

DEVELOPMENT OF PERSONAL KNOWLEDGE MANAGEMENT SYSTEM WITH LEARNING CONTRACT AND PEER ASSISTED LEARNING FOR ENHANCE ACADEMIC WORK OF GRADUATE STUDENTS

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Abstract: The purpose of this study was development of personal knowledge management system using learning contract and peer-assisted learning to enhance academic task of graduate students. The research and development (R&D) process was divided into four phases: 1) studied, analyzed and synthesized related documents and interviewed the experts' opinions concerning components and steps of personnel knowledge management process, learning contract process and peer-assisted learning process 2) developed a prototype of personnel knowledge management system for learning communities using learning contract and peer-assisted learning 3) studied the effects of the system for six weeks and 4) proposed the personnel knowledge management system using learning contract and peer-assisted learning. The instruments used in this research consisted of document management system, blog system, rubric for academic writing, a product evaluation form, and an after action review form. The populations of this experiment were graduate students of Department of Education Technology Faculty of Education Chulalongkorn University, who enrolled the course of Research in Educational Technology and Communications. Quantitative statistics used in this study were frequency distributions, percentage, mean, standard deviation and Wilcoxon Matching Pairs Signed-Ranks Test. The research findings indicated that: 1. The developed process composed of three components: 1) people including graduate student teacher and peer as experienced student 2) learning contract and 3) technology for personal knowledge management. 2. The developed process composed of four steps: 1) preparation 2) process 3) presentation and 4) evaluation. 3. There were significant differences between pretest and posttest personnel

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knowledge skill scoring at the .05 level. The overall academic works developed by the samples were evaluated at a good level.

Keywords: Personal Knowledge Management, Contract Learning, Peer-Assisted Learning, Academic Task.

Introduction

Academic work is an important part of Graduate program study. Some academic works are part of research of dissertation or thesis, while some works are part of subject such as term project. To accomplish academic work, graduate students need to integrate all of knowledge and technique which they learned from various kinds of material (e.g. classroom, research paper, journal article, etc.) to extract the ideas and use them as resources to create an idea of research. In most of graduate degree program, thesis or dissertation is an important part of the curriculum. To do thesis or dissertation, student has to start with thesis proposal, whose details vary in each of the faculties departments and disciplines. After thesis proposal was approved by the Graduate School, student began the research plan specified in thesis proposal. In each academic year there are students who have not graduated because they cannot complete the thesis within specified period or leave the thesis conducting halfway. This is a waste of educational (Praman Choopipat, 1986). Major cause in the failure of the thesis is student's personality, students are often stressed, anxious and burnout in conducting thesis. The causes of the stress are volume and complexity of the research task, and conflict in the roles such as students have to learn coursework in the same time with research development or occupation working in same time with conducting thesis (Winai Pantho, 1999).

This is because students lack targeting, planning the proper step and time of thesis conducting, self-acceptance, intrinsic and extrinsic motivation. These cause mental health problems that affect the duration and quality of thesis (Chana Kongtra, 2537; Sutteera Phonrak, 2540). In addition, students have to collect research papers and articles which are benefits for their research, have interaction with other students in the research group regularly and use information technology to build their own knowledge and evaluate, classify, store, analyze, apply and archive their research paper and articles collection. These activities required personal knowledge management skill. This skill will help store, search and apply the knowledge resources quick and easy. However there are various types of resources in a variety of media formats, such as printed materials, television, audio, image files, text files, etc. Thus, the need to develop personal knowledge management skills to convert all type of formats media to suit to store in the personal storage, and lead to the classification, indexing, linking these data together to create a resource library of personal knowledge. Benefits of this skill will help the students to learn and succeed in subject and information literate.

An important process in the personal knowledge management is knowledge exchange, in this process students have to learn new knowledge from knowledge sharing and from tacit to tacit knowledge to builds up their knowledge wider and clearer to their research. Students have to plan and self-control to participate knowledge sharing process with other students in same research regularly. However

the process of personal knowledge management, if the designing is not good enough such as a limited amount of time to learning, student feels time is not enough then the social isolation will occurs. To prevent this there is the concept of learning by peer members who have the knowledge and experience in research and thesis conducting to help in any issues that students need help. There is activities are planned to meet and exchange knowledge and experiences, after that student will have opportunity to consider what they have learned from peer and analysis the issues to a concept in its research further with positive reinforcement as a reward to promote community activities, and a feed back after the issues are brought to practice and members of the personal knowledge management group can get more benefit from these learning activities.

Graduate students are group of literacy and maturity. Therefore, the teaching of graduate students can be applied with the principles of adult learning theory, assuming that graduate students need to have a mind of their own, at the same time they want others to see that they can stand on their own feet. They should be encouraged to take responsibility for learning to the students themselves. Teachers should provide students the classroom affiliation which students are involved learning such as goal setting, learning process planning, knowledge resources seeking and authentic assessment. With self-directed learning, the teaching will emphasize a student-centered learning and students responsible for the planning, implementation and evaluation of their learning. (Hiemstra, 1994) In order to develop self-directed learning, the students must be responsible for their own learning, track their own learning activities continuously under the advice of teachers and use Learning Contract to make accountability and motivation in learning (Onjaree Natakatoong, 2536). Learning Contract is an agreement between the student and the teacher about level of evaluation, teacher will determine the conditions to obtain grades and students will decide the grade that they (Barlow, 1974), the students must work as agreed in the Learning Contract within a specified period (Murrey, 1974, Christen, 1976) based on the difference purpose, method and learning resources of each student. To use Learning Contract will help students to gain motivation and self-directed learning skills (Anderson et al. 1996, Archanya Ratana-Ubol, 2545).

The purpose of study was development personal knowledge management tool with learning contract and peer assisted learning to help student to conducting good quality academic work, and also development of graduate student to become the graduates with desirable characteristics.

Research Objective

There are three objectives:

1. To study problem and need analysis of personal knowledge management system with learning contract and peer assisted learning to enhance academic work of graduate students.
2. Develop personal knowledge management system with learning contract and peer assisted learning to enhance academic work of graduate students.

3. To study the effects of personal knowledge management system with learning contract and peer assisted learning to enhance academic work of graduate students.

Conceptual Framework of The Study

According to the studies and research reviews related to, researchers synthesize personal knowledge management, learning contract and peer assisted learning to support academic work conducting of graduate students, researchers synthesize the conceptual framework for research as follows: (view on Figure 1)

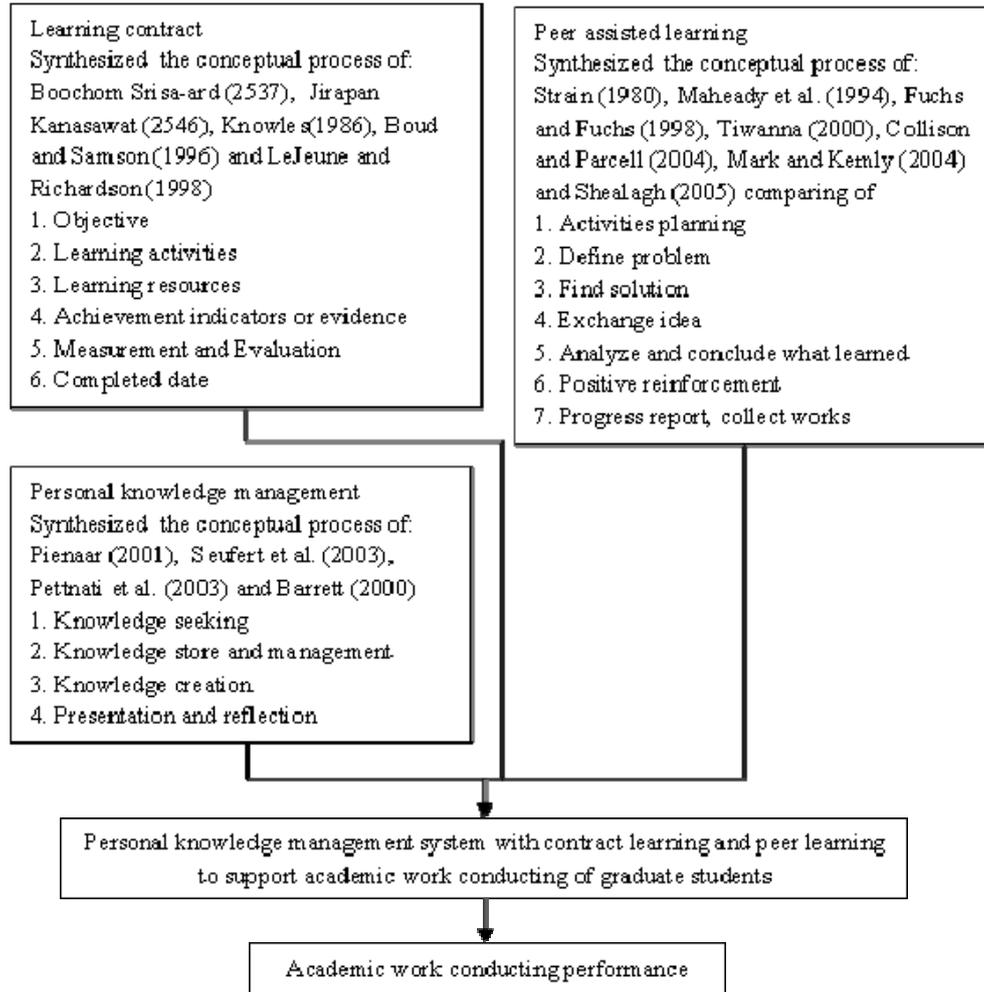


Figure 1: Conceptual Framework of The

Personal knowledge management system with learning contract and peer assisted learning to enhance academic work of graduate students are developed from concepts, theories and research on Learning Contract, Peer assisted learning

and Personal Knowledge Management. This system is developed to promote forming of a similar objective group with exchanging of information, knowledge and experiences for knowledge seeking and to create new knowledge which benefits for group member's research. The group participated was in face to face (Face 2 Face) and online. The group members trusted each other in information, knowledge and experiences sharing and open-minded to gain the knowledge and opinions from others even the knowledge and opinions are opposition to their opinion. The elements of Personal knowledge management system with learning contract and peer assisted learning to enhance academic work of graduate students are as following.

1. Learning Contract means the agreement between students and instructors about procedure, schedule, objective and result included self-assessment of this study. Contract is based on needs of students but still in line with the goals and principles of the institution. The components of the Learning Contract are as follows: 1) Objectives 2) Learning 3) Resources 4) Learning achievement evidenced of success 5) Measurement and evaluation 6) Time expected to be achieved.

2. Peer assisted learning is a technique that groups people together to exchange knowledge and experience of the problem, project or activity that group member interested to learn and learning through experience, assistance, opinions and perspectives from expert peer by interacting and doing activities together. Activities of peer assisted learning are 7 phases: 1) Activities planning 2) Define problem 3) Find solution 4) Exchange idea 5) Analyze and conclude what learned 6) Positive reinforcement 7) Report progress and Collect works

3. Personal knowledge management is procedure to create a personal's knowledge and develop intelligence in a person by gathering, managing, and exchanging knowledge. Personal Knowledge Management consists of four major procedures.

3.1 Knowledge seeking is a procedure for knowledge discovery from many sources, knowledge may be in the format of articles, books, documents, multimedia, etc., to acquisition of knowledge, researcher must have skilled in knowledge searching and know about the sources such as where to get information, quality of information.

3.2 Knowledge store and management is a procedure of gathering knowledge from different sources, classification and store knowledge, tagging or creating a label for searching and the link between internal and external resources.

3.3 Knowledge creation is a procedure in the knowledge that they have learned to create new knowledge. And disseminate the knowledge by releases out as written.

3.4 Presentation and reflection is a procedure for students to discuss their work with others. Open mind and exchange knowledge and experience from others, which become their own tacit knowledge.

4. Academic work conducting performance means ability to create academic works of graduate students. The measurements of the success of academic work conducting performance are.

- 4.1 Quality refers to the academic quality of the work. The evaluation criteria includes: The integrity of the content, corrective and Initiative. The quality of the work was evaluated by experts and teacher.
- 4.2 Achievements in fulfilling the learning contract and the quality of academic work were equal or better than the students' agreement in the learning contract.

Methodology

1. To study problem and need analysis of personal knowledge management system using learning contract and peer-assisted learning to enhance academic task performance of graduate students

Study theories and methodologies of personal knowledge management system, learning contract and peer-assisted learning to design questionnaire of problem and need analysis.

Sample group of study problem and need analysis are graduate students of Chulalongkorn University in academic year 2012. The questionnaires were consisted of problem and need analysis in learning contract, peer assisted learning, personal knowledge management and academic work conducting performance. Number of question was 50 and they were 5 points Likert scale question. The questions were checked for content validity by index of consistency by 3 experts. After adjusted questions by experts' recommendation, the questionnaires were sent to 11,992 students and received 2696 questionnaires return.

2. Develop personal knowledge management system using learning contract and peer-assisted learning to enhance academic task performance of graduate students

Design personal knowledge management system using learning contract and peer-assisted learning in following concept.

2.1 Component of system

- 2.1.1 People, there were 3 groups of people in the system, 1) student 2) teacher 3) peer as senior student
- 2.1.2 Learning contract
- 2.1.3 Knowledge management system as content management system

2.2 Procedure of system

- 2.2.1 Preparation, the first stage of personal knowledge management system using learning contract and peer-assisted learning, 1) System preparation, the system had to be setting up and prepared for users. 2) System usage agreement, students must agree to use the system in term of boundary of using and time & frequency of using. 3) Learning contract creation, teacher and students had to create agreement for learning such as learning objective, time to finish and assessment.
- 2.2.2 Process, the stages of conducting academic work student had to prepare resources, study resources, exchange knowledge and conducting academic work.
- 2.2.3 Presentation, in this stage student had to present their academic work to other students and peer, gather all comments and reflection to improve their academic work.

2.2.4 Evaluation, the final stage of personal knowledge management system using learning contract and peer-assisted learning, students had to evaluate the system for further improvement and students' academic work will be evaluated by teacher and experts

Examine design of personal knowledge management system using learning contract and peer-assisted learning by 7 experts, tool is Semi-structure Interview.

3. Experiment personal knowledge management system using learning contract and peer-assisted learning to enhance academic task performance of graduate students.

Population of experimental group is 9 graduate students of Department of Educational Technology, Faculty of Education. Researcher created 40 questions pretest and 40 questions posttest and found discrimination index by 30 graduate students who had experience in academic work conducting and setup the personal knowledge management system using learning contract and peer-assisted learning by applied Microsoft Office 365 which is cloud base Software which had features about document management and created blog system in Microsoft SharePoint 365. Research creates learning contract which consisted of learning objective, time to finish and assessment. The assessment in this system was a rubric system which measured 1) Knowledge integration 2) Research topic 3) Consistency of content 4) Research Resources 5) Research Reference 6) Accuracy of language 7) Accuracy of content. This experiment took 6 weeks. 1st week was for orientation, introduced the methodologies and tools for personal knowledge management system, students had to learn about resources, methods and tools for knowledge seeking, knowledge store & management, knowledge creation and presentation & reflection, student had to create and sign Learning contract consisted of the period to submit their work and rubric for assessment their work. 2nd is a step recommended peer as senior students. The researcher selected by the people who had been successful in creating academic work in course that were used in the experiment. 3rd-6th weeks, the students had to create their academic work as research article with personal knowledge management system and assistant from peer. Presented and reflected the academic works and the academic works divided into introduction, literature review, survey results, discussion and the complete article. After finishing all students' academic work were examined by teacher and also 3 experts for validation.

4. Certify personal knowledge management system using learning contract and peer-assisted learning to enhance academic task performance of graduate students.

Population of certify group was 3 experts, tool was system certification form with 5 level Likert scale

(See Figure 2 on the next page)

Results, Discussions and Suggestions

The research results showed that

1) From 2,696 responses of questionnaires of need analysis of graduate students presented in Table 1. In order to verify the mean and standard deviation, an interpretation criterion for this study is as follows.

Mean Score 4.01-5.00 Very High

Mean Score 3.01-4.00 High
Mean Score 2.01-3.00 Moderate
Mean Score 1.00-2.00 Low

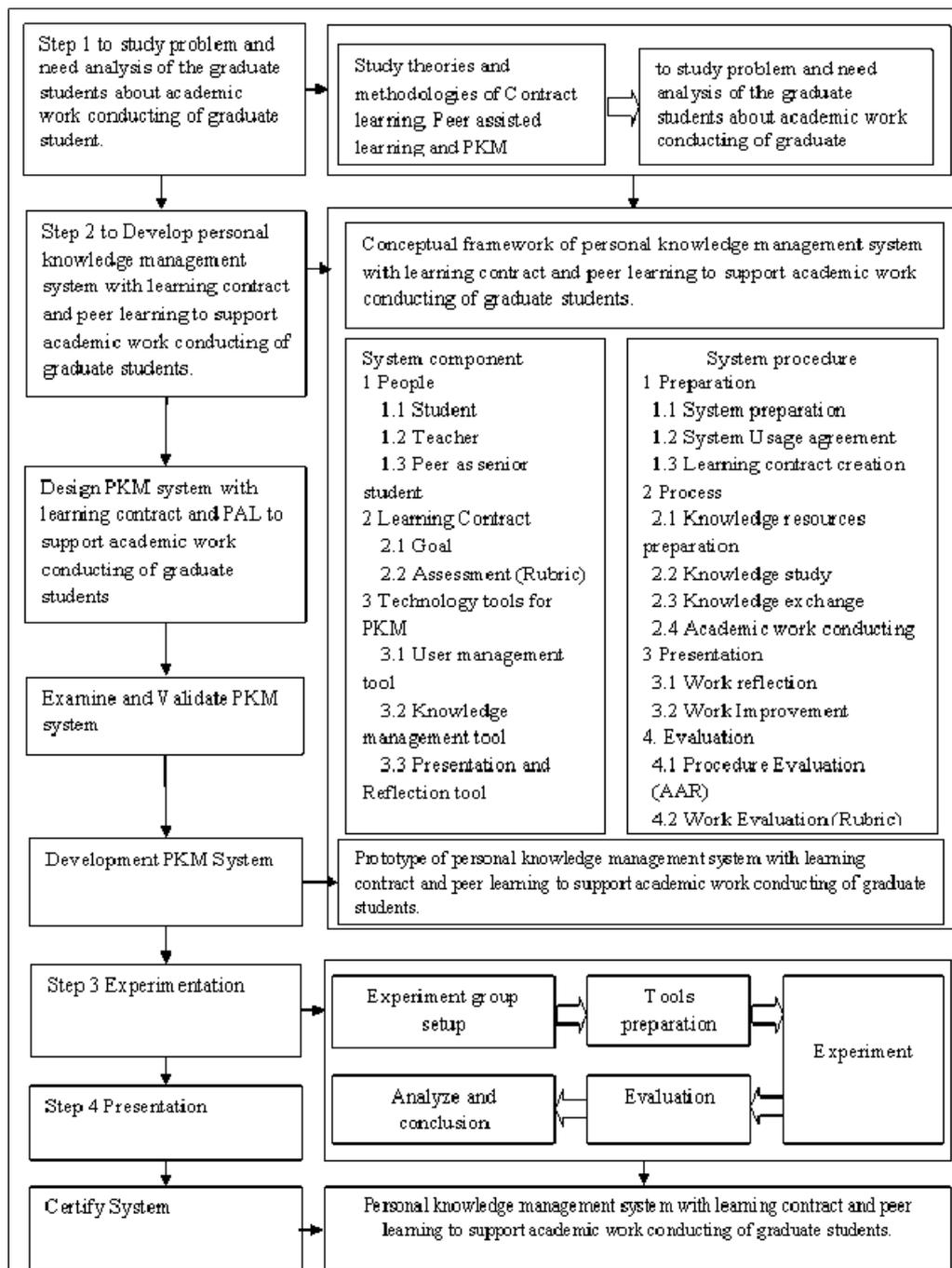


Figure 2: The Methodology of Development of Personal Knowledge Management, Learning Contract and Peer Assisted Learning to Support Academic Work Conducting of Graduate Students

From Table 1 a personal knowledge management system using learning contract and peer-assisted learning to enhance academic work of graduate students, the overall need of system equals 4.10 (SD = 0.86), drilled down to each component, the need of peer-assisted learning to enhance academic work equals to 4.15 (SD = 0.88), the need of Learning contract to enhance academic work equals to 4.11 (SD = 0.85) and the need of personal knowledge management equals to 4.06 (SD = 0.86). The demographic information of graduate students was measured by frequencies and percentages from the statistical tool used. 62.98 % of the respondents were female and 37.02 % were male. The age group 21-39 had 66.91% of the respondents, the age groups 31-40 had 25.89% of the respondents, the age group 41-50 had 5.56% of the respondents and the age group 51-60 had 1.16% of the respondents. 74.89% of respondents were graduated students of master programmes and 25.11% of respondents were graduated students of PhD programmes.

Table 1: Need Analysis of Personal Knowledge Management System Using Learning Contract and Peer-Assisted Learning to Enhance Academic Work of Graduate Students Only Very High and High Variables

Variables	\bar{x}	S.D.	Interpretation
1. Personal knowledge management	4.06	0.86	Very High
1.1 Knowledge searching	3.94	0.87	High
1.2 Knowledge store and management	4.33	0.76	Very High
1.3 Knowledge creation	4.14	0.79	Very High
1.4. Presentation and reflection	3.83	0.91	High
2. Peer-assisted learning	4.15	0.88	Very High
2.1 Define problem	3.80	1.05	High
2.2 Find solution	4.25	0.72	Very High
2.3 Exchange idea	4.31	0.78	Very High
2.4 Conclude idea and Implement	4.23	0.84	Very High
3. Learning contract	4.11	0.85	Very High
3.1 Objective	3.72	0.94	High
3.2 Learning activities	4.04	0.74	Very High
3.3 Measurement and evaluation	4.38	0.72	Very High
3.4 Completed date	4.29	0.80	Very High
Overall	4.10	0.86	Very High

2) Designed & developed a personal knowledge management system using learning contract and peer-assisted learning to enhance academic work of graduate students, and experimented with 9 graduate students of Department of Educational technology Faculty of education Chulalongkorn University. On 1st week of experiment students had to do pre-test, created rubric for assessment academic work and agreed the learning contract which included wanted score of rubric. The rubric was consisted of 4 categories (Very good, Good, Fair and Unsatisfactory) focusing on 1) Knowledge integration 2) Research topic 3) Consistency of content 4) Research Resources 5) Research Reference 6) Accuracy of language 7) Accuracy of content. All students chose fair level on all dimensions, and got score 11 of 20 from pretest.

After 6 weeks all academic works of students were examined 3 experts and results as table 2

Table 2: Compare Scores Between Contract Learning and Score From Experts

Dimensions	Contract		Quality		Interpretation
	\bar{x}	S.D.	\bar{x}	S.D.	
1 Knowledge integration	2.00	0.00	2.52	0.51	Higher
2 Research topic	2.00	0.00	2.85	0.36	Higher
3 Consistency of content	2.00	0.00	2.56	0.51	Higher
4 Research Resources	2.00	0.00	2.85	0.46	Higher
5 Research Reference	2.00	0.00	2.96	0.19	Higher
6 Accuracy of language	2.00	0.00	2.41	0.50	Higher
7 Accuracy of content	2.00	0.00	2.56	0.51	Higher

The results shown that students can achieve higher quality academic work comparing with score that they agreed in learning contract all the criteria set out in the contract. Additionally the pre-test of 1st week of experiment and post-test after experimental, the scores were as follows.

Table 3 Personal knowledge management skill before and after experiment (n=9) analyzed by Non-Parametric Statistics (Wilcoxon Matching Pairs Signed-Ranks Test)

PKM Skills	Pre-test		Post-test		Z	P
	\bar{x}	S.D.	\bar{x}	S.D.		
1 Knowledge seeking	2.13	0.99	4.13	0.64	2.56	0.01*
2 Knowledge store & management	2.88	0.64	4.75	0.87	2.56	0.01*
3 Knowledge creating	2.25	0.70	3.25	0.46	2.27	0.02*
4 Presentation & reflection	1.63	0.74	3.25	0.46	2.41	0.02*
Overall	11.00	1.69	14.25	1.38	2.56	0.01*

Results had shown that personal knowledge management skills of the students are higher after finish 6 weeks of experimental and signification at level .05 in overall and every skill by Non-Parametric Statistics)Wilcoxon Matching Pairs Signed-Ranks Test).

3) Results of the evaluation of the process of a personal knowledge management system using learning contract and peer-assisted learning to enhance academic task of graduate students from exports were overall in very good. The average of score is 4.81 of 5.

Results Discussion

Results of the research on Personal knowledge management system with learning contract and peer assisted learning for enhance academic work of graduate students were able to discuss in following topic.

1. General information about research development. Overall graduate students had commented Personal knowledge management system with learning contract and peer assisted learning for enhance academic work of graduate students was very

important. When focused in element of the system: peer assisted learning, learning contract and personal knowledge management. Graduate students commenting on all of elements was also important to be successful in academic work conducting, requiring social factors of peer-assisted learning which allows humans to develop their own knowledge from the knowledge exchanging with other people in the social who might be junior or senior or experts in the area. This is the shortcut for learning. And student had to drive themselves by setting goal in learning contract which consisted of topic of work, time to finish and how to assessment the work and the results of a questionnaire also shown the graduate students gave importance to personal knowledge management, that graduate students focused on knowledge store & management to help students to manage a lot of information that retrieved from internet. And personal knowledge management should be easily accessible anywhere, anytime system.

2. Design of personal knowledge management system with learning contract and peer assisted learning for enhance academic work of graduate students. Personal knowledge management system was consists of four major procedures 1) Knowledge seeking 2) Knowledge store and management 3) Knowledge creation 4) Presentation and reflection. The students had to understand the methodologies and tools of personal knowledge management to be useful for academic work conducting. Nowadays there are a lot of knowledge resources in Internet, to become successful students must be able to know how to retrieve, evaluate useful information and store & organize the useful information into secure place that is fast and easy to bring them back in future (Avery et al., 2001). And the students must know the useful tool and technique to create academic work such as graphic tools, multimedia tools, and text editing tools. And know how to share and retrieve the useful feedback to improve their work (Jarche, 2009)

3. The academic work. The results of After Action Review shown the students had a lot of expectation of the system to improve their academic work performance. However in learning contract the students were not challenged to set their goal in high level. They choose the safe level as fair level in every dimensions of academic work assessment rubric. And the final academic works' quality of all dimensions was better than their expectation. If teacher challenged students to set higher goal in further, this might be useful to push the student to work harder to their limitation and their academic works would be of better quality.

Suggestions in Utilizing The Research Findings

1. Teachers should encourage students to learn tools and skills related to personal knowledge managing. So that learners can use the tools and skills to conduct academic works effectively.

2. Students should be grouped with similar research topics for useful reflection, comment and opinion to conduct academic works effectively.

3. Teachers and peer must play a role in motivating the students. The peer should be select the senior student with the proper qualifications such as well experience in the field of relevant content, well achievement in subjects and be philanthropists, who were ready to sacrifice the time to give advice to junior students.

Suggestions for Further Researches

1. This research the main tool was Microsoft Office 365. In further researcher should study other tools that might be allow the process of Personal knowledge management system with learning contract and peer assisted learning for enhance academic work of graduate students are more effective.

2. This research was an experiment with graduate students in PhD program of Educational technology, and the scholar article writing was a part of course. In further researcher should experiment on other group such as group of student who had to propose thesis or other PhD or Master program.

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