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A study of mathematical development of pre-cadets receiving Online Learning Management

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Abstract

This research aims to compare the mathematics achievement of pre-cadets before and after receiving the online learning management and study the development of mathematics learning of pre-cadets managed online learning. The sample was 2nd year of pre-cadets in the Armed Forces Academies Preparatory School (AFAPS) under the National Defense Studies Institute, Royal Thai Armed Forces, number of 66

was used in this research. The research tool was the achievement test on exponential and logarithmic functions. The test was multiple-choice form of 18 questions and fill form of 2 questions, included 20 questions. The statistics used for data analysis were means, standard deviation, percentage, t- test and relative growth score.

Keywords: Development of Mathematics Learning

Introduction

In teaching, instructors are concerned with the knowledge, ability, or the achievement of the learners. Significantly, the teacher should also pay attention to the education of the learner's learning development. Therefore, it will be a measure and evaluation that is meaningful and useful to learners even more. Because each person is different whether it is basic knowledge, intelligence, aptitude or skills.

The measurement of the developmental score has received a lot of attention from many educators because the development score is used as an index to indicate the progress of the thing to be measured. In education, developmental score measurement is an important process of educational measurement and evaluation. This is because the results of the measurement can be used as useful information to learners, teachers and administrators in order to improve teaching and learning management and planning for educational administration. Growth Score is a quantity obtained by comparing the results of two or more measurements, with different names such as Gain Score, Difference Score (Wichitwanna, S. 2004).

Due to the situation of the coronavirus or COVID-19 outbreak from December 2020 to the present. The epidemic situation has spread all over the world. As a result, learning management for 2nd year pre-cadets in the first semester from May to July 2020 is an online learning management which has both advantages and limitations. Providing online math education for military school is new and challenging for teachers. However, what teachers care about the pre-cadets is a concern that students will not be able to develop their academic achievement not to their full potential. This is because online learning can have a number of limitations that hinder learning.

From the above, the researcher is interested in studying mathematics learning development of 2nd year military preparatory students online learning management. Academic year 2020 to use the research results in planning to improve the mathematics achievement of military preparation students.

Research Objectives

1. To compare the mathematics achievement of the pre-cadets before and after receiving the online learning management.
2. To study the development of mathematics learning of the pre-cadets receiving online learning management.

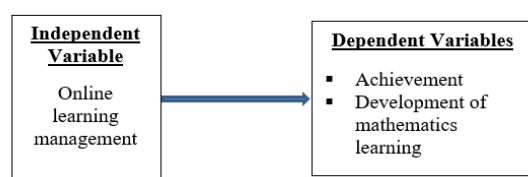
Research Areas

1. The population in this study were 793 of the 2nd year of pre-cadets in AFAPS, first semester of academic year 2020. The sample consisted of 66 students in the 2nd year of pre-cadets, first semester of academic year 2020 and the researcher used cluster sampling.

- The content used in this research study were the achievement and development of mathematics learning on exponential and logarithmic functions.
- Online learning management refers to the organization of learning activities or learning experiences for the learners by using the Internet network. Manage classrooms and organize learning activities through channels: Google Classroom, Zoom, Line Application.

Research Methodology

This research is quasi – experimental research an aim to compare the mathematics achievement of pre-cadets before and after receiving the online learning management and study the development of mathematics learning of pre-cadets managed online learning that showed by diagram as followed.



Research instrument

Research tool was the achievement test on exponential and logarithmic functions consist of multiple-choice form of 18 questions and fill form of 2 questions with 0.87 by KR-20 and 0.84 by Cronbach's alpha coefficient for reliability, respectively.

Data analysis

The statistics used for data analysis were mean, standard deviation, percent, t-test and relative growth score. The result showed as followed

Table 1: Comparison of Mathematics achievement pre- post test receiving the online Learning management

Test	N	Total score	\bar{x}	S.D.	t	df	Sig
Pre -test	66	20	8.58	3.891	10.433	65	0.000*
Post-test	66	20	13.21	3.681			

*p<0.05

Table 1 showed that the pre-cadets had a statistically higher mathematics achievement after receiving online learning management than before at a level 0.05, with mean score of 8.58 and standard deviation of 3.891 of pre-test score and mean score of 13.58 and standard deviation of 3.681 of post-test score.

Analysis by relative growth score showed by table 2 as followed.

Table 2: Development of mathematics learning of pre-cadets after receiving online learning management

	Criterion scores	Level	Number	Percentage
	76 - 100	Very high level of development	6	9.09
	51 - 75	High level of development	17	25.76
	26 - 50	Intermediate development	25	37.88
	0 - 25	Primary development	18	27.27
Average	42.59	Total	66	100.00

Table 2 showed that the pre-cadets had a very high level of development number of 6 students, accounting for 9.09 percent, 17 students had high-level development, accounting for 25.76 percent, 25 students had intermediate level development, accounting for 37.88 percent, and 18 students had a primary level of development, accounting for 27.27 percent. The average development score of 42.59 percent which corresponding to intermediate development score.

Conclusions

- The pre-cadets had a statistically mathematics achievement after receiving online learning management higher than before.
- The pre-cadets had an intermediate level of mathematical development.

Results

Analysis by t-test found that pre-cadets had a statistically higher mathematics achievement after receiving online learning management than before at a level 0.05, with mean score of 8.58 and standard deviation of 3.891 for pre-test score and mean score of 13.58, standard deviation of 3.681 for post-test score.

Analysis by using relative growth score found that pre-cadets have an intermediate level of mathematical development with an average development score of 42.59 percent.

Discussions

- From the research results found that the pre-cadets had higher mathematics achievement after online learning management than before. This is because students get online learning where they have time to study at home without the need for daily practice as they are in AFAPS that result in students have time to fully study the content. In addition, teaching mathematics, teachers have uploaded teaching clips to google classroom, so students can review the content at any time. It is consistent to Krisana Sikkhman (2011) ^[1] said that online teaching is an instructional model that is designed, teaching in a systematic manner and the objectives or goals of teaching and learning are clearly defined. Knowledge transfer, content presentation, teaching and learning activities and communication use technology as a tool which currently focuses on the use of the internet network. Thus, enabling students to access and learn without limitation of place and time. In addition, this finding is consistent to the result of Suwat Banlue (2018) ^[5] which has developed the suitable model of online learning and teaching for Ubon Ratchathani Rajabhat University, the study found that the average score of achievement in information technology subject of students have higher achievement after online learning management than before at the level of .05 statistically significant.
- From the research results found that the pre-cadets had a moderate development in mathematics. Due to the online learning, students can review contents that they are interested in at any time that make better understanding of the subject content. This finding is consistent to the research of Uwairana Matungkun (2011) studied the writing development of early childhood students enhancing paper arts activities, the study found that the writing development of children

was higher through out the 8 executive weeks. However, there are still some students who improve their learning. May be due to a misunderstanding in the content, lack of content review and interaction with teachers and classmates that causing the incomprehensibility to not be resolved that resulting in poor development scores, this result is consistent to the research of Pornchanok Bunchantorn (2015) [2] studied the effects of student team achievement division cooperative learning supplemented with metacognitive strategies on achievement mathematics and problem-solving abilities. The results were found that the students who studied using cooperative learning supplemented with metacognitive strategies had the mean score of after study higher than before due to students interact and help each other for their studies.

Suggestions

1. Feedback from the research.

As a result of the research, it was found that a number of the pre-cadets had primary learning development level. Teachers should find ways to develop the knowledge and abilities of this group of students for a better learning development.

2. Suggestions for further research.

Further research should study the results of improving mathematics achievement of students with conventional learning management and online learning management. To compare and find ways to improve mathematics achievement even more, especially the group that developed learning at the primary learning development level.

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