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## The Contextual Factors Affecting the Scholarly Communication of Faculty Members in Iran's Universities

Farshad Parhamnia<sup>1\*</sup>, Fatemeh Nooshinfard<sup>2</sup>

1. **(Corresponding author)** Assistant Professor in Department of Knowledge and Information Science, Kermanshah Branch, Islamic Azad University, Kermanshah, Iran, fparhamnia@yahoo.com
2. Associate Professor in Department of Knowledge and Information Science, Science and research Branch, Islamic Azad University, Tehran, Iran. nooshinfar2000@yahoo.com.

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### Abstract

**Purpose:** The goal of the present study was to investigate the contextual factors affecting the scholarly communication of the faculty members in Iran's Universities.

**Methodology:** The study aimed to be an applied analytic survey. The statistical population included the faculty members working in all universities in Iran. The data gathering instrument was a researcher-made questionnaire containing 35 questions. The obtained Alpha Cronbach correlation coefficient was .881 which proved the reliability of the questionnaire. The data were analyzed based on multiple regression analysis using Amos and SPSS 21.

**Finding:** The multiple regression analysis showed that among the contextual factors, the variable of the relationship with government, the academic freedom, the social environment and political and cultural environment can statistically explain the variance of scholarly communication.

**Conclusion:** : It is concluded that there is significant relationship between the scholarly communication with the scientific products. Moreover, the scholarly communication can explain the variance of the scientific production.

**Keywords:** Higher education, Scholarly Communication, Scientific Products, Contextual factors, Faculty members, Iran's Universities.

### Introduction

Sociology of science is a rather new subcategory of sociology. Based on its classic definition, sociology of science is the study and examination of the relations between science and community (Mirzaei et al, 2007; Neshat, 2007). According to its doctrine, scholars of each science are the creators of the scientific atmosphere of that science in any given period of time in history and any new scholar who aims to study in that field must act in this atmosphere. (Kazemi et al, 2013). According to Kuhn, there is a scientific structure in academic communities which brings scientists together within a common set of values and norms. (Kuhn, 2012). In addition, sociologists of science underline the importance of communication as the main mechanism for development and production of

science and ascribe advancement of science to its communication system. Scholarly communication within educational and research organizations and beyond has always been a significant factor affecting the production and development of science and underlies coherence and coordination in the academic community. (Mohammadi, 2008). Therefore, among the issues that need to be addressed in sociology of science are the academic community and the scholarly communication amongst scholars. (Khosrojerdi, 2008).

Communication is an indispensable part of scientific practice (Nielsen, 2012). Piechock (1977) believed in the necessity of the distribution of the information among nations in the modern world; therefore, communication, information storage and information retrieval is one among the most important issues in the recent modern age (Holden, 1986, p. 199). Garvry argues that communication is the foundation of any scientific practice and any scientific endeavor is based on the distribution and information sharing, results, methods, products as well as new processes (as cited in Hurd, 2000). Kyvik and Larsen (1994) assumed that there is a bilateral relationship between international contact and academic performance. Merton also believed that science is a social phenomenon and it is essential to use science to develop any scientific system (Merton, 1957, 1973). Scientific production is considered as an index of scientific development in every society. The science production is considerably influenced by structural and normative factors (GhaneiRad & GhaziPorr, 2002). Some researchers have had a particular attention on the economical-social conditions of organizations (e.g. Ronson, Hining and Greenwood, 1980).

Over the last several decades, a lot of research studies have been carried out on scholarly communication (Liu, 2003; Costa and Meadows, 2000). The scholarly communication is a multi-faceted issue that has undergone a great evolution (Odlyzko, 2013). Scholarly communication has been defined in versatile ways. It is defined as the process of sharing and publishing the research findings (Cortez, 2011). In another definition, scholarly communication is defined as the process of disseminating research results through publication and other similar processes. Scholars who participate in the scholarly communication process carry out different roles, not just as authors or readers (Ezema, 2016). The study of scholarly communication includes the growth of scholarly information, the relationships among research areas and disciplines, the information needs and uses of individual user groups, and the relationships among formal and informal methods of communication (1989, p. 586; 2000a, p. 144; 2000b, p. 414). Scholarly communication denotes different processes, tasks or systems in which scientific information and intellectual properties are devised and disseminated among scholars—including scientists, researchers, faculty members, students and other users—for academic activities". (Association of College & Research Libraries, 2003; Xia & Li, 2015;).

One of the main important areas in the scholarly communication is libraries that connect producers and scientists. Since researchers, publishers and libraries play a key role in the scholarly communication systems, they can be considered as having a vital role the main in the production and the distribution of scientific messages. It seems that these various factors which play crucial role on the scholarly communication have turned to be challenging for scientists. Additionally, the study of scholarly communication should take into consideration the social context. This is why the scholarly communication taking place in Iran has its own particular characteristics being affected by various factors. As Galyani-Moghaddam & Momeni (2014) note, in addition to the influence of history, religion, and the understanding of basic concepts, there are many more factors that may have an effect on scholarly communication in Iran (p. 816). Lack of proper attention to these factors will lead to weak scholarly communication in an academic community. Previous literature have

mostly addressed the channels of scholarly communication or scientific production citations as their main focus. Therefore, a thorough research needs to be conducted in this regard. This study, thus, aims to detect structural and peripheral factors affecting the scholarly communication and production among faculty members of the universities across the country.

### **Literature Review**

Despite the recent nature of scholarly communication, it has been implemented in practice for a long time. Mainly due to diverse sociopolitical and economic conditions prevailing in different parts of the world, scholarly communication has taken different forms (Xia, 2006). In addition, scholarly communication usually occurs through formal and informal channels. That is, the functions of scholarly communication range from very formal to informal. The activities carried out while individual(s) participating in an academic community engage in in an scholarly communication include sharing ideas, receiving feedback from colleagues, obtaining intellectual recognition, and publishing. After digital channels, emerged informal communication has become a more public scholarly record, leading to the blurring of distinction between the informal and the formal. For example, national/international conference presentations are readily disseminated via Web, taking the role of public Web-based reference material (Park and Shim, 2011). Although scholarly communication has witnessed diverse changes, it has included the oral to the written to the printed and now to the electronic form, the main role of scholarly communication has not undergone drastic changes in the past three centuries. At this point, it has to be stressed that scholarly communication is used as a broad term to cover all the activities related to producing, exchanging and disseminating knowledge.

Scholarly communication is a part of human communication that is employed at all stages of the knowledge cycle; therefore, factors affecting scholarly communication have a wide range. Moreover, scientific communication is influenced by external and internal factors which in turn influence the decision-making process and ultimately influence the formation of scientific communication. Among the factors, the role of government, scientific freedom, economic environment, social environment, and political and cultural environment is studies in the present research.

#### **1. The relationship with government**

Government supports organizations through laws and regulations, financial support and the transfer of social and public roles to governmental and non-governmental organizations (Mirzaei Aranjani and Moghimi, 2003). Therefore, government plays a key role in the scholarly communication at universities. This means that, the greater the support of the government in scholarly communication, the more scholarly communication among faculty members will be strengthened.

#### **2. The academic freedom**

Faculty members of universities, either individually or in groups, need scientific freedom. Scientific freedom, in the literal sense, became institutionalized only in the new era of university history and during the nineteenth and twentieth centuries in the democratic societies of the world. As to the importance of scientific freedom, Grovov, et al (1988) believes that members of the scientific community should be independent in their scientific activities and practices and should not be placed under any pressure (as cited in Frastkhah, 2003).

#### **3. The economic environment**

The paramount role of higher education in development of a country is inevitable. Higher education system consists of a number of human resources including faculty members working to achieve educational and research goals. Darling and Hammond (1984) believe that paying attention to the material motivations of faculty members makes them active and motivated; accordingly, their economic interests and motivations must be taken into account to attract and retain talented individuals. (as cited in Hosseiny Shavoun and Jahed, 2013). Because of the close relationship between the scientific system and the economic system (Ghaneirad, 2003), economic factors can play an important role in scholarly communication between faculty members. As Cole and Cole (1967) argue, if notable researchers publish the most important papers, it is because the reward system operates in a way that encourages creative scientists (as cited in Bourdieu, 2007).

#### 4. The social environment

With the expansion of information communication technology applications in recent years, we are witnessing the emergence of a new generation of Internet tools that has provided greater opportunities for interactions, negotiation, dialogue and two-way communication (as cited in Bashir and Afrasiabi, 2012). One of these new technologies is social networking, which has become a place for faculty members to exchange ideas and seek help for their needs. Social system here means the set of institutions whose function is to create cohesion and solidarity among the society (Ghaneirad, 2003).

#### 5. The political and cultural environment

In most social communication theories, culture has a vague meaning (Karimian and Ahmadvand, 2012). It has been defined as a set of values, habits, beliefs, and traditions shared within a group or community (Korpala, 1996, as cited in Nakhoda and Horri, 2005). According to Janet (1995), scholarly communication is an essential tool of cultural understanding and contributes to the growth and development of academic and research centers. Recognition, discovery, innovation are among important values of cultural elements. These values have been the driving force behind technology development, and has led to the discovery of the secrets of nature and the universe (as cited in Ahmadi and Qasemi, 2013).

Initial research in scholarly communication dates back to 1960s and 1970s, "with massive growth in the scientific enterprise, in scholarly publishing and libraries, and the expansion of universities. Researchers sought to understand the processes involved in scholarly communication by building models of information flows and by testing theories of behavior" (Borgman, 1989, 2000a, 2000b). Several articles by Menzel (1964, 67), Garvey and Griffith (1972), Hills 1983 (as cited in Ying, 2017), Price (1986), Calabrese (1992), Roosendaal and Geurts (1997), Fjallbrant, (1997), Harter (1998), Zuccala (2006), Pikas (2006), Mukherjee (2009), Bruns, Brantley and Duffin (2015), Chen and Ke (2016), focused mainly on theoretical and conceptual aspects of scholarly communication. They tended to identify patterns of scholarly communication, their characteristics and Invisible College. From 1990s onwards, authors such as Hurd (2000) addressed the effects of information and communication technologies, especially the Internet, on scholarly communication. No research has so far been conducted that directly focuses on the factors affecting scholarly communication. There are, however, a few studies that have dealt with factors affecting scholarly communication. These studies include Ghaneirad and GaziPoor (2002), Rahimi (2007), Mohammadi (2008), Dehghani, et al (2011), Karimian, et al (2012), Etzkowitz and Leydesdorff (2000), Ehikhamenor (1990), Kyvik and Larsen (1994) and Mulaudzi (2005). These studies can be divided into three categories of 1) studies regarding modality and functions of scholarly communication, 2) studies regarding the usage of information and communication technologies in scholarly communication, and 3)

studies regarding the effects of scholarly communication on scientific production and effectiveness. It should be noted that the above studies have many similar aspects and it is sometimes difficult to distinguish between them. Each of the factors considered by these studies has a significant role in scholarly communication and a sum of these factors establishes the key factors of conceptual patterns examined in this study.

### **Research Hypotheses**

Specifically, the study investigated the following research hypotheses:

1. Variables of contextual factors have the capability to predict changes in scholarly communication.
2. Variable of scholarly communication as the mediating dependent variable has the capability to predict scientific production as the criterion dependent variable.

### **Methodology**

The present research was an applied study, and the statistical population included 29876 faculty members of various universities including Ministry of Science, Research and Technology, Ministry of Health and Medical Education and Islamic Azad University. All universities were located in the central city of provinces located in Iran. Based on Krejcie and Morgan Table (1970), 380 faculty members were selected as the participants, then using Mahalanobis distance and considering the outliers, 378 individuals were chosen. The data gathering instrument was a researcher-made questionnaire containing 35 questions. The obtained Alpha Cronbach correlation coefficient was .881 which proved the reliability of the questionnaire. The data were analyzed based on multiple regression analysis using Amos and SPSS 21.

Contextual factors refer to all environmental and external organizational conditions and factors (Mirzaei Ahranjani, 1998; Mirzaei Ahrani and Moghimi, 2003; Safarzadeh and Jafari, 2011) that affect the behaviors of an organization. Environmental characteristics are among the factors that determine the scope of an organization's activities and determine the amount of activities and the type of products it produces. Contextual factors include relationship with government, academic freedom, social environment, economic environment, political environment and cultural environment.

It should be noted that, the contextual factors, in the present study consists of all the external, environmental factors in the organization including relationship with government, academic freedom, social environment, economic environment, and political and cultural environment. These factors affect the behaviors of an organization. Environmental characteristics are among the factors that determine the scope of an organization's activities and determine the amount of activities and the type of products it produces. Scholarly communication include various types of interactions among faculty members leading to exchange of ideas which is considered mediating dependent variable in this paper. Scientific production, as well, consists of the productions by faculty members regarding academic and research activities such as writing a book, translation, ISI-published articles, scientific research articles, scientific advocacy articles, articles presented in conferences and seminars, and research projects that faculty members publish during their lifetimes which are considered criterion dependent variables in this study.

### **Findings**

As to the first hypothesis, variables of peripheral factors have the capability to predict changes in scholarly communication. In the study, to examine the relationship between the contextual factors including relationship with government, academic freedom, social

environment, economic environment, and political and cultural environment as the independent or predicting variables and scholarly communication as intervening variable. The first output of the multiple regression analysis showed in Table 1.

**Table 1. Collinearity Diagnostics: Multiple Relations Condition Indexes Values**

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	Relationship with government	Academic freedom	Social environment	Economic environment	Political and cultural environment
	1	5.705	1.000	.00	.00	.00	.00	.00	.00
	2	.106	7.326	.00	.13	.04	.01	.70	.00
1	3	.069	9.093	.00	.00	.43	.00	.09	.57
	4	.061	9.703	.00	.28	.52	.04	.08	.26
	5	.040	11.954	.06	.57	.00	.46	.07	.09
	6	.020	17.062	.93	.01	.01	.48	.05	.08

According to Bellesly, Kuh and Welsch (1980), a Condition Index equal or higher than 30 or Condition Index higher than 50 indicates significant multicollinearity (Meyers, Gamst and Guarino, 2006). Based on the results, the Condition Index is less than 30; therefore, again, no problem of multicollinearity can be found here.

The second output of the multiple regression analysis showed that R is equal to .529. The value of  $R^2$  is equal to .280; In other words, the variance of intervening variable as determined by five independent variables showed that these five variables stands for 28 percent of variance in the dependent variable or the intervening variable (scholarly communication). Besides, the results of ANOVA revealed that the observed F is equal to 28.869 (df=5) ( $P=.000<.05$ ) with the significant F at .05 indicating that with %95 probability there is a significant relationship between contextual factors and the scholarly communication. Therefore, the variance of the scholarly communication can be explained. The coefficients of multiple regression analysis of scholarly communication obtained from predicting variables of contextual factors are shown in Table 2.

**Table 2. Coefficients <sup>a</sup> (Predictor Variables Scholarly Communication)**

Model	B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part
(Constant)	.385	.020		19.566	.000			
The relationship with government	.196	.024	.390	8.086	.000	.480	.387	.356
The academic freedom	.065	.023	.132	2.807	.005	.285	.144	.124
The social environment	.077	.031	.120	2.528	.012	.293	.130	.111
The economic environment	-.007	.018	-.018	-.398	.691	.028	-.021	-.018
The political and cultural environment	.054	.023	.107	2.332	.020	.189	.120	.103

a. Dependent Variable: scholarly communication

There are four predicting, independent variables due to the contextual factors including: relationship with government, academic freedom, social environment, political and cultural environment containing  $p<.05$ ; Therefore, Alpha level is .05 that statistically

explain the variance of scholarly communication. However, the economic environment doesn't have a role in the prediction. The  $\beta$  standard correlation shows that the effective correlation of relationship with government is ( $\beta=.390$ ) and  $t= 8.086$  and the correlation of academic freedom is ( $\beta=.132$ ) and  $t=2.807$ , the affective correlation of social environment is  $\beta=.180$  and  $t=2.528$  and the effective correlation of political and cultural environment is  $\beta=.107$  and  $t=2.332$ , these variables explain the scholarly communication.

Regarding the second hypothesis, variable of scholarly communication as the mediating dependent variable has the capability to predict scientific production as the criterion dependent variable. Based on the multiple regression analysis i.e., Condition Index, in the present study it was found that the Condition Index is less than 30. As such, it can be concluded that there is no problem multicollinearity among variables. The result of multiple regression analysis shows that R is equal to .154. The correlation was and  $R^2$  is equal to .024. In other words, the variance of intervening variable as determined by the model showed that this variable stands for 24 percent of the variance the criterion variable (the scientific products). Besides, the results of ANOVA revealed that the observed F is equal to 1.270 ( $df=1$ ) ( $P=.003<.05$ ) which the level of F at the .05 level of significance. There is %95 probability that there is a significant relationship between the scholarly communication and the scientific productions.

As to the second hypothesis, variable of scholarly communication as the mediating dependent variable has the capability to predict scientific production as the criterion dependent variable.

The coefficients of multiple regression analysis of scientific products obtained from variable scholarly communication are shown in Table 3.

**Table 3. Coefficients <sup>a</sup> (Intervening variable Scholarly Communication)**

Model	B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part
(Constant)	1.353	.155		8.705	.000			
<sup>1</sup> The Scholarly Communication	.810	.269	.154	3.014	.003	.154	.154	.154

a. Dependent Variable: Scientific Products

The results of t-test related to the weight of the intervening variable (the scholarly communication) is  $p<.05$ , therefore, there is a meaningful variance for the scientific products at Alpha .05. The  $\beta$  standard correlation showed that the effective correlation of scholarly communication is  $\beta=.154$ . Moreover, the obtained  $t= 3.014$  explains the variables of scientific products. Meanwhile, the effective correlation is positive, indicating that if one unit is added to the scholarly communication, the scientific products will increase up to 30 percent.

### Fit indices of the model

The study was based on the path analysis of the predictor, intervening and criterion variable. Accordingly the best, possible paths among the contextual factors including: the relationship with government, the academic freedom, the social environment, and political and cultural environment as the independent variables of scholarly communication as the intervening variable with the scientific products as the criterion variable were analyzed. Each variable was analyzed using confirmatory factor analysis as was presented as the observed variables in the study (see Figure I).

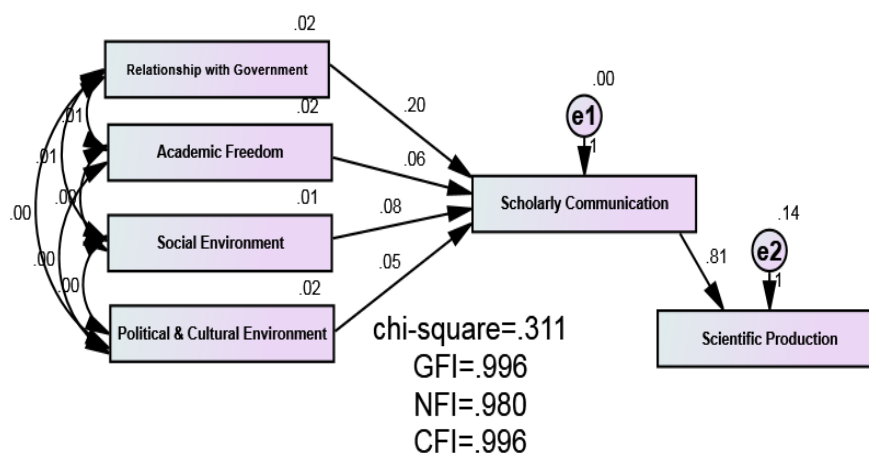


Figure 1. Research Model

The results of the most important factors are shown in Table 4.

Table 4. Index of fit indices model

Index name	(CMIN)( $\chi^2$ )	(CMIN/DF)&P	RMSEA	NFI	CFI	GFI	AGFI	RMR	PRATIO
Fitting Adequacy Value	1.194	4.777 (P=.311)	.023	.980	.996	.996	.978	.001	.267

Based on the statistics of chi-square (CMIN) ( $\chi^2$ ) is 1.194 and relative chi-square (CMIN/DF) is 4.777, with  $df=4$  and  $p=.311 > .05$ . It can be inferred that there is adjustment between the suggested model and the observed data. The factors are  $GFI=.996$ ,  $AGFI=.978$ ,  $CFI=.996$ ,  $NFI=.980$ , were equal or close to one. It can be inferred that the outstanding models enjoyed good fit. Furthermore, the PRATIO value of .267, RMSEA value of  $.023 < .023$ , and RMR value of .001 are indicative of the good fit. All in all, based on the results of absolute, adaptive and parsimonious indices there is a good fit in the communication model between the contextual factors as the predictive variable with the scholarly communication as the intervening variable. There is also a strong relationship between scholarly communication and scientific production. Furthermore, there is a linear relationship between the intervening variable and the latent variables. It can also be inferred that there is linear relation between variables and the latent variables indicating that the model enjoys a good fit.

### Discussion

The present study aimed at examining the relationship between contextual factors with scholarly communication and production and sought to answer to the research hypothesis. In answer to the first research hypothesis the following finding were obtained. Variable of relationship with government was of the highest predictor of scholarly communication. The relationship between relationship with government variable and scholarly communication is significant in that the government has a key role in development and improvement of scholarly communication in universities namely through its policies and strategies as well as its financial contributions to education and research. Academic freedom, as the second element of the communication, is one of the main objectives of universities and is considered as an essential structural-functional requirement of the scholarly community. Either individually or collectively, faculty members need academic



freedom. Social environment, as another element of the communication model, affects scientific development through compatibility or incompatibility of cultural structure of the bigger society, or of normative structure of various social institutions, with feelings and norms of science as an entity (Ghaneirad, 2005). According to Kohen (2012), scholarly communities have a type of scientific structure in the same way that societies have social structure. The findings also supported a significant relationship between political and cultural environment and scholarly communication. Social environment includes decisions made regarding publication policy. In addition, culture is a foundation for scholarly communication in University. Culture, here, is composed of three elements; namely, different and in cultural context, language and kinship.

This result is consistent with the study by Dehghani, Marzooghi, Faghih and Fouladchang (2011) which showed that academic rank significantly affects academic freedom educationally, intellectually, organizationally. Based on the finding, the type of university also affected instructors' academic freedom in terms of research and organization. It was also found that university instructors, awareness of rules and regularities educationally, intellectually and organizationally has effect on their academic freedom. Also, results by Karimian, Kojouri, Lotfi, and Amini (2012) indicated that lack of university, dependence on government budget and their lack of financial independence, the effect of political relations on international scientific relationships, the effect of political views of university presidents on the academic environment, and constant changes in plans resulting from managerial changes are among items with highest average of problems. The results are consistent with Ghaempour (2015) who showed that social and academic relations among university students were more than average but those among students and professors were low. Besides, there is a relationship between professors-students social and academic relations and students' grade. The finding is consistent with that of Rahimi (2007) who showed that the presence of a cooperative spirit and social insight about the role of participation in science production, the most influential factor on the environment and the closeness of individuals to each other had the least effect among the contextual factors affecting the scientific collaboration.

The study by Fazollahi and Maleki Tavaana (2011) showed cultural barriers are among the most effective ones in science production and development in universities. Results by Mulaudzi (2005) suggested cultural differences and language was a determining factor for developing effective communication among South African Tribes. A number of scholars agree that there is a strong tie between communication and culture; even though the relation between national culture and scientific communication has received little attention (Mahmood, Hartley and Rowley, 2011). The finding of the study conducted by Mahmood, Hartley and Rowley shows that Libyan scientists put stress on significance of scientific communication the nature of communication is drastically affected by cultural and national issues.

The results regarding the second hypothesis suggest that scholarly communication explain scientific production variance and that scholarly communication can explain changes in scientific production. This is consistent with Kyvik, and Larsen (1994) who showed that the relationship between international contact and research performance is a mutual interaction. It also supports the results by Ghaneirad and Ghazipour (2002) and Mohammadi (2008) who confirm the effect of scientific production on the academic community as well as the relationship between scientific activities by faculty members with their international scholarly communication. It also supports Soleimani and Shokoei (2008) who proved the role of scholarly communication in scientific production, as well.

### **Conclusion**

In the present study, an attempt was made to present a suitable model of factors affecting the scholarly communication of faculty members of Iranian universities. The results of the data analysis indicated that in order to successfully implement scholarly communication in Iranian universities, many criteria must be met. Therefore, it is necessary to pay attention to contextual factors affecting scholarly communication. Since universities are organizations in which development and advancement of science takes place, the purpose of the use of scholarly communication and the appropriate strategies to achieve that goal must be specified and explained to the faculty members. This help with the expansion of universities' strategic plans. Furthermore, the use of various motivational stimuli along with planning for teamwork among faculty members can enhance their willingness to strive for scholarly communication. In general, attention to contextual factors provides appropriate strategies for the success and implementation of scholarly communication in universities.

### **Limitations**

As other studies, the present study also has some limitations. First, since a questionnaire is used to collect the data, the accuracy and validity of the findings depend on the honesty of the participants and their understanding of the meaning of the items. These factors, especially in some of the internet questionnaires, have more impact on the validity and reliability of the data. Another limitation of the study is the large number of variables studied, which resulted in more items in the scale. The third limitation was the lack of information resources on contextual factors affecting scholarly communication in the country and abroad, which limited the literature review of the study.

### **Recommendations in theory and practice**

Based on the findings of the present study which revealed that contextual factors are effective on scholarly communication and scientific productions, it is suggested that scholarly communication cannot be successfully established without a proper cultural context which is based on mutual trust. To develop scholarly communication, there is also a need for cultural development. The cultural environment is an important element that needs to be taken into consideration.

### **Further study**

Based on the proposed model, the relationship between the underlying factors affecting scholarly communication and scientific productions is underlined. Therefore, it is suggested that graduate students and scholars who intend to do studies in this field make attempt to construct and validate other factors that influence scholarly communication. They can also test the present model among graduate students. The results of this study can determine the similarities or differences of academic communication variables among students of different educational levels if compared with faculty members.

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