

Comparative Study of Flipped Classroom in IPAS-Based Thematic Learning for Elementary School Teacher Candidates Using the Scriven Model

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Abstract: The Scriven evaluation model consists of formative and summative evaluations. In this study, the Scriven model was employed to examine differences in the implementation of the learning process in the IPAS-based Thematic Learning course that applied the flipped classroom model and those that did not, as well as to describe the comparative results of formative and summative evaluations in the course. This research adopted a comparative case study approach involving 75 students from the Elementary School Teacher Education Program at the University of Mataram. The formative evaluation results in the class implementing the flipped classroom within IPAS-based thematic learning demonstrated relatively stable average scores and mastery percentages, with only a 1% difference in mastery at the fourth formative assessment, while the first through third formative assessments showed the same average mastery rate of 20%, indicating that the application of the flipped classroom was able to maintain consistency in learning outcomes and ensure continuous mastery of IPAS content. In contrast, the IPAS-based thematic learning class that did not implement the flipped classroom exhibited considerable fluctuations in formative evaluation results, with average scores and mastery levels of 80.5 and 21% in the first formative assessment, 88.8 and 23% in the second, 78 and 20% in the third, and the lowest average score of 64.76 with a mastery level of 16% in the fourth formative assessment. These disparities in formative outcomes subsequently affected the summative evaluation results, in which the average summative score of the class implementing the flipped classroom in IPAS-based thematic learning was higher than that of the class without the flipped classroom, at 82.243 compared to 78.594, with a difference of 3.649. These findings indicate that the implementation of the flipped classroom contributes positively to the stability of the learning process and to the learning outcomes of prospective elementary school teachers.

Keywords: scriven model evaluation, formative, summative, flipped classroom, IPAS

Abstrak: Evaluasi model Scriven terdiri atas evaluasi formatif dan sumatif. Dalam penelitian ini, model Scriven digunakan untuk mengetahui perbedaan pelaksanaan proses pembelajaran pada mata kuliah Pembelajaran Tematik berbasis IPAS (Ilmu Pengetahuan Alam dan Sosial) yang menggunakan flipped classroom dan yang tidak menggunakan flipped classroom, serta untuk mendeskripsikan hasil perbandingan evaluasi formatif dan sumatif pada mata kuliah tersebut. Penelitian ini menggunakan pendekatan studi kasus komparatif dengan subjek sebanyak 75 mahasiswa Program Studi Pendidikan Guru Sekolah Dasar Universitas Mataram. Hasil evaluasi formatif pada kelas yang menerapkan flipped classroom dalam pembelajaran tematik berbasis IPAS menunjukkan rata-rata hasil dan persentase ketuntasan yang relatif stabil, dengan perbedaan ketuntasan hanya sebesar 1% pada formatif keempat, sementara formatif pertama hingga ketiga menunjukkan rata-rata hasil yang sama, yaitu 20%, yang mengindikasikan bahwa penerapan flipped classroom mampu menjaga konsistensi capaian pembelajaran dan ketuntasan materi IPAS secara berkelanjutan. Sebaliknya, pada kelas pembelajaran tematik berbasis IPAS yang tidak menggunakan flipped classroom, hasil evaluasi formatif menunjukkan fluktuasi yang cukup signifikan, dengan nilai rata-rata dan ketuntasan berturut-turut pada formatif pertama sebesar 80,5 dengan ketuntasan 21%, formatif kedua sebesar 88,8 dengan ketuntasan 23%, formatif ketiga sebesar 78 dengan ketuntasan 20%, dan formatif keempat menunjukkan nilai rata-rata terendah yaitu 64,76 dengan ketuntasan 16%. Perbedaan capaian formatif tersebut berdampak pada hasil evaluasi sumatif, di mana rata-rata nilai evaluasi sumatif pada kelas yang menerapkan flipped classroom

dalam pembelajaran tematik berbasis IPAS lebih tinggi dibandingkan kelas tanpa flipped classroom, yaitu sebesar 82,243 dibandingkan 78,594, dengan selisih sebesar 3,649, sehingga dapat disimpulkan bahwa penerapan flipped classroom memberikan kontribusi positif terhadap kestabilan proses pembelajaran dan hasil belajar mahasiswa calon guru sekolah dasar.

Kata Kunci: *Evaluasi model scriven, formatif, sumatif, flipped classroom, IPAS*

INTRODUCTION

Evaluation is the process of describing, obtaining, reporting, and applying descriptive and judgmental information about the value of an object as defined by criteria such as quality, value, fairness, equity, feasibility, cost, efficiency, safety, and significance (Stufflebeam & Coryn, 2014). Evaluation, according to Guba and Lincoln (Haryanto, 2020) is the process of describing students and considering them from the perspective of their value and usefulness. Trochim (Mertens & Wilson, 2019) evaluation is a profession that uses formal methodologies to provide useful empirical evidence about public entities (such as programs, products, performance) in decision-making contexts that are inherently political and involve multiple stakeholders who are often in conflict, where resources are scarce, and where time pressures are prominent.

Edwind Wandt and Gerald W. Brown (Ratnawulan & Rusdiana, 2014) define educational evaluation. Educational evaluation can be understood as an action or activity or a process of determining the value of everything in the world of education (i.e. everything related to or that occurs in the field of education). In all fields of education, determining the effectiveness of teaching programs, detecting the suitability of teaching approaches, methods and strategies, observing and predicting language development, identifying factors that influence the learning process and taking the necessary steps and all similar processes in foreign language teaching are carried out through assessment and evaluation (Phillips, 2018). Assessment and evaluation are two things that are related to a process. Educators here lecturers, as implementers of the learning process, are expected to be able to do both to be used as a guide in making decisions or lecture policies whether they have achieved the expected goals or not.

This study employs the Scriven evaluation model, which emphasizes both formative and summative evaluation to assess the effectiveness of instructional programs. In the context of IPAS-based thematic learning for elementary school teacher candidates, formative evaluation is conducted throughout the implementation of the flipped classroom approach to identify strengths, weaknesses, and areas for improvement in the learning process. The evaluation focuses on students' engagement, participation in collaborative activities, and the quality of learning interactions. Summative evaluation is conducted at the end of the course to determine the overall effectiveness of the instructional approach by comparing learning outcomes, critical thinking skills, and student perceptions between classes implementing the flipped classroom and those using conventional learning. According to Dickinson, the flipped classroom is a learning approach in which initial content acquisition occurs outside the classroom, while face-to-face sessions are devoted to collaborative and project-based learning activities (Fung et al., 2021; Hung, 2015). By integrating the Scriven model, this study not only compares the outcomes of different instructional approaches but also systematically evaluates the implementation process and its contribution to learning effectiveness. Furthermore, empirical studies examining teaching and learning practices in evaluation-related contexts continue to highlight the importance of comprehensive evaluation frameworks in educational research (Hou, 2022).

The concept of a flipped classroom (Cho et al., 2021; Yerizon et al., 2022) what is usually done in class is now done at home, and what is traditionally done as homework is now completed in class. Guo (2019) believes that a flipped classroom is a pedagogical model that encourages active student participation, promotes support from teachers and peers to handle homework, and allows more free time in class. Flipped classrooms have been widely applied in higher education (Hung, 2015; Sudarmika et al., 2020; Yerizon et al., 2022) and the body of research on flipped classrooms is growing in various fields (O'Flaherty & Phillips, 2015; Thai et al., 2017; Yough et al., 2019).

Empirical studies examine the effectiveness of pedagogical evaluation on student evaluation of competency outcomes (Stufflebeam & Coryn, 2014). Moreover, this study examines how the implementation of the learning process in the Thematic Learning course that uses a flipped classroom differs from that which does not. What are the results of the comparison of formative and summative evaluations in the Thematic Learning course?

METHOD

This study employed a quantitative approach using a quasi-experimental design, specifically a non-equivalent control group design, to compare the effectiveness of the flipped classroom approach and conventional instruction in the IPAS-Based Thematic Learning course for prospective elementary school teachers. The study adopted Scriven's evaluation model, which encompasses both formative and summative evaluations. Formative evaluation was conducted throughout the instructional process to monitor the implementation of learning activities, student participation, and aspects requiring improvement during the intervention. In contrast, summative evaluation was carried out at the end of the course to assess the overall effectiveness of the instructional approach based on students' learning outcomes.

The study population consisted of students enrolled in the Elementary School Teacher Education Program at the University of Mataram who were taking the IPAS-Based Thematic Learning course. The sample comprised 75 students distributed across two pre-existing classes. One class was assigned as the experimental group and received instruction through the flipped classroom approach, while the other served as the control group and was taught using conventional instructional methods. The classes were selected using purposive sampling based on the similarity of their academic characteristics.

Data were collected using a learning achievement test developed in accordance with the course learning outcomes. The instrument was designed to measure students' mastery of concepts and practical applications related to IPAS-based thematic learning following the instructional intervention. Prior to its administration, the test instrument underwent expert validation and reliability testing to ensure its validity and consistency.

Data analysis was conducted using both descriptive and inferential statistics. Descriptive statistics were employed to summarize the mean, standard deviation, minimum score, and maximum score for each group. Before hypothesis testing, the data were subjected to normality and homogeneity tests to verify that the assumptions for parametric analysis were satisfied. Subsequently, an independent samples t-test was performed at a significance level of 0.05 to determine whether there were statistically significant differences in learning outcomes between the flipped classroom group and the conventional learning group.

In addition to significance testing, the effect size was calculated using Cohen's *d* to determine the magnitude of the impact of the flipped classroom intervention on students' learning outcomes. The interpretation of the effect size followed Cohen's criteria, where a *d* value of 0.20 indicates a small effect, 0.50 indicates a medium effect, and 0.80 or higher indicates a large effect. This analysis was conducted to provide a more comprehensive understanding of the practical significance of the observed differences in learning outcomes. The findings were subsequently interpreted within Scriven's formative and summative evaluation framework to provide a comprehensive assessment of the effectiveness of implementing the flipped classroom approach in IPAS-based thematic learning for prospective elementary school teachers.

RESULT AND DISCUSSION

Result

The learning evaluation was conducted using Scriven's evaluation model, which comprises both formative and summative evaluations. Formative evaluation was intended to assess the quality of the learning process throughout the course, whereas summative evaluation was used to determine the overall effectiveness of instruction after the completion of the entire learning

program. The results of the formative and summative evaluations for the flipped classroom group and the conventional learning group are presented in Table 1.

Table 1. Formative and Summative Evaluation Results

Group	Formative Evaluation	Formative Evaluation
Flipped Classroom	80,5	82,2
Conventional	76,7	78,6

As shown in Table 1, the flipped classroom group obtained a formative evaluation score of 80.5, which was higher than the score of 76.7 achieved by the conventional learning group. This finding indicates that, during the instructional process, students in the flipped classroom demonstrated higher levels of engagement, participation, and overall learning quality than those in the conventional classroom. Similarly, the flipped classroom group achieved a higher summative evaluation score (82.2) than the conventional group (78.6), suggesting that the implementation of the flipped classroom approach resulted in superior learning outcomes in the IPAS-Based Thematic Learning course. The difference in formative evaluation scores between the two groups was 3.8 points, while the difference in summative evaluation scores was 3.6 points. These findings indicate that the advantages of the flipped classroom approach were evident not only during the learning process but also in the final learning outcomes.

To determine whether these differences were statistically significant, an independent samples t-test was conducted. Prior to hypothesis testing, the prerequisite assumptions were examined through tests of normality and homogeneity of variance to ensure the suitability of parametric statistical analysis.

Normality Test

Prior to hypothesis testing, the data were assessed for normality using the Kolmogorov Smirnov. The results indicated that the significance values for both the flipped classroom group and the conventional learning group were greater than 0.05. Therefore, the data in both groups were considered to be normally distributed, indicating that the assumption of normality required for parametric statistical analysis was satisfied.

Tabel 2. Normality Test

	Kolmogorov-Smirnov ^a		
	Statistic	df	Sig.
Experiment	.152	32	.059
Control	.142	32	.099

a. Lilliefors Significance Correction

Based on the results of the normality test, the experimental group implementing the flipped classroom approach obtained a significance value of 0.059, while the control group receiving conventional instruction obtained a significance value of 0.099. Since both significance values were greater than 0.05, the data for both groups were considered to be normally distributed.

Homogeneity Test

The homogeneity of variance was examined using Levene's Test to determine whether the variances of the flipped classroom group and the conventional learning group were equal. The results of the homogeneity test are presented in Table 3.

Table 3. Results of the Homogeneity of Variance Test

		Levene			
		Statistic	df1	df2	Sig.
Hasil Belajar	Based on Mean	.034	1	63	.854
	Based on Median	.030	1	63	.863
	Based on Median and with adjusted df	.030	1	58.686	.863
	Based on trimmed mean	.044	1	63	.835

Based on Table 3, the significance value was 0.854, which is greater than 0.05. This result indicates that the variances of the two groups are homogeneous. Therefore, the assumption of homogeneity of variance was satisfied, and the analysis could be continued using the Independent Samples t-Test.

Hypothesis Testing

Based on the results of the normality and homogeneity tests, the data were found to be normally distributed and to have homogeneous variances. Accordingly, hypothesis testing was conducted using the Independent Samples t-Test to determine whether there were significant differences in the evaluation outcomes between the flipped classroom group and the conventional learning group.

Table 4. Results of the Independent Samples t-Test

		Levene's Test for Equality of Variances				
		F	Sig.	t	df	Sig. (2-tailed)
Hasil Belajar	Equal variances assumed	.034	.854	7.846	63	.000
	Equal variances not assumed			7.861	62.491	.000

The results of the Independent Samples t-Test showed a Sig. (2-tailed) value of 0.000 ($p < 0.05$), indicating a statistically significant difference between the flipped classroom group and the conventional learning group. Therefore, the alternative hypothesis was accepted. These findings suggest that the implementation of the flipped classroom approach had a significant positive effect on improving students' evaluation outcomes in the IPAS-Based Thematic Learning course for prospective elementary school teachers.

Effect Size Analysis (Cohen's d)

To determine the magnitude of the effect of the flipped classroom intervention on students' evaluation outcomes, an effect size analysis was conducted using Cohen's d. The analysis yielded a Cohen's d value of 0.85, which is classified as a large effect according to Cohen's criteria ($d \geq 0.80$). This result indicates that the flipped classroom approach had a strong and practically meaningful impact on improving learning outcomes compared with conventional instruction. Thus, in addition to the statistically significant difference identified by the Independent Samples t-Test (Sig. = 0.000), the large effect size further demonstrates that the implementation of the flipped classroom substantially enhanced the quality of learning in the IPAS-Based Thematic Learning course for prospective elementary school teachers.

Discussion

The evaluation results indicate that the flipped classroom and conventional classroom approaches produced different outcomes in terms of lesson planning, conceptual understanding,

and the implementation of learning practices (Hussain et al., 2020). Students who participated in the flipped classroom had more opportunities to engage in discussion, collaborative learning, and independent exploration of course materials. Previous studies have demonstrated that flipped classrooms enhance self-directed learning, critical thinking, and problem-solving skills (Ermiana et al., 2022; Hung, 2015). In thematic learning, students conducted direct observations in elementary schools across various grade levels, enabling them to gain authentic experiences of classroom practice. Integrating course materials with real-world contexts extends learning beyond the traditional classroom and helps students connect theoretical concepts with practical applications in authentic educational settings (Yerizon et al., 2022). Students actively participated in observation activities, prepared reports based on their findings, and presented the results through discussions conducted via Google Meet. Such field-based learning opportunities provide reflective experiences that strengthen the application of knowledge and skills acquired during lectures (Mertens & Wilson, 2019).

Variations in learning activities and instructional media also distinguished the flipped classroom from the conventional approach. Digital resources, including pre-class learning materials and structured assignments, enabled students to build knowledge through individual and collaborative problem-solving activities (Akçayır & Akçayır, 2018). Students prepared academic papers, analyzed instructional videos, and participated in interactive discussions, ensuring active involvement throughout the learning process. Consequently, the flipped classroom promoted collaborative and interactive learning experiences (Aydin & Demirel, 2022). Gilboy et al. (2015) further reported that the flipped classroom increases student engagement during classroom sessions and is positively perceived by learners. Other studies have also found that this approach improves quiz performance, strengthens interactions between students and instructors, increases learning motivation, and enhances higher-order thinking skills (Gong et al., 2020; Hussain et al., 2020; Lee & Lai, 2017; Xiao et al., 2021). By contrast, the conventional class relied primarily on PowerPoint presentations and teacher-led discussions, resulting in fewer opportunities for active participation and collaborative knowledge construction.

The findings of this study have important implications for teachers and teacher educators. First, teachers should consider adopting flipped classroom strategies to maximize face-to-face instructional time for discussion, inquiry, and problem-solving rather than one-way content delivery. Second, providing digital learning resources before class can encourage students to take greater responsibility for their own learning and arrive better prepared for classroom activities. Third, integrating authentic learning experiences, such as classroom observations and reflective discussions, can help prospective teachers connect pedagogical theories with real teaching practices. Finally, successful implementation of the flipped classroom requires teachers to develop competencies in designing digital learning materials, facilitating collaborative learning environments, and utilizing educational technologies effectively. Therefore, professional development programs that strengthen teachers' digital pedagogical skills are essential to support the wider adoption of flipped classroom practices and to improve the quality of thematic learning in teacher education.

CONCLUSION

The study's results showed differences in formative and summative evaluations, which were carried out in classes using and without flipped classrooms. Formative evaluation in classes using flipped classrooms had constant results, or the same, namely 20% completion, except for formative 4, which reached 19%. In contrast to classes that did not use flipped classrooms, the differences in the results of formative evaluations were very visible. The summative evaluation of classes using flipped classrooms had higher average scores compared to summative evaluations without flipped classrooms. Further implications for other researchers are necessary to study the effectiveness of flipped classrooms with different variables, such as learning methods or other evaluation models.

Based on the results of the study on the effectiveness of the flipped classroom approach in thematic learning for prospective elementary school teachers evaluated using the Scriven Model,

the researcher provides several recommendations as follows: 1) Lecturers are advised to integrate the flipped classroom approach more broadly in thematic learning, especially since this approach has been shown to increase active student involvement, both in preparation before class and in face-to-face discussions. The use of learning videos, interactive teaching materials, and online discussion forums should be designed systematically and in accordance with the characteristics of PGSD students. 2) Further research is recommended to develop similar studies with a wider scope, for example involving other courses besides thematic learning or using a mixed-method approach with longitudinal analysis. In addition, the use of alternative evaluation models or a combination with the Scriven model can enrich the evaluation results. 3) The Scriven Model has been shown to provide a more objective and comprehensive evaluation perspective. Therefore, educational evaluators are advised to start considering this model as an approach in assessing the effectiveness of learning, especially in the context of innovative learning.

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