Adoption of Social Networks within Academic Context: A Diffusion of Innovation Approach

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Abstract— **Social networks continue to attract people more and more every day. Today, many people around the world practice many activities on social networks like: dissemination and sharing of information, communication, following news, socialization, etc. In the academic environment, it is important to all universities and academic institutions to take advantage of the powerful advantages offered by social networks in enhancing and developing the educational process. For successful integration of social networks in the academic environment it is important to study perceptions and attitudes of academics toward this integration. From this point, this study came to investigate the adoption of social networks by Saudi faculty members for academic purposes based on the diffusion of innovation theory. It attempted to determine if the attributes of innovation as perceived by faculty members in public universities in Riyadh predict their social networks adoption.**

Keywords-Social networks; diffusion of innovation; faculty members; higher education.

I. INTRODUCTION

In the past several years, social networks have received a widespread adoption and played important role in the personal and professional lives of many people around the world. They are one of the most powerful and beneficial tools offered by web 2.0 which considered as a key driver that changing the learning paradigms and supporting innovative teaching methods [1]. Social network can be defined as a web site where individuals are defined by a profile and communicate with each other by posting messages, sharing photos, videos, and links, instant messaging, and so on [2]. These networks include sites such as Facebook, Twitter, and LinkedIn, and each of them is used by millions of people. There are hundreds of social networking sites with consistent features but have various technological capabilities and each of them supports a wide range of interests and cultures [3]. For example, some sites attract various audiences, while others attract audiences with common language, nationality, interests, religious, etc. These sites also vary in incorporating new information and communication tools, such as mobile connectivity, blogging, and photo/video-sharing [3]. As a shared feature, almost all social networks allow for various levels of visibility and privacy controls [4].

Social network sites first emergence was around 1997 and these sites became a significant cultural phenomenon in 2003 when Friendster attracted mass media attention [5]. Social networks continue to attract people more and more every day. Today, many people around the world practice many activities on social networks like: dissemination and sharing of information, communication, following news, socialization, etc.

In the academic context, social networks have proved its vital role in supporting the academic process. These networks provide a base for a new teacher-student relationship [6]. Many academics use social networks for a variety of purposes: academic service support, student support, social and cooperate learning, and achievement representation [7]. It is important to all universities and academic institutions to take advantage of the powerful advantages offered by social networks in enhancing and developing the educational process and integrate these communicational tools to enrich the educational platforms.

II. PURPOSE OF STUDY

The purpose of this study is to investigate the perceived attributes of innovation in relation to Saudi faculty members' adoption of social networks in the academic sector. The attributes of innovation included in this study were: Relative Advantage, Compatibility, Ease of use, Visibility, Result Demonstrability, Trialability, and Image.

Specifically, this study attempted to answer the following questions:

1) *Does the attributes of innovation Relative Advantage, Compatibility, Ese of use, Trialability, Result Demonstrability, Visibility, and Image as perceived by faculty members predict their social networks adoption?*
2) *For what purposes do faculty members use social networks in the academic environment?*

III. THEORETICAL FRAMEWORK

The theoretical framework of this research is based on a modified version of [8]'s diffusion of innovation model which was suggested by [9]. [8]'s model is one of the most popular

adoption models for studying the process of adopting new innovations [10]. Reference [11] describe the diffusion theory as a popular means of investigating the generation of new ideas, policies, or products and a widely used framework in the area of technology diffusion and adoption. The theory also has been used as a research framework from a broad variety of disciplines [12]. For example, it was used to study faculty's attitude towards the adoption of information technology in the teaching process in higher education [13]. In the context of Saudi Arabia, it was used to study faculty perceptions of attributes affecting the diffusion of online learning in Saudi Arabia [14]. Reference [15] also used the theory to study the Internet adoption among faculty members of Al-Imam Muhammad Ibn Saud Islamic University in Saudi Arabia.

Reference [8] defined the diffusion as "the process in which an innovation is communicated through certain channels over time among the members of a social system" (p.5). According to this definition, the diffusion of innovation has four main elements: an innovation, communication channels, time, and the social system. Innovation is described the as an idea, practice, or object that is perceived by an individual or other unit of adoption as new [8]. Reference [8] saw that the innovation-decision process consists of five stages:

1) *Knowledge:* Occurs when any decision-making unit is exposed to the existence of an innovation and gains some understanding of how it works.
2) *Persuasion:* Occurs when any decision-making unit starts to form a favorable or unfavorable attitude toward the innovation based on its perceived attributes.
3) *Decision:* Occurs when any decision-making unit engages in activities that lead to a choice to accept or reject the innovation.
4) *Implementation:* Occurs when any decision-making unit puts a new innovation into use.
5) *Confirmation:* Occurs when any decision-making unit seeks reinforcement of the innovation-decision already made or reverses the previous decision when exposed to conflicting messages about the innovation.

Reference [8] also identified five attributes that affecting the rate of adoption of any innovation:

1) *Relative advantage:* the degree to which an innovation is considered to be better than its alternatives. The relative advantage of an innovation is positively associated with its rate of adoption.
2) *Compatibility:* the degree to which an innovation is viewed as consistent with existing values, past experiences, and needs of the adopters. The compatibility of an innovation is positively associated with its rate of adoption.
3) *Complexity:* the degree to which an innovation is considered as hard to understand and use. Innovations that are easy to understand and use are adopted rapidly than difficult ones.
4) *Trialability:* the degree to which an innovation can be experimented with on a limited basis. New innovations that can be tried will be adopted more rapidly.
5) *Observability:* the degree to which the innovation's results are visible to others. It is more likely to adopt an innovation if individuals can see the positive results of it.

Reference [8] indicated that these five perceived attributes of an innovation are an important explanation of the rate of adoption of an innovation as they explain from 49 to 87 percent of the variance in the rate of adoption.

The current research used [8]'s model as modified by [9] to study the adoption of social networks by Saudi faculty members. [8]'s model included the five attributes of innovation: Relative Advantage, Compatibility, Complexity, Trialability, and Observability. However, [9] applied some modifications to these attributes. The authors renamed the attribute Complexity as Ease of Use which was adopted from [16] because of the similarity in their concepts. Reference [8] defined Observability as the degree to which the innovation's results are visible to others. Reference [9] indicated that it also included the idea of the innovation being visible. Therefore, the authors decided to split Observability into two independent attributes: the first is Result Demonstrability which focus on the visibility and communicability of the results of using the innovation, and the other attribute is Visibility which focus on the actual visibility of the innovation. The authors also added the attribute Image beyond [8]'s five attributes. They defined Image as the degree to which use of an innovation is perceived to enhance individual's image or status in the social system and they assumed that it is positively associated with the rate of adoption. Reference [8] include Image as an aspect of Relative Advantage but [9] consider it as a separate factor as its impact is different enough from Relative Advantage. Accordingly, the research model is consisted from the seven attributes of innovation that affect the adoption of social networks which are: Relative Advantage, Compatibility, Ease of use, Result Demonstrability, Visibility, Trialability, and Image. These seven attributes represents the research independent variables while the dependent variable of the study is the adoption of social networks by Saudi faculty members for academic purposes. The independent variables were measured by calculating the arithmetic mean for the responses to a group of statements related to each attribute. The dependent variable was measured by calculating the arithmetic mean of frequencies of social network usage in the academic sector for different purposes indicated by participants.

IV. Literature Review

Many studies have reported on what motivate people for using social networks. Reference [6] explored the various motives behind the use of social networks in India. The results identified seven motives behind the use of social networks: self-reflection and image-building, utility, information-gathering and problem-solving, networking, simply-spending time, revisiting-memories, and peer influence.

Reference [17] investigated end-user motivations to use social networks in Norway. The analysis ended up with 12 categories reflecting the most important reasons for using social networks reported by the users. The most important

reason was seeking new relations (31%). The second reason was to keep in touch with friends (21%). The third reason was general socializing (14%), whereas the fourth was access to information (10%).

In the academic context, many studies have reported on the potential academic application of social networks. Reference [18] investigated which online social networking activities are connected to the education context and what social technologies can support these activities. Based on a critical literature review, the authors identified for activities which are relevant in the education context: content generating, sharing, interacting and collaboratively socializing.

Reference [7] argued that there are few researches on social networking application in higher education subject. Depending on literature analysis, the authors found that there are four main functions of social network usage in higher education: academic service support, student support, social and cooperate learning, and achievement representation.

Reference [19] described the usage of social networks by the faculty members of the School of Library and Information Science (SLIS), at the College of Basic Education, the Public Authority for Applied Education and Training (PAAET), Kuwait. The study revealed that the main tasks on social networks made by faculty members were to make communication, send/receive messages, and find general and specific information.

For successful integration of social networks in the academic process, it is vital to study the faculty perceptions regarding this integration. Reference [20] used the decomposed theory of planned behavior (DTPB) to assess faculty's awareness of the benefits of the Web 2.0 applications: blogs, wikis, social networking, and social bookmarking to supplement in-class learning and to understand faculty's decisions to adopt these tools. The results revealed that attitudes and perceived behavioral control have strong positive influences on behavioral intention to use Web 2.0 technology, while subjective norm did not influence behavioral intention.

Reference [21] examined the opinions and reactions of faculty members and students at Lee University in Cleveland, TN regarding their use of Facebook and how it affects their education. The study found that over 50% of the interviewed faculty mentioned that Facebook has the potential to be a useful academic tool and 90% indicated that Facebook provides an open line of communication between faculty and students. The results revealed that 40% of faculty have students as friends and 60% of students have faculty as friends. This result indicated that students are more willing to communicate with their instructors on Facebook as it gives them another opportunity to connect faculty members (Towner & Muñoz, 2011). As a conclusion, the authors revealed that faculty members do not put as much weight into relationships on Facebook as students.

The findings of [20] and [21] were supported by [22] which argued that most higher education faculty remain laggards in the adopting of technology innovations. The authors compared student and faculty uses of Facebook and their perceptions of its utility as a classroom support tool at a mid-sized, southern public university. The findings revealed that instructors were agree that "Facebook is not for education" more strongly than students, but both student and instructors reported that privacy was an issue in this context. The comparison results of faculty and student responses revealed that students are much more likely to use Facebook and similar technologies to support classroom work than faculty members who are more likely to use more traditional technologies such as email.

Reference [23] investigated factors influencing the use of social networks by different users at Yonsei University in Seoul, South Korea. The results found that most of the faculty members are non-active users of the social network and they resist the adoption of new technology. This resistance was thought to originate from: the busy life of faculty members, privacy concerns, and conventional methods of socialization.

Reference [24] determined faculty perceptions and use of social media in the medical imaging curriculum in the United States. It was found that 67% of surveyed faculty believed that social media should be exploited in the medical imaging curriculum, and 75% believed that the integration of social media enhances learning.

Reference [25] found that a high percentage of academics (89%) believes that one of the main advantages of using social networks is encouraging students to be active. The main reasons for not using social networks were lack of time (68%), lack of information technology skills (46%), do not like to use them (43%), and lack of experience (39%).

Reference [26] explored faculty and students perceptions and attitudes of using social networks in academic and nonacademic contexts. The study found that students are more active users of social networks than faculty, but they are equal in the amount of time spent on social networks for academic purposes. Regarding perceptions and attitudes of using social networks in the academic sector, the study found that nearly half the faculty believe that social networks are useful tools for teaching. The results also showed that 46.7% of the faculty agreed or strongly agreed with that they should use social networking media in teaching and 46.6% believed that they need training in how to use social media appropriately within school psychology programs.

In the context of Saudi Arabia, there are few studies that focus on the usage of social networks in the academic sector especially in higher education. Reference [27] determined social media usage level and the motivations and obstacles faced by faculty members and students in Princes Nourah Bint Abdulrahman University in their usage of social media in education. The study found that 56.1% of faculty members are using social media for one to two hours daily and 46.3% are visiting social media sites more than four times daily. The results also revealed that most faculty members are skilled in using social media in an excellent level but they trust them in a moderate level. Moreover, the findings showed that 82.9% of faculty members are using social media in the academic process and 70,7% of them have already visited any of the Saudi universities' social media site in order to get scientific references, follow the university news, and search for new

studies. The author found that the most important motives of using social media were sharing opinions and ideas, obtaining information, and the ability of students to use educational technologies while the most important obstacles represented in the difference in students' skills in using social media, the difficulties in following up the educational activities, and the shortage of social media in providing the educational services.

V. Research Design

Research method and instrument

This research used the quantitative method. A questionnaire instrument with closed questions was used to collect the data. The instrument was divided into three sections. The first section gathered demographic information to give a description for the research sample. The second section solicited information about the adoption of social networks by faculty members and the different academic purposes that faculty members use social networks for. The third section gathered information to study faculty perceptions regarding using social networks for academic purposes and to measure if the attributes of an innovation: Relative Advantage, Compatibility, Ease of use, Visibility, Result Demonstrability, Trialability, and Image as perceived by faculty members can predict their social networks adoption. The items in this section were adopted from [9] who created an instrument based on the attributes of an innovation that was "applicable to a wide variety of innovations" (p. 194). Reference [9] items has been adopted with some modifications to be applicable for this study.

Content Validity and Reliability of the Instrument

In the methodologic literature, there is agreement that content validity is a matter of judgment which includes two phases: a priori efforts to promote content validity by the instrument developer through precise conceptualization and domain analysis, and a posteriori efforts by experts to assess the relevance of the instrument's items [28].

To ensure the content validity of the research instrument, the researcher make effort before items generating to enhance content validity through reviewing of previous literature and related works to ensure precise conceptualization of the research constructs and concepts. After generating the instrument items, it was translated into Arabic, the native language of the research population, because a great number of them are not English speakers. Subsequently, a panel of 6 experts with PhD degree was selected to examine the instrument. This panel was asked to review the instrument to ensure the items' validity, clarity, and consistency with the main objectives of this research. Moreover, some of these experts who speak both Arabic and English languages were asked to ensure the accuracy of the instrument translation. Finally, some clarifications and rewording of some items were done based on the panel notes. Then, the questionnaire was pilot tested to ensure its reliability. Internal consistency was used to measure the reliability of the research instrument which clarify how well a set of items measures a specific variable. Cronbach's alpha was calculated using the data obtained from the pilot study. The results in Table showed that alpha coefficients reached an acceptable level for all research constructs ranged from 0.704 to 0.878.

TABLE 1: CRONBACH'S ALPHA FOR THE RESEARCH CONSTRUCTS

Variable	Cronbach's Alpha
Relative Advantage	0.878
Compatibility	0.802
Ease of use	0.734
Result Demonstrability	0.713
Visibility	0.707
Trialability	0.704
Image	0.845

Data Gathering Procedure

While this study needs quantitative data, it employed questionnaire survey method to collect the data. The population of the study consisted of male and female Saudi faculty members who had PhD degree from Al-Imam Muhammad Ibn Saud Islamic University, King Saud University, and Princess Nourah Bint Abdulrahman University in Riyadh. Lecturers, teacher assistants, and staff were not included. According to the last statistics available on the website of the Ministry of Education (2014-2015) [29], King Saud University has 2184 faculty members, Al-Imam Muhammad Ibn Saud Islamic University has 1008 faculty members, and Princess Nourah Bint Abdulrahman University has 628 faculty members. Accordingly, the study population consists of 3820 faculty members for the three universities.

To collect data, a web based version of the questionnaire was distributed to all faculty members via the universities' email systems. The response rate in this stage was very weak as only 109 responses were collected. Therefore, to increase the response rate, a printed copy of the questionnaire was distributed to a sample of faculty members with the help of the secretary of various colleges departments in the three universities. Reference [30] provided a table to simplify the sample size decision which ensures a good decision model. According to [30]'s table, a sample size of 351 is considered as reasonable to represent a population of 4000. Accordingly, as the study population is about this number, consists of 3820 faculty members, the sample size of 351 was considered as the minimum sample size. However, the total number of the questionnaires that were actually distributed was 850 which is greater than the needed sample size of 351 because some factors that might reduce the final sample size such as the response rate and missing data were taken in the consideration. The faculty members number in the three universities were different so each university was proportionally represented in the sample. Therefore, 480 questionnaires were distributed at King Saud University, 220 questionnaires were distributed at Al-Imam Muhammad Ibn Saud Islamic University, and 150 questionnaires were distributed at Princess Nourah Bint

Abdulrahman University. Out of 850 questionnaires distributed, a total number of 367 questionnaires were returned, 354 of them were returned completed representing a response rate of 42%. The total number of the web based and printed questionnaires was 463 responses.

Construct Validity

Construct validity is the degree to which an instrument measures the construct it is purported to measure [31]. It refers to the degree to which the items on an instrument are related to the relevant theoretical construct [32].

After collecting the data, Principal Component Analysis was conducted with a Varimax rotation to assess construct validity. Varimax is the most commonly used orthogonal rotation which used to rotate the factors to maximize the loading on each factor and thus polarizes loadings on factors for easy interpretation [33]. The results showed that each group of items that belongs to a specific attribute have the highest loadings on the factor that are supposed to belong to, which proved the construct validity.

Data Analysis

Statistical Package for the Social Sciences (SPSS 22.0) software was used for analyzing the data to answer the research questions. The first question aimed to study if the attributes of innovation: Relative Advantage, Compatibility, Ease of use, Trialability, Visibility, Result Demonstrability, and Image, as perceived by faculty members predict their social networks adoption. Multiple regression analysis was used to examine the research model to answer the question.

The second question aimed to explore purposes of using social networks in the academic environment by faculty members. To answer this question, faculty members were asked to indicate the frequency of their use of social networks for different academic purposes and then the arithmetic mean was calculated for each item to arrange these uses according to the most commonly used.

VI. Results

Participants Profile

The total number of faculty members who participate in this study was 463. Among this number, 61 (13%) are non-adopters of social networks. As this research focus on the factors affecting the adoption of social networks by faculty members, the non-adopters faculty were excluded from the analysis because they are not users of social networks. The following table describes the adopter participants characteristics.

TABLE 2: A PARTICIPANTS PROFILE DESCRIPTION

Variable		Frequency	Percent
Gender	Male	229	57.1
	Female	172	42.9
Age	20-29	8	2.0
	30-39	93	23.2
	40-49	186	46.4
	50-59	94	23.4
	60 or more	20	5.0
Rank	Professor	48	12
	Associate professor	131	32.7
	Assistance professor	222	55.4
Experience	1-5	69	17.2
	6-10	54	13.5
	11-15	119	29.7
	16-20	79	19.7
	20 or more	80	20
University	King Saud University	220	54.9
	Al Imam Mohammad Ibn Saud Islamic University	115	28.7
	Princess Nourah bint Abdulrahman University	66	16.5

Attributes of Innovation as Perceived by Faculty Members

a multiple regression analysis was applied to the research model which consists of the seven attributes of social networks to account for the variance in the dependent variable, social networks adoption. The analysis results of the combined variables revealed that the model was statistically significant in predicting social networks adoption at the level of 0.05. The R square value for the model was 0.555 , which means that 55.5% of the variance in social networks adoption by faculty members was explained by the seven predictors together (see Table 3).

TABLE 3: COEFFICIENTS OF THE SEVEN ATTRIBUTES

	Sum of Squares	*df*	Mean Square	*F*	*p*	R^2
Regression	135.544	7	19.363	70.157	<0.001	0.555
Residual	108.468	393	0.276			
Total	244.012	400				

The overall mean for each variable was used to determine how this variable is perceived by faculty members and what is the expected effect of this perception on the dependent variable. Then, the statistical significance and coefficient (see Table 4) for each variable were used to determine the actual effect of that variable, as perceived by faculty members, in predicting social networks adoption. The following is a description for each variable.

TABLE 4: COEFFICIENTS OF THE RESEARCH CONSTRUCTS

	Unstandardized Coefficients		Standardized Coefficients	
	B	Std. Error	Beta	*p*

(Constant)	0.242	0.305		0.427
Relative_Advantage	0.698	0.039	0.736	<0.001
Compatibility	0.081	0.046	0.074	0.078
Ease_of_Use	0.113	0.057	0.070	0.051
Result_Demonstrability	0.129	0.034	0.143	<0.001
Visibility	-0.086	0.031	-0.103	0.006
Trialability	-0.071	0.033	-0.099	0.030
Image	-0.126	0.041	-0.122	0.003

1) *Relative Advantage:*

The detailed answers for the Relative Advantage statements are shown in Table 5. The responses were measured on a scale of 1 to 5, where 5 is "Strongly Agree". The overall mean for responses to these statements was 3.6, indicating that faculty were more likely to perceive social networks as advantageous. This positive perception was expected to have a positive effect on social networks adoption. As shown in Table 4, the attribute Relative Advantage as perceived by faculty members is statistically significant in predicting social networks adoption at the 0.05 level (p<0.001). The coefficient for Relative Advantage is 0.698, which means that as this variable increases one unit, social networks adoption will increase by 0.698 when holding the other six variables constant in the model. Thus, this result met the expectations and is consistence with [8]'s generalization which stated that Relative Advantage of an innovation as perceived by potential adopters is positively associated with its rate of adoption.

TABLE 5: DISTRIBUTION OF ANSWERS FOR THE RELATIVE ADVANTAGE STATEMENTS

Item	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		*M*
	f	%	f	%	f	%	f	%	f	%	
Using social networks enables me to accomplish academic tasks more quickly.	17	4.2	56	14	78	19.5	162	40.4	88	21.9	3.62
Using social networks improves the quality of work I do.	33	8.2	44	11	84	20.9	159	39.7	81	20.2	3.53
Using social networks makes it easier to do my job.	25	6.2	53	13.2	77	19.2	160	39.9	86	21.4	3.57
Using social networks enhances my effectiveness on the academic tasks.	25	6.2	53	13.2	84	20.9	172	42.9	67	16.7	3.51
Using social networks supports gaining information on any subject anytime from anywhere.	2	0.5	18	4.5	74	18.5	176	43.9	131	32.7	4.04
Using social networks encourages my students to be active.	27	6.7	46	11.5	104	25.9	170	42.4	54	13.5	3.44
Using social networks enhances communications between me and students.	30	7.5	47	11.7	92	22.9	179	44.6	53	13.2	3.44
Using social networks fosters positive peer relationships in my university.	10	2.5	27	6.7	79	19.7	186	46.4	99	24.7	3.84

2) *Compatibility:*

Table 6 shows the distribution of answers for the Compatibility statements. The overall mean for these statements was 3.67 indicating favorability rating near to "Agree." This perception was expected to have a positive impact on social networks adoption. However, the results indicated that the attribute Compatibility was not statistically significant in predicting social networks adoption at the 0.05 level (p=0.078). This unexpected result is inconsistence with [8]'s generalization as the positive perception of Compatibility was expected to have a positive impact on the social networks adoption.

TABLE 6: DISTRIBUTION OF ANSWERS FOR THE COMPATIBILITY STATEMENTS

Item	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		*M*
	f	%	f	%	f	%	f	%	f	%	
Using the Internet for academic purposes is compatible with all religious and cultural aspects of my community.	4	1	28	7	110	27.4	185	46.1	74	18.5	3.74
Using social networks for academic purposes is compatible with all aspects of my work.	10	2.5	30	7.5	116	28.9	169	42.1	76	19	3.68
I think that using social networks fits well with my personal way and needs to work.	5	1.2	36	9	104	25.9	180	44.9	76	19	3.71
Social networks are good for entertainment but not for academic use[a].	11	2.7	41	10.2	90	22.4	187	46.6	72	18	3.67
Using social networks require some technology which is not available in my university[a].	25	6.2	63	15.7	84	20.9	151	37.7	78	19.5	3.48

a. statement entered by reverse coding

3) *Ease of use:*

The answers distribution for the Ease of Use statements is shown in Table 7. The overall mean for Ease of Use was 4.25 which indicating that faculty members agree to that social networks are easy to understand and use. This positive perception of Ease of Use was expected to have a positive effect on social networks adoption. However, Multiple regression analysis of the research model revealed that Ease of Use approximately has significant correlation with faculty members' social networks adoption at the 0.05 level (p=0.051). The coefficient for Ease of Use is 0.113, which means that as this variable increases one unit, social networks adoption will increase by 0.113 when holding the other six variables constant in the model. This result is consistence with [8]'s generalization as the positive perception of Ease of Use was

expected to have a positive impact on the social networks adoption.

TABLE 7: DISTRIBUTION OF ANSWERS FOR THE EASE OF USE STATEMENTS

Item	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		*M*
	f	%	f	%	f	%	f	%	f	%	
Overall, I believe that social networks are easy to use.	0	0	3	0.7	23	5.7	231	57.6	144	35.9	4.29
I can learn to use social networks quickly.	0	0	6	1.5	33	8.2	206	51.4	156	38.9	4.28
Learning how to use social networking is easy for me.	0	0	5	1.2	28	7	219	54.6	149	37.2	4.28
English language is not a barrier when I use social networks.	5	1.2	11	2.7	43	10.7	196	48.9	146	36.4	4.16

4) *Result Demonstrability:*

The distribution of answers for the Result Demonstrability statements is shown in Table 8. The overall mean for Result Demonstrability was 3.7 indicating favorability rating near to "Agree." This positive perception was expected to have a positive impact on social networks adoption. Multiple regression analysis (see Table 4) showed that the independent variable of Result Demonstrability has a statistically significant relationship with the dependent variable (social networks adoption) at the 0.05 level (p<0.001). The coefficient for this variable is 0.129, which means that as this variable increases one unit, social networks adoption will increase by 0.129 when holding the other eight variables constant in the model indicating a positive correlation between Result Demonstrability and social networks adoption which meets the expectations and is consistence with [8]'s generalization.

TABLE 8: DISTRIBUTION OF ANSWERS FOR THE RESULT DEMONSTRABILITY STATEMENTS

Item	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		*M*
	f	%	f	%	f	%	f	%	f	%	
The results of using social networks encourages to continue using them.	11	2.7	45	11.2	71	17.7	178	44.4	96	23.9	3.76
My use of social networks has led to increase my scientific information and education.	15	3.7	55	13.7	60	15	168	41.9	103	25.7	3.72
The results of using social networks are apparent to me.	8	2	50	12.5	59	14.7	182	45.4	102	25.4	3.80
I would have difficulty explaining why using social networks may or may not be beneficial.[a]	7	1.7	62	15.5	74	18.5	182	45.4	76	19	3.64

a. statement entered by reverse coding

5) *Visibility:*

The overall mean for the answers of Visibility statements (shown in Table 9) was 3.4 indicating a positive rating of Visibility. This result was expected to affect social networks positively. However, multiple regression analysis of the research model (see Table 4) revealed that Visibility has significant negative correlation with faculty members' social networks adoption at the 0.05 level (p=0.006) with coefficient value of -0.086. This result is unexpected as [9] suggested a positive relationship between innovation's Visibility and its rate of adoption.

TABLE 9: DISTRIBUTION OF ANSWERS FOR THE VISIBILITY STATEMENTS

Item	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		*M*
	f	%	f	%	f	%	f	%	f	%	
I know many faculty members who use social networks.	13	3.2	57	14.2	99	24.7	151	37.7	81	20.2	3.57
I know some faculty who use social networks in teaching.	26	6.5	76	19	112	27.9	135	33.7	52	13	3.28
The university units and departments are using social networks to communicate with its employees and students.	10	2.5	73	18.2	103	25.7	148	36.9	67	16.7	3.47
It is easy for me to observe others using social networks in my university.	23	5.7	70	17.5	94	23.4	149	37.2	65	16.2	3.41

6) *Trialability:*

The answers distribution for Trialability statements is shown in Table 10. The overall mean for Trialability was 3.3 which indicating an average perception. Multiple regression analysis of the research model revealed a negative statistically significant effect of Trialability on social networks adoption at the 0.05 level (p=0.030) with coefficient value of -0.071. This surprising result does not comply with [8]'s generalization.

TABLE 10: DISTRIBUTION OF ANSWERS FOR THE TRIALABILITY STATEMENTS

Item	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		*M*
	f	%	f	%	f	%	f	%	f	%	
It is easy to try social networks before committing to use them.	7	1.7	63	15.7	118	29.4	143	35.7	70	17.5	3.51
Before deciding whether to use any social network application, I was able to properly try them out.	29	7.2	108	26.9	63	15.7	134	33.4	67	16.7	3.25
The duration of my trial period to use social networks was enough.	56	14	86	21.4	61	15.2	123	30.7	75	18.7	3.19

7) *Image:*

Table 11 shows the distribution of answers for Image statements. The overall mean for these statements was 3.7

indicating that faculty members approximately agree to that the use of social networks enhances their image or status. According to [9], this positive perception is expected to have a positive effect on social networks adoption. However, multiple regression analysis (see Table 4) revealed a negative significant correlation between Image and faculty members' social networks adoption at the 0.05 level (p=0.003) with coefficient value of -0.126. This result is conflicted with [9]'s assumption.

TABLE 11: DISTRIBUTION OF ANSWERS FOR THE IMAGE STATEMENTS

Item	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		*M*
	f	%	f	%	f	%	f	%	f	%	
Using social networks improves my image within the university.	10	2.5	14	3.5	97	24.2	185	46.1	95	23.7	3.85
Faculty members in my university who use social networks have more respect and appreciation than those who do not.	15	3.7	23	5.7	169	42.1	157	39.2	37	9.2	3.44
Using social networks is a status symbol in my university.	14	3.5	21	5.2	119	29.7	169	42.1	78	19.5	3.69

Academic Purposes of using social networks

As seen from Table 12, the most common purpose for using social networks in the academic sector by faculty members was to share news about university, conferences, academics, etc., followed by using them to share some information and ideas with academics and peers, using them to post field related topics, using them to communicate with students, using them to share some information and ideas with students, and to publish announcements about researches and academic works. All the previous purposes yielded frequency values above the average value of 3. The less common purposes for using social networks in the academic sector were using them to communicate with academics and peers, to get advice from academics about issues on related field, to increase students learning, to find information and gain new knowledge on related field, and to enrich teaching methods and teach more effectively. These purposes yielded frequency values below the average value of 3.

TABLE 12: DIFFERENT PURPOSES OF USING SOCIAL NETWORKS ARRANGED BY MOST COMMONLY USED

Purpose	**Mean**
I use social networks to share news about university, conferences, academics, etc.	3.77
I use social networks to share some information and ideas with academics and peers.	3.38
I use social networks to post topics related to my field.	3.19
I use social networks to communicate with students.	3.16
I use social networks to share some information and ideas with students.	3.12
I use social networks to publish announcements my researches and academic works.	3.06
I use social networks to communicate with academics and peers.	2.95
I use social networks to get advice from academics about issues on my field.	2.85
I use social networks to increase students learning.	2.84
I use social networks to find information and gain new knowledge on my field .	2.74
I use social networks to enrich my teaching methods and teach more effectively.	2.37

VII. SUMMARY OF FINDINGS

The above results can be summarized in terms of the research questions listed at the beginning of the paper.

Research Question 1

Does the attributes of innovation Relative Advantage, Compatibility, Ese of use, Trialability, Result Demonstrability, Visibility, and Image as perceived by faculty members predict their social networks adoption?

As shown from the results, the attributes Relative Advantage, Ese of use, and Result Demonstrability were perceived positively and found to have positive statistically significant impact in predicting social networks adoption. Relative Advantage attribute was the strongest predictor of social networks adoption, followed by Result Demonstrability and Ese of use respectively. The attribute Compatibility was not statistically significant predictor of social networks adoption. Visibility, Trialability, and Image were perceived positively but found to have unexpected negative statistically significant impact in predicting social networks adoption.

Research Question 2

For what purposes do faculty members use social networks in the academic environment?

The most common purpose for using social networks in the academic sector by faculty members was to share news about university, conferences, academics, etc., followed by using them to share some information and ideas with academics and peers, using them to post field related topics, using them to communicate with students, using them to share some information and ideas with students, and to publish announcements about researches and academic works. All the previous purposes yielded frequency values above the average value of 3.

The purposes: using social networks to communicate with academics and peers, to get advice from academics about issues on related field, to increase students learning, to find information and gain new knowledge on related field, and to enrich teaching methods and teach more effectively, yielded frequency values below the average value of 3.

VIII. CONCLUSION

This research has led to the following conclusions:

1) The model for this research explained 55.5% of the variance in social networks adoption which proved the vital

role of the attributes of innovation and the importance of the diffusion of innovation theory in explaining the variance in the rate of adopting new innovations.

2) The attributes Compatibility, Visibility, Trialability, and Image were found to have unexpected results in predicting social networks. Therefore, future research investigating the reasons of this results may contribute to make enhancements and to add improvements and precision to the current research model.

3) The most common purpose of using social networks in the academic sector was using them for sharing news about universities, conferences, academics, etc. which proved the vital role of social networks in the instance communication of information, updates, and news which considered as a vital and important aspect in the academic environment and especially in the field of technology.

4)The less common purpose for using social networks in the academic sector was using them to enrich teaching methods and teach more effectively. Although some studies report the need for immediate integration of these networks in education to cope with student's needs [24], this result showed a resistance from faculty members to incorporate social networks in teaching and indicated that faculty need training to motivate them toward exploiting social networks in teaching.

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