

Effectiveness of Flipped Classroom Teaching Activities on Learning Achievement of Second-Year Teacher Students in Vocational Colleges

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(Received: 2026-04-09; Revised: 2026-09-04; Accepted: 2026-09-07)

Abstract

The purposes of this study were to compare: 1) students' learning achievement in the Primary Classroom Management course before and after using the traditional teaching method, 2) students' learning achievement in the Primary Classroom Management course before and after using the flipped classroom teaching activities and 3) post learning achievement between students taught through the flipped classroom teaching activities and learning through the traditional teaching method.

The sample group of this study consisted of 100 second-year students majoring in Primary Education at Guangxi Modern Polytechnic College during the first semester of academic year 2025. The samples were selected using cluster random sampling and divided into an experimental group and a control group, with 50 students in each group. The research instruments included learning management plans based on the flipped classroom teaching activities and the traditional teaching method, as well as a primary classroom management test used as a pretest and posttest to measure learning achievement.

The results of the study revealed that: 1) students' learning achievement after instruction using the traditional teaching method was significantly higher than before instruction at the .01 level, 2) students' learning achievement after instruction using the flipped classroom teaching activities was significantly higher than before instruction at the .01 level and 3) students who learned through the flipped classroom teaching activities achieved significantly higher post learning achievement than those who learned through the traditional teaching method at the .01 level.

Keywords: Flipped Classroom Teaching Activities, Traditional Teaching Methods, Learning Achievement, Primary Classroom Management, Teacher Students

Introduction

Vocational teacher education plays a crucial role in preparing future primary school teachers with both theoretical knowledge and practical competence. In applied courses such as the Primary Classroom Management course, students are expected not only to understand classroom management theories but also to apply them effectively in real or simulated teaching contexts. The effectiveness of instructional design in such courses directly influences students' professional readiness and learning achievement. Biggs and Tang (2011, p. 20) emphasized that effective teaching design should align learning activities with intended learning

outcomes to enhance students' understanding and performance. Kyriacou (2009) also noted that well-structured instructional approaches are essential for developing professional teaching competence in teacher education programs.

The Primary Classroom Management course integrates theoretical principles with practical training and aims to cultivate students' ability to make appropriate judgments and decisions in complex classroom situations. However, in many vocational colleges, the traditional teaching method remains dominant. This approach is typically characterized by teacher-centered lectures, concept explanation, and note-taking. Although it facilitates knowledge transmission, it often provides limited opportunities for contextual practice and interactive learning. Biggs and Tang (2011, p. 20) argued that teacher-centered instruction supports structured knowledge delivery but may not sufficiently promote deep learning or knowledge transfer.

Qin (2024, p. 136) pointed out that current Primary Classroom Management courses in vocational teacher education are often outdated and lack sufficient practical training, resulting in limited understanding of authentic teaching situations and restricted development of classroom management skills. In addition, low intrinsic learning motivation and weak professional identity among vocational teacher students may further affect learning achievement (Zheng, 2024, p. 93). Wang (2023, p. 183) also found that limited interactive teaching reduces students' opportunities to develop practical competence. These issues highlight the need for instructional innovation that promotes active engagement and contextual learning.

In recent years, flipped classroom teaching activities have emerged as a promising instructional approach for transforming traditional teaching structures. Baker (2000, pp. 9-17) first described flipped classroom teaching activities as shifting content delivery outside the classroom while using class time for interactive learning. Lage, Platt, and Treglia (2000, pp. 30-43) further explained that this approach allows students to engage with learning materials before class and participate in active learning during class. Bergmann and Sams (2012 pp. 1-7) later popularized flipped classroom teaching

activities as a strategy for increasing student engagement and improving learning outcomes.

In flipped classroom teaching activities, knowledge acquisition occurs during the pre-class stage through videos or digital materials, while in-class time focuses on discussion, collaboration, and problem-solving. This structure enhances student participation and cognitive engagement. Yildirim and Kiray (2016, pp. 814–821) reported that flipped classroom teaching activities improve participation and academic performance. Ozdamli and Asiksoy (2016, pp. 98–105) found that they enhance student engagement, and Ağırman and Ercoşkun (2022, pp. 72–76) demonstrated positive effects on learning achievement.

Flipped classroom teaching activities align well with applied vocational education, where practical skills and contextual understanding are essential. Through pre-class preparation and in-class activities, students can apply theoretical knowledge to simulated classroom situations. From a constructivist perspective, learning is enhanced when students actively construct knowledge through interaction and application (Vygotsky, 1978, pp. 79-91). Jonassen (1999, pp. 217-219) similarly emphasized that meaningful learning occurs through problem-solving and authentic tasks.

Despite increasing attention to flipped classroom teaching activities, empirical evidence in vocational teacher education remains limited. Zhang, Li, and Chen (2024, pp. 45-52) noted that although flipped classroom teaching activities have been introduced in vocational education reform, systematic experimental research is still insufficient. Zuo (2024, pp. 101-106) also highlighted the need for further empirical validation. Consequently, it remains unclear whether flipped classroom teaching activities can significantly improve learning achievement in applied teacher education courses.

At Guangxi Modern Polytechnic College, the Primary Classroom Management course is a core subject for second-year students majoring in Primary Education but

still face challenges such as monotonous traditional teaching methods, limited classroom simulation, and weak connections between theory and real teaching practice. These issues constrain students' ability to internalize knowledge and apply classroom management strategies effectively. Learning Management regularly processes through the traditional teaching method which includes introduction, teaching (explaining), and conclusion. It conducts passive learning and lack of flexibility.

Therefore, this study investigates the application of flipped classroom teaching activities in the Primary Classroom Management course at Guangxi Modern Polytechnic College. Using learning achievement as the primary indicator, the study compares students taught through flipped classroom teaching activities with those taught through the traditional teaching method. Through a quasi-experimental design, this research aims to provide empirical evidence regarding the effectiveness of flipped classroom teaching activities in vocational teacher education and to offer a replicable instructional model for improving course effectiveness and student learning achievement.

Research Purposes

1. To compare students' learning achievement in the Primary Classroom Management course before and after using the traditional teaching method
2. To compare students' learning achievement in the Primary Classroom Management course before and after using the flipped classroom teaching activities
3. To compare post learning achievement between students taught through the flipped classroom teaching activities and learning through the traditional teaching method

Research methodology

1. Research Design

This research adopted an experimental research method, specifically in the type of pre-test - post-test control group design.

2. Population and Sample

2.1 The population consisted of five classes totaling 250 second-year students majoring in Primary Education at Guangxi Modern Polytechnic College in the first semester of the 2025 academic year. All students had registered for the required prerequisite courses as specified in the curriculum and had passed all of them.

2.2 The sample included 100 students selected through cluster random sampling. Two classes were chosen, with 50 students in each class. One class was assigned as the experimental group and the other as the control group. The intervention lasted for six weeks. Each class, once per week for 90 minutes, results in a total time of 9 hours.

3. Research Instruments

There were two main types of research instruments consisting of lesson plans and learning achievement test.

1) Lesson Plans Both groups studied the same six Teaching contents: Lesson plan 1: Form a core team, lesson plan 2: Set class goals, lesson plan 3: Develop class rules, lesson plan 4: Overview of daily management and classroom environment management, lesson plan 5: Provide individualized guidance for students in the class and lesson plan 6: Understand emergency situations and their handling principles. The control group was taught using the traditional teaching method, characterized by teacher explanation, note-taking, and homework assignments. The experimental group

was taught using flipped classroom teaching activities, which consisted of four stages: 1) Pre-class content learning, 2) In-class active learning, 3) Immediate feedback and evaluation and 4) Post-class consolidation.

2) Learning Achievement Test was a standardized Primary Classroom Management test that was developed to measure students' learning achievement. The test contained 50 multiple-choice questions covering the six instructional topics. Each question was worth 2 points, for a total score of 100 points. The test was used as both the pretest and posttest for the experimental and control groups.

The lesson plans and test instruments were developed based on the course syllabus and learning objectives. Both traditional and flipped classroom teaching plans were reviewed by three experts in primary education. Content validity was evaluated using the Item-Objective Congruence (IOC) method. Items with IOC values between 0.67 and 1.00 were considered acceptable. Revisions were made based on expert feedback before implementation. The learning achievement test was also reviewed by experts to ensure content validity and alignment with course objectives.

4. Data Collection

Data collection was conducted during the first semester of the 2025 academic year. The procedure was as follows: two classes were selected and assigned to experimental and control groups. Both groups were taught by the same instructor. They completed the pretest before instruction. There were 50 students in each class. One class was assigned as the experimental group and the other as the control group. The intervention lasted for six weeks. Each class, once per week for 90 minutes, results in a total time of 9 hours. The experimental group received flipped classroom teaching activities including 4 steps: 1) Pre-class content deliver 2) In-class active learning 3) Instant feedback and In-class assessment 4) Post-class consolidation and extension, while the control group received traditional teaching methods including 3 steps of general instruction as introduction, teaching, and conclusion. After six weeks

of instruction, both groups completed the posttest. The IOC values of the finalized all lesson plans and test items ranged from 0.67 to 1.00, indicating acceptable to highly appropriate content validity. Test had moderated difficulty index ($P=0.30-0.70$), their discrimination was at good level ($r=0.51-0.87$) and the reliability coefficient (KR-20) was at 0.82.

5. Data Analysis

The research data were analyzed using descriptive and inferential statistics as follows.

1) Paired-sample t-tests were used to compare pretest and posttest scores of students' learning achievement in the Primary Classroom Management course before and after using traditional teaching methods.

2) Paired-sample t-tests were used to compare pretest and posttest scores of students' learning achievement in the Primary Classroom Management course before and after using flipped classroom teaching activities.

3) An independent-sample t-test was used to compare post learning achievements between students taught through the flipped classroom teaching activities and learning through the traditional teaching method.

Research Results

The comparison results of learning achievement in the Primary Classroom Management course before and after using traditional teaching methods were as shown in Table 1.

Table 1 Comparison of Learning Achievement Before and After Using Traditional Teaching Methods

Traditional Teaching Methods	N	$\bar{X}$	S.D.	df	t-test	p*
Pre-test	50	61.48	5.55	98	7.503*	.00
Post-test	50	66.34	4.45			

* $p < .01$

Table 1 shows the results of the paired-sample t-test comparing learning achievement before and after instruction using the traditional teaching method. The mean post-test score ($M = 66.34$, $S.D. = 4.45$) was higher than the pre-test score ($M = 61.48$, $S.D. = 5.55$), with a mean gain of 4.86 points. The improvement was statistically significant ($t = 7.503$, $p < .01$). This result indicates that the traditional teaching method produced a measurable improvement in students' learning achievement, although the magnitude of improvement was moderate.

The comparison results of learning achievement in the Primary Classroom Management course before and after using flipped classroom teaching activities were as shown in Table 2.

Table 2 Comparison of Learning Achievement Before and After Using Flipped Classroom Teaching Activities

Flipped Classroom Teaching Activities	N	$\bar{X}$	S.D.	df	t-test	p*
Pre-test	50	60.70	5.35	98	17.267*	.00
Post-test	50	73.88	4.08			

* $p < .01$

Table 2 presents the paired-sample t-test results for the experimental group. The mean post-test score ($M = 73.88$, $S.D. = 4.08$) was substantially higher than the pre-test score ($M = 60.70$, $S.D. = 5.35$), with a mean gain of 13.18 points.

The improvement was statistically significant ($t = 17.267$, $p < .01$). The large mean gain indicates that flipped classroom teaching activities had a strong positive effect on students' learning achievement.

The comparison results of post learning achievements between students taught through the flipped classroom teaching activities and learning through the traditional teaching method were as shown in Table 3.

Table 3 Comparison of Learning Achievement After Learning Through Traditional Teaching Methods and the Flipped Classroom Teaching Achievement

Group	<i>N</i>	$\bar{X}$	<i>S.D.</i>	<i>t-test</i>	<i>df</i>	<i>p</i>
Traditional Teaching Methods	50	66.34	4.45	8.83*	98	.00
Flipped Classroom Teaching Activities	50	73.88	4.08			

* $p < .01$

Table 3 shows the independent samples t-test comparing post-test scores between the two groups. Students who learned through flipped classroom teaching activities achieved a higher mean score ($M = 73.88$) than those who learned through the traditional teaching method ($M = 66.34$). The mean difference was 7.54 points.

The difference between the two groups was statistically significant ($t = 8.83$, $p < .01$), indicating that flipped classroom teaching activities were more effective than the traditional teaching method in improving students' learning achievement.

Discussion

1) The findings indicate that both instructional approaches improved students' learning achievement; however, the magnitude of improvement differed between the two methods. Students who learned through the traditional teaching method showed a statistically significant increase in post-test scores, but the overall improvement was relatively modest. Biggs and Tang (2011, p. 20) noted that teacher-centered instruction is effective for structured knowledge delivery but less effective for promoting higher-order learning. The moderate improvement observed in this study is consistent with this view. The results of Kyriacou (2009, pp. 17–18) described traditional teaching as a mode of instruction in which the teacher directs the learning process and students mainly follow instructional arrangements. Under such conditions, performance differences among students may be reduced due to uniform teaching pace and content delivery. This is reflected in the reduced standard deviation observed in the post-test results of the present study. However, the limited magnitude of improvement in learning achievement further supports Kyriacou's view that traditional teaching provides insufficient opportunities for students' active participation and higher-order cognitive engagement.

2) Students who participated in flipped classroom teaching activities demonstrated a substantially greater improvement in learning achievement. The larger mean gain indicates that flipped classroom teaching activities provided a more effective learning environment for mastering course content. From a constructivist perspective, learning is enhanced when students actively construct knowledge through interaction and application Vygotsky (1978, pp. 79–91) and Jonassen (1999, pp. 217–221). The flipped classroom teaching activities implemented in this study combined pre-class preparation with in-class collaborative learning, allowing students to engage more deeply with course content and apply knowledge in practice-oriented tasks. In addition, Biggs and Tang (2011, p. 20) propose that learning outcomes are enhanced when teaching objectives, learning activities, and assessment tasks are

constructively aligned. In this study, the flipped classroom teaching activities were designed to ensure alignment among instructional objectives, in-class learning activities, and learning achievement assessments. The significant improvement in students' learning achievement following the implementation of the flipped classroom teaching activities offers empirical evidence supporting the effectiveness of constructive alignment in instructional practice.

3) The comparison of post-test scores further confirmed that flipped classroom teaching activities were more effective than the traditional teaching method. Students in the flipped classroom group achieved significantly higher post-test scores, indicating stronger learning achievement, than students in traditional teaching method group. The flipped classroom provided clear task process through the active learning activity. According to Biggs and Tang (2011, p. 20), learning outcomes improve when learning activities and assessments are constructively aligned. In this study, flipped classroom teaching activities were designed to align learning objectives, classroom tasks, and assessment methods, which may explain the higher learning achievement observed. Kyriacou (2009, pp. 17–18) describes traditional teaching as a teacher-centered instructional approach in which learning activities are largely directed by the teacher and students mainly follow predetermined instructional arrangements. Under such conditions, students' opportunities for active participation, interaction, and independent problem solving are limited. This instructional characteristic may explain why, although students in the Traditional Teaching group showed improvement in learning achievement, their post-test performance remained lower than that of students in the flipped classroom group.

From a constructivist learning perspective, Vygotsky (1978 as cited in Mcleod, S, 2025, pp. 17–20) emphasizes that learning is most effective when learners actively engage in knowledge construction through social interaction and collaborative activities. The flipped classroom teaching activities implemented in this study allocated more classroom time to discussion, application, and problem-solving tasks,

thereby providing richer opportunities for student interaction and engagement. These learning conditions support deeper understanding and help explain the higher post learning achievement observed among students in the flipped classroom group.

In addition, Mustapha, M. Z. & Abdullah, N. (2024, pp. 3395–3396) argues that the flipped classroom which involved student centered in the learning process. Meaningful learning occurs when learners actively process information and apply knowledge in authentic or contextualized tasks. The flipped classroom teaching activities reduced the dominance of one-way knowledge transmission and encouraged students to engage with course content through active learning tasks during class time. The superior post-test performance of students in the flipped classroom group reflects the effectiveness of such learner-centered and activity-based instructional designs in promoting sustained learning gains.

Overall, the findings suggest that while the traditional teaching method can improve learning achievement to some extent, flipped classroom teaching activities produce greater learning gains. These results highlight the importance of student-centered instructional approaches in vocational teacher education and suggest that flipped classroom teaching activities can serve as an effective instructional model for improving learning achievement in practice-oriented courses.

Suggestions

1. Suggestions for Research Utilizations

1.1 To expand the research scope by increasing sample size and including students from different vocational colleges, majors, or regions to enhance the general ability of the research findings

1.2 To extend the duration of flipped classroom teaching activities in future studies in order to examine the long-term effects of this instructional approach on students' learning achievement

2. Suggestions for Further Study

2.1 To investigate additional learning-related variables, such as learning motivation, classroom engagement, or self-regulated learning ability, alongside learning achievement to obtain a more comprehensive understanding of instructional effectiveness

2.2 To employ qualitative or mixed research methods, such as interviews or classroom observations, to explore students' learning experiences and perceptions of flipped classroom teaching activities

2.3 To further explore the integration of instructional design strategies and educational technologies within flipped classroom teaching activities in vocational education contexts.

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