

# The Utilization of Internet Communication into Knowledge Sharing Activities in Primary Schools

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## Abstract

The transformation of the Malaysian national policy from an industrial-based to a knowledge-based nation has prompted educational institutions to adopt a culture that promotes the advancement in knowledge, skills and area of expertise among the academic staff in schools. This study identifies the knowledge sharing activities using internet among teachers in the national schools. In addition, it also examines the relationship between environmental factors which consisted of technological factors, leadership, culture, incentives and school management system and the knowledge sharing culture. Apart from that, factors that impede the development of knowledge sharing in schools, which include teacher's attitude, time and workloads, were also studied. Quantitative analyses revealed that the teachers were practicing knowledge sharing with the wide usage of internet as part of their professional development activities and regression analysis also proved that school leadership was perceived to be the dominant factor that influences the development in knowledge sharing culture in educational institutions.

*Keywords: internet communication; technology in education, knowledge sharing, knowledge management*

## 1. Introduction

The importance of knowledge sharing and producing knowledge worker has taken a dramatic increase in organizational and human resource development issues recently [36] due to implications towards organizational effectiveness [2]. The emergence of knowledge as a tool towards achieving organizational vision started when the technological advancement in the information and communication technologies occurred with the advent of computer and the Internet. The Internet provides an effective communication infrastructure and creates new forms of human interactions to enable knowledge sharing through communication software and hardware. It is this innovative way of storing, accessing and distributing information that has transformed society and

organizations [1]. Soon the world is a boundary less space and opportunity and many organizations, be it private or otherwise, have thrived successfully. Therefore, it is with that in mind, Malaysia considered knowledge as an important advantage for the development of individuals and businesses as it encourages effectiveness in organizations and economic growth in the nation. Gradually, economic policies in Malaysia shifted its aims from an industrial-based to knowledge-based (K-Economy) [6] through the wide usage of computer-assisted systems. Soon after, government officials and organizational leaders were encouraged to inculcate the paradigm shift in their routine teaching tasks.

## 2. Literature review

### 2.1 Knowledge sharing: definition and issues

The concept of integrative knowledge-based schools which is defined as a process of understanding and appreciating knowledge with respect to differentiated functions and depending on the effective processes and knowledge sharing activities among members of any organization [24], [31]. [49]. On the other hand, it is argued that knowledge sharing deals with a process of telling, interpreting and educating other colleagues through the process of sharing information whether internally or externally through ICT-based assisted approaches in realizing organizational vision, mission and objectives by a requirement on how the teaching staff absorb, sharing and applying the knowledge and information on their working environment. Knowledge sharing concept is also defined as a set of behaviors and exchange of information or assistance to the other members in the same organization [11]. The significant impact of the knowledge sharing through Internet communication creates the concept of community of practice. This concept was introduced by Lave and

Wenger (1998) [32] postulate the idea of people with a common interest in the same area sharing ideas, developing innovations and collaborating over a period of time. In the context of this paper, knowledge sharing is mainly viewed from teachers' perspective in order to improve their teaching skills. This includes both formal and informal knowledge sharing. Collaboration through knowledge sharing also allows teachers to co-ordinate different types of teaching approaches and to avoid any duplication [22].

## 2.2. Knowledge Sharing Using Internet

Theoretically, ICT has significant impact towards improving teacher training and professional development especially to improve capabilities in teaching and learning processes [13]. In most EU countries, teachers are much more committed to the use of internet with flexible and adaptable system that caters the needs of teachers [23] aligned with EU policies of creating a knowledge-based economy [19]. As an educator in a digital and knowledge era, teachers are urged to work in networks, take part in networks, and consider that their role is to develop human networks or other colleagues for learning. Being part of a network, being able to behave in a network, taking benefits from networking demand teachers themselves experience such networked activities [17]. Beneficial aspects of using ICT in teachers training are remarkable based on teacher's responses towards the usage of internet in knowledge sharing activities; as a part of informal teacher training and development. An internet-based training is considered as flexible and adaptable approach to cater teachers' needs while minimizing travel costs and increasing internet competences [7]. In Germany for example, internet communication through the application of e-learning is considered as suitable learning tools to improve teachers and student teachers capabilities in teaching in creating positive networks that play as a tool for competence development and knowledge exchange among teachers because teachers are well-developed with self-management skills and motivated to use internet individually through usage of internet for sharing and development of knowledge and changing and sharing their experiences [26].

In Malaysian setting, application and digital technologies enhancement in education were always placed as top priority by the Malaysian government under the Ninth Malaysia Plan from 2006 to 2010 [33]; [43]. The Ministry of Education through its strategic policy on ICT revealed three vital objectives related to the internet communication implementation in schools. The first policy was that of ICT is used as an enabler to reduce the digital gap between the schools. The second, ICT plays a

role and function in education as a teaching and learning tool, as part of a subject and as a subject by itself. Thus, this policy emphasizes the importance of having access to information, communication, and as a productivity tool via computer technology. ICT as a part of a subject refers to the use of a software in each respective subject such as "invention" and "engineering". The third policy has a direct relation with using ICT so as to improve productivity of the management system. Based on the implementation effort, the Ministry, namely the Division of Educational Technology was assigned to materializing the following multi-phase strategies to make sure that the objectives of ICT will be achieved. Listing from the five important pillars, the educational technology division is committed to developing of ICT-based knowledge and skills among the students and teachers. By this implementation objective, ICT and internet communication will be extensively used to automate and mechanize work processes such as the processing of all related documentations such as, generating timetables, lesson planning, management of information systems and financial management [14]; [37].

The setting up of the ICT and internet connectivity in local school systematically will enhance the platform of the knowledge sharing system among teachers through the use of e-mails, blogs and school web pages as tools for sharing knowledge, information and disseminate practical skills to other teachers. With the objective of creating knowledgeable society and workforce, utilizing techno-education as their culture they culminate in utilization by others. In addition, they also realize the creation of knowledge-society to intensify the usage of information and communication technology in schools [14]. The andragogical learning and teaching process for enhancing teaching professional development through the development digital enhancement lead to the country's education reform and revamp in the near future to transform the Malaysian teachers into knowledge society and a developed country.

The role of ICT and internet communication in Malaysian schools is to connect and wire other teachers as a cost effective move in disseminations of knowledge and learning to other teachers with the objective to overcome the hurdles with maximizing the vast and richness under the rapid technological and globalization of information. Salbiah (2003) [43] pointed out that the use of internet in Malaysian local schools is to improve the learning process and, in particular, on interactive teaching and learning in which students and teachers have to collaborate with their partners and colleagues from other schools. Collegial interaction within and between schools using internet facilitates such as e-mail automatically will enhance the sharing of resources, expertise and advices and

information related to teaching and learning among teachers. This remarkable effort would enable them to be centered into one place not only for the purpose of networking among their peers but also for social connectivity and values such as friendship, racial integration, religious tolerance and knowledge. The rapid development of computers and information technologies in Malaysian educational system is relevance to support and play as a mediator for knowledge sharing, develop their teaching skills, gaining and sharing knowledge with other teachers as a part of the system that supports exchange and socialization of knowledge [3]. Using ICT that encompasses social networking, e-learning and blog spots as tools for knowledge sharing, makes teachers to be able to have an access, share, analyze, and disseminate information gained from a variety of sources such as blogs, web pages and e-mails in order to improve their teaching and knowledge related to professionalism issues. By the usage of internet, teachers have more chances to involve in an active working environment in collaborative and independent manner. On the basis of their experiences, teachers have some insights to choose appropriate educational software which creates more choices and allows transferences of skills and stimulate thinking skills. In fact, the function of internet communication within the scope of knowledge sharing is both to improve drastically the learning experiences of students and also to guide teachers to generate avenues for themselves as community practice member to work in a group and improve their team spirited attitudes, cohesion and social values. Implicitly, knowledge sharing system maintains the process through which both explicit and implicit knowledge is shared by other teachers. They take part in the system by supporting exchange, means, sharing of explicit knowledge, and socialization, say, promoting of tacit knowledge [39] among their colleagues.

### 3. The context of the study

Numerous literature have studied the knowledge sharing activities with the assistance of internet among teachers based on various setting that made this study a replicate version. However, least study was implemented using primary school teachers as their respondent that made this study significant to the contribution of teacher training research that related to the implementation of knowledge management in primary school setting. This research outlined four essential questions: (1) Do teachers implement knowledge sharing activities using ICT at school? (2) What factors influence the implementation of knowledge sharing activities using ICT and internet communication? (3) What are the main factors that

influence the implementation of knowledge sharing in schools using internet communication?

## 4. Methodology

### 4.1. Sampling

Research participants were selected from pool of primary school teachers that used ICT and internet as their medium for knowledge sharing activities whether formal and informally. Empirically, teachers that participated in this study as the research population came from the list of primary schools that were active in the ICT activities managed by the state department of education. The sampling data was provided by the State Department of Education with a total Of 300 teachers were listed as research sample for this study. A total of 300 teachers were selected through random sampling approach were contacted through their personal emails and later followed by an official letter to notify them that they being selected as sample for this study. Thus, 300 copies of the survey questionnaire were distributed to teachers who were contently willing to take part as respondents for this study. Out of 300 questionnaires that were distributed, only 200 sets of usable questionnaire were returned to the researchers, yielding a 76.5 percent response rate. The anonymity of teachers was protected with disclosing their real identities. The survey questionnaire was answered by participants based on consensus and voluntary basis and will be used as meaningful data in analyzing the validity and reliability of the measurement scales.

### 4.2 Instrumentation

The self-construct survey questionnaires have two major sections. Section one detailing the teachers' reflection related to the implementation of knowledge sharing in primary schools that comprised of four constructs which were the importance of knowledge sharing for teachers ( 6 items); positive social interactive through knowledge sharing using internet (6 items); teacher readiness in sharing knowledge with the assistance of internet in schools (6 items); improvement of teachers' potential, innovation, motivation and creativity improvement and job performance through Knowledge Sharing using Internet communication (6 items). The second section of the questionnaire was designed to measures the influencing (organizational leadership; technological and internet supports; institutional culture; recognition and rewards; management system) with 20 items and 5 items for each influencing factors. 12 items were constructed to measures the constraint (teachers' awareness and attitudes; time and workloads) factors with the

distribution of 4 items for each constraint factor. The overall total numbers of items studied were 56 items.

The instrument was based on Likert Scale level of agreement consists of 56 items designed to obtain the teachers' perspective and evaluation on the influencing and constraint factors on the successful implementation of knowledge sharing using ICT in primary schools. All items were scaled using a five-item Likert scale ranging from 'strongly disagreed' (1) to 'strongly agreed' (5). In order to ascertain the content validity, panel of lecturers from the knowledge management, educational technology program and the state education officer was approached to assess content of the survey items. Based on the suggestions and constructive comments, some items were revised and changed. Next, instrument was piloted to 19 primary school teachers to determine the understandability of the items included in the questionnaire and also to incorporate any useful suggestions that they might offer. The item modification including rephrasing and rewording were done based on the feedback obtained from the pilot study. All items in the questionnaire were measured using the Cronbach alpha for overall internal consistency was at 0.8731 which considered as high reliability of measurement. Rasch analysis was used to determine the validity and reliability of the items studied. Reasons for resorting to Rasch analysis was empirically based into account the categorical and ordinal nature of such data [50] and small numbers of respondents that involved in the pilot study which were less than 20 respondents. Before proceeds with the actual data, rasch analysis was used to determine the reliabilities and the fit of the items. Item reliability that represents the dimensions of implementing the knowledge sharing through internet was measured at 0.98; while separation index of 0.94 showed the overall fit between the data and the model was good. Rasch analysis also indicated that constraint factors were determined at 0.92 and influencing factors were measured at 0.88 while separation index for items shows value ranging from 2.35 to 11. 56 items indicate acceptable values of more than 2.00. Hence, the data based on the pilot study was accepted based on the respondents' reliability index and item which indicates more than 0.8 is acceptable [50]. In addition, the separation index of more than 2.0 is also acceptable. The next step was determination of point measure correlation based on the summary of point measure correlation (PTMEA CORR) table for 56 items. All items show positive values with index > 0.30 which shows that items that were carefully constructed. Data was also evaluated based on the item and person measure is based solely on the logit scale. The results confirmed that all items are scattered and pointing towards the capability level of respondents' diversity. The item which is difficult

to be agreed upon is d7 with difficulty to be measured is 3.68 logit on the top scale, whilst the simplest item to be agreed upon is item a1 with measurement of -1.18 logit on the lower scale [51]. Rigorous evaluation showed that the achievement of the respondent or person is higher than the items in the instrument.

## 5. Results

This part describes the findings in research according to the research objectives as shown earlier. A total of 200 (66%) responses were Table 1 depicts the descriptive analysis. Generally, the teachers rated the implementation of knowledge sharing using internet in their schools as well implemented and was considered important to improve teachers' professionalism (mean score – 4.49). It is assumed that teachers place a greater priority and support on the implementation of knowledge sharing in their schools with the help of internet based instrumentation. Apparently, the teachers have been practicing knowledge sharing using internet internally and externally as part as their professional development activities with colleagues and other major subject teachers elsewhere. Empirically, teachers also believed that the implementation of knowledge sharing with ICT is considered as an important process and approach for teachers to enhance their performance, productivity and knowledge related to teaching specification and upgrading their major subject knowledge. In addition, teachers were perceived as active practitioners of the knowledge sharing processes which included the implementation of absorbing, sharing and applying the knowledge sharing approach while nurturing their career path.

Table 1: Means score of the implementation knowledge sharing using ICT.

<i>Constructs</i>	<i>Means</i>	<i>SD</i>
The importance of Knowledge Sharing using internet communication	4.85	0.39
Positive Social Interaction through Knowledge Sharing using internet	4.58	0.59
Readiness to Share Knowledge using internet	4.21	0.71
Improvement of Potential, Innovation, Motivation and Creativity Improvement and Job Performance through Knowledge Sharing using internet.	4.34	0.59
Total Mean Score	4.49	0.54

Additionally, this study also investigated the environmental factors which were considered influential in promoting the knowledge sharing culture in the identified educational institutions. Based on the literature



review, influencing factors such as technological and ICT supports, organizational leadership, institutional culture, recognition and incentives, and management system do influence development of the knowledge driven culture using ICT as knowledge catalyst. In contrast, factors that impede the implementation of knowledge sharing were teacher’s attitudes and awareness, time constraint, and academic workload. Table 2 below illustrates the list of influencing and constraining factors.

Table 2: Means score of influence and constraint factors

<i>Factors</i>	<i>Mean scores</i>	<i>SD</i>
<i>Influencing</i>		
Technological and ICT supports	4.16	0.68
Organizational leadership	4.37	0.54
Institutional culture	4.27	0.64
Recognition and incentives	3.97	0.73
Management system	3.95	0.62
<i>Constraining</i>		
Teacher’s attitudes and awareness	4.12	0.68
Time constraint	3.53	0.54
academic workload	4.27	0.65

Table 2 indicates factors that advocate and limit the knowledge sharing implementation using internet as mediator in primary schools. Based on the descriptive analysis, teachers selected organizational leadership as the most important determinant in promoting the knowledge sharing proven by the highest mean score of 4.37. The second highest noted was supportive culture (mean score - 4.27) followed by ICT and technology support (mean score - 4.16). Meanwhile, recognition and incentives (mean score - 3.97) and management system (mean score - 3.95) were considered as weak factors that support the implementation of knowledge sharing. In contrast, three important constraint factors were identified were teacher’s attitude and awareness, time constraint and academic workload. Based on the descriptive analyses, academic workload (mean score – 4.27) was chosen as the main constraints for teachers to share their knowledge with other colleagues followed by the teacher’s attitudes and awareness (mean score – 4.17) and lastly time constraint factor (mean score – 3.53).

Regression analysis listed the influencing factors, which were ICT and technology support, organizational leadership, institutional culture; recognition and incentives and the management system.

Table 3: Regression coefficients of teachers’ knowledge sharing implementation using ICT.

<i>Influencing Factors</i>	<i>t-values</i>	<i>Betas</i>	<i>p-values</i>
ICT and technological supports	1.63	0.13	0.11

Organizational leadership	3.91	0.27	0.00*
Institutional culture	2.71	0.24	0.01*
Recognition and incentives	-0.22	0.02	0.82
Management system	1.69	0.11	0.09

$p < 0.05$  ; \*\* $p < 0.01$

From the regression analysis, it is clear that knowledge sharing implementation using internet communication was strongly predicted by two important factor which were the organizational leadership [ $t=3.91$ ,  $\beta=0.27$ ,  $p < 0.05$ ] based on teachers perception and evaluation towards the implementation on knowledge sharing using ICT in primary schools. In addition, institutional culture was also measured as the second important predictor for implementation on knowledge sharing [ $t=2.71$ ;  $\beta=0.24$ ,  $p < 0.05$ ].

## 6. Discussion

It is apparent from this study that teachers’ perception provides some significant findings related to the concepts and implementation of knowledge sharing in an educational setting. As an educational organization that enhanced and promoted the concept of learning organization, the realization of knowledge sharing was particularly implemented through professional development approach in which teachers are urged to share their knowledge and skills internally with other teacher’s colleague especially novice teachers and externally with major subject teachers from other schools in order to produce highly capable, intellectual and skillful teachers.

According to the findings, it is presumed that teachers have high confidence towards the implementation of knowledge sharing blended with internet communication as the main catalyst and considered as an important asset for them to increase their teaching, classroom management and administrative skills in nurturing their capabilities in major teaching subjects and internet practical skills as part of informal teaching education and training that located in their schools. These findings reveal that teachers are practicing the concept of ‘community of practice’ (CoP) which is defined as a group of people who share, concern and deepen their knowledge through interactions among members in their organization [32] [29] and [30] with ICT as the main mediator for transferring and gaining the knowledge. The implementation of knowledge sharing truly promotes teachers to partake in discussions, contribute each other, and share their knowledge using e-mails, internet and intranet as instruments in delivering knowledge through

boundary less environment. This process is crucial in teacher professional development that improving their credibility in teaching. The above results generally confirm previous findings that showed significant knowledge sharing practices that used internet communication as their main catalyst in sharing teachers' knowledge and information without limited boundary and internet communication were considered as the important tools in realizing their networking in Malaysian context. In terms of measuring the relationship between influencing factors with knowledge sharing approach, it is indicated that there was a strong association between the influencing factors with knowledge sharing implementation using internet communication as catalyst in educational institutions. Based on regression analysis, the findings also showed that organizational leadership plays a salient role in supporting knowledge sharing environment among teachers. Organizational leader plays as an active catalyst or provider in promoting and enhancing sharing of knowledge among teachers especially using internet communication as the provider to achieve effective learning culture in educational organization. This is indeed a dimension worthy of another study. Nevertheless, this finding concurs with the study findings by Low (2000) [34] that indicate the most influential factor of knowledge sharing was organizational leadership. A study by Pan & Scarbrough (1999) [40] also found that the role of organizational leadership is a crucial factor in the implementation of knowledge sharing. This study also proves that there is a significant relationship between institutional cultures: staffs' attitudes and supports from group members, with the knowledge sharing implementation. In this sense, the improvement of the implementation of knowledge sharing in any organization also depends on staff attitudes and supporting climate from their colleagues

## 7. Conclusion

Finally, undoubtedly leadership is an important indicator in determining the successful of the knowledge sharing using the internet and ICT as main supporter whether in every institution that promotes learning as part of professional development process. Thus, organizational leaders should promote the culture of knowledge sharing using ICT as a medium to share knowledge and skills to improve human resource competencies. Thus, a leader determines the achievement of the implementation of knowledge sharing in organizations. He or she acts as a catalyst and control the activities in learning organizations. We see many examples of leaders who bring their organizations towards success and many

schools that implement the knowledge sharing ethos in their schools that reaps the rewards and accolades.

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