Knowledge Sharing System to Improve Teacher Performances in SMA Negeri 1 Ciwaru

Dyah Puteria Watät, Yoyo Zakariaät
*Department of Information and Communication Technology Education, STKIP Muhammadiyah Kuningan
*d.puteriawati@gmail.com

Abstract: This study is based on a view that today's competitive high school institutions are able to exploit existing knowledge in every human resource to achieve excellence and competitiveness at the optimal level. Thus, this study aims to analyze the influence of knowledge sharing system that implemented in order to develop knowledge sharing culture among teachers to improve teacher performances in SMA Negeri 1 Ciwaru. The method that used in this study is the SECI model developed by Nonaka and combined to knowledge integration. While software quality testing techniques are tested by adapting the four characteristics of software quality of the ISO 9126 model of functionality, reliability, usability, and efficiency. The results of this study shows the knowledge sharing system applied has excellent quality testing with 89.46%. So it could be the right solution to improve the performance of SMA Negeri 1 Ciwaru teachers to obtain tacit knowledge and explicit knowledge.

1. Introduction

Educational institutions take an important role to produce the knowledge. Knowledge itself is a habit, skill, understanding of something or experience-based, someone’s expertise gained from the process of learning or innate. In educational institution, knowledge sharing is an important process that must be done by the teachers to maintain sustainability and achieve competitive advantage as a center of knowledge [1].

Knowledge sharing in organizations is very interesting for researchers and practitioners. It can improve organization’s performance, increase competitive advantage, organization’s learning, innovation, and even survival [2]. It can also create, channeling knowledge and apply to the organization [3]. An organization that considered superior and competitive today are the organizations that are able to exploit existing knowledge in each of its human resources and combine it into an organization knowledge, with the aim of achieving excellence and competitiveness to optimal level [4]. Whereas Slade & Albert state that knowledge sharing is an approach needed to facilitate the recording of knowledge and encourage the effectiveness of sharing with colleagues. To support all this, a tool that is intuitive and easy to use is needed [5].

Some studies suggest that the problems that often arise in managing knowledge in educational institutions are knowledge sharing that has not become a habit and will [6]and also the lack of tools or
systems that can facilitate knowledge sharing and ensure the sustainability of knowledge management [7]. Though knowledge sharing activities with colleagues in a company or institution are proven to accelerate the improvement of individual knowledge and further enhance the ability of individuals to produce new products or knowledge that are useful for the company or institution [8].

The different knowledge in every individual especially in a high school education can set unbalanced material. It maybe due to sharing knowledge among teacher in an organization is not working really well. So, teacher with same subject is possibly has different visions about the material that delivered. Based on the opinion above, the authors conclude that the problem that occurs at this time is the culture of sharing between teachers who do not go well causing differences in teacher material while doing the teaching process, at that time also causes different skills and knowledge for teachers who teach the same subject causing differences in the weight of material delivered to students.

The research problem that must be answered is how the prototype model of knowledge sharing system that appropriate to support knowledge sharing communication between teachers so teacher performances can be improved. While The purpose of this study was to create a model of knowledge sharing system by utilizing the existing information technology that is website-based in Ciwaru 1 High School to improve teacher performance.

2. Research Methods

The method used in this study is referred to SECI model that developed by Nonaka which is combined to knowledge integration. She stated that conversion of knowledge is divided into four ways [9] as follows:

![Figure 1. Knowledge Conversion](image)

Figure 1. Knowledge Conversion [9]
Knowledge integration is the process by which an organization introduces new knowledge into the organization itself. Knowledge integration is divided into four ways.

![Figure 2. Knowledge Integration [8]](image)

The data collection that used is questionnaires where the sample selection process that conducted in this study is using purpose sampling. It means, there were some teachers at SMA Ciwaru took a part on it.

System development methods used in this study are evolutionary prototype models, and software quality testing techniques that tested by adapting the four software quality characteristics of the ISO 9126 model, namely functionality, reliability, usability, and efficiency.

ISO 9126 quality testing consists of two parts, namely the level of quality of each aspect that adapts the four characteristics of ISO 9126 and the overall quality level of the four characteristics of ISO 9126. From 14 respondents who filled out the can be measured using the following formula:

\[
\% \text{ Skor Aktual} = \frac{\text{Skor Aktual}}{\text{Skor Ideal}} \times 100\%
\]  

notes:
- (actual score is the answer of respondents)
- (Ideal score is the maksimum score)

The next step, data taken is measured and referred to the criteria that made as follows:

| % Score  | Criteria |
|----------|----------|
| 20.00 – 36.00 | Poor     |
| 36.01 – 52.00 | Bad      |
| 52.01 – 68.00 | Average  |
| 68.01 – 84.00 | Good     |
| 84.01 – 100   | Very Good|

3. Result and Discussion

3.1. Knowledge Sharing System Analysis

To formulate a knowledge sharing model, basically it requires a process of knowledge management cycle consisting of four stages that correspond to the SECI Nonaka model. The following is the relationship between making, formulating and disseminating knowledge.
Table 2. KSS Analysis

| No. | Process      | Activity                                             | Implementation |
|-----|--------------|------------------------------------------------------|----------------|
| 1.  | Socialization| Preparation of teaching and learning process         | Teachers’ meeting |
| 2.  | Externalization| Develop learning tools                               | Syllabus, lesson plan material, semester program, GPA etc |
| 3.  | Combination  | Looking for learning materials both from the results of discussions and other sources | Discussion |
| 4.  | Internalization| Teacher’s activity                                   | Activity |

Based on the analysis obtained, a knowledge sharing system scenario was formed to support activities and improve the performance and sharing culture of the teacher which was the result of the SECI Model. Following is the SECI model process.

Table 3. Model SECI KSS

| Socialization (Tacit > Tacit) | Externalization (Tacit > Explicit) |
|-------------------------------|------------------------------------|
| - Teachers meeting            | - Developing learning program      |

| Internalization (Explicit > Tacit) | Combination (Explicit > Explicit) |
|------------------------------------|----------------------------------|
| - Teacher activity                 | - Discussion                     |

It can be seen from the knowledge sharing system analysis by using the SECI model above, if it is combined with existing technology and knowledge integration because it consists of four basic components, the authors describe the research model of this research as follows.

Figure 3. Research KSS Model
3.2. System Planning

The usecase diagram that describe proposed system of knowledge sharing system can be seen as follows:

![Diagram](image)

**Figure 4. Usecase Diagram KSS**
3.3 Display

Knowledge sharing system display in SMA 1 Ciawaru.

3.3.1. Add Data Display

On this webpage the teacher can add learning device data in the form of Basic Competencies, Performance Achievement Index, semester program, annual program, Syllabus, RPP, and instructional materials.

![Figure 5. Display of learning device data additional](image1)

3.3.2. Data Display

On this webpage the teacher can see a list of learning devices that have previously been stored, can change and delete and download the device.

![Figure 6. Display of learning device data list](image2)
3.3.3. Quality Testing

The result of questionnaire by using ISO 9126 is as follows:

| Aspect     | actual | Ideal | % Aktual | Criteria   |
|------------|--------|-------|----------|------------|
| Functionality | 378    | 420   | 90.00    | Very Good  |
| Reliability  | 365    | 420   | 86.90    | Very Good  |
| Usability    | 362    | 420   | 86.19    | Very Good  |
| Efficiency   | 199    | 210   | 94.76    | Very Good  |
| Total        | 1304   | 1470  |          | Average    |

Average 89.46 Very Good

4. Conclusion

Based on the results of the study obtained 89.46% system quality feasibility testing and it can be concluded that this knowledge sharing system can be used by teachers as a knowledge sharing media so as to facilitate the search for tacit and explicit knowledge so as to improve teacher performance at Ciwaru 1 High School.

5. References

[1] SHABRINA, VINA, et. al, 2015. Factors Analysis on Knowledge Sharing at Telkom Economic and Business School (TEBS) Telkom University Bandung, Procedia - Social and Behavioral Sciences, Vol. 169 : 198-206.

[2] ALONY, WHYMARK DAN JONES. 2007. Sharing Tacit Knowledge: A Case Study in the Australian Film Industry, The International Journal of an Emerging Transdiscipline, Vol. 10 : 41-59.

[3] AULAWI, HILMI. et. al, 2009. Hubungan Knowledge Sharing Behavior dan Individual Innovation Capability, Jurnal Teknik Industri, Vol. 11 : 174-187.

[4] UHARTI, LIELI DAN IRWIN HARTANTO, 2009. Identifikasi Kesiapan Penerapan Knowledge Management, Jurnal Ekonomi dan Bisnis, Vol. 15 : 181-196.

[5] ANDREW, J. SLADE, DAN ALBERT, 2001. Conceptual Approaches for Personal and Corporate Innovation and Knowledge Management, Proceedings of the Hawaii International Conference on System Science, Vol. 2 : 1-8 IEEE.

[6] SARI, WINDA. et al, 2014. Penerapan Knowledge Management System (KMS) Berbasis Web Studi Kasus Bagian Teknisi dan Jaringan Fakultas Ilmu Komputer Universitas Sriwijaya, Jurnal Sistem Informasi, Vol. 6.x

[7] CHENG, MING YU., JESSICA, DAN PEI, 2009. Knowledge Sharing In Academic Institutions : A Study Of Multimedia University Malaysia, Electronic Journal of Knowledge Management, Vol. 7 : 313-324.

[8] MARK W. MCELROY. 2000. Knowledge and Innovation: Journal of the KMCI, Vol. 1 : 43-67.

[9] NONAKA, IKUJIRO, et. al, 2000. SECI. Ba and Leadership: a Unified Model of Dynamic Knowledge Creation, Long Range Planning, Vol. 33 : 5-34.