
Exploring Web-Based Knowledge Sharing Practices among Students of Higher Education

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Abstract: This study aimed to explore the latent factors in the Web-based knowledge sharing practices. Seven latent factors were identified through a factor analysis with varimax (orthogonal) rotation and interpreted based on simple structure convergence, item loadings, and analytical statistics. The number of factors retained was based on the analysis of Kaiser Normalization criteria and Scree plot. The reliability tests revealed a satisfactory reliability scores on each of the seven latent factors of the Web-based knowledge sharing practices. Limitation, conclusion, and future work of this study were also discussed.

Keywords: Factor Analysis, Latent Factors, Knowledge Sharing Practices, Students, Web-Based.

1. Introduction

The 21st century has been marked with the advancement of ICT that covers almost every aspect of human endeavors on earth. One of such advancements in ICT can be traced from web technologies and beyond, which play a vital role in a number of dimensions to organizations including educational institutions. Among the dimensions of web is knowledge sharing within the educational institutions and organizations as well as individuals.

Knowledge sharing can be seen as the willing act whereby knowledge is capable of being used again or repeatedly in the course of its transfer from one party to another. Actually, the knowledge sharing is among the key aspects of knowledge management in organizations. For any initiative undertaken via knowledge management to be successful, a knowledge-sharing culture ought to be created and cultivated within the organization. The simple reason is that knowledge is a power and not everyone is willing to give it away freely. Thus there is a need to create a knowledge-sharing environment which takes into account the social and economic factors that influence knowledge sharing.

Several studies have been carried out on knowledge sharing using web applications especially in the area of determining factors that influence individuals to share knowledge with other colleagues. Some of the studies have identified three most important categories of issues influencing the success or failure of knowledge sharing in organizations as individual, organizational, and technological factors. This study focuses on these three influencing factors (individual, organizational, and technological factors) to explore the Web-based knowledge sharing practices among students of International Islamic University Malaysia (IIUM). Hence, the study is aimed at contributing towards understanding the determinant factors that influence students to the knowledge sharing. In today's learning environment, the emphasis on teaching and learning has shifted to students learning centric. Therefore, web enabled technologies play a vital role in facilitating students to share, create, collaborate, and communicate with their colleagues as well as their lecturer at anytime, anywhere.

1.1 Purpose of the Study

The 21st century brought a number of technological advancement that simplifies teaching and learning. Various institutions worldwide are trying to accommodate such technological innovation purposely to enhance and promote information dissemination and knowledge sharing. International Islamic University Malaysia (IIUM) being one of the growing universities is not left out in the struggle towards the global competition for the achievement of technological advancement. In an effort to make the University to continue to improve its rank globally, the University invested huge amount of money in providing technological facilities in order to enhance the quality of teaching and learning.

The empirical investigation involving the use of web tools and factors that influence its usage among students in knowledge sharing would immensely help IIUM. This can enable the university to improve the

system, as well as encourage and facilitate students and staff in Knowledge sharing. Therefore, the study is aimed at exploring the factors that can determine the Web-based knowledge sharing practices in the university.

2. Literature Review

In the past social observation and interaction were mostly restricted to immediate social environment of individuals, which enabled people to acquire a variety of important information that can be used to direct their own behavior and beliefs. However, web technologies have changed the ways of knowledge sharing practices as now people are able to share knowledge or work collaboratively with co-workers around the globe. The web has changed the traditional knowledge sharing that was centralized in knowledge repository to a more interactive conversational approach.

On the other hand, knowledge sharing is a vital asset of almost all organization as such many educational institutions and organizations have employed online learning systems and virtual learning communities to support knowledge sharing. The implementation of online learning systems and virtual learning communities cannot force people to share their knowledge with others but it can only be possible through encouragement and facilitation. As a result, abundant literatures exist on various factors that can foster sharing of knowledge in organizations as well as educational institutions. Literature has recognized several factors that influence employees to knowledge sharing activities, which have been grouped into three broad factors as individual, organizational, and technological factors however; the factors can also be applied to educational institutions.

In the context of individual factors, knowledge sharing is being considered as personal characteristics of individuals willing to share knowledge between organizations or with colleagues. Some of the factors identified in literature are beliefs, experience, values, and motivation; benefit, cost, and experiences; expectations, perceptions, attitudes and mind-set towards knowledge sharing. Similarly, study shows that knowledge sharing relies on communication skills comprising both verbal and written. It is also found that individual's ability to share positively influences knowledge sharing.

Several studies have been published showing the influence of organizational factors on knowledge sharing. It has been lamented that organizational factors include organizational culture and managerial implications. Organizational culture involves feedback and valuable contributions and participation from colleagues and the level of collaboration in and across business units, while managerial implications cover the responsibility of providing sufficient training, valuing contributions, giving affirmative feedback, participation and organizational guidelines for using social media tools. Technological factors cover the information and communication technologies (ICT) of the organization, such as internet, intranets, web services, and all other online tools. It is generally believe that efficient and well-implemented ICT in an organization can support knowledge sharing among staff. ICT services and infrastructures serve as facilitator that encourage and support knowledge sharing because they are related to the knowledge management technology used in the sharing activity, and they make knowledge sharing easier and more effective.

3. Methodology

The study comprises of the undergraduate and postgraduate students of the International Islamic University Malaysia (IIUM) Gombak Campus. The campus has 7 faculties - KICT, INSTED, KENMS, KOE, AIKOL, KIRKHS, and KAED.

The target sample size of this study was 385 students drawn from various faculties of IIUM Gombak Campus. This sample was considered because it is adequate to represent the population size up to 1,000,000. However, the actual sample size that responded to this study was 263 respondents.

The study employed disproportionate stratified sampling whereby disproportionate allocation for, between-strata was selected and analyzed. According to; disproportionate allocation for between-strata

analyses aimed at allowing a researcher to compare strata to each other in order to sufficiently select numbers of elements for each category. The author laments that if a researcher is aspiring to maximize the sample size of each stratum, equal allocation (also referred to as “balanced allocation” and “factorial sampling”) may be appropriate. This means that a researcher may seek to select an equal number of elements from each stratum. The data was collected using a survey questionnaire where the researchers administered the questionnaire to students who comprise of both Undergraduates and Postgraduates. The Questionnaire was designed in five points Likert scale format that ranged from 1 = strongly disagree to 5 = strongly agree. Principal component analysis (PCA) was used to explore the latent factor on survey items related to determinants of Web-based knowledge sharing practices among students.

4. Results and Discussions

4.1 Descriptive Statistics

Descriptive statistics revealed the ratings of the opinion of importance of survey items among the respondents. The results show that there are differences in the respondents' perceptions of importance of the 30 survey items related to determinants of Web-based knowledge sharing practices among students. The means ranged from 3.16 (The IIUM sharing tools support functions like instant messaging / chat) to 4.27 (I can learn from my home using these Knowledge sharing tools). The top-five rated survey items were: I can learn from my home using these Knowledge sharing tools ($M = 4.27$; $SD = 0.746$), Working in a discussion group helps me to gain more knowledge rather than working independently ($M = 4.17$; $SD = 0.706$), The Features of knowledge sharing tools facilitate my work daily (assignment, term paper etc) ($M = 4.17$; $SD = 0.693$), I use the tools to help my colleagues ($M = 4.17$; $SD = 0.733$), and I like to work with others to develop my skills and knowledge ($M = 4.15$; $SD = 0.654$). The bottom-five rated survey items included The IIUM sharing tools support functions like instant messaging / chat ($M = 3.16$; $SD = 0.911$), I usually inform my classmates of what I am working on via Web tools ($M = 3.29$; $SD = 0.945$), I have little confidence on what other shared ($M = 3.35$; $SD = 0.842$), IIUM knowledge sharing tools have variety of features ($M = 3.41$, $SD = 0.799$), and The features of IIUM knowledge sharing tools are User-friendly ($M = 3.42$; $SD = 0.838$).

4.2 Reliability

The services of IBM SPSS version 20 was employed to test the reliability of the measurement instrument. The internal consistency alpha coefficient was 0.878 of the entire survey items related to determinants of Web-based knowledge sharing practices among students. The results indicated that the items scale was robust for the sample size and the respondents mixed. All the factors have satisfied the minimum requirement of Cronbach Alpha 0.7. Table 1 depicts the Cronbach's alpha value of each factor.

4.3 Factor Analysis

This study employed the principal component analysis (PCA) to explore the underlying constructs of determinants of Web-based knowledge sharing practices among students' items. The Kaiser-Meyer-Olkin measure was 0.847. Similarly, the Bartlett's test of sphericity was significant ($\chi^2 = 3438.359$, $p = .000$), which indicated that the correlation matrix was not an identity matrix. These results suggested that factor analysis was appropriate and the sample size was sufficient for meaningful factorability. The study used Varimax rotation based on the exploratory nature of items, which indicated low correlation among latent factors.

The number of factors retained was based on the analysis of Kaiser Normalization criteria and Scree plot. Therefore, the seven-factor solutions were examined, using varimax rotations of the factor loading matrix and interpreted based on simple structure convergence, item loadings, and analytical statistics. Each of the seven factors had eigenvalues greater than 1. Similarly, the seven factors accounted for 63.3% of the total variance explained.

In general, the factors were moderately related with Pearson moment correlation showing relatively low values ranged from 0.005 to 0.298 and the high item-total correlations ranged from 0.301 to 0.493. This indicates that the items measured relatively distinct factors within the determinants of Web-based knowledge sharing practices among students. Table 2 depicts the detailed correlation values.

The seven factors and their loadings, mean score, standard deviation, and Alpha coefficient are presented in Table 1. The seven factors were named by the researchers based on the similarity of the items loading as follows:

1. *Experience with Web Services*: This factor has 5 items revealing the personal knowledge with Web technologies. In addition, the factor accounted for 25.2% of the total variance explained in the sample.
2. *Knowledge Sharing Practices*: it comprised of 4 items reflecting the behaviour to share knowledge. The factor accounted for 8.7% of the total variance explained in the sample.
3. *Benefits of Knowledge Sharing*: consisted of 4 items revealing the personal benefits derivable from the knowledge sharing with Web tools. The factor accounted for 6.4% of the total variance explained in the sample.
4. *Knowledge Culture in IIUM*: it comprised of 5 items reflecting the internal culture within the university to share knowledge. The factor accounted for 8.5% of the total variance explained in the sample.
5. *Technological Support to Knowledge Sharing*: consisted of 3 items revealing the support of Knowledge Sharing Tools in IIUM. The factor accounted for 5.2% of the total variance explained in the sample.
6. *Teamwork in Knowledge Sharing*: it comprised of 3 items reflecting the impact of teamwork in sharing knowledge. The factor accounted for 5.0% of the total variance explained in the sample.
7. *Barriers to Knowledge Sharing*: consisted of 5 items revealing the personal impediments to knowledge sharing with Web tools. The factor accounted for 4.4% of the total variance explained in the sample.

Table I: The Seven Latent Factors

Factor	Factor Loading	Mean/ std.dev	Alpha Value
Factor1: Experience With Web 2.0		3.39/ 0.65	0.826
The IIUM sharing tools support functions like instant messaging / chat	.778		
IIUM knowledge sharing tools have variety of features	.764		
The IIUM sharing tools provide platform for free dissemination of information (e.g. learning experience, seminars, workshops etc.)	.729		
The features of IIUM knowledge sharing tools are User-friendly	.703		
I use personal skills when using IIUM knowledge sharing tools features.	.675		
Factor 2: Knowledge Sharing Practices		3.46/ 0.77	0.876
I usually share with my classmates the new knowledge that I acquire via Web tools	.861		
I engage in asking questions and Soliciting feedback from students, colleagues etc via Web tools	.802		
I always tell my classmates whatever I know when they ask me via Web tools	.786		
I usually inform my classmates of what I am working on via Web tools	.775	4.13/ 0.57	0.770
Factor 3: Benefits of Knowledge Sharing			
I can learn from my home using these Knowledge sharing tools	.836		
I use the tools to help my colleagues	.741		
I feel a sense of belonging when I share knowledge	.685		
The Features of knowledge sharing tools facilitate my work daily (assignment, term paper etc)	.636		

Factor	Factor Loading	Mean/ std.dev	Alpha Value
Factor 4: Knowledge Culture in IIUM		3.80/ 0.61	0.811
Student use instant messaging / chat on the web to communicate/collaborate with other students in the course	.730		
The sharing tools in the university enable students to share digital content (e.g. photos, audio files, movies, digital documents etc	.726		
Instant messaging/chat on the web is use to communication between Lecturers and students in the course	.673		
In IIUM, students keep members up to date with current information (e.g. news, technology etc)	.653		
As students of IIUM, we help each other to learn new skills regardless of seniority	.571		
Factor 5: Technological Support to Knowledge Sharing		3.89/ 0.65	0.881
Knowledge Sharing Tools in IIUM make it easier for me to share knowledgewith my classmates and other students	.807		
Knowledge Sharing Tools in IIUM make it easier for me to have knowledge that is relevant to me	.801		
Knowledge Sharing Tools in IIUM make it easier for me to get in contact with my classmates who have knowledge that is important to me	.767		
Factor 6: Teamwork in Knowledge Sharing		4.07/ 0.53	0.764
I like to work with others to develop my skills and knowledge	.827		
I learn a lot from other members in this community	.675		
Working in a discussion group helps me to gain more knowledge rather than working independently	.656		
Factor 7: Barriers to Knowledge Sharing		3.55/ 0.65	0.709
I have little confidence on what other shared	.732		
I'm so worry about wrong information that is shared.	.719		
Time factor is the major obstacle for me to share knowledge.	.684		
It troubles me that if I share information it can be misused by others	.648		
I have difficulty to share knowledge using the existing knowledge sharing tools in IIUM	.596		

Table II: Correlation

Factor	1	2	3	4	5	6	7
1	1						
2	.353 **	1					
3	.170 **	.245* *	1				
4	.447 **	.341* *	.301* *	1			
5	.420 **	.40 9**	.28 4**	.493 **	1		
6	.298 **	.32 9**	.47 0**	.42 8**	.391 **	1	
7	.125 *	.00 5	.14 9*	.11 2	.098	.097	1

Label

1. Experience with web services
2. Knowledge sharing practices
3. Benefits of knowledge sharing
4. Knowledge culture in IIUM
5. Technological support to knowledge sharing
6. Teamwork in knowledge sharing
7. Barriers to knowledge sharing

4.4 Discussion of the Results

The study reveals seven factors that are determinants of Web-based knowledge sharing practices among students. These seven factors consist of: Experience with Web 2.0, Knowledge Sharing Practices, Benefits of Knowledge Sharing, Knowledge sharing Culture in IIUM, Technological Support to Knowledge Sharing, Teamwork in Knowledge Sharing, and Barriers to Knowledge Sharing.

The factor analysis results have shown that all the items under study have satisfied the requirements with the values of Kaiser-Meyer-Olkin's (KMO) and Bartlett's Test of Sphericity greater than 0.5 and 0.000 respectively. This means the instrument is qualified to be used for further research. Similarly, the majority of communalities and all the diagonals of the anti-image correlation matrix were all over 0.5 further confirming that most of the items shared some common variance with other items. The remaining communalities that did not reach 0.5 were all greater than 0.4. The communality of 0.3 and above is acceptable. Therefore, all the items of the factor analysis were retained with no items deleted.

The results of this study have conformed to some previous findings. Factor 1, Factor 3, and factor 7 have been studied in relation to individual factors to share knowledge among employees using social media. The outcome of the research shows that benefits (in this study factor 3) and experience (in this study factor 1) with social media have a significant impact on personal factors while the influence of costs (in this study factor 7) was not supported by the study. Similarly, it was also found that technology support (in this study factor 5) significantly influences knowledge sharing among students and employees. Factor 6 has been studied on the basis individuals coming together in particular platform and on regular basis to share their experience and expertise to achieve a common goal. In addition, a study found a significant relationship between dimensions of collaborative work (same as factor 6 in this study) to share knowledge. Knowledge culture (in this study factor 4) has emerged that requires the consideration of the importance of application and the practical value of content where both students and university lecturers actively participate in knowledge generation, production, and distribution. Lastly, it was found that knowledge sharing practices (factor 2) play a vital role in interactivity, resources, commitment of time, and the need to cater to specific audiences.

This empirical study also supports factors clustering. Factor 1, Factor 3, and factor 7 are grouped together to measure individual factor; factor 4 and factor 6 to measure organizational factor; while factor 5 to measure technological factor. Factor 2 is the dependent factor. The main reason of grouping these factors into three broad factors with one dependent factor is to enable the researchers to apply appropriate statistical techniques to indentify the factors that predict knowledge sharing among students in subsequent research. Besides, literature has recognized several factors that influence knowledge sharing activities, which have been grouped into three broad factors as individual, organizational, and technological factors.

4.5 Limitations of the Study

A number of limitations are associated with this study. Firstly, the respondents of this study were from international Islamic University Malaysia. This university is one out of the 20 public universities in Malaysia hence caution need to be taken in trying to generalize findings beyond the scope of this study. Secondly, this study is aimed to explore the underlying factors of Web-based knowledge sharing without making any prediction among the factors. Lastly, the designed nature of survey questionnaires were based on the students' related activities/roles with the Web-based knowledge sharing without considering the lecturers' activities or roles, and administrators' responsibilities, which serve as another a limitation of the study.

5. Conclusion

This study identifies and accommodates multiple variables for determinants of Web-based knowledge sharing practices. The study also systematically explores the latent factors within the Web-based knowledge sharing practices by evaluating the perceptions of importance of the 30 items from the perspectives of students. Therefore, this identification of diverse Web-based knowledge sharing practices variables and examination of the latent factors will provide a solid base for developing a comprehensive Web-based knowledge sharing practices conceptual model and future research on Web-based knowledge sharing practices among students in the university.

The findings of the study provide support that the Web-based knowledge sharing practices consist of multidimensional constructs or factors. In addition, results offer strong evidence of the reliability of the survey instrument used in the study as well as the high mean score of most of the survey items rated by the students further confirm the content validity of the items. The outcomes of this study also underline the importance of factors clustering to predict Web knowledge sharing practices among students as identified in previous literature. The literature review has identified three broad factors that include individual, organizational, and technological factors to knowledge sharing practices. In this study, individual factor consisted of Benefits (factor 3), Experiences (factor 1), and Barriers (factor 7); organizational factor consisted of Knowledge culture (factor 4) and teamwork (factor 6); and technological factor comprised of technology support (factor 5). Knowledge sharing practices (factor 2) is the assumed predicted outcome.

Future research on the Web-based knowledge sharing practices by the researchers will use Multiple Regression Analysis (MRA) to validate the prediction of the variables on the outcome. In addition, Pearson moment correlation may be used to further explore and validate the relationships among these factors.

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