receiving SMS.

Some of the interviewed students showed their academic concerns regarding the use of SMS. For instance Nowfa was one of the students who mentioned that the use of SMS may cause addiction problem, she clarified this concern stating that:

“When I said SMS may cause addiction problem, I was not talking about myself. I think I am too old to get addicted to technology, but I have teenage son who are very addicted to SMS, where that ruined his writing because of SMS abbreviations”.

In addition Nowafa complained about receiving too many SMS advertisements without subscribing to such services. Nowafa stated that “sometime I really feel annoyed from receiving several SMS advertisements during the day. Sometimes, it really causes disruption”.

5.2 Students' Perceptions toward the Use of SMS as out - of - Class, Student–Instructor Interaction Tool

The analysis of the students' responses to the set of the survey open-ended questions showed that students have overall positive perceptions toward SMS as student–instructor interaction tool. The open-ended questions examined students' opinions and beliefs regarding the advantages and disadvantages of SMS as student–instructor interaction tool. Table 3 shows student responses to the open-ended questions regarding the advantages and disadvantages of SMS as student–instructor, interaction tool.

Similar to the students' perceptions of the SMS as communication technology, the students reported that SMS have several advantages as student–instructor interaction tool. All the students indicated that they would sign for SMS service that serves as student–instructor, interaction tool. The perceived advantages of SMS as student–instructor, interaction tool were: it increases student-instructor interaction; it improves student-instructor relationship; it makes the students feel more connected to the class and the university; it helps students to reflect on class' events and environments; it reduces student's anxiety about class and tests; it saves students' time and effort; and it adds fun and playfulness to the class.

Table 3. Student responses to the open-ended questions regarding the advantages and disadvantages of SMS as out-of-class student–instructor interaction tool

Responses	Number of times reported
Perceived advantages of SMS integration as out-of-class, student–instructor interaction tool	
Increase student-instructor interaction	27
Improve student-instructor relationship	24
Make the students feel more connected to the class and the university	24
Help students to reflect on class' events and environments	22
Reduce student's anxiety about class and tests	17
Save students' time and effort	15
Add fun and playfulness to the class	8
Perceived disadvantages of SMS integration as out-of-class, student–instructor interaction tool	
Does not allow for exchange of large amount of information and/or educational material	13
Might cause social problems and embarrassments	6

Regarding the perceived disadvantages of the SMS as student–instructor interaction tool, some students had complained about the inability to send or receive large amount of information or educational material through the SMS. In addition six female students reported that the use of SMS, as student–instructor interaction tool, might cause social problems and embarrassments.

The analysis of the students' responses in the interviews confirmed and clarified students' open-ended questions responses regarding their perceptions of the use of SMS as out-of-class, student-instructor interaction tool. The interviewed students were excited regarding the use of SMS as out-of-class, student-instructor interaction tool. All the interviewed students believed that use of SMS as out-of-class, student-instructor interaction tool had increased their interactions with the instructor. Mera explained "the use of SMS to interact with my instructor increased my feeling of self worth and that make me more motivated to contact my instructor more often" Anan stated that "the use of SMS increased the potential time of interaction with the instructor, it is like the 24/7 communication service". Nowfa noted that "if I or any other students feel embarrassed or shy to talk face to face with the instructor, SMS can resolve this issue". Samar stated that "for out-of-class communication with my instructor, as a female student I do prefer to communicate with via electronic medium rather than face-to-face, SMS was interesting alternative"

Majdi stated that

"I liked the idea of using SMS to communicate with my instructor it is like opening a new channel of communication with instructor and that for sure increase and improve my communication with the instructor regarding different issues not just academic ones".

The interviewed students believed that the use of SMS as out-of-class, student-instructor interaction tool had improved their relationship with the instructor. Anan noted that "SMS is efficient ice breaker with the instructor". Samar noted that "I use SMS to communicate with friends and family, but in this class I added the instructor to the friends list who I send them a weekly greeting SMS". Mera stated that "due to the use of SMS, I felt the instructor was psychologically close to me and to the other students, I believe SMS has more soul in it than others communications tools". Anan stated that "the use of SMS allowed for personal communication between the students and the instructor".

Students feeling of being close to the instructor made them feel close to the class and the university too. Some of the interviewed students believed the use of the SMS in the class made them academically and psychologically connected to the class and the university. Mera stated that "among the classes I took, I liked this class the most because of the use of SMS. I felt that I am in class whenever I hold my phone". Samar stated that "in this class I kept a record of the SMS archives between I and my instructor, where that make reaching some important information related to the class just few clicks away". Maher stated that "the SMS made me feel close to the class and the university".

The interviewed students highlighted the role of SMS in providing the instructor with their reflections on the class's activities, assignments, and tests. The SMS served as a tool to provide feedbacks to the instructor. Anan stated that "I believe that the most important use of the SMS was to send the instructor notes related to the class". Mera stated that "when I did not understand specific part of the lecture, I sent SMS to instructor asking to explain this matter in the next class; I would not do that without the SMS". Maher stated that "it happened that due to compelling circumstances I could not attend class, the SMS was helpful tool to timely inform the instructor about my situation"

Knowing that instructor's help is close and available all the time made the students less anxious about the class and the tests, for instance Anan stated that "the use of SMS as out-of-class communication tool with instructor made the learning environment very friendly and minimize my concerns regarding the class". In addition, Samar stated that "my communication with the instructor before the tests helped me a lot to overcome my concerns about the tests, where I just felt confident of passing the test".

Another reported advantage of the use of SMS was related to saving students' time and effort; where in some cases the students used SMS instead of visiting the instructor's office. Nawfa stated that "the use of SMS reduced the number of my visits to the instructor's office, where exchanging SMS was enough". In addition, some students used the SMS to make sure that the instructor is available before visiting his office. Majdi stated that "it happened to me several time that I was visiting my instructor in his office and I found that he left the office because of administrative or emergency matters, the use of the SMS resolved this problem since I can make sure that he would be in the office before visiting him" Maher stated that "As school teacher, it is hard to visit the university within the official time, The SMS was helpful to substitute my visit"

Some of the students believed that the use of SMS added kind of fun to the class, where Mera stated that "it was fun sharing jokes with the instructor via SMS, it helps showing the students' sense of humor that they cannot show without the SMS".

Regarding the perceived disadvantages of the SMS as out-of-class, student–instructor interaction tool, only three interviewed students reported that SMS has disadvantages. One of these disadvantages was technical related one, where Majdi complained about the limited capacity of the SMS to send large amount of information and attached media. The other disadvantage was social/cultural one, where two interviewed female students pointed to the issue of using SMS to communicate with male instructor. Nawfa noted that “It was really hard convincing my family that I am texting my instructor since the use of SMS is popular among teenagers rather than adults”. In the same context, Samar noted that “in our society SMS is popular as flirting tool between males and females rather the being used as educational tool, people are not used to see female student texting male instructor. It took a lot of explaining to my family about the use of SMS in my class”.

5.3 Patterns of Students' Use of SMS

The examination of the received SMS showed that all the students (100%) have sent at least one SMS. The instructor has received a total of 355 messages. The instructor replied to 317 messages. The largest number of SMS was received in November (112 messages). The highest average of received SMS was in January, where 7 to 8 messages were received per day.

Figure 1 shows the time distribution of messages along the period of SMS experiment that started at the twenty third of September and lasted till the twelfth of January.

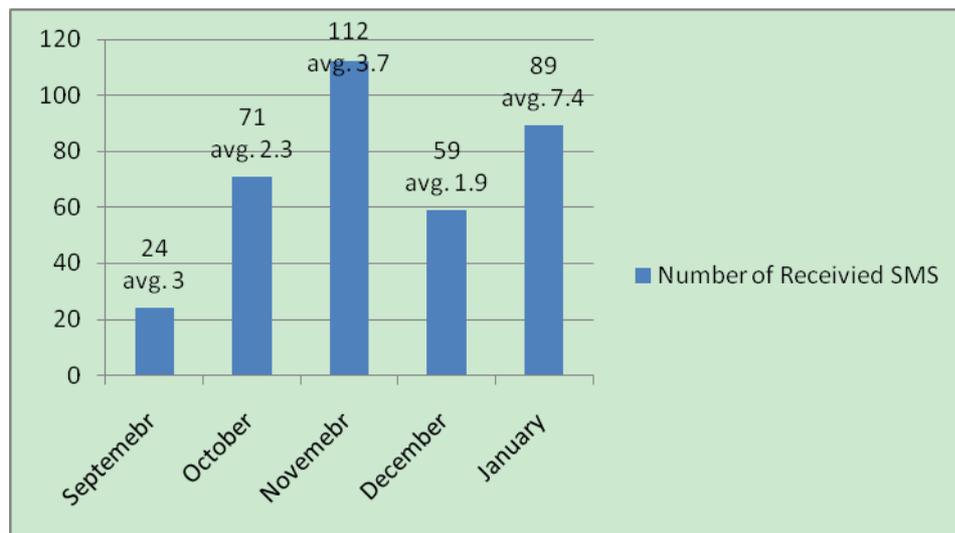


Figure 1. The time distribution of the received messages

The received SMS can be categorized into seven types that include reflection, administrative, educational, greetings, religious quotes, jokes, and incomprehensible messages. The content analysis of the received messages shows that the largest number of messages was reflective ones (105 messages). Examples of the content of the reflective messages include short comments related to the lectures, exams, educational subjects, assignments, the computer lap, or website. The students used the SMS to send inquires related to administrative matters, where 98 received messages were related to administrative matters. Examples of the content of the administrative messages include questions regarding the due dates of the assignments, questions regarding the marks, questions regarding exam location and time, questions regarding the posting time of online educational materials, absence note, or late notes. Beside the use of SMS to send reflective comments and administrative inquires the students used the SMS to send educational questions to the instructor, where 59 messages contained educational inquires e.g., clarification of concepts related to the educational subject, were received. In addition the students sent number of messages that were not related to the class subject, where the students sent 55 greetings messages e.g., holiday greetings, twenty six religious quotes, seven jokes, and five incomprehensible messages. Figure 2 shows the received messages content analysis.

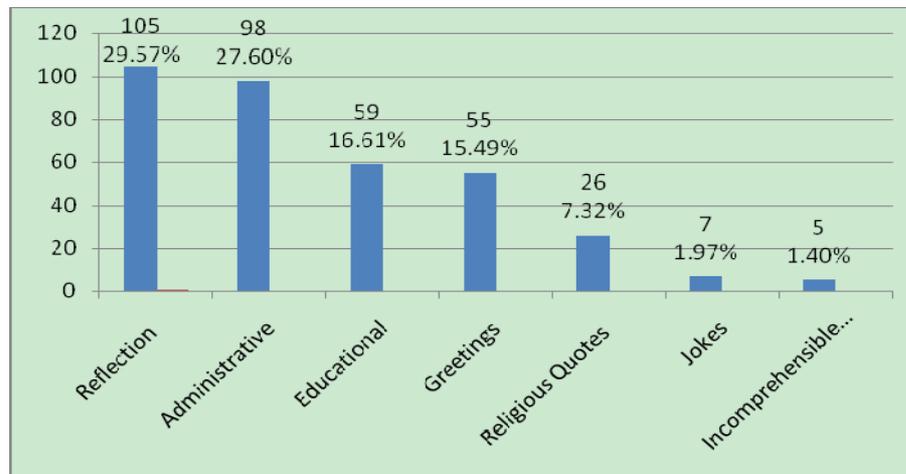


Figure 2. The received messages content analysis

6. Discussion

6.1 Students' Perceptions toward SMS as Communication Technology

The analysis of the students' responses to the open-ended survey questions regarding their perceptions toward SMS as communication technology showed that the students had positive perceptions toward the SMS, where all the students had used SMS to communicate with others. SMS was popular among the participants to send greeting and blessing messages to friend and family, and to participate in TV and radio programs. The students' perceived SMS to have more advantages than disadvantages. The students perceived SMS to be immediate, easy to use, easy to access, cheap, silent, and effective in term of sending one message to multiple people. Some of the findings were similar to the findings of Leung's (2007) study that found SMS's convenience and low cost represented the main motives for the undergraduate students to use it. In addition, the some of the findings of the current study were similar to the findings of Balakrishnan and Loo's (2012) study that investigated undergraduate students' perceptions and use of SMS. The common reported advantages of SMS were being private, cheap, easy to use, quick, and convenient mode of communication.

Students' responses to the open-ended survey questions revealed that the students perceived SMS to have limited disadvantages. Some of these disadvantages were technology relates ones, i.e., limited number of characters per message, reliability issues of the mobile network, and compatibility issues of different mobile phones. In addition, limited number of students reported problems with SMS in term of causing distraction and addiction.

In the interviews, participants confirmed and explained the survey's findings. The popularity of mobile phones among Jordanian people and their experiences using the mobile phone services made them aware of the main advantages provided by the SMS. The interviewed students like the SMS because it is fast, readily available and easy to use communication technology. In addition, the competition among mobile providers in Jordan has made mobile services within the reach of everyone's hands. It free to receive SMS in Jordan and most mobile plans included certain number of free SMS. The nature of the participants' work, as school teachers, made them appreciated some capabilities of SMS as communication tool, where they valued the potential of SMS to facilitate silent communication with family members and friends as well as the capacity of SMS to send one message to multiple people saving their time and effort.

The interviewed students clarified the disadvantages of SMS that were reported in their responses to the open-ended survey questions. In limited cases, the compatibility issues of different phone models caused receiving incomprehensible symbols via SMS and the reliability issues of mobile network that caused delay in receiving SMS. However, the advancements in mobile technologies provided users with wide range of mobile software that support different languages and resolve the issues of mobile phones' compatibility.

In the survey responses, only four participants complained about the reliability issue of the mobile network in Jordan indicating that the reliability issue of the mobile network does not represent a major problem of using SMS considering the volume of SMS exchange. For instance, the statistics show that estimated volume of exchanged mobile messages in normal days is about 4.3 million messages and it has recorded nearly 17 million messages in the night of Ramadan, the holy month of Muslims (Alghad newspaper, 2012)

Some of the participants' criticized SMS as communication technology from their perspectives as educators, where they complained about the teenagers' tendency to get addict to SMS and its affect on their writing. However, the effect of SMS texting on literacy is still subject of controversy (Vosloo, 2009).

6.2 Students' Perceptions toward the Use of SMS as out - of - Class, Student–Instructor Interaction Tool

The analysis of the students' responses to the open-ended survey questions regarding their perceptions toward the use of SMS as out-of-class, student–instructor interaction tool showed that the students had positive perceptions toward the use of SMS. The reported advantages were related to increasing student-instructor interaction, improving student-instructor relationship, connecting students to the class and university, allowing students to reflect on the educational process, reducing student's anxiety about class and test, saving students' time and effort, and adding fun to the educational process. Some of the findings of the current study were similar to the findings of other research studies. The findings related to the role of SMS to increase out-of-class, student-instructor interaction as well as students' reflections were similar to the findings of Markett et al.'s (2006) study that showed the role of SMS to increase undergraduate in-class students' interaction with the instructor. The findings related to the role of SMS to improve the connection between the students in one side and the instructor, class and the university on the other side were similar to the findings of Harley et al.'s (2007) study that showed the students who received different types of SMS form the university had improved their connection to the university. The findings of the current study related to the students' perceived advantages of SMS to save their time and effort were similar to the findings of Horstmanshof (2004) study that concluded that SMS was useful to resolve the issue the availability of the instructor on campus.

The students reported only two disadvantages of SMS as out-of-class, student–instructor interaction tool. The first one was related to the limited capacity of SMS to send large amount of information or attached documents. However, SMS was not the main communication channel between the students and their instructor, where it was used as supplementary, out-of- class communication channel along with email and face-to-face communication in the office hours.

The other reported disadvantage of the use of SMS as out-of- class, interaction tool was reported by only six female students, where they indicated that SMS might cause social problems and embarrassments.

In the interviews, participants confirmed and clarified the survey's findings. The participants valued the role of the SMS to increase student-instructor interaction. The students explained that their interaction with the instructor was increased because of several factors. SMS provide the student 24/7 communication medium where they can interact with the instructor at anytime and from anyplace. The use of SMS made the students felt of their self-worth where that motivate them to interact with the instructor. The SMS helped shy and anxious students to interact with the instructor electronically, where SMS help anxious students to reveal their real-self through text better than face-to-face or voice call exchanges (Reid & Reid, 2004). Due to the cultural norms that limit the face-to-face interaction between females and males in Jordan, the female students appreciated the use of SMS and they consider it an effective alternative to face-to-face interaction.

Because of the traditional formal relationship that governs the relationship between the instructor and students in Jordan, the students valued the use of SMS to develop informal relationship with the instructor. The interviewed students confirmed that the use of SMS as out-of-class interaction tool with the instructor had improved their informal relationship with the instructor. SMS is popular among Jordanian students to communicate with family and friends, therefore the use of SMS as student-instructor interaction tool made the students feel close to the instructor, where SMS made the participants feel that educational help is close. In addition, the use of SMS facilitated personal and individual communication between the students and their instructor.

Students' responses to the interview questions showed that their feeling of being close to the instructor made them feel close to the class and the university too. The students liked the class because of the SMS. The students used the SMS to send educational and administrative inquires to the instructor, where they kept SMS archives of the important educational and administrative information related to the class.

The use of SMS as interaction tool made the students able to share with the instructor their concerns regarding the class reducing their anxiety regarding the class's activities, assignments, and tests. In addition, the use of SMS contributed in building friendly learning environment. Literature have shown that reducing students' anxiety would improve their performance (Chan, 2001)

The interviewed students perceived SMS as a helpful tool to send the instructor their feedbacks and reflections related to the educational process in the class. The SMS helped the students to draw the instructor attention to

their struggle with some educational and administrative issues where that leads to improved students' learning and class management.

The interviews' responses showed that use of SMS as out-of class, interaction tool between the instructor and the students had saved their time and efforts. The students' jobs as school teachers had limited their visit to the university during the official working hours. The students used SMS to communicate with the instructor rather than visiting his office and they used SMS to schedule and confirm their face-to-face meeting with the instructor.

Some of the interviewed students believed that SMS added kind of fun to the class, where it allowed them to share jokes with the instructor and to show their sense of humor.

Some of the interviewed female students pointed to the social and cultural barriers of the use of SMS as communication tool between the female students and the male instructor, where SMS is popular among Arab people of being flirting tool. For instance, Ibrahimine, (2008) stated that "mobile phones and SMS help Arab females and males explore new forms of dating and flirting, one of the thorniest taboos in these religiously embedded societies" (Ibrahimine, 2008; p.55).

6.3 Patterns of Students' Use of SMS

The time distribution of the received messages showed that the students had a little hesitation about the use of SMS in the beginning of the SMS experiment where 2 to 3 messages a day were received in the first five week of the SMS experiment. The use of SMS increased in the following four weeks in which the midterm took place, where 3 to 4 messages were received a day. In following months, students' use of SMS have decreased, where about 2 messages were received a day. In the last 12 days of the semester, students' use of SMS reached its peak, where 7 to 8 messages per day were received. The increase in students' use of SMS can be attributed to the due date of portfolio submission and the final exam. In addition, the class did not meet face-to-face in the last week of instruction.

The analysis of the received messages content showed that great majority of the received SMS were academic, where 73.8% of the received SMS were related to the class, while 26.2% of the received SMS had class-unrelated contents. The academic messages were in three types: reflection, administrative, and educational. Mainly, the class-unrelated contents were in three types: greetings, religious quotes, and jokes. The findings of the current study related to the SMS's contents differ from the findings of Horstmanshof's (2004) study, in which the researcher found that the majority of students used SMS to send absent and late notes as well as appreciation messages to the instructor. However, the findings were, to some extent, similar to Markett et al.'s (2006) study in which the researchers found that when SMS was used as in-class student-instructor interaction tool, the great parts of messages' contents were academic.

7. Conclusion

SMS provides out-of class channel of communication to students and instructors that facilitate communication that would not happened without SMS. SMS as student-instructor interaction tool has the potential to support other type of communications i.e., face-to-face and internet-based, rather than replace it. From the perceptions of Jordanian graduate students, the advantages of SMS as communication tool and its use as out-of-class, student-instructor interaction tool overshadowed the disadvantages. The popularity of SMS among Jordanian people made them aware of its common benefits and advantages as communication tool. In addition, the students showed positive perceptions and uses of SMS as out-of-class, student-instructor interaction tool. As previous research studies found that SMS is appropriate to be used with undergraduate students (Horstmanshof, 2004; Markett et al., 2006; Harley, et al., 2007), the current study showed that SMS is also appropriate to be used with older graduate students.

Simple and short text messages exchanges between the students and the instructor played key role in facilitating the learning process and managing the class as well as improving informal relationship between the students and the instructor. Set of interrelated advantages of the SMS as out-of-class student-instructor interaction tool were reported by the Jordanian graduate students. The use of SMS as an additional medium of communication between the instructor and the students had increased students' interaction with the instructor, improved students' relationships with the instructor, enhanced students' feeling of being connected to the class and university, helped students to reflect on the class's activities, reduced students' anxiety in the class, saved students' time and efforts, and added fun to the class. Students' uses of SMS to communicate with the instructor showed another indication of their positive perceptions of the SMS. The use of SMS as out-of-class, student-instructor interaction tool can serve academic and personal purposes.

Based on the findings, Jordanian higher educational system should take advantages of the students' positive perceptions toward the SMS through integrating such technology to serve as additional communication channel between the university faculty members and students. The official integration on the university level of SMS as out-of-class student–instructor interaction tool might eliminate the social and cultural barriers of the use of SMS.

The current research study is believed to serve as knowledge base for future research studies related to the integration of mobile services and SMS in the Jordanian higher education. However, the findings of current study have limited generalizability, where low number of Jordanian graduate students participated in the study.

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Appendix A: Open-Ended Survey Questions

- 1) In your daily life, do you use SMS? If yes, for what reasons?
- 2) What are the advantages of SMS as communication technology?
- 3) What are the disadvantages of SMS as communication technology?
- 4) What are the advantages of SMS as student–instructor interaction tool?
- 5) What are the disadvantages of SMS as student–instructor interaction tool?
- 6) Was the use of SMS as student–instructor interaction tool useful in the educational process?
- 7) What are the factors that encouraged you to use SMS to communicate with the instructor?
- 8) What are the factors that discouraged you from the use of SMS text messaging?
- 9) Did you use SMS before to communicate with your instructor?
- 10) In the future, would you sign for SMS service to serve as student–instructor interaction tool? Why? Why not?

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