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Learning Package by Means of the Inductive Teaching with Group Process

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Abstract This research focuses on the inductive teaching with group process and students' behavior as working in a group. There were four instruments under this study. The descriptive statistics were employed. The findings revealed that, firstly, the effectiveness of LPIDTGP is higher than the fixed criteria. Secondly, the students' learning achievement is higher than the fixed criteria. Thirdly, the students' behavior as working in a group, as the overall, is good. Lastly, the students' learning satisfaction towards LPIDTGP is greatly satisfied.

Keywords Derivative, Group Process, Inductive Teaching, Learning Package

1. Introduction

In the education circumstance, the good education management should consider the learner's characteristics. They are differences in terms of knowledge, personality, and creative thinking. The learners should be active students. The learners should also be encouraged to express their knowledge and feeling while in the classes.

Mathematics is considered as one of the high effective tool. It is used to describe various fields of knowledge and it is also well-known acknowledged. According to [1], the problems for mathematics learning were that the topics taught in the classes were quite difficult. Thus, this made the learners dislike mathematics, including that there were no effective materials to stimulate the learners' interest.

Inductive teaching with group process is one approach considered more effective. The students will be encouraged to learn new knowledge as working in a group [2]. This supports the strategies for teaching students in the 21st century that the collaborative skill is the great approach that promotes students' learning [3]

From the statements above, the researcher, as the lecturer of mathematics at RUS, aims to develop LPIDTGP on the topic of "Derivative" for undergraduates at RUS.

2. The Objectives of the Study

1) To develop the Learning Package by means of the Inductive Teaching with Group Process (LPIDTGP) for undergraduates at Rajamangala University of Technology Suvarnabhumi

2) To investigate the students' learning achievement towards LPIDTGP by based on the fixed criteria as 65%

3) To examine the students' behavior as working in a group towards LPIDTGP

4) To study the students' learning satisfaction towards LPIDTGP.

3. The Scope of the Study

The content is used in this study was on the topic of "Derivative." The sampling was the undergraduates enrolling in Calculus 1 in 2015. It was obtained by making use of purposive sampling. The independent variable was LPIDTGP. The dependent variable consisted of the students' learning achievement, the students' behavior as working in a group, the students' learning satisfaction towards LPIDTGP.

4. Literature and Theoretical Framework

Under this study, four theoretical frameworks were described as follows:

A. The theories about learning packages. The learning package played a vital role to enhance the high learning achievement. This was because the learning package was the combination of multi-media. It consisted of related course objectives, content, learning experiences. It also supported the learners for the continual learning. Thus, after using the learning package, the learning achievement is higher. [4]

B. The theories about the inductive teaching.[5]-[7] stated that inductive teaching was the teaching procedure from details to the main topics, or teaching from observing, testing, or comparing from the information provided and

then concluding the principles or rules from what they learnt. This teaching method enables learners to learn by heart and last long memory. The learners have logical thinking. They understand how to solve the problems correctly. Hence, the inductive teaching approach is suitable for the learners who can construct their own idea.

C. The theories about the group process teaching. [8]-[10] described the group process as the collaboration of people with the same aim. Everybody in the group has a significant role to push the group go forward, including cooperating with others to achieve the success.

D. The teaching and learning mathematics. [5], [11]-[12] stated that the teaching and learning mathematics should begin from the simple to complicated topics. The individual's readiness should be considered as well. Moreover, the teaching style should be changed, that is to say, the abstract teaching should be replaced by lively teaching in order to make the learners more enjoyable.

5. Research Design and Methodology

A. The instruments employed in this study were as follows:

a) The Learning Package by means of the Inductive Teaching with Group Process

b) The Evaluation Form for the Learning Package by means of the Inductive Teaching with Group Process

c) The Learning Achievement Test

d) The Group Work's Behavior Assessment Form

e) The Satisfaction Evaluation Form towards the Learning Package by means of the Inductive Teaching with Group Process

B. the development and verification of the instruments

The inductive teaching approach is employed for the creation of learning packages. The benefit of learning package is that the learners can study by themselves with their own interests. Integrated learning packages with inductive teaching, it enable the learners to have the high effectiveness. Moreover, new idea is generated from this process. The group process is employed in order to create the cooperation of the members in the groups. The learners help each other to complete their tasks. As a result, the instruments utilized in this study were developed and verified as following:

a) The development of the LPIDTGP. The development procedure for the LPIDTGP was studied. Then the draft of the LPIDTGP was outlined. Next, it was verified by the experts.

b) The development of the Learning Achievement Test. First, the test was constructed, covering the contents and objectives. Next, it was verified by the experts. A pilot study was conducted before using with the target group.

c) The development of the Groupwork's Behavior Assessment Form. The theoretical frameworks about the groupwork's behavior were studied. This assessment form consisted of five parts. It was verified by the experts and adjusted before using with the target group.

d) The development of the Students' Satisfaction Evaluation Form. This evaluation form was 5-rating scale. It was verified by the expert.

6. Data Collection

1. Prepare the Learning Package by means of the Inductive Teaching with Group Process to test with the target group.

2. Conduct the experiment, the steps as follows:

2.1 Explain the students about the instructions of how to use LPIDTGP, the learning management, duration, evaluation approach. This was to ensure that the mistakes would be lessened.

2.2 Divide students into a group of 4. It consisted of a student with high competency, 1 student was with medium competency, and 2 students with low competency. This regarded the students' willingness, too.

2.3 Process the activities by using LPIDTGP. After that, test the students' learning achievement individually.

3. Evaluate the students' behavior as working in a group and their learning satisfaction towards LPIDTGP.

3.1 Administer the evaluation form to the students. The evaluation was divided into 3 parts: student's evaluation; peer's evaluation; and teacher's evaluation. The students firstly evaluated themselves, following by peers and teachers.

7. Data Analysis and the Descriptive Statistics under this Present Study

The data analysis was as follows: First, the teaching approach, the learning activities, and the evaluation approach were analyzed by IOC. Second, the effectiveness of the Learning Package by means of the Inductive Teaching with Group Process was analyzed by the fixed criteria as E_1 / E_2. Third, the learning achievement score was compared by average, S.D., and t-Test. Fourth, the groupwork's behavior and the students' learning satisfaction towards LPIDTGP were analyzed by average and S.D.

8. Results

Based on the research purposes, the results of data analysis were as follows:

1. The experts' opinions towards the learning package were that all topics were at the highest level. It can be interpreted as very good. Regarding the average and S.D., it showed that each learning package was nearly suitable, as shown in Table 1.

2. The effectiveness of the learning package is 83.44/83.99, which is higher than the fixed criteria. It

implied that, as hypothesized, this LPIDTGP was effective.

3. The students' learning achievement was 90.91. It indicated that this LPIDTGP is effective.

4. The students' behavior as working in a group, as the overall, was 2.61. It could be interpreted as good. Considering in details, it appeared that students were good at task achievement $\left(\overline{X} = 2.72\right)$.

5. The students' learning satisfaction towards LPIDTGP was at the highest level $\left(\overline{X} = 4.56, S.D. = 0.24\right)$. Considering in details, students were happy and satisfied with LPIDTGP $\left(\overline{X} = 4.84, S.D = 0.12\right)$.

Table 1. The average and S.D. of the experts towards the learning packages

	Average	S.D.	Interpretation
algebraic function	4.31	.13	very good
logarithmic function	4.31	.12	very good
exponential function	4.29	.11	very good
trigonometric function	4.33	.09	very good
inverse trigonometric function	4.34	.11	very good

9. Discussion and Conclusions

A. The effectiveness of the LPIDTGP. The finding indicated that the effectiveness of LPIDTGP is 83.44/83.89. This is because the researcher planned to develop the learning package well. The learning package was researched from various trustworthy papers and verified by the experts. This finding supports [4], [13] studies that the development of the learning package should be corresponded the contents, activities, and objectives. The learning package is combined and verified. Thus, it could also change the learner's behavior.

B. The students' learning achievement. The finding showed that LPIDTGP could enable students to gain higher learning achievement score at 90.91%. This is because students can learn the new knowledge. They can also work in a group very well. For example, they helped each other to make sheets and worksheets, including giving a presentation well. The students also have freedom to learn and practice the LPIDTGP. This finding is also consistent with [14] that the learning package is the multi-media combined as the package. The learning package should be consisted of simple contents. The activity instructions should not be complicated. The content does not need to be in sequence. In addition, the knowledge from the sheet is related to the worksheet and can be checked through the answers. This proves [4] that the learning package can increase the students' learning achievement because the learning package is supported by the learning continually. Moreover, the students can practice the learning package at any times. This is also consistent with [5] in which that teaching mathematics should be from simple to complicated topics. It also supports [12] that teaching mathematics should focus on observation. This finding also proves [15]-[18] that the inductive teaching creates students to be more active and take participation in this approach better.

C. The students' behavior as working in a group towards LPIDTGP. The findings appeared that the students' behavior, as the overall, is 2.61. It can be interpreted as "good." Considering in details, it shows that the learning achievement is the most concerned, following by the participation and responsibility, and the students' role. This is because learning with the group process emphasizes the students to cooperate. Every student in the group tried to achieve the task. This supports the Educational committee that the group process has a great influence on students' learning in the group and makes students to work together. It is consistent with [19]-[20] studies that learning with the group process can increase the students' learning achievement and make students a good behavior when working as a group.

D. The students' learning satisfaction towards LPIDTGP. The results showed that the students' learning satisfaction towards LPIDTGP is the highest. Considering in details, it appears that the students are happy and satisfied with LPIDTGP. This is because this learning approach helps students to have freedom to do the activities and don't feel stress. In addition, the contents and the activities correspond to the students' need and learning experiences. This supports [19], [21] studies that group process learning makes students greatly happy and satisfied.

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