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Wikis For Collaborative Learning: A Case Study Of Knowledge Management And Satisfaction Among Teacher Trainees In Malaysia

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Abstract

Wikis have been shown to be beneficial for collaborative learning. The knowledge management processes required during collaborative writing develops higher level cognitive skills. These processes are important for sustaining collaboration and innovation in the online learning environment. However, there does not seem to be many studies in the use of online collaborative workspaces or wikis among teacher trainees in Malaysia, and even less on the analysis of knowledge management processes. In this study, the knowledge management processes of teacher trainees is analysed and determined from a survey and interviews after completion of several collaborative tasks over a period of four weeks. A content analysis of the written documentation of the tasks on the wiki was done to verify the findings. In addition, a survey of the trainees’ satisfaction of the wiki tool and the use of the materials is determined. The results indicate that the knowledge management processes were used during the collaborative writing process, and that they were satisfied with the use of the wiki for learning. This study is significant as it is important for teacher trainees to develop knowledge management skills and to encourage the use of these skills while teaching in school.

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Keywords: Wiki, collaborative learning, student satisfaction, knowledge management;

1. Introduction

The 21st century, which is an era of constant change, requires learning environments which can promote skills such as collaborative problem-solving skills (Grieff, Wustenberg, Holt, Goldhammer and Funke 2013). Collaborative...
problem-solving facilitates critical thinking and sharing of information while knowledge is constructed (Hung, 2013). Some researchers argue that problem-solving and communication skills need to be acquired before content knowledge (Grieff et al. 2013; Hung 2013).

Studies have shown that the use of wikis for collaboration enables the generation of knowledge (Zhang, Scardamalia, Lamon, Messina & Reeve, 2007; Montero-Fleta & Pérez-Sabater, 2011). The analysis of the interactions during collaboration on online platforms have shown that knowledge construction occurred (Jyothi, McAvinia, & Keating, 2012; Zydne y, deNoyelles, & Seo, 2012).

However, there has not been many studies in the analysis of collaborative learning on wikis using knowledge management (KM) processes (Biasutti & El-Deghaidy 2012). KM is originally used for the management of organizations, but its use has been extended to education (Biasutti & El-Deghaidy, 2012). Kappes and Thomas (1993) have explained the procedures of KM for the transformation of knowledge as follows: Knowledge acquisition, Knowledge internalisation, Knowledge creation, Knowledge sharing, Knowledge application and innovation process. Instructional activities may require students and undergraduates to search and transform knowledge from the large amounts of information online accessed through the internet. However, there does not seem to be much emphasis on KM in schools, as well as in higher education (Cranfield & Taylor 2008; Biasutti & El-Deghaidy, 2012). Hence, there is a need for studies to determine how knowledge management can be effectively utilised in schools and institutes of higher learning for construction of knowledge.

In preparing the collaborative writing task, the learners need to manage the knowledge before it can be published on the wiki (Biasutti & EL-Deghaidy, 2012). The learners undergo the processes of knowledge management, such as searching and selecting appropriate information, linking the new knowledge to existing mental schemes for internalization, and creation on new knowledge by making it a collective knowledge for a new situation, as well as sharing and applying the knowledge to different situations (Kappes & Thomas, 1993). These processes are involved in collaborative writing and develop higher level cognitive skills (Biasutti & El-Deghaidy, 2012, Kappes & Thomas, 1993).

In the Malaysian context, there has not been many studies in the use of wikis among teacher trainees, and even fewer on the analysis of knowledge management processes. This study is important as Malaysia’s education system is undergoing a transformation towards quality teaching and learning. Teacher education programmes should emphasise on the use of knowledge management skills for developing good teaching practice (Biasutti & El-Deghaidy, 2012). Knowledge management skills can be used in the classroom to prepare the students they teach as future knowledge workers (Biasutti & El-Deghaidy, 2012)

2. Method

In this case study, the knowledge management processes of teacher trainees is analysed and determined from a survey and interviews after completion of several collaborative tasks over a period of four weeks.

• What are the participants’ perception of knowledge management processes in an online Wiki experience?
• What are the participants’ perception of satisfaction learning using wiki?

2.1. Procedure

In this study, the participants were 30 teacher-trainees in a final year undergraduate class on educational technology in a public university. The tasks were to identify different types of curriculum and curriculum models and to post the answers on group wikis in a Moodle-based Learning Management System. The tasks were done in the computer laboratory during the class, as well as out of class. On completion of the tasks, the participants were surveyed using the questionnaires below. Triangulation of data from the interviews and the content analysis of the written documentation of the tasks on the wiki were done to verify the findings.

2.2. Instrument

There were two instruments used; The Knowledge Management Questionnaire (KMQ) and Student Satisfaction Questionnaire (SSQ). The KMQ measures the application of KM processes in online wiki collaborative activities
using a 5-point Likert Scale for KM (Biasutti & El-Deghaidy, 2012). The KMQ was reliable above the 0.70 standard of reliability, with a total Cronbach alpha of 0.86. The SSQ assessed the students’ opinions on the use of wikis for collaborative tasks on a 5-point Likert scale covered the use of the wiki; the didactic material and the instructor (Biasutti & El-Deghaidy, 2012). The SSQ had Cronbach’s alpha coefficients above the 0.70 standard of reliability as follows: Wiki tool alpha: 0.73; Didactic materials: 0.71; and Instructor: 0.85.

3. Findings and Discussion

Although many of the students were digital natives, many had never used wikis before (23.3%) with more (60.0%) who used wikis very rarely. This course had provided most of them their first experience of using wikis for learning. While most were successful in using the wiki, 2 participants (6.7%) did not access the wiki at all (Table 1).

Table 1: Frequency accessing wiki for period of assignment

<table>
<thead>
<tr>
<th>Number of times accessed wiki</th>
<th>Never</th>
<th>Only once or twice</th>
<th>3-6 times</th>
<th>7-12 times</th>
<th>More than 13 times</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>2</td>
<td>9</td>
<td>5</td>
<td>12</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Percent (%)</td>
<td>6.7</td>
<td>30.0</td>
<td>16.6</td>
<td>40.0</td>
<td>6.7</td>
<td>0.0</td>
</tr>
</tbody>
</table>

3.1. Knowledge management processes

In the KM processes, the participants scored highest in the domain of knowledge sharing (Mean = 4.2821; S.D. = 0.60624); while the lowest is in knowledge acquisition and knowledge internalization (Mean = 3.8718; S.D. = 0.53642 and Mean = 3.8462; S.D. = 0.50213 respectively) (see Table 2). While participants are able to share the knowledge the internal processes related to knowledge generation is slightly lower among teacher trainees.

Table 2: Min and standard deviation on KM domains

<table>
<thead>
<tr>
<th>Domain</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Acquisition</td>
<td>3.00</td>
<td>5.00</td>
<td>3.8718</td>
<td>.53642</td>
</tr>
<tr>
<td>Knowledge Internalization</td>
<td>3.00</td>
<td>5.00</td>
<td>3.8462</td>
<td>.50213</td>
</tr>
<tr>
<td>Knowledge Creation</td>
<td>3.00</td>
<td>5.00</td>
<td>4.0256</td>
<td>.63043</td>
</tr>
<tr>
<td>Knowledge Sharing</td>
<td>3.00</td>
<td>5.00</td>
<td>4.2821</td>
<td>.60624</td>
</tr>
<tr>
<td>Knowledge Application</td>
<td>3.00</td>
<td>5.00</td>
<td>4.0769</td>
<td>.64051</td>
</tr>
</tbody>
</table>

KM processes which involved knowledge sharing, creation and application were occurring according to the student’s perception. This was evidenced in the content analysis and interviews. There was evidence of knowledge acquisition processes: I acquired knowledge through reading and searching for information; and I read work from other groups and acquired knowledge from one another. Although it was difficult to get evidence of internalization in the writing task during the interviews the learners shared: *When you discuss things online, the information stays in words, we gain knowledge and retain the knowledge. When we read what had been written, we process the old information into new information, or point out things we might have missed.*

Knowledge creation was evidenced from the tasks on the wiki. As a suggestion from one participant: *We’re in such a modern age that we should really utilize the technology that we have to move students to encourage them to produce better quality work and train them to arrange their thoughts and findings in a cohesive and academic manner.*

Knowledge sharing and Knowledge application was shown to be beneficial. *Wiki helped me to apply knowledge*
through the benefits of cooperative learning and sharing. It is great to learn from each other and its less teacher-centered too. It is precisely the shift that we need if we want to improve the educational system - to instil a want to learn, a thirst for knowledge that students would seek and share it. Not just wait for information to be given to them.

3.2. Student Satisfaction

As for satisfaction in the use of wikis, the participants seemed to have a higher mean for the instructor (Mean = 4.6838, S.D. = 0.38449) as compared to the wiki tool and didactic materials (Table 3). The instructor was friendly, energetic and stimulated the formation of the online community by giving feedback and suggestions during the activity. There were didactic materials posted for interaction to generate knowledge for the tasks but the participants found it somewhat useful, but less useful and challenging. However, all participants agreed on the usefulness of seeing others comments for learning. The participants were less satisfied with the wiki tool and the materials provided for the task but seemed more engaged with the instructor. One participant stated: *I think wiki is a new way for students to do group work, but it doesn't really induce changes in my teaching as we have to consider the facilities available in schools before we can use all those technologies. The wiki may be used for group work, but should not be the only method.*

<table>
<thead>
<tr>
<th>Table 3: Min and standard deviation on Student Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
</tr>
<tr>
<td>Wiki tool</td>
</tr>
<tr>
<td>Didactic materials</td>
</tr>
<tr>
<td>Instructor</td>
</tr>
</tbody>
</table>

The participants believed that they would continue to use wikis in other courses (46.7%), while the remainder (53.3%) stated they would definitely use wikis.

4. Conclusions and implications

This study is significant as it is important for teacher trainees to develop knowledge management skills and to encourage the use of these skills while teaching in school. Collaborative problem solving is important for developing critical thinking and sharing of information for knowledge construction. KM processes can aid in knowledge construction to generate new knowledge. In this case, a specific technology tool, the wiki is used for collaboration and knowledge construction.

Firstly, knowledge acquisition is not limited to text as information can be found in repositories, databases and social media. Search engines afford the task of locating knowledge but the acquisition of knowledge requires the selection of appropriate information using suitable strategies, tools and methods. Teacher trainees will need to be trained in these strategies and methods (Biasutti & El-Deghaidy, 2012). When the newly acquired knowledge is linked to previous mental schemata, internalisation occurs and knowledge is incorporated into the individual’s tactic knowledge (Biasutti & El-Deghaidy, 2012).

Knowledge creation occurs when there is new knowledge from the community after acquisition and internalization processes, as the community transforms the tactic knowledge into explicit knowledge collectively. This transformation occurs through collaboration and interaction in supportive learning environments maintained by the instructor (Grieff et al. 2013; Hung 2013; Zhang et al., 2007; Montero-Fleta & Pérez-Sabater, 2011). Teacher trainees need to acquire skills which can guide the community of learners to transform the knowledge.

Knowledge sharing enhances the externalisation and dissemination of knowledge. The wiki seems to be a satisfactory tool for this purpose. The interaction and sharing of information with the instructor’s support enabled collaborative learning (Biasutti & El-Deghaidy 2012). Knowledge innovation and application is the ultimate goal of KM as the purpose of KM is to realise the value of knowledge and create new wealth for the community by seeking
new inventions, acquiring new knowledge, exploring and mastering the new rules (Chen & Xu, 2010).

The success of the KM processes may be directly related to teachers’ skills. Further studies will need to be done to verify this. In addition, there is a need for a model for knowledge generation and innovation using KM processes for teachers and trainee teachers to manage and process information for learning. The information literacy skills which is required for KM processes needs to be identified for successful learning. In addition, instructional methods and technology tools which can be used for successful KM is required.

There are advantages to using wikis in KM processes for learning. However, the role of the instructor in using the tool and encouraging collaboration is important in the design of the learning environment. KM processes are important to develop skills for use in this era of rapid change in the 21st century.

Acknowledgements

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References


