ปัญหาและอุปสรรคในการทำงานวิจัยของอาจารย์ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี

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บทคัดย่อ

บทความนี้เสนองานวิจัยพื้นฐาน ซึ่งมีวัตถุประสงค์เพื่อศึกษาหาแนวทางแก้ไขปัญหา และอุปสรรคในการทำวิจัยโดยคณาจารย์ของมหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี เนื่องจากมหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรีมีนโยบายเน้นความสำคัญของการวิจัย คณาจารย์ของมหาวิทยาลัยได้รับการกระตุ้นให้ทำงานวิจัยโดยเฉลี่ยอย่างน้อยปีละหนึ่งเรื่อง ในขณะที่อาจารย์หลายท่านสามารถปฏิบัติตามนโยบายนี้ อีกหลายๆ ท่านยังไม่สามารถกระทำได้ ผลวิจัยในการศึกษาครั้งนี้คือคณาจารย์ของมหาวิทยาลัยผู้มีผลงานวิจัยอย่างน้อยหนึ่งเรื่องในระยะเวลา 3 ปีที่ผ่านมา ข้อมูลในการวิจัยได้จากแบบสอบถามเกี่ยวกับปฏิกิริยา การแก้ปัญหา และข้อเสนอแนะในการจัดการปัญหาในการทำวิจัย คำตอบจากคณาจารย์กลุ่มแรกผู้สามารถฝ่าฟันอุปสรรคต่างๆ จนสามารถทำวิจัยได้สำเร็จได้ถูกนำมาวิเคราะห์และเปรียบเทียบกับคำตอบของคณาจารย์กลุ่มหลังผู้ไม่สามารถทำวิจัยได้สำเร็จตามนโยบาย

การวิจัยครั้งนี้มีสมมุติฐานว่าคณาจารย์กลุ่มแรกและคณาจารย์กลุ่มหลังประสบปัญหาในการทำวิจัยแตกต่างกันและทำงานภายใต้เงื่อนไขต่างกันซึ่งเป็นผลกระทบกับผลสำเร็จในการทำวิจัยผลจากการวิจัยนี้พบว่าสมมุติฐานนี้เป็นจริงและสะท้อนให้เห็นปัญหาและอุปสรรคในการทำวิจัยที่คณาจารย์ของมหาวิทยาลัยประสบ และเสนอแนะแนวทางส่งเสริมสนับสนุนการทำวิจัยของคณาจารย์ต่อไปในอนาคต

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Problems and Obstacles of KMUTT Lecturers in Conducting Research[2]

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Abstract

This article presents a research which aims to investigate KMUTT lecturers' suggestions to tackle research problems and obstacles. Due to the fact that KMUTT's policy emphasizes conducting research, lecturers should preferably complete at least one piece of research annually. While many lecturers could fulfill this policy, some others could not. The subjects in this study were KMUTT lecturers who accomplished at least one research within the past three years. The data was collected from the questionnaires on their reactions, solutions and suggestions to deal with problems and obstacles in conducting research. The answers from the first group who could overcome the obstructions and could accomplish at least one research annually were analyzed and compared with those of the second group of lecturers who could not.

This study set up the hypothesis that the first group and the second group encountered different problems and worked under different conditions and these affected their achievement in producing research.

The results of the study proved that the hypothesis was true and it reflected the problems and obstacles in conducting research that KMUTT lecturers confronted and suggested the methods for promoting their work on research in the future.

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1. Introduction

As stated in the university's policy [1], King Mongkut's University of Technology Thonburi intends to play a leading role in the research, study, development and selection of technology appropriate to Thai economic and social contexts, in helping the Thai community to be peaceful and to have a competitive capability. As a result, the University promotes and supports research study, its beneficial use as a provision of academic services to society, including the establishment of interaction with other universities, institutes, private schools and communities.

From the Annual Report 2002 [2], there were five flagships that the university council had planned. One mission is to turn KMUTT into a research university. The strategies to reach this research goal could be summarized as follows. First, it should develop the potency of centers and workshops to achieve expertise in specific technologies in order to develop agricultural and industrial production and reservation of energy, technology and environment in the country. Next, it should also increase efficiency in technological knowledge transfer, application and innovation from its industrial park to the public, especially in its fields of expertise. Accordingly, it should focus on teaching at the graduate level to increase research and development and create new researchers. It should also nurture its own researchers to become nationally and internationally well known for the good reputation of the university and the country. Moreover, it should conduct joint research with foreign countries to increase its researchers' skills at international levels. And lastly, it should reform the teaching and studying of sciences to construct a strong basis in studying science and technology in order to develop students' capacity in science and technology competitions.

From the records of the Research and Intellectual Property Promotion Center, the number of published research papers has increased from 177 in 1997 to 646 in 2002 as shown in Table 1 below.

Table 1 Number of published research papers

Year	Number of Published Research Papers				
	International and Regional Journals	National Journals	International Conference Proceedings	National Conference Proceedings	Total
1997	30	20	74	53	177
1998	44	44	59	95	242
1999	63	47	105	108	323
2000	52	52	69	110	283
2001	68	50	125	215	458
2002	66	63	240	277	646

Source: http://www.kmutt.ac.th/organization/Research/Intellect/abstract.htm

This record shows that our personnel work hard and successfully on research, in accordance with the university's policy. Actually, this might not be comparable with world records such as reported by May, [3] that most developed countries had a very high research proficiency index estimated from the number of published research papers. The countries with the ten highest research proficiency index were Switzerland (167), Israel (152), Sweden (147), Denmark (127), Canada (127), Netherlands (109), Finland (107), England (104), U.S.A. (100), and New Zealand (99). It is clearly seen that we have to try harder as Suwanwela et al. [4] said that university lecturers needed to realize and value research for academic excellence and search for new knowledge. If not, in the future, Thai universities would not keep up with universal development.

A very interesting study of Damsuwarn [5] investigated the intention of the faculty at Kasetsart University to achieve academic excellence in different areas of research, identified variables affecting the intention from the model modified from Klein's control theory model of work motivation.

He found that research volition was a common factor of self-esteem and subjective expected utility. It also had a significant direct effect on the intention. From his study, the intention of researchers in agricultural fields was significantly higher than that of researchers in the sciences and social sciences at 0.05 level but no difference was found between science and social science groups. Goal commitment, self-esteem, and subjective expected utility were variables that significantly affected directly the intention of the faculty to achieve academic excellence in research. Work value such as discrepancy, stability dimension of attribution search, need for achievement, self-efficacy belief, work norm, research climate and research experience were significant variables that indirectly affected the intention.

In studying about the productivity of lecturers, Raksasat and Wongsawatdiwat [6] indicated reasons why Thai researchers would not conduct research, from the most important to the least, as follows:

1) lack of time due to too much work,

2) difficulty in finding research fund,

3) no support from superiors,

4) lack of attentive team work,

5) no progress in research jobs,

6) lack of knowledge in writing research proposals,

7) lack of knowledge in statistics and data analysis.

Other factors concerning research were investigated. It was found that intentions for producing academic work correlated with the research climate [7]. Therefore, organizations should create and develop research climate to motivate conducting research, for example, setting up seminars, and provide liberal, comfortable offices and an accessible research library [8]. The exchange of comments and comprehensiveness among peer researchers also correlated significantly with research productivity [9].

Many scholars suggested strategies to promote conducting research. Tang and Chamberlain, [10] stated that rewards affected attentiveness and times spent on research. Furthermore, being a researcher whose works were acknowledged and being rewarded by the university were more effective for research productivity rather than colleagues' recognition. Blackburn, R.T. et al. [11] found that two major variables that were related with research productivity of university lecturers were academic position and interest in conducting research. Klein [12] also insisted that reward structure was one variable that directly influenced attractiveness of goal attainment and results in behavior.

Panich [13] proposed that in order to encourage researchers towards academic excellence, they should be challenged with more difficult work, let them work freely with high power in decision making. They should have opportunities to follow their own motivations because those researchers who aimed for academic excellence obtained work satisfaction in self-actualization. Damsuwarn [5] also suggested that university administrators should balance the obligations for research and other missions. An appropriate reward structure should be developed. From his study, the most desired rewards for researchers were the publication of their research, invitations as expert advisors by other organizations and acknowledgments from colleagues. Next, the work norm should be clearly set up so that research is one obligation in parallel with teaching. He also proposed that the research climate

should be improved, i.e. by increasing the capacity of specific research centers, joint research between departments and faculties, and support from a research assistant system. The last but not the least important, incentive was that researchers should be granted support to get more experience by providing publishing agents, provided support in presentation of their research reports at national and international conferences, and provided support in conducting team research and multi-disciplinary research.

2. The Research Problem

When I studied the records of KMUTT research files in detail, an interesting fact emerged: during the past three years, the increasing number of annual research projects did not come from lecturers at every faculty. The above Annual Report indicated that most of the research projects were directed to the applications of science and technology. Whereas lecturers from some faculties produced a large number of research projects annually, lecturers from other faculties hardly worked out one project within the period studied. I became interested in finding out why these phenomena occurred. Why could some lecturers achieve their task while others could not? Did all of them encounter the same problems? What were the problems and obstacles in conducting research and how did they react to those problems?

The following questions were studied in this research:

1. Within the last 3 years, what kind of research did the subjects conduct and how many projects?
2. How did they rate the problems that confronted them when conducting research?
3. How did they react to the problems?
4. In their opinion, what should KMUTT do to solve the problems that obstructed them and to promote their conducting research?

3. Objective

This study aims to investigate the reasons behind the productive and unproductive phenomena of these KMUTT lecturers. Their revelations about the problems that affected their research projects may reflect the obstacles they were facing. Their techniques for solving the problems may also inspire others and their complaints may draw helpful support from the university as well as other organizations.

4. Hypothesis

This study has set up a hypothesis that two groups of lecturers encounter different problems and work under different conditions and this affects their achievement in producing research.

5. Materials and Procedures

Subjects:

The subjects in this study consisted of 235 KMUTT lecturers. What is different from the Annual Report 2002 which included all the lecturers and support officers, is that this study looked only at lecturers according to the objectives of the research.

The faculties were divided into 2 groups according to their research productivity characteristics from the records in the Annual Report 2002. Those faculties whose lecturers produced many research projects were classified as Group 1 and the rest as Group 2.

Group 1 consisted of 174 lecturers from the faculties of Engineering, Energy and Materials, Bio-resources and Technology, and Science. From the records of the Research and Intellectual Property Promotion Center, most of them produced many research projects annually. My criterion in choosing the subjects in this group was that each of them must have accomplished or published at least 3 research projects within the past three years.

Group 2 consisted of 61 lecturers from the faculties of Industrial Education, Architecture, School of Information Technology, and Liberal Arts. A small number of them produced some research projects once in a while. My criterion in choosing the subjects in this group was initially the same as for the first group, but there were too few subjects to pass the criterion, so I chose those lecturers who accomplished or published at least 1 research project within the past three years.

Instrument:

The instrument used in this research was a questionnaire (in Thai) that was distributed to these 235 lecturers. The questionnaire consisted of questions about their conducting research, the problems they encountered and how they solved these problems. The English version of the questionnaire is shown in the Appendix. The data was obtained from the returned questionnaires which were answered completely. In cases where some answers were not clear, I telephoned to ask the owner for confirmation. If the questionnaire was not completed and the owner was not accessible, that questionnaire was rejected.

At the end, there were 100 questionnaires that met the criterion and were used in this study. These questionnaires came from 76 lecturers in Group 1 and 24 lecturers in Group 2. The details are shown in Table 2 below:

Table 2 The subjects

Group	Faculty	Questionnaire sent	returned	Percent
1	Engineering	87	40	45.9%
	Bio-resources and Technology	29	13	44.8%
	Energy and Materials	33	12	36.3%
	Science	25	11	44%
2	Industrial Education	32	10	31.2%
	Architecture	2	2	100%
	Information Technology	13	5	38%
	Liberal Arts	14	7	50%
1+2	**Total**	**235**	**100**	

From the data above, the subjects in this study will represent the target population, that is, the lecturers who accomplished or published research project(s) within the past three years.

Procedures:

1. The researcher studied the records of research projects within the past three years and selected the target lecturers from all faculties according to the research production criteria, to be subjects in this study.

2. In designing questions for the questionnaire, some lecturers were interviewed.

3. The questionnaire was designed, piloted and revised before being distributed to the subjects.

4. The data was collected from the returned questionnaires that were answered completely. The data was processed and calculated for statistical description and frequency with the SPSS program.

6. Findings

From the returned questionnaires that were completely answered, the researcher observed several interesting facts as follows

6.1 Finding 1 : Within the last 3 years, what kind of research did the subjects conduct and how many projects?

The subjects in Group 1 and Group 2 conducted research mostly in the form of thesis supervision and work projects. These work projects were undergraduate students' assignments that resulted in term papers. The highest number of thesis supervision plus work projects was 692 in Group 1 and 122 in Group 2. In this study, these types of work were not considered typical research for these lecturers since they did not conduct them directly on their own. The ones that counted were their individual research and team research with their colleagues. In general, the difference between the two groups is that Group 1 conducted individual research less than Group 2 whereas Group 2 conducted team research less than Group 1. The details of the findings are shown in Table 3 below, the numbers in parenthesis are the means of each topic. The last column shows the means of individual and team research conducted by each group. It clearly shows that within the last three years, Group 1 conducted more research projects than Group 2.

Table 3 The type of research conducted

Group	N	1) individual	2) team	3) thesis supervision	4) other (projects)	means 1) + 2)
Group 1	76	50 (0.65)	262 (3.44)	540 (7.10)	152 (2)	4.10
Group 2	24	21 (0.87)	35 (1.45)	92 (3.83)	30(1.25)	2.32

6.2 Finding 2 : How did they rate the problems that confronted them when conducting research?

6.2.1 The problem that was rated by the subjects in Group 1 as having most affected their conducting research was ***the lack of equipment.*** The greatest group of the subjects (about 23.7%) rated this problem as the most serious, 18.4% rated it serious and 19.7% rated it moderately serious. The next problems that confronted them secondly and thirdly were ***research funding*** and ***lack of helpers or research assistants*** respectively. Research funding problems were rated moderately serious at 31.6%, serious at 3.9% and most serious at 23.7%. Lack of helpers or research assistants was rated moderately serious at 26.3%, serious at 11.8% and most serious at 10.5%. These problems are shown in Fig.1 as follows.

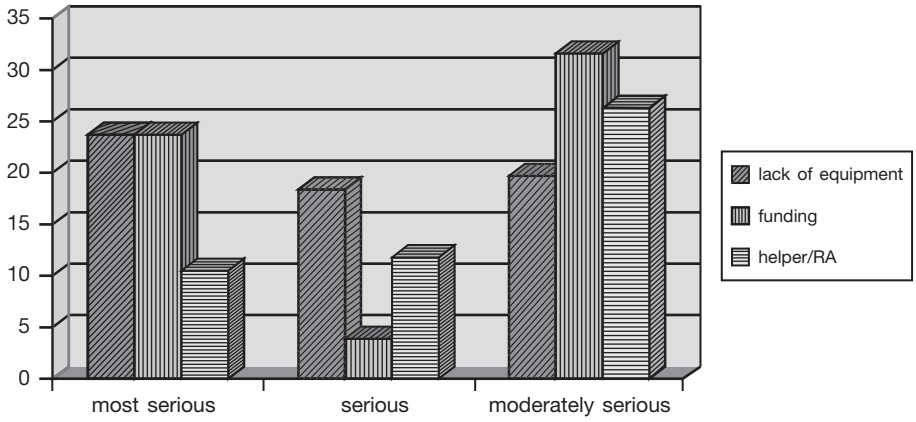

Fig. 1. The most serious problems of Group 1

The highest-rated problem by the subjects in Group 2 that most affected their conducting research was the ***teaching load*** problem. The greatest of the subjects (about 33.3%) rated this problem the most serious, 25% rated it serious and 16.7% rated it moderately serious. ***Other work in KMUTT*** was the second highest-rated problem since the majority of the subjects (about 45.8%) rated it as moderately serious, serious at 4.2%, and the most serious at 12.5%. The third highest-rated problem for Group 2 that affected their conducting research was the ***administrative load.*** About 29.2% of the subjects rated this problem serious, the most serious at 16.7% and moderately serious at 12.5%. The fourth problem in the rank was the ***lack of helpers or research assistants*** which was rated moderately serious at 37.5%, serious at 8.3%, and the most serious at 8.3%. The last problem was the ***lack of incentive,*** which was rated as serious at 29.2%, moderately serious at 16.7% and the most serious at 4.2%. These problems are shown in Fig. 2.

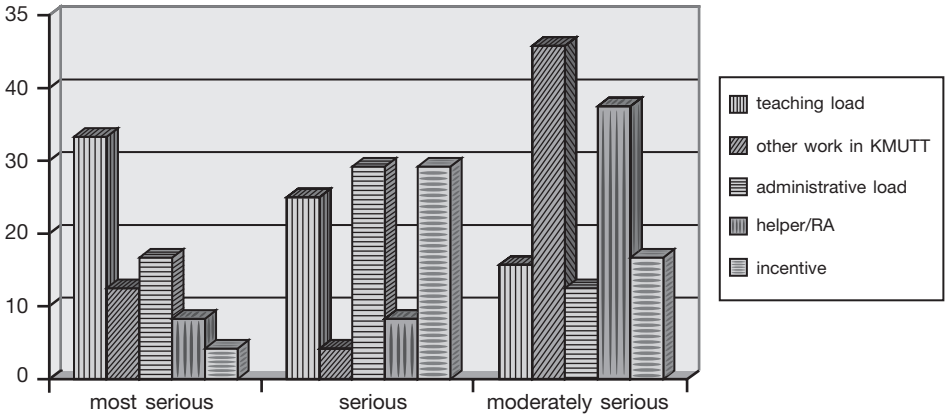

Fig. 2. The most serious problems of Group 2

6.2.2 The problems that were rated by the subjects in Group 1 as having slightly affected their conducting research were ***family financial problems, health problems,*** and ***lack of mentors.*** They rated these problems slightly affecting at 46.1%, 46.1%, and 38.2% respectively.

As for Group 2, they thought these problems were slightly affecting: ***health problems*** (45.8%), ***lack of superior's support*** (41.7%), ***lack of mentors*** (38.2), ***expertise in research*** (29.2%) and ***research funding*** (25%). These problems are shown in Fig. 3 as follows.

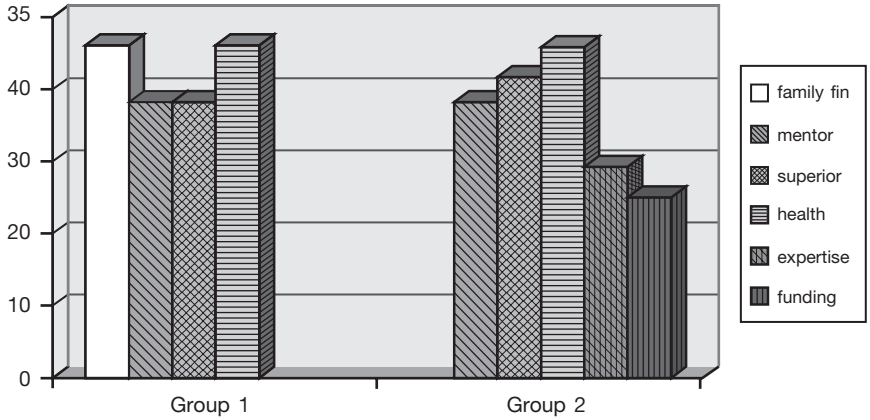

Fig. 3. The slightly affecting problems for Group 1 and Group 2

6.2.3 The fewest problems that the subjects in Group 1 confronted and had not affected their conducting research were ***lack of subject/co-operation*** (48.7%), ***lack of superior's support*** (46.1%), ***family financial problems*** (42.1%), ***expertise in research*** (40.8%), ***work outside KMUTT*** (38.2%), ***lack of team work*** (38.2%) ***non-researchable teaching*** (38.2%), ***administrative load*** (32.9%), ***teaching load*** (30.3%), ***other work in KMUTT*** (28.9%) ***and lack of incentive*** (26.3%).

As for Group 2, they found these problems were the fewest and had not affected their conducting research: ***lack of subject/co-operation*** (48.7%), ***family financial problems*** (41.7%), ***work outside KMUTT*** (37.5%), ***non-researchable teaching*** (37.5%), ***lack of equipment*** (33.3%) ***and lack of team work*** (33.3%). The 5 highest-ranked problems of each group are shown in Fig. 4 as follows.

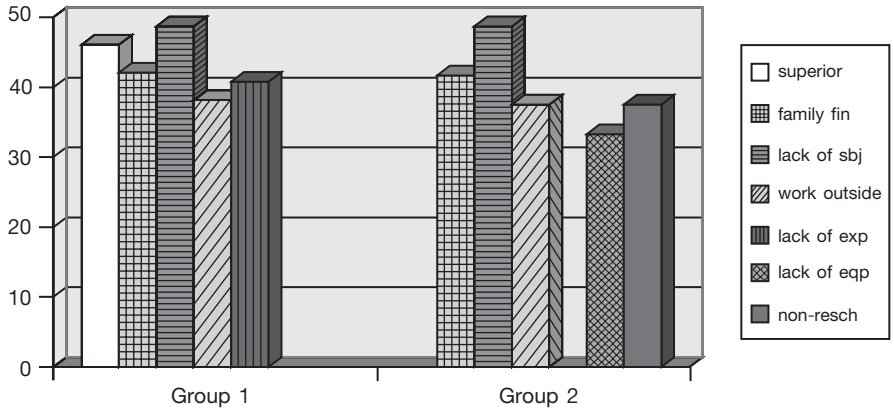

Fig. 4. The non affecting problems for Group 1 and Group 2

6.3 Finding 3 : How did they react to the problems?

When they encountered these problems listed above, most subjects in Group 1 chose to change or adapt to cope with the situation (53.9%) whereas most subjects in Group 2 postponed or stopped the research (54.2%). A small number of subjects in Group 1 chose to ask for help from KMUTT and a small number in Group 2 chose to solve the problem themselves such as supporting themselves or researching after official work time. Their reaction is shown in Fig. 5. below.

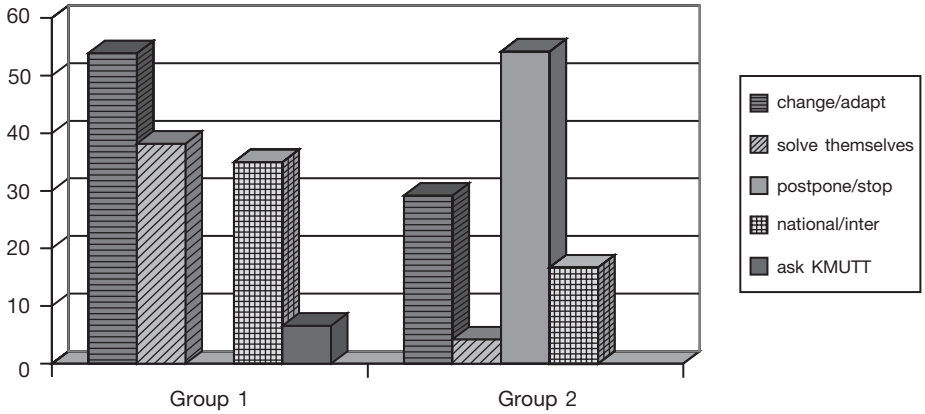

Fig. 5. Their reaction to the problems

6.4 Finding 4 : In their opinion, what should KMUTT do to solve the problems that obstructed their conducting research?

The comments from the subjects using this open-ended question reflected some interesting viewpoints as follows:

6.4.1 Financial support : Many subjects suggested that the university should provide more funding for research and presentations. It should lower over-head charges and increase incentives for conducting research as in compensation of income from teaching extra hours.

6.4.2 Academic support : Apart from funding, the lack of teamwork or mentors, secretarial staff, research helpers and support equipment and resources such as computers, journals and text-books are detrimental to conducting research.

6.4.3 Research-promotion policy : Many subjects suggested that the university should put its policy of promoting research into practice. Some suggestions were to lower the teaching and administrative loads, provide research friendly environments, lab facilities, buildings, vehicles, pool research equipment for sharing amongst faculties and setting up a center with a secretarial team for funding applications, financial processing and other red-tape work. It would also be helpful if the university reconsidered the criteria for evaluating work efficiency and strict timing for daily work.

6.4.4 Miscellaneous : Many problems that were stated by the subjects were varied but nonetheless affected their conducting research. Some of the problems were the research funding regulations that limited the chances for application and the neglect of superiors to their conducting research but required extra work.

7. Summary and Discussion

From the study, it is evident that the productive and unproductive phenomena that occur amongst KMUTT lecturers derive from several problems resulted from the nature of their work. The different conditions of their work also affects their type, manner and achievement of their conducting research.

About their types of research, from the first finding the two groups of subjects conducted most research in the form of work projects. Since these work projects were undergraduate students' assignments, they were not the lecturers' own research because they only supervised their students, so ***lack of subject/co-operation*** and ***lack of team work*** had not affected them. The large number of projects partly reflected ***teaching load*** which was one serious problem for researchers in Group 2. Nonetheless, in my opinion the large number of projects might provide secondary experience in conducting research to these lecturers and enrich their expertise. This probability is supported by the statistics that Group 1 had more student projects than Group 2 and Group 1 stated that ***expertise in research*** had not affected them whereas it slightly affected Group 2. In the same vein, both groups

decided that ***lack of mentors*** slightly affected their conducting research.

As for the manner in conducting research, it was found that lecturers in Group 1 conducted more teamwork projects than Group 2 and the latter group tended to work individually. From my personal view, this may come from the fact that scientific and engineering projects often require a large number of workers to complete the multiple steps of an experiment, therefore, teamwork is naturally essential as well as ***research funds*** and ***equipment*** that were regarded as serious problems. On the contrary, an individual researcher can conduct a self-sponsoring, small project in social science, architecture or information technology so what is mostly needed is ***incentive.*** Another reason may be the number of researchers in each Group. As reported in the Annual Report 2002, there were more researchers in Group 1 than in Group 2. Thanks to this fact, it was more convenient for researchers in Group 1 to find co-researchers who were interested in the same topic.

From the second finding, the two groups of lecturers actually encountered different kinds of problems when conducting research projects. Group 1 considered ***lacking research equipment*** the most serious problem but Group 2 thought it was not an issue. On the other hand, the most serious problem for Group 2 was ***teaching load*** but it was not an issue for Group 1. Whereas ***lack of superior's support*** was considered slightly serious for Group 2, Group 1 viewed that this problem had not affected their conducting research.

These different problems reflect the different nature of work between the two groups and this nature brought about different methods for solving the problems, as found in the third finding. Whereas the subjects in Group 1 changed their project and coped with the lack of equipment, the subjects in Group 2, due to their teaching load and lack of superior's support, could do nothing but stop or postpone working on research.

We can also see that some of the problems were mutual between the two groups and these problems reflect the general obstacles for any researcher, regardless of their faculty. For example, ***lack of helpers or research assistants*** was regarded as one of the most serious, whereas ***health problems*** and ***lack of mentors*** were regarded as slightly serious. These findings are in accordance with the study of Raksasat and Wongsawatdiwat [6] as mentioned before.

From the fourth finding, the subjects proposed several ideas to the university administrators to solve the problems. Actually, the university is on the right track to solve some problems. From the Annual Report 2002, the university would support scientific projects by setting up 8 Excellence Centers, all of them concern with the development of engineering, energy and biotechnology research.

When these centers are supplied with the necessary equipment and support staff, that may partly substitute research funding. The most serious problems of Group 1 would be partly, if not all, solved.

As for Group 2, it is noticeable that they stated their workload repeatedly in terms of teaching, administrative, and other work in KMUTT. All of these reflect the limitations that obstructed their conducting research. This is in common with what was found by Raksasat and Wongsawatdiwat [6] that the lack of time due to too much work was the first cause of unproductive phenomenon. I also agree with Damsuwarn [5] that the balance between research work and other work would be helpful in creating a research climate.

The other serious problem for Group 2 was the lack of incentives. In my viewpoint, research funds are essential for big-scale projects whereas incentives are essential for small-scale projects that the researcher self-sponsors. As suggested by Damsuwarn [5], Sapianchai [8], and Tang and Chamberlain [10], the research climate and rewards motivate conducting research. In fact, KMUTT has a policy to support its researchers in terms of grants for research presentations, publications, reduced workloads, promotions and acknowledgements. What I would like to suggest is that this incentive policy could be applied in practice with more supporting and flexible regulations that would motivate more lecturers in Group 2 to work on research.

As seen from this investigation, the unproductive phenomenon in Group 2 derived from problems that could not be solved by themselves. With further investigation on the workload and motivating incentive system, the university planning staff may get clearer ideas to improve the situation and facilitate the lecturers' endeavors to conduct more research projects. In consequence, our goal to become a research university could be well accomplished.

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Appendix

The Questionnaire about problems and obstacles in conducting research and how to solve them

1. Within the last 3 years, what kinds of research have you conducted and how many projects?

☐ a. individual projects ..... ☐ b. team projects .....

☐ c. acted as thesis advisor ..... ☐ d. other (please specify) .....

2. Please rate the problem you confronted in conducting the research. 5 = many 1 = few

1. research funding	☐	2. teaching load	☐
3. administrative load	☐	4. other work in KMUTT	☐
5. work outside KMUTT	☐	6. expertise in research	☐
7. lack of mentors	☐	8. lack of helpers/RA's	☐
9. lack of team work	☐	10. lack of incentive	☐
11. lack of equipment	☐	12. lack of subjects / cooperation	☐
13. non-researchable teaching	☐	14. lack of superior's support	☐
15. health problems	☐	16. family financial problems	☐
17. other (please specify)			☐

3. Which problem above affected the most seriously for your conducting research?.....

4. When you faced problems, what did you do? You can choose more than one technique.

☐ a. postponed or stopped the research

☐ b. change/adapt to cope with limitation

☐ c. solved it yourself, e.g. support yourself or researched after official work time

☐ d. asked for help from your department/faculty

☐ e. asked for help from KMUTT

☐ f. asked for help from national/ international organization

☐ g. other (please specify) .....

5. In your opinion, what should KMUTT do to solve the problems that obstructed your conducting research? .....

.....