

Enhancing Mathematics Classroom Teaching Through Micro-Lessons and Increased Learning Interest

Zhou Xiaomin, Rajamangala University of Technology Thanyaburi, Thailand
Piyanan Pannim Vipahasna, Rajamangala University of Technology Thanyaburi, Thailand

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Abstract

This research discusses how to strengthen the teaching of mathematics class by using micro-lessons and improve students' interest in learning. In order to solve these problems, this study puts forward the application of micro-lesson in mathematics teaching. The needs analysis is carried out in advance with the aim of stimulating students' perceptions of learning using micro-lessons. The purpose includes of this study were: 1) To identify the efficacy of the proposed micro-lesson on mathematics classroom learning. 2) To compare students' learning achievement through pre-test and post-test the micro-lessons to study mathematics and 3) To assess satisfaction from using micro-lessons. The sample for this study included 30 third-grade students studying in a private school in Guangdong Province. Students were selected using a simple random sampling technique. The data were analyzed using mean, standard deviation and t-test. The findings showed that 1) The efficacy of the proposed system (E1/E2) were at levels greater than 80 percent. 2) The students' achievement based on the post-test was higher than pre-test significantly at the level of .05. 3) The student's level of satisfaction toward the system was at the highest level. The results show that the micro class is beneficial to the learners' interest in mathematics. The application of micro-lessons in mathematics classroom teaching reduces learners' anxiety in mathematics learning, and there is a significant difference between the experimental group and the control group.

Keywords: Micro-Lessons, Subject Teaching, Teaching Practice, Application

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1. Introduction

Under the background of the high efficiency development of information technology, the teaching before, during and after class of teachers in primary schools has undergone new changes and developments. The transformation from the traditional single offline course and teaching to the "online + offline" mixed teaching model provides a convenient platform and rich resources for the extension of the classroom. Such massive resources provide more humanized technical support for the teaching of primary school teachers, and constantly optimize the teaching practice and classroom of primary school teachers, which also requires the continuous development and improvement of the information ability of primary school teachers, so as to better combine digital information with teaching.

"Micro-lessons" refers to the whole process of recording teachers' wonderful teaching and learning activities centering on certain knowledge points (key and difficult points) or teaching links in the course of education and teaching both inside and outside the classroom with video as the main carrier. Therefore, "micro-lessons" is not only different from the traditional single-resource teaching resources such as teaching examples, teaching courseware, teaching design, teaching reflection, but also a new kind of teaching resources inherited and developed on its basis. In education and teaching, the content taught in the micro-lessons is in the form of "points" and fragments.

2. Research Objectives

This study aims to combine micro-lecture with various courses to realize the deep integration of information technology and education teaching, which can meet the individual learning needs of students and change their learning methods.

2.1 To develop micro-lessons application to improve students' self-learning ability.

2.2 Students in the learning achievement test comparison before and after.

2.3 Students satisfied with using micro lessons to learn.

3. Research Hypothesis

The emergence of micro-lessons will break the traditional teaching methods, satisfy students' personalized learning of different subject knowledge points and select learning according to needs, which can check the gaps and make up for them, and strengthen and consolidate knowledge. It is an important supplement and expansion resource for traditional classroom learning.

4. Research of Methodology

4.1 Variables

4.1.1 Independent variable is a small video of learning mathematics curriculum knowledge in micro-lessons to improve students' learning interest.

4.1.2 The dependent variable is (1) Student learning achievement; (2) Student satisfaction toward the micro lessons.

4.2 The population: The objects of this study are 280 students and 20 teachers in Grade 3 of Country Flower City School, Shunde District, Foshan City, Guangdong Province, China. The sample of this study are 30 students and 4 teachers from Country Flower City School, Shunde District, Foshan City, Guangdong Province, China.

4.3 The research instruments

4.3.1 Small videos for learning subject knowledge in micro-lessons;

4.3.2 “Questionnaire star” APP.

4.3.3 The students were pre-test and post-test.

4.4 Content

This study will investigate the application status of micro-lessons in primary school mathematics teaching, so as to understand the shortcomings of the current micro-lessons in primary school mathematics teaching, collect the opinions of teachers and students on the application of micro-lessons in class, and then analyze, synthesize, compare and summarize, so as to provide suggestions and measures for primary school mathematics teachers to use micro-lessons in class.

5. Conclusion

The analysis result of the above information answers to the research objectives as follows:

5.1 The effectiveness of using Micro-lessons in mathematics classroom learning shows that the E1/E2 coefficient 1 of the learning process score (E1) is equal to 82.83, and the performance score (E2) is equal to 81.53, which is higher than the standard defined by 80/80. The research results clearly show that the mathematics classroom teaching effect is good in Country Flower City School.

Items	n	\bar{X}	Percentage	S.D.	Standard	E ₁ /E ₂
Ongoing score	100	82.83	82.83	3.51	80	82.83
Post-test score	30	24.46	81.53	2.43	80	81.53

Table 1: E1/E2

5.2 The third grade students in Country Flower City School were taught Micro-lessons to improve their interest in learning mathematics. The results of the post-test results were higher than the pre-test results, with a significant level of 0.05.

5.3 The results of students' satisfaction show that students' satisfaction with Micro-lessons teaching is higher, and the average score is higher 4.22, especially in terms of access to teaching content and participation in other learning resources, students have higher satisfaction with Micro-lessons teaching and are more suitable for learning.

5.4 Summary

In this research, researcher have suggested that the results of the study should be applied as follows:

5.4.1 The development of Micro-lesson instruction should be carried out step by step according to best practices in the field, as this will enable researchers to achieve the goal of building Micro-lessons instruction courses to enhance teaching effectiveness and implement them more successfully.

5.4.2 Mathematics classroom teaching is a subject that has been studied in many aspects, and it has been found that using Micro-lessons teaching can successfully improve students' interest in learning mathematics, so it is necessary to further study the application of Micro-lessons to the learning and teaching of other subjects.

5.4.3 Taking into account the different learning styles of students, students should be given the opportunity to decide whether they wish to study independently or in groups. This will promote cooperative learning skills and peer correction.

5.5 Discussion

The research and discussion on carrying out Micro-lessons teaching in mathematics classroom in Country Flower City School to improve students' interest in learning mathematics are as follows:

5.5.1 Analysis of Using Micro-lesson to study mathematics in class of efficiency of $E_1/E_2 = 80/80$

The experiment construction based on the application of Micro-lesson in mathematics classroom teaching to improve the interest of third grade students in learning mathematics in Country Flower City School is divided into three stages, aiming to test whether E_1/E_2 efficiency value under the 80/80 efficiency standard can be reached before the experiment is implemented. The first stage is traditional teaching. 30 students are taught in traditional mathematics classroom. The second stage is called the use of Micro-lessons in mathematics classroom teaching. After this video for Micro-lesson teaching has been modified and refined, the final stage is called field testing. It was carried out by 30 students. The results show that the E_1/E_2 efficiency is 82.83/81.53. This result is consistent with the results of several related studies. Ye Ma (2023) conducted a study on the application of Micro-lesson teaching technology, and the results showed that the efficiency value of E_1/E_2 was 80/81.80. In addition, Yanghui Lu (2022) also showed that the efficiency of E_1/E_2 was 80/80 by analyzing the application significance of Micro-lessons in mathematics classroom teaching. Xinjun Zhao (2022) developed an innovative teaching model based on Micro-lesson teaching, and the results showed that the efficiency level of E_1/E_2 was 83.50/84.25, which met the standard.

5.5.2 A comparison of students' use of Micro-lessons in mathematics classroom learning tests

Through the comparison of students using Micro-lessons in mathematics classroom learning performance, the results show that students in the Micro-lesson learning group score higher in the mathematics classroom using Micro-lessons learning performance test, reaching a significant level of 0.05. When the content of Micro-lesson teaching is suitable, Micro-lesson teaching can produce effective learning effect. This is because the tool can help motivate users to use fascinating techniques such as motion graphics and images. Qiang Ma(2020) compared teaching using micro-lesson resources with traditional teaching methods and showed that students using Micro-lesson teaching had higher academic performance, with a significance level of 0.05.

5.5.3 Students' satisfaction with the use of Micro-lessons in mathematics classroom learning

According to the results of the experiment, the students have a high degree of satisfaction with the use of Micro-lessons in mathematics classroom learning. This is consistent with the findings reported in the literature (Ma Deng, 2022; Dan Ma, 2020; Xiaoyong He, 2021; Ping Chen, 2022 and Ying Chen, 2023). In these studies, two-thirds (2/3) of students were very satisfied with the use of Micro-lessons for math classroom learning. This is because they can use Micro-lesson resources anytime and anywhere. They benefit from learning new things at their own pace. In addition, their learning speed can be adjusted according to their learning ability.

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