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Improving Student Academic Performance through Knowledge Sharing

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Abstract:

The study aims to find empirical evidence regarding the positive influence of social network variables and information and communication technology variables on knowledge sharing. The study also aims to find empirical evidence regarding the positive influence of knowledge sharing variables on student academic performance. The population of the study were all students at universities in the City of Semarang, Central Java, Indonesia. Meanwhile, 296 samples were taken using the quota sampling method. Data processing was carried out using Structural Equation Modeling-Partial Least Square (SEM-PLS) with the help of the WarpPLS application. This study succeeded in proving that social network variables and information and communication technology variables positively influenced knowledge sharing. The study also found empirical evidence that knowledge sharing has a positive effect on student academic performance. The research has theoretical and practical implications. From the theoretical implication, the findings give clearer description about the relationship among variables used in the current research. From the practical one, the findings can be used by main stakeholders to improve academic performance by increasing knowledge sharing activities. The study also has limitations and future research agendas.

Keywords: social network, knowledge sharing, student academic performance.

通过知识共享提高学生的学习成绩

摘要:

该研究旨在寻找关于社交网络变量和信息与通信技术变量对知识共享的积极影响的实证证据。该研究还旨在寻找关于知识共享变量对学生学业成绩的积极影响的经验证据。研究对象是印度尼西亚中爪哇省三宝壟市大学的所有学生。同时，采用配额抽样法抽取了 296 个样本。在变形求助应用程序的帮助下，使用结构方程建模-偏最小二乘法(扫描电子显微镜)进行数据处理。这项研究成功地证明了社交网络变量和信息与通信技术变量对知识共享有积极影响。该研究还发现经验证据表明，知识共享对学生的学业成绩有积极影

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响。该研究具有理论和实践意义。从理论意义来看，研究结果更清楚地描述了当前研究中使用的变量之间的关系。从实践的角度来看，主要利益相关者可以使用这些发现来通过增加知识共享活动来提高学业成绩。该研究也有局限性和未来的研究议程。

关键词： 社交网络、知识共享、学生学习成绩。

1. Introduction

Nowday, the main advantages of an organization are no longer based on tangible assets. Organizational excellence actually comes from intangible assets, especially knowledge. The indication is in line with the statement of González-Loureiro, Alonso, and Schiuma (2015) that knowledge is accepted as an intangible asset to create and maintain competitive advantage. With the increasing importance of knowledge, many organizations are starting to focus on increasing their intellectual assets through knowledge management. Knowledge sharing is a major issue in organizational knowledge management (Levine et al., 2013).

Knowledge sharing has an important role in improving the performance of institutions, including higher education institutions. This is complies with Tabish and Syed (2015), stating that knowledge sharing has an important role to improve performance in all academic institutions, included universities. Knowledge sharing is considered the basis for learning and research in higher education institutions (Kumar, 2005). Lichtenthaler and Ernst (2006) stated that knowledge sharing is a daily activity of universities and individuals who are involved in it. The parties involved have the hope of increasing insight and understanding of concepts and practical applications. Thus, the level of learning and expertise will increase.

One of the important elements of higher education is students. For students, knowledge sharing is considered an important instrument where students can learn from each other and develop intellectually. Collaboration and knowledge sharing occurs between students and students, between students and their lecturers, between fellow lecturers and others. The output of the collaboration and knowledge sharing promote the creation of new knowledge and ideas and improves student academic performance.

According to social constructivist theory, learners create new knowledge by collaborating with others in certain contexts or through socialization and social interaction. In accordance with the theory above, learning will be more effective if students are involved in discussions, dialogues, problem-solving activities with fellow students regarding knowledge, ideas, experiences and skills. In this context, students need to have good social networks.

Social networks are one of the important things in knowledge sharing. Through social networks, knowledge is shared among individuals. These networks can bridge the knowledge and skill gaps (Leibowitz, 2007) and encourage collaboration among learners. The use of social networking sites has attracted a lot of attention from internet users. These

sites have become part of his daily routine activities. Students spend many time every day for this activity (Michikyan et al., 2015).

The growth of social networks offers solutions, new insights and mechanisms for knowledge sharing for many institutions, including educational institutions. The exchange of information and knowledge through social networks has changed lifestyles and promoted individual and organizational learning (Chen & Hung, 2010). The internet facilitates the exchange of information in various ways (Liang et al., 2008).

As the use of social networking websites expands, the demand for communication and information sharing among individuals is increasing. An increasing number of internet users collaborate on social networks to gain knowledge to manage life's difficulties (Liang et al., 2008). More specifically, Grosseck, Bran, and Tiru (2011) found that students spend much time doing activities in this social network to send e-mails to family members or acquaintances. They also share photos and videos and comment on posts. The students also share information and knowledge with each other in order to do their academic assignments.

Active and voluntary knowledge sharing is a key to successful collaborative learning for college students. These exchanges help students answer questions, solve problems, learn new concepts and improve understanding of certain subjects (Högberg & Futurizer, 1998). Thus, this is evidence that interaction and knowledge sharing among students is an important component in the student learning process (Ma & Yuen, 2011).

In addition to social networks, technology is also an important factor in knowledge sharing. The research by Eid and Nuhu (2011) examines the influence of learning culture and the use of information technology on knowledge sharing. Research findings indicate that the use of information technology is important in improving learning. Furthermore, information and communication technology has a facilitative role for sharing organizational intellectual assets in the form of knowledge (Yuan et al., 2013).

Many studies on knowledge sharing in the context of business and the public sector have been conducted out (Tsai & Ghoshal, 1998; Rhodes et al., 2008). However, in-depth research that analyzes the factors that influence knowledge sharing and student academic performance is still lacking (Eid & Nuhu, 2011). Several previous studies positioned knowledge sharing as the dependent variable. Meanwhile, knowledge sharing can influence performance, including student academic performance. Thus, knowledge sharing can be treated as a mediating variable. Knowledge sharing can be directly influenced

by certain antecedents. However, knowledge sharing can directly affect academic performance and other outputs (Zaqout & Abbas, 2012). This research attempts filling the existing gap.

Based on the description above, the study aims to find empirical evidence regarding the influence of social networks, information and communication technology on student knowledge sharing. The study also aims to find empirical evidence regarding the effect of knowledge sharing on student academic performance.

2. Literature Review

2.1. Social Networking and Knowledge Sharing

The knowledge creation view is considered an appropriate approach for building and investigating knowledge networks in informal learning setting (Paavola et al., 2004). Truran (1998) found that informal interaction is an effective way to share a lot of meaningful knowledge among learners. Thus, social interaction is important in knowledge sharing.

Some researchers focus on the role of social networks in knowledge sharing (Al Saifi et al., 2016). Chai et al. (2011) discuss the influence of social networks on knowledge sharing in the Some researchers focus on the role of social networks in knowledge sharing (Al Saifi et al., 2016). Chai et al. (2011) discuss the influence of social networks on knowledge sharing in the blogging community.

Meanwhile, Marouf (2007) focuses on business and social ties and their impact on knowledge sharing in 22 public and private sector companies. One of the important findings from a number of studies above is that social networks have an important role in knowledge sharing activities.

In social networks, individuals and other organizational elements participate as social actors to share common interests. In a broader perspective, social networks play an important role in knowledge sharing (Molina-Morales & Martínez-Fernández, 2010). Cheng et al (2012) chose a practical theoretical knowledge approach on a campus basis with their research based on case studies. They suggested that related parties could apply a procedural approach in encouraging teachers/lecturers and students to share their knowledge. Based on the description above, the first hypothesis of the study is H_1 : social networks have a positive influence on knowledge sharing.

2.2. Information and Communication Technology and Knowledge Sharing

Since Internet Technology has rapidly changed the world of knowledge by providing users with greater access to knowledge. Alavi and Leidner (2001) state that information technology enhances knowledge transfer by opening up new lines of communication. Thus, it is possible for individuals to gain knowledge that under normal conditions they may not be able to access. The flow of knowledge through formal

communication networks generally occurs to the extent of authority within the organization, but through ICT, knowledge is open by facilitating contact between those seeking knowledge and those with knowledge.

The convenience of using IT makes knowledge easier to share and more efficient (Riege, 2005). One of the benefits associated with the use of ICT in higher education is flexibility in learning. Students can study in their own place, with flexible time and the method they prefer (Uys et al., 2004). The ease of access to ICT in educational institutions can provide opportunities for the flow of knowledge to several parties at once, between lecturers and students, between lecturers and students, and others. By using ICT, students can periodically publish their work on the internet. The learning process will be recorded and traceable. Information and knowledge can be accessed by all students anytime and anywhere (Chiu, 2010). Based on the description above, the second hypothesis is H_2 : Information and communication technology has a positive influence on knowledge sharing.

2.3. Knowledge Sharing and Student Academic Performance

Knowledge sharing is one of the important elements in knowledge management. Knowledge sharing is the process of sharing knowledge among individuals, groups and organizations. Knowledge sharing can occur through written or face-to-face communication. Ko, Kirsch, and King (2005) defines knowledge sharing as the transmission of knowledge from one source in a certain way delivered to the recipient. Knowledge sharing is also defined as a procedure for the voluntary distribution of skills, experience and knowledge from one person to another (Davenport et al., 2003).

Many students use social media for academic purposes to attend lectures. Al-Rahmi, Othman, and Yusuf (2015) found that social networks can help improve students' academic performance when lecturers use social networks as a teaching method. Their findings show that social networks facilitate collaborative learning that can improve students' academic abilities. Improvements in academic communication can have a positive impact on class discussion and student engagement in the learning process (Ross et al., 2009).

Meanwhile, interaction with others encourages the development of communication skills and increases self-esteem for those who have good interpersonal skills. Thus, it is important to ensure that students spend time with their colleagues appropriately (Ainin et al., 2015). From this context, lecturers who provide lecture materials in various forms, electronic books, ppt files, online videos and others are useful in motivating students to study in an online environment (Chen, 2015). Based on the description above, the third hypothesis is H_3 : Knowledge sharing has a positive influence on students' academic performance.

3. Methods

The study tests hypotheses for justifying or strengthening the proposed hypotheses. The results of the study are intended to strengthen the theory used. The study uses primary data, namely, data obtained directly from the object of research. Questionnaires were used to collect research data. Data collection methods used in the study include primary data collection from questionnaires distributed to selected respondents.

The population of the study were all private university students in Semarang. While the research sample is part of the existing population. The sample of the research is 296 students. The sampling technique is conducted by means of non-probability sampling. This means that not all populations have the same opportunity to be sampled. The reason the researchers use this technique is that of the homogeneous nature of the population. There are several techniques that can be used in this sampling. One of them is the sampling quota. Quota sampling technique is a sampling technique in which a population with certain characteristics are sampled until the specified quota is fulfilled.

The variables in the study include student academic performance, knowledge sharing, social networks and

information and communication technology. Student academic performance was measured using a questionnaire adapted from Igarria and Tan (1997). To measure knowledge sharing, the researcher used a questionnaire from Lin (2007) and Bock et al. (2005). Social network was measured by Kim and Lee (2006) questionnaire (2). Meanwhile, to measure the variables of information and communication technology used a questionnaire developed by Lee and Choi (2003). The research data is processed by using the SEM-PLS structural equation model with the WarpPLS application.

4. Results and Discussion

The results of hypothesis testing on the inner model can be seen in Table 1. Table 1 shows that social network variables and information and communication technology variables have a positive effect on knowledge sharing. This can be seen from the p value < 0.001, smaller than 5%, with path coefficient values of 0.412 and 0.227. Likewise, the variable knowledge sharing on student academic performance, p value < 0.001, with a path coefficient value of 0.297, which means that knowledge sharing has a positive influence on student academic performance.

Table 1. Path coefficient value between variables (PLS output, 2021)

Predictor Variable	Response Variable	Path Coefficient	p-value	Remarks
Social Network	Knowledge Sharing	0.412	0.0<01	H1 accepted
Informationa Technology and Communication	Knowledge Sharing	0.227	<0.001	H2 accepted
Knowledge Sharing	Academic Performance	0.297	<0.001	H3 accepted

4.1. Effects of Social Network toward Knowledge Share

Social networks have a positive influence on knowledge sharing. This indicates that the better the social network the students have, the higher the students tend to share knowledge. Social networks in this context can be via email, Twitter, Facebook and others. Through these social networks, students share their information and knowledge with their colleagues. A student with more and wider social networks, will increasingly encourage him to share knowledge at a higher frequency. This means that the social network media owned by students can be an effective medium to increase knowledge sharing activities.

This finding agrees with the findings of previous studies (Talja and Hansen, 2006; Hodgkinson, 2006). Besides being involved in formal learning activities, students also take advantage of social networks with their colleagues. Shah and Mahmood (2006) examined the effect of trust, social networks variables on knowledge sharing. Furthermore, Chong, Teh and Tan (2014) investigated knowledge sharing among students at universities in Malaysia. A finding shows that technology support influences knowledge sharing. This indicates that Generation Y now views technology as an

important tool for sharing knowledge. Technology acts as a facilitator to encourage and support knowledge sharing more effectively (Riege, 2005).

4.2. Effects of Informationa Technology and Communication on Knowledge Sharing

Information and communication technology has also been shown to influence knowledge sharing. The available information and communication technology will encourage students to do knowledge sharing activities. The effectiveness of this media also triggers students to share knowledge. The nature of the wider reach and real time is also a medium that encourages students to share knowledge.

Haq and Haque (2018) and Shah and Mahmood (2016) argue about the influence of information and communication technology on knowledge sharing. Information and communication technology has an important role in capturing knowledge in real time. By increasing access to knowledge and removing existing barriers, information and communication technology can enhance knowledge sharing (Hendriks, 1999). Meanwhile, Wangpipatwong (2009) examines the factors that influence students to share knowledge. The findings indicate that technology support has a positive

effect on knowledge sharing. Technology provides facilities for students to interact with their colleagues and discuss and share knowledge. The availability of information technology infrastructure not only provides facilities for employees to share knowledge internally, but also across a wide geographic area.

4.3. Effects of Knowledge Sharing on Student Academic Performance

While the third hypothesis is about the effect of knowledge sharing on student academic performance. The findings of the study indicate that knowledge sharing has a positive effect on student academic performance. The higher the knowledge sharing carried out by students, the higher the academic performance they will achieve. By sharing information and knowledge, some problems encountered by students can be resolved. The problems in question can include difficulties in understanding the lecture material they gets the assignments given by their lecturer. A better understanding of the lecture material and the work done will certainly improve academic achievement.

Zaqout and Abbas (2012) examined the influence of factors that encourage student involvement to share knowledge. This study also examined the effect of knowledge sharing on academic performance. The others finding is in line with the findings of Reychav and Weisberg (2009) that performance is influenced by knowledge sharing.

5. Conclusion

This study succeeded in finding empirical evidence regarding the positive influence between social networks and information and communication technology on knowledge sharing. This study can also prove that knowledge sharing has a positive influence on student academic performance. The findings support the previous research findings. Thus, they strengthen the theory of relationship among the variables used in the current research. This research has both theoretical and practical implications. In terms of theoretical implications, the results of this study provide theoretical support regarding the model of the relationship between variables in this study. The results of this study strengthen the existing theoretical building. Meanwhile, for practical implications, the results of this study provide input for higher education management to be able to improve student academic performance through increased knowledge sharing. Meanwhile, increasing knowledge sharing can be done through increasing social networks and information and communication technology. This study has several limitations, including that the data of this study were entirely taken from student responses in questionnaires distributed via google form. This study did not get data from the written responses of the respondents.

6. Limitations and Further Study

This study also had limitations in terms of access to

interviews with respondents. Researchers cannot meet in person for interviews with respondents. This is due to the unfinished COVID-19 pandemic. Thus, the analysis carried out is not in-depth. Future research can be conducted by expanding the determinants of knowledge sharing. Future research can also expand the scope of research by examining other important elements of higher education, namely, lecturers.

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Authors' Contributions

The following statements should be used "Conceptualization, Suhana; methodology, Anwar Mansyur; software, Anwar Mansyur; validation, Suhana; formal analysis, Lie Liana.; investigation, Anwar Mansyur.; resources, Mohammad Fuazan; data curation, Lie Liana; writing—original draft preparation, Mohammad Fauzan.; writing—review and editing, Suhana; visualization, Lie Liana; supervision, Suhana; project administration, Lie Liana; funding acquisition, Suhana.

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