The Analysis of Knowledge Management Process on Thesis/Dissertation Management: A Systematic Review

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Abstract

Knowledge management is the process of creating, sharing and storing knowledge to be managed as a resource, which can increase values or encourage innovation. This systematic review aims to analyze the state of the art within a literature subject, which is knowledge management process in the management of thesis/dissertation. The systematic review uses the PRISMA (Preferred Reporting Item for Systematic Review and Meta-Analysis) guidelines. This review encompasses 24 literature from various publishers and knowledge management processes in the management of thesis/dissertation. The result reveals that there is a knowledge management process existing in the management of thesis/dissertation despite a little coverage of the three processes in the literature. This systematic review concludes that the management of thesis/dissertation can be identified using the knowledge management concept.

Keywords: Thesis, dissertation, knowledge management process, PRISMA.

1. INTRODUCTION

Knowledge management has been the subject of researches for decades. Several studies revealed that knowledge could create and enhance organizations' values (Costa & Rezende, 2018)(Cepeda-Carrion, Martelo-Landroguez, Leal-Rodríguez, & Leal-Millán, 2017); therefore, the management process becomes essential. Nonaka and Takeushi considered knowledge to be divided into two, namely tacit and explicit. Tacit knowledge is subjective in that it is gained through experience and practice, but difficult to explain to others. Whereas, explicit knowledge is very objective because it is available for others. Explicit knowledge is obtained from facts and information(Maravilhas & Martins, 2018).

In knowledge management, Kanat and Atilgan revealed that the knowledge management process is divided into three phases: 1) the creation phase, where knowledge is acquired and validated, 2) the storage phase, where knowledge is maintained and managed, 3) the transfer phase, where several individuals exchange

and share knowledge(Cerchione & Esposito, 2017). These phases are processes that can be implemented to create values or innovation for an organization.

In the creation phase of Nonaka argued that knowledge management has four processes: socialization, externalization, combination, and internalization which are commonly called the SECI model (Adomako et al., 2019). *Socialization* reflects the process that changes the existing tacit knowledge possessed by individuals into new tacit knowledge. This can be executed through shared experiences and joint activities (for example, internships or social interactions). *Externalization* of knowledge reflects how the existing tacit knowledge is converted into explicit knowledge that is understood by others. It might appear in the form of metaphors, analogies, or dialogues. *Combination* shows the conversion of obtained explicit knowledge into a more systematic media network. *Internalization* reflects the process by which explicit knowledge is transferred to tacit knowledge. In the creation process, individuals can acquire and absorb knowledge through demonstration or learning how to do work.

Universities or colleges have the potential as a knowledge producing machine (Martins, Rampasso, Anholon, Quelhas, & Leal Filho, 2019), due to the presence of academics such as lecturers, students, and other researchers who can produce knowledge. In fact, the quality of a university or college can be seen from the number of publications of scientific works representing the result of knowledge production. Scientific work in universities takes the form of thesis/dissertation reports, journals, patents, intellectual property rights, and others.

Scientific work in the form of theses/dissertations is a prerequisite for student graduation. Therefore, knowledge management in theses/dissertation process is very necessary. The knowledge management process can support the creation of values from the resulted scientific work, encourage the improvement in the number of university or college innovation, and increase the effectiveness and efficiency of business processes that occur when students conduct theses/dissertation research. This raises the question of how the knowledge management process contributes to the thesis/dissertation research process. To answer this question, we present a systematic review that identifies and analyzes the knowledge management process approach. We want to discover how this approach supports students' theses/dissertation activities and, specifically, in which phases (creation, storage, or transfer) they are fully supported.

The contribution of this paper is a comprehensive review of the knowledge management process approach to the management of students' theses/dissertation research which has been developed over the past four years. The main aspect of this systematic review is to identify the knowledge management process approach in the management of students' theses/dissertations based on studies published in reputable journals. We identified the evidence from the study by considering three phases of the knowledge management process. The main result is a comprehensive picture of the application of knowledge management processes in the management of student theses/dissertations.

The remainder of this paper is organized as follows. In the second part, we provide an overview of the basic concepts of the knowledge management process. The third section presents the objectives and research questions we answered based on the results of a systematic review. In the fourth section we describe the research methods we followed during a systematic review, and we provide details for each of the steps undertaken. In the fifth section, we present the results of assessing the quality of studies included in the review and answering research questions based on data taken from selected studies. In the sixth section, we discuss research suggestions, and in the last section, we draw conclusions.

2. LITERATURE REVIEW

2.1 Knowledge Management Process

The concept of knowledge management is learned to identify groups of knowledge and their use in organizations. Strategies that can be used in knowledge management are codification and personalization. Both of these strategies have different focuses. Codification focuses on systematizing and storing information, which in essence, makes information available for reuse, while personalization focuses on preparing information from sources of knowledge (Weinreich & Groher, 2016). The strategy reveals the importance of the knowledge management process.

Recent research revealed by Kanat and Atilgan divides the process into three stages, namely the creation, storage and transfer of knowledge (Cerchione & Esposito, 2017). For this reason, in this study, we use the latest sources as material to analyze the knowledge management process in the management of student theses/dissertations. Based on our opinion, the use of the latest sources can give us an idea of knowledge management processes that are applied to the phenomenon of business processes occurring recently.

2.2 Research objectives and questions

The overall aim of this literature review is to identify a knowledge management process approach that supports the management of student theses/dissertations. Therefore, we formulated the research questions (RQ) as follows:

- RQ1: Does the *knowledge management process (creation, storage, transfer)* support students' *theses/dissertation* management?
- RQ2: Which *knowledge management process* does fully support the students' *theses/dissertation* management?
- RQ3: Which activities in students' *theses/dissertation* management can be supported by using *knowledge management process* approach?

In RQ1, we identified the *knowledge management process* approach obtained from the *systematic review*. The information helped us in deciding which *knowledge management process* support is mostly used in students' theses/dissertation management in order to answer RQ2. The results of the identification list of activities supported by the knowledge management process are used to answer RQ3. We hope that with the previously mentioned research questions readers will get insights related to the support of knowledge management processes in the management of student theses/dissertations.

3. RESEARCH METHOD AND DISCOVERY PROCESS

This research is a systematic review following PRISMA (*Preffered Reporting Item for Systematic Review and Meta-Analysis*) guidelines (Akhigbe, Zolnourian, & Bulters, 2017). PRISMA provides 27 guidelines recommended in a list sequencing.

The reviewed literature was literature that discusses the knowledge management process in the management of student theses/dissertations. We applied the eligibility criteria to the literature that we would review, namely literature published by ScienceDirect, IEEE, SpringerLink, Emerald Publishing, Wiley Backwel, and Oxford University. We only selected literature published in 2016 or more to ensure the recent study we would review. We limited the type of literature into journals and proceedings only. In searching for literature we use the following keywords in each publisher source

- "Knowledge creation" & theses/dissertation
- "knowledge storage" & theses/dissertation
- "knowledge transfer" & theses/dissertation

The literature collected from the search process was filtered several times. In the first selection process, we eliminated all liters from search sources by looking at the suitability of the keywords that have been set. In the second selection process we eliminated duplicate literature. Next, we ensured the relevance of literature by reading its abstracts and skimming its contents. The literature selection process was carried out independently by each group member of four people.

After the literature was obtained, we conducted a review of the written material that would be used as a reference in writing this systematic review. Then, the results of the review were included in a summary that listed the knowledge management processes and their activities from each literature. The process of selecting data to be entered into the matrix was accomplished regarding the results of the mutual agreement. In this systematic review, we focused on the activities included in the knowledge management process that was revealed in the literature. The process of validation of reading material was fulfilled using a peer review method conducted by each author of the reading material read by other authors. To minimize errors in interpretation each reviewer crosschecked the other results. Therefore, the reviewer mapped some possible differences in the results of the research obtained from the literature.

The primary measure used in this systematic review is the activities in students' theses/dissertations management that reflect the knowledge management process.

4. RESULTS AND DISCUSSION

Research conducted at ScienceDirect, IEEE, SpringerLink, Emerald Publishing, Wiley Backwel, and Oxford University produced a total of 2024 citations. However, from 2024 existing literature, only 152 literature whose titles have relevance to the keywords that have been set. Most of the literature obtained is not focused on the management of the thesis/dissertation. From 152 literature, we removed the duplicate citations. It emerged that there were four duplicate literature, so there were 147 literature left. Afterward, we filtered the results again by reading the abstract and skimming the contents that were suitable or relevant to the purpose of this systematic review. In this final stage we got 24 literature that met the requirements. We made these results a reference for conducting a literature review.

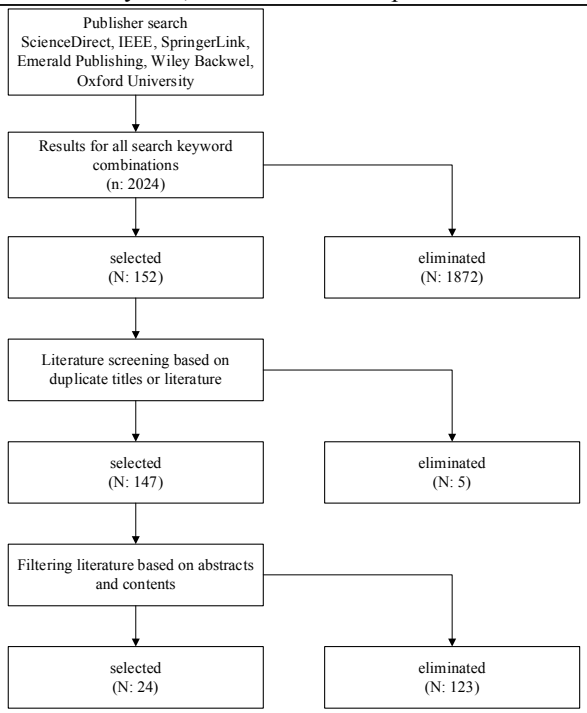

Figure 1. *The flow* of the literature searching process

The characteristics of the literature we accepted are literature that is in accordance with the topic of this research, which discusses knowledge management processes in students' theses/dissertations management. We accepted types of journal literature and proceedings published only in 2016 or more. In the validation process, we set the control variables namely knowledge management process creation (KMP-C), knowledge management process storage (KMP-S) and knowledge management process transfer (KMP-T). Based on these three variables we listed literature that mentions knowledge management process support, then we used the results to answer RQ1, as shown in table 1.

Table 1. The list of *knowledge management process* supporting *theses/dissertations* management

Literatur	**(KMP-C)**	**(KMP-S)**	**(KMP-T)**	**KMP**
(Mork, Hansen, Strand, Giske, & Kleppe, 2016)	Yes	Yes	Yes	Exploration of research support literature (KMP-S), discussions with experts/supervisors (KMP-T), research results (KMP-C)
(Faccin & Balestrin, 2018)	Yes	No	Yes	Improvement of innovation (KMP-C), collaborative practice (KMP-T), knowledge stock (KMP-C)
(Sampaio,	Yes	No	Yes	Research (KMP-C), mentoring

Literatur	**(KMP-C)**	**(KMP-S)**	**(KMP-T)**	**KMP**
Terroso, & Matos, 2019)				(KMP-T)
(Azagra-Caro, Barberá-Tomás, Edwards-Schachter, & Tur, 2017)	No	Yes	Yes	Patent determination from research results (KMP-S), the publication of patent results (KMP-T)
(Fernández-Esquinas, Pinto, Yruela, & Pereira, 2016)	No	Yes	Yes	Student research results used to enhance company innovation (KMP-S), collaborative research between students and industry (KMP-T)
(Anderson & Gold, 2019)	V	No	No	New knowledge discovery (KMP-C)
(Duffy, Pinckney, Powell, Bixler, & McGuire, 2018)	No	Yes	Yes	Expansion of literacy in research (KMP-S), discussion (KMP-T)
(Henricson, Fridlund, Mårtensson, & Hedberg, 2018)	No	Yes	Yes	Thesis products as new knowledge (KMP-S), supervision and guidance (KMP-T).
(Singh, Devika, Herrmann, Thiede, & Sangwan, 2019)	Yes	No	No	Increased experience through practice in student research created new knowledge (KMP-C)
(Fernandez, 2019)	No	Yes	No	Strengthening literacy in research (KMP-S)
(Berbegal-Mirabent, 2018)	Yes	No	Yes	Total of thesis productivity in universities (KMP-C), Collaboration in promoting thesis quality (KMP-T)
(Rajaeian, Cater-Steel, & Lane, 2018)	No	No	Yes	Collaboration in research (KMP-T)
(Machan & Sendra Portero, 2018)	Yes	Yes	Yes	Thesis products as a result of new knowledge (KMP-C), thesis results as material for other researchers' literacy (KMP-S), the publication of thesis-

Literatur	**(KMP-C)**	**(KMP-S)**	**(KMP-T)**	**KMP**
				results (KMP-T)
(Thurlow, Morton, & Choi, 2019)	Yes	No	No	A thesis generates student creativity that enhances university innovation (KMP-C)
(AboWardah, 2019)	Yes	No	Yes	In the thesis process, students gain new knowledge (KMP-C), students execute discussions with the supervisor to complete research (KMP-T)
(Alimohammadlou & Eslamloo, 2016)	No	Yes	Yes	The diffusion of knowledge by students in the thesis process (KMP-S), the process of knowledge transfer in the implementation of the student thesis (KMP-T)
(Limanto, Benarkah, & Adelia, 2019)	No	No	Yes	The process of transferring information related to the administration of the thesis to students (KMP-T)
(Miremadi, Saboohi, & Arasti, 2019)	No	Yes	Yes	Utilization of student thesis research results (KMP-S), industrial collaboration with students conducting research (KMP-T)
(Murphy, 2017)	Yes	No	No	The creation of new knowledge in research design (KMP-C)
(Renaud & Biljon, 2017)	Yes	No	No	Visualization of students' thesis research results as new knowledge (KMP-C)
(van Stijn, van Rijnsoever, & van Veelen, 2018)	Yes	Yes	Yes	Student thesis research results (KMP-C), Utilization of student thesis research results (KMP-S), the publication of scientific papers (KMP-T)
(Johnston, 2017)	No	No	Yes	The need for industrial collaboration in student thesis research in enhancing student practice experience (KMP-T).
(Kobayashi, Berge, Grout, & Rump, 2017)	No	No	Yes	Supervisors and students' interaction in conducting thesis research helps develop student competency (KMP-T).
(Castelló, Pardo, Sala-Bubaré, & Suñe-	No	No	Yes	The need for socialization and integration into the scientific community in the process of completing student

Literatur	**(KMP-C)**	**(KMP-S)**	**(KMP-T)**	**KMP**
Soler, 2017)				dissertations (KMP-T).

Three literature (Mork et al., 2016)(Machan & Sendra Portero, 2018)(van Stijn et al., 2018) revealed that there are knowledge management processes of *creation, storage* and *transfer* in the thesis/dissertation management. Four literature (Faccin & Balestrin, 2018)(Sampaio et al., 2019)(Berbegal-Mirabent, 2018)(AboWardah, 2019) revealed that there are knowledge management processes of *creation* and *transfer* in the thesis/dissertation management. Six literature (Miremadi et al., 2019) (Alimohammadlou & Eslamloo, 2016)(Henricson et al., 2018)(Duffy et al., 2018) (Fernandez, 2019)(Azagra-Caro et al., 2017) revealed that there are knowledge management processes of *storage* and *transfer* in the thesis/dissertation management. Five literature (Renaud & Biljon, 2017)(Murphy, 2017)(Thurlow et al., 2019)(Singh et al., 2019)(Anderson & Gold, 2019) revealed that there are knowledge management processes of *creation* only. One literature(Fernandez, 2019) revealed that there are knowledge management processes of *storage* only. The remaining five literature (Castelló et al., 2017)(Kobayashi et al., 2017)(Johnston, 2017)(Limanto et al., 2019) (Rajaeian et al., 2018) revealed that there are knowledge management processes of *transfer* only. The results of the knowledge management process list were then quantified to see the number of knowledge management processes that supported the theses/dissertation management the most, as shown in table 2.

Tabel 2. The list of the *knowledge management process* that supported students' theses/dissertation management the most

Knowledge management process	Total
Knowledge management process – Creation	12
Knowledge management process – Storage	10
Knowledge management process - Transfer	18

Table 2 enlists the answer of RQ2. Table 3 shows that the knowledge management process that supports students' thesis/dissertation most is the transferring process. The form of activities of the transferring process is reflected in: (1) the process of mentoring, interaction and discussion with theses/dissertation supervisor, (2) publication of the theses/dissertation scientific work, (3) collaboration in research,

(4) dissemination of information related to administration , and (5) socialization and interaction with the scientific community.

Furthermore, to answer RQ3, we mapped the activities on students' theses/dissertations management with three knowledge management process variables, namely creation, storage, and transfer, based on the list of Table 1. The following Table 4 is a matrix portraying the implementation of knowledge management processes on student's thesis/dissertation management.

Table 3. The matrix of *knowledge management process* implementation on students' *thesis/dissertation* management

KMP-Creation	***KMP-Storage***	***KMP-Transfer***
The discovery of new knowledge in student thesis/dissertation research	Patented thesis/dissertation results	Publication of scientific papers from students' theses/dissertations
Increased student experience through thesis/ dissertation research	The results of the thesis/dissertation used by industry	Collaboration between researchers, supervisor or industry in thesis/dissertation research
The results of the thesis/dissertation as university products	Expansion of literacy in the research process	Discussion in expanding knowledge with experts, supervisor or other researchers in the thesis/dissertation process
Increased innovation from the results of student thesis/dissertation research	The results of the thesis/dissertation used as literacy material for other researchers	Knowledge transfer with experts during the research process
Research designs created by students in the research process	Students diffusing knowledge in the research process	Information and administration in the thesis/dissertation process
Visualization of students'	Utilizing the results of student	Socialization and integration in the scientific community

KMP-Creation	***KMP-Storage***	***KMP-Transfer***
thesis/dissertation research results	innovation in the thesis/dissertation process	implemented by students conducting a thesis/dissertation

Table 3 shows the activities that occur in the thesis/dissertation management process which is a reflection of the knowledge management process.

SUGGESTION & CONCLUSION

This paper highlights the support exists in students' thesis/dissertation management activities regarding the knowledge management processes of creation, storage, and transfer; though not all research reports reveal these three processes. Table 4 shows that the process of storage appears the least in a number of literature. This provides an opportunity for further research to be able to discover more in-depth about the storage process in student theses/dissertations management. Table 5 in this paper notes colleges or universities to pay attention to activities that reflect the knowledge management process, so that they can be managed well. Effective and efficient management of knowledge management process activities can increase the value of the college or university.

The purpose of this systematic review is to find out the state of the art of the knowledge management process in student thesis/ dissertation management. The knowledge management process is divided into three: creation, storage, and transfer. The literature review allows us to identify three questions:

- RQ1: Does knowledge management process (creation, storage, transfer) support students' theses/dissertation management?
- RQ2: Which knowledge management process does fully support the students' theses/dissertation management?
- RQ3: Which activities in students' theses/dissertation management can be supported by using knowledge management process approach?

Regarding RQ1, based on the literature study, it can be identified that each literature reveals the support of the knowledge management process in student thesis/ dissertation management as seen in Table 1 although only some of the literature use all three processes. This shows that in the thesis/dissertation management process, students need knowledge management. With the need for knowledge management, a

good thesis/dissertation management process can contribute to increasing the value of universities or colleges.

Regarding RQ2, Table 2 in this paper highlights the number of knowledge management processes discussed in the literature. It can be concluded that most researchers are concerned more with the transfer process. Nevertheless, the storage process still needs to be reviewed, in order to discover what kind of activities reflect the storage process in the management of student theses/dissertations.

As for RQ3, Table 3 on this paper shows activities that reflect the knowledge management process, which can be used as a record for universities in taking notes on these activities and improving the quality of the thesis/dissertation process.

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