Teaching to Learn and Learning to Share: Assessing a Culture of Sharing Amongst Information and Knowledge Management Students in a Virtual Environment

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Abstract: Knowledge and information sharing has become synonymous with the concept of creating value and power for organisations. Knowledge is being recognised as a valuable asset and the promotion and dissemination of information and knowledge in its internal workings has the aim of creating learning organisations. The sharing of information and knowledge creates a community where participants can collaborate with each other in achieving their goals. In a knowledge management course in the Department of Information and Knowledge Management, at the University of Johannesburg (South Africa), students are introduced to these concepts as part of their training to pursue various careers as information and knowledge workers within organisations where these concepts have to be applied. Using a philosophy of teaching by example, students are encouraged to share information and knowledge, making use of discussion boards in a virtual learning environment as part of a multi-modal learning approach that includes face-to-face lectures as well as an online interactive environment. Discussion topics are provided in line with a case study that students are requested to analyse. Students' reflections on the learning that has taken place, based on the responses to the discussion topics, form part of the case study analysis which is assessed. The purpose of the research is to gain insight into the effectiveness of information and knowledge sharing in a virtual environment using discussion boards in terms of its impact to generate a learning culture. A mixed methods approach is applied to 210 registered students in a second year group and 123 registered students in a third year group by monitoring their discussions on allocated topics. Firstly, content analysis methodology is applied to assess the knowledge sharing that is taking place in the virtual environment. Secondly, a survey is conducted at the end of the discussion period to determine student experiences, perceptions and opinions on the knowledge sharing process and is used to adapt and develop the course design. Thirdly, students are required to reflect on the learning experiences as part of the submitted case study analysis assignment. The discussion monitoring will investigate the following variables: (1) student participation rates, frequency and patterns; as well as (2) cognitive and meta-cognitive components of student messages. The survey and reflection will be used to assess the students' (3) perception of learning through sharing; (4) experiences of group dynamics and (5) their perceived individual performances based on the discussion groups. This research includes an investigation of using different group dynamics to compare the experiences of students being managed in a randomly selected group as opposed to students signing up to a group of their own choice. It is hypothesised that the findings from this research will provide important answers required to facilitate students with diverse skills and socio-economic backgrounds in their cognitive and meta-cognitive development for information and knowledge sharing when making use of online discussions boards.

Keywords: Knowledge and information sharing, learning organisations, virtual environment, discussion boards, content analysis methodology

1. Introduction

"We believe most people have a natural desire to learn, to share what they know, and to make things better" (O'Dell, Grayson & Essaides 1998).

Drucker (1988) predicted that typical businesses in 2008 would have half the levels of management and one-third the managers that they had twenty years ago. He predicted that work would be done by specialists across traditional departments, that information technology would lie behind the changes, that knowledgeable users would be transforming data into information and that businesses would be knowledge-based with disciplined, self-directed specialists that measure their own performance through organised feedback from colleagues, customers and headquarters. Drucker (1988) further described the revolutions that have been taking place in the concept and structure of organisations. The current revolution is the third revolution that he describes which entails the shift from command-and-control driven organisations to the knowledge-based organisation that is continuously learning in order to survive and grow. Authors such as Malhotra (2001, 2004), Stewart (2001) and Koenig (2004, 2005) confirms the existence of this third revolution. Giley and Maycunich (2000) defines a learning organisation as one that "learns powerfully and collectively, continually transforming itself to more effectively manage knowledge and empower its people to learn as they work, utilising technology to maximise learning and production". If tertiary institutions are to train knowledge workers for these

knowledge-based organisations, a link between learning, working and organisation should be fostered within the teaching philosophy.

Knowledge-based organisations have to supply context, support and stimulate activities for creating knowledge. Tobin (1997) is of the opinion that organisations learn through experience and discovery, supported by sharing knowledge and providing access to knowledge. This teaching by example approach has been taken in a second (equivalent to sophomore) and third year (equivalent to junior) undergraduate Information and Knowledge Management course at the University of Johannesburg, South Africa. Through a combination of face-to-face and online delivery between lecturer and student, coupled with interactive learning activities in a student to student interaction a learning environment with an appropriate knowledge-base is created through which students have the opportunity to develop skills required for entering into knowledge-based learning organisations. The student to student interaction is the subject of this research and is designed to encourage students to share information and knowledge on their own learning and understanding of prescribed topics making use of discussion boards on the University's interactive learning platform based on the Blackboard system called Edulink. The purpose of the research is to gain insight into the effectiveness of the information and knowledge sharing that has taken place in terms of its impact to generate a learning culture. The objectives are to:

- assess the content of discussion groups on prescribed topics;
- gauge student experience, perceptions and opinions of knowledge sharing through discussion boards;
- monitor discussions in terms of student participation rates, frequency and use patterns;
- assess variations in group dynamics.

A mixed methods approach is applied to 210 second year students and 123 third year students by monitoring their discussions on allocated topics in terms of content, discussion patterns and following up with a survey on their perceptions, opinions and experiences.

2. Research methodology

A mixed methods approach, combining qualitative and quantitative methods is decided on to offset the weaknesses inherent within one method with the strengths of the other method (Cresswell 2003:217). The research follows an exploratory and descriptive design typically done, according to Babbie (2007:88) to satisfy the researcher's understanding of the topic, to test the feasibility of undertaking a more extensive study and to develop the methods employed in any subsequent study. Furthermore a case study research design is followed based on case studies being the preferred strategy when 'how' and 'why' questions are being posed, when the researcher has little control over events and when the focus is on contemporary phenomenon within real-life context (Yin 2009:2).

In order to address the objectives that have been set a four-pronged approach is used to gather primary data.

2.1 Content analysis methodology

Content analysis methodology is used to assess the knowledge sharing that is taking place in the virtual environment for this research. Content analysis methodology is regarded as the preferred approach for content analysis. The methodology as described by Henri (1992) consists of five elements that evaluate computer-mediated communication. The five elements are participation, interaction, socialisation as well as cognitive and meta-cognitive evaluation. According to Hara, Bonk and Angeli (2000) cognitive and meta-cognitive evaluation is used for measuring reasoning, self-awareness and critical thought. Cognitive presence is defined as "the extent to which participants in any particular configuration of a community are able to construct meaning through sustained communication" (Garrison, Anderson and Archer 2000). The content analysis methodology is applied to address the first stated objective, namely to assess the content of discussion groups on prescribed topics.

2.2 Survey and reflection of experiences, perceptions and opinions

The second objective namely gauging students' experiences, perceptions and opinions of knowledge sharing through discussion boards will be achieved by designing and administering a survey at the

end of the discussion period. The survey is custom designed but will draw on previous research found in literature and will include socio-demographics as well as various questions to address experiences, perceptions and opinions in both close-ended and open ended questions. The socio-demographics are included to draw potential correlation analyses of quantifiable data. A descriptive analysis will be conducted for the open-ended questions. Two different forms of reflection have been included, one formal section in a case study discussion that will be assessed and a second as part of the open-ended question in the custom-designed survey.

2.3 Discussion monitoring

A discussion monitoring schedule is designed to address the third objective and will monitor discussions in terms of student participation rates, frequency and use patterns. The expected findings of the discussion monitoring will be used to address the logistical aspect of the course design and suggested changes for the future.

2.4 Comparative analysis of group dynamics

The groups for the second years were randomly assigned to a maximum of 10 members per group using the computer-based randomisation tool on the Blackboard system. The third year group was allowed to assign themselves to groups to a limit of 10 members per group. Bearing maturity levels of the second versus third year students in mind a comparison in group dynamics will be done between these two groups as part of the survey questions representing the student opinions on the role the group played on their discussions. The monitoring schedule will also be used to pick up variations in discussion patterns and determine if this would correlate to the group dynamics.

The focus of the research is to gauge the learning that is taking place through and on knowledge sharing by using a virtual learning environment as a collaboration tool which is known as a discussion board creating a virtual environment where students and lecturers can interact with each other.

3. Literature review

Johannessen (2008:407) indicates that due to the complexity of the workplace the requirements for the training of the workforce are undergoing a shift from traditional, practical training towards training at higher education which has a theoretical nature. Employees are required to have methodological strengths being able to define, analyse and synthesise problems. Furthermore "applied skills such as realism, initiative, the ability to innovate and willingness to run risks will be on demand" (Johannessen 2008:407). Employees that can interact their knowledge with other branches of knowledge to function as a whole will be sought after.

Knowledge and information sharing according to Skyrme (2001) creates value and more power for organisations. People working together and sharing their knowledge will succeed in establishing a more powerful working environment and knowledge is seen as the most valuable asset, playing an important role in an organisation with the aim of creating a learning organisation. Skyrme (2001) indicates that the sharing of information creates a community where participants can collaborate with each other in achieving their goals. Sharing of knowledge is encouraged with the objective of forming collaboration platforms among people in a working environment. The collaborative platform that forms among people is referred to as a community of practice. A community of practice has the intention of gaining more knowledge through the sharing of information, thoughts and ideas based on a common goal. Burk (2000) points out that communities' members raise each others competencies through sharing. Information and knowledge sharing focus has shifted from face-to-face interaction to sharing information in a virtual environment. It is in line with this reality in modern businesses that the virtual learning environment was developed for students to learn and share in addition to face-to-face classroom facilitation.

Naish (2009:11) emphasises that in learning, attention management is a crucial skill and guiding students through resources is needed when students are faced with information overload. He remembers one of his university professors telling him that "lectures are an invitation to learn, rather than a complete summary of what you have to learn" (Naish 2009:11). The discussion topics for this research were developed to allow students to learn in a platform other than traditional learning platforms.

Information and knowledge sharing has become a strategic tool applied by people to achieve their goals. According to Yuen & Majid (2006) students are very fortunate with the large amount of information to their disposal in furthering their studies. Walker (2002) mentions that knowledge sharing through a collaboration platform can create positive learning amongst students. Students can thus experience a positive learning outcome which can impact positively on their academic results. Some research findings on virtual learning environments are provided.

3.1 Previous research on virtual learning environments

Virtual learning environments include learning applications such as e-learning (mostly web-based gaining access via computers) and lately m-learning (access gained via mobile technology such as personal digital assistants and mobile phones) (Hockley 2009:24). Although e-learning cannot be regarded as a new way of learning it remains a popular way of learning in businesses and the academic world. Regardless of e-learning's initial enthusiasm to replace face-to-face learning it has grown into a significant part of blended learning approaches (Hockley 2009).

Harasim in Wu and Hiltz (2004) provides a distinction between computer mediated discussion and face-to-face discussions indicating that they are based on their richness and communication structure as well as the time and place dependence. Larkin-Hein and Irvine (1998) describes online discussions groups as relatively new applications that can be used by learners to facilitate their active role in the learning process. Wu and Hiltz (2004) reported research by Harasim which showed that learners' perceptions of learning are more focused in an online interaction than in a face-to-face encounter. The theory behind the active participation suggests that students involved in an intellectual online environment establish a platform for better learning because active, thoughtful and equal contributions are made possible (Althaus 1997). The study done by Althaus (1997) determined whether face-to-face discussion and/or computer-mediated communication (CMC) can contribute to undergraduate students' academic performance when they are part of a large lecture group. The study showed that a superior learning environment was created by the participation of one hundred and forty- two undergraduates who used the combination of face-to-face and computer mediated communication in comparison with the traditional face-to-face discussions only. Rodgers (2009:22) found that an extra hour of e-learning engagement increased average student's module mark.

Larkin-Hein and Irvine (1998) reports a pilot study from the American University in terms of the effectiveness and understanding of Physics of sixty two students that volunteered to participate in online discussions. The study results concluded that online discussions were found useful and beneficial and that most students had the perception that online discussions must be continued for future classes, but on a voluntary basis and that instructors should give constructive feedback. Larkin-Hein and Irvine (1998) acknowledges online discussions as a tool to provide additional learning where students can apply the information they have gathered. According to a study done by Thomas in Wu and Hiltz (2004) high levels of cognitive engagement and critical thinking can be achieved in online discussion boards, but this virtual learning environment lacks the coherent and interactive dialogue that is necessary for conversational modes of learning. A way of overcoming this is through active involvement of the facilitator or instructor.

Wu and Hiltz (2004) reports on a survey conducted by the SUNY Learning Network with the purpose of establishing three factors which can have an influence on the success of online courses. The sample included 800 registered students in 264 courses. Three factors played a vital role in the success of these online courses namely the consistency in course design, contact with the instructors as well as active discussion. The students' perceptions of learning were related to interactions from the instructors, other people and the value placed on participation.

Numerous differences between males and females have been shown in previous research. Some studies showed that females experience problems during computer-supported learning due to a lack of computer ownership and lack of computer skill confidence (Wu and Hiltz 2004). However some studies have shown superior verbal skill amongst females outranking those of males. Female students showed higher confidence levels in online discussions as apposed to males (Wu and Hiltz 2004). Rodgers (2009:23) confirms female students outperforming male students, however he found that the benefit that female students derived from a given level of e-learning effort was less than that gained by male students. A possible reason for this was reported to be the reality that male and female students learn systematically different and that a male academic developed the learning package. Rodgers (2009:23) cautions that these aspects should be considered when developing e-

learning material. Previous research identified a number of advantages and disadvantages of learning through online discussion boards.

3.2 Advantages and disadvantages of online discussions

According to De Bruyn (2004) an online discussions or CMC gives students the opportunity to communicate irrespective of time and place. Small groups can be formed to create questions, opinions and queries based on communication. Students are furthermore able to follow and trace conversations that are specified by label and recognised by structure.

De Bruyn (2004) summarises the associated advantages of online discussions as described by several authors (Harasim, Hiltz, Teles & Turoff 1998; Hewitt 2001; Mason & Kaye 1989, 1990). Further advantages as described by Emmer and Gerwels (2002) as well as Hara, Bonk and Angeli (2000) are listed below:

- Communication skills, group dynamics and more active sharing of knowledge are increased.

- Assist students with understanding of work, answering questions and solving problems.

- Increase in connectivity and accessibility through online discussions shows an increase of group interactions. Students' participating in an online interaction finds that resources are accessible.

- Equal communication is encouraged because communication is spread equally amongst students instead of them having to take turns.

- Reflection of students increases through rereading and revisiting the messages before replying to message.

- Student conversation becomes boundless seeing that there are no time or place restrictions to contributions from all students.

- CMC allows students control in reflective learning giving students the opportunity to reflect on thinking and to communicate ideas.

- Comments can be reused by students to refer back to discussions and answer patterns and a progress report can be created that can keep an update on students' developments of online discussions and can also predict the development factors necessary for assisting a learning group.

The same authors have also reported a number of disadvantages:

- Technical difficulties are often experience associated with hardware and software access problems.

- Communication anxiety towards interaction due to students perceiving their messages as wrong, or students new to online discussions may experience anxiety due to the unfamiliar and impersonal online environment.

- Lack of social presence due to the online environment that operates as a platform of learning and does not allow for social cues.

- Limited student interaction as a result of students not trusting that the online interaction can provide them with the knowledge they need. Another reason may be that students may lack encouragement and motivation.

- Lack of support of convergent process.

- Time management problems where students have a time limit when engaging in a face-to-face encounter could hamper communications.

- Information overload often overwhelm students due to the amount of information coming in.

- Misconceptions can be created when feedback are not given to students regarding their discussion.

- Traditional roles in terms of students and the instructor are not always clear.

- Lack of visual communication of facial expressions leave students in a position to make their own assumptions of their audience

Based on the lessons learned through the findings of the previous research that has been reported, as well as building in possible avoidance strategies to counter the disadvantages identified in the

previous research the online discussions were developed in the second and third year groups at the Department of Information and Knowledge Management at the University of Johannesburg.

3.3 Discussion boards for teaching and learning at the University of Johannesburg

The online learning environment at the University of Johannesburg is known as Edulink and is based on the Blackboard learning management system. Blackboard is according to Greasley and Bennett (2004) a web based server software platform which offers structures for subject materials and course management. The learning management system is part of the integration in the University of Johannesburg portal and student registration system. This platform offers the content needed for teaching a subject which can only be accessed by students and their instructors The blackboard consist of course content, announcements, assignments, tools, grades, resources and discussions boards which supports learning and teaching functionalities. The functionalities are divided according to;

- Information and communication tools including a calendar, e-mail, discussions and chat.

- Assessment and assignment tools consisting of quizzes and surveys.

- Management tools that involves tracking and grading of students' results.

The discussion board functionality is a collaboration medium which allows interaction between students and their lecturers via the internet on Edulink. The purpose of the discussion board creates the opportunity of interaction between students as peers, as well as students and lecturers based on information about the specific subject. It can be seen as a learning environment between participants in creating an understanding and sharing new knowledge. This is seen as a great opportunity for students who want to attain higher grades by engaging in this interaction. The value of online discussions according to Simpson (2004) is to create a rich learning environment through interaction and to engage in collaborative learning experiences in tertiary education.

This statement resides on the belief that the knowledge conversion life cycle or the SECI model as developed by Nonaka and Takeuchi (1995) does in actual fact transpire during and after discussions have taken place. Students would have experienced tacit knowledge being conversed into explicit knowledge and again into tacit knowledge as part of the creation of new knowledge.

4. Lessons learned during the research process

Weekly discussion topics were designed for the second years for the first four weeks of the second quarter of the first semester and for the third years for the first three weeks of the second quarter of the first semester. Both second and third years received topics requesting students to critique, debate or explain topics relating to a larger case study report due respectively within the third and fourth week of the semester. The reasoning behind this approach was to facilitate students in an early engagement with the work for the case study as experience has shown that students tend to engage at the last minute with submission work. A part of the case study report requests students to reflect on the learning that has taken place during the discussions and the reflection contributes 20 % towards the case study report assessment mark. This was done to ensure student participation in discussion boards by adding a value (assessment) mark to the purpose of participating in online discussions. At the time of writing this paper the discussions are progressing in the third week and concrete results have not been received in the form of the feedback or survey results and content analysis had not been finalised. However preliminary results in the form of observations of the monitoring of the process have been done. The following observations and possible reasons have been made. In most cases corrective actions have been taken as well. Major disruptions to the second quarter of the first semester have been experienced in terms of the year planner of the University of Johannesburg for an autumn recess as well as in terms of public holidays during the month of April. Week one discussions commenced prior to the autumn recess on 26 March (the autumn recess commenced 28 March-14 April). Class attendance was very poor at the time of announcing the discussion topics. The autumn recess ended a day after the Easter weekend and with three academic days remaining on the calendar class attendance was also very poor for week two. Week three of the second quarter of the semester had a public holiday on the Wednesday and week four had a public holiday on the Monday. Although most students attended class in weeks three and four they had to catch up on missed discussions that took place in weeks one and two. The initial planning was to allow a week window period for discussions after which time the discussion topic would be closed for new entries. This idea was abandoned when the logistical problems surrounding the holidays became apparent. All discussion topics then remained open to allow for improved frequency and responses to postings. As

a result the instructor was inundated with tracking and responding to an average over 250 new messages per week for discussions 1-4 and 1-3 as students posted messages to all discussions at any time of the three and four week period. This message overload compromised on the instructor's ability to respond timely to all message groups.

In correspondence with the disadvantages of online discussions as reported in paragraph 3.2 it was observed that students had obstacles in gaining access to the virtual environment due to planned software upgrades (communicated at the last minute to instructors) as well as bandwidth difficulty with students working from home during holidays. Some students are confined to using computers at the university as they do not have personal computers or laptops. Computer laboratories were also closed during public holidays during which time students could not access Edulink discussions.

Corrective measures to counter these unforeseen obstacles included lengthening the window opportunity for contributing to discussions, motivating students during classes to participate in the discussions by relating the benefits of peer learning and the discussion topics to the context and content of their syllabus work. With technical software problems immediate corrective action was taken by Edulink design and support staff to ensure the smooth running of the applications of the discussion boards.

5. Preliminary findings

Although content analysis can only commence once the discussions have been concluded and preliminary observation has been made with regards to response differences in the second and third year groups. The second year group was divided into randomly selected groups, while the third years had the opportunity to assign themselves to a group of their choice to a maximum of 10 members per group. When monitoring the differences between the discussion postings of the second year and third years a greater frequency of message postings are seen amongst the third year group. The intent is to determine with the survey whether the variations in frequency are related to the students being assigned to a group versus assigning themselves to a group of their choice. It is however possible that the variations in frequency of message postings between the second and third years can be due to a higher level of academic maturity amongst the third years. Once the content has been analysed and possible correlations drawn in terms of survey results and groups a greater understanding of this preliminary observation will be achieved.

It was also observed that students tend to respond with higher quality discussions after message posting from the instructor to either compliment students on their insightful postings or by correcting misconceptions. Final analysis will determine whether this observation is a trend throughout the second and third year groups.

Drucker (1988) characterised learning organisations as those where work is done by specialists that are willing to discipline themselves. If an actual correlation exists in the student's approaches to deliver better quality after moderation intervention has taken place, more needs to be done to develop self-motivated students that can become disciplined specialists geared to harnessing working, learning and innovation as an extension of their personal aspirations. Botha, Kourie and Snyman (2008:75) identify a close link between working, learning and innovation which was conventionally thought to conflict with each other. Learning is viewed as the bridge between working and innovation which evolves in communities of practice being significant sites of innovation. If an organisation wishes to foster working, learning and innovation it needs to close the gap by re-conceiving itself as a community of communities. Within ivory-tower mentality so often found in universities individual learning and specifically organisational learning has to become the prime focus area. Davis and Botkin (1995) envisaged that smart technologies may revolutionise learning by employees and customers in business before it affects students and teachers in schools. If a learning organisation is an organisation skilled at creating, acquiring and transferring knowledge, and at modifying its behaviour to reflect new knowledge and insights it could be safe to say that universities are learning organisations due to its inherent core function of knowledge creation and transfer. Botha et al (2008:91) maintain that successful organisational learning and the knowledge-enabled organisation is the result of symbiosis of people and their knowledge (lecturers), business processes (knowledge creation and transfer through research and teaching) and supporting technology achieved through a successful learning cycle of conceive, act and reflect.

6. In conclusion

It is with bated breath that the results of this research are awaited. Not only will the results provide valuable lessons in the instructional design of discussion boards within syllabi contents but it will also show the quality of learning that students experienced when analysing the content of the messages as well as their reflections on the learning. The comparison in the group dynamics of the second and third years, as well as the survey results will provide valuable answers in making future decisions regarding the assigning of groups and the running of the process. Most importantly the results are expected to show whether the students learnt the value of using an application such as a discussion board as part of a value and power creating process by having communities of practice share knowledge with the aim of not only creating learning organisation, but creating new knowledge - the pathway might be paved for innovation.

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