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LESSON STUDY WITH POSITIVE REINFORCEMENT TECHNIQUES: IMPACT ON RESILIENCE AND LEARNING MOTIVATION

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Page
17-25

ABSTRACT

Resilience and learning motivation are crucial attributes that need to be developed in students, particularly in challenging subjects such as statistics. This research aims to evaluate the impact of lesson study combined with positive reinforcement techniques on enhancing resilience and learning motivation in statistics courses. An experimental research design using a one-group pretest-posttest approach was employed. The study involved 47 first-semester students from the Counseling Guidance Study Program at Ivet University for the 2022/2023 academic year, selected through simple random sampling. The research utilized scales for measuring resilience and learning motivation. Pretest and posttest scores were analyzed using t-test statistics. The results indicate a significant improvement (p-value 0.000) in both resilience and learning motivation, leading to the rejection of the null hypothesis. The research concludes that lesson study with positive reinforcement techniques is effective in increasing resilience and learning motivation among guidance and counseling students facing difficulties in learning statistics. These findings can serve as a reference for enhancing resilience and learning motivation in similar educational contexts.

Keywords: lesson study, positive reinforcement, resilience, learning motivation

INTRODUCTION

Projected for 2025, prospective graduates are expected to master the top 10 skills of the future (Withing, 2021). Among these skills is resilience, crucial for Generation Z students (born between 1995 and 2001), who dominate university populations and will soon enter the workforce (Plochocki, 2019). Thus, the learning process must equip students with these essential skills. However, adjusting to campus life poses significant challenges for academic success (Bland et al., 2012).

The transition from senior high school to university introduces new adjustment difficulties. Academic challenges are common among university students (Cameron & Rideout, 2020). Additionally, the shift from adolescence to adulthood brings pressure and difficulties in adapting to new environments (Bland et al., 2012), affecting both academic performance and mental health (Leppink et al., 2016).

Resilience, one of the 10 essential skills for 2025 (Withing, 2021), is defined as the ability to overcome academic difficulties (Cassidy, 2016) and bounce back from challenges and problems encountered during the learning process (Dilla et al., 2018; Van Breda, 2018). This ability enables students to adapt and persist through obstacles (Sari et al., 2020), despite a lack of confidence and anxiety about learning materials (Kusumawati & Nayazik, 2017). Therefore, resilience is crucial for students, allowing them to thrive in difficult situations. Students with high resilience are better equipped to navigate and overcome difficult situations.

Internal factors, such as motivation, significantly influence daily activities (Magnano et al., 2016). Motivation serves as the fundamental drive behind actions (Uno, 2017) and is essential for the learning process (Sari & Sugiyarto, 2015). It relates to students' self-will to perform tasks and achieve learning goals (Schunk et al., 2010)

and determines the level of academic success. Motivated students facilitate the teaching process, making it easier for lecturers to deliver material (Sari & Sugiyarto, 2015). Conversely, students with low motivation may struggle to follow instructions properly, as motivation activates and directs behavior towards learning (Sumiati et al., 2019). Thus, both resilience and learning motivation are critical for student development.

The statistics course is a compulsory subject in the Ivet University educational study program. It introduces prospective teachers to fundamental research and statistical concepts. This course requires students to engage actively, develop critical thinking skills, and interpret problems from multiple perspectives. Students are also expected to compile and test hypotheses using research data and apply statistical analysis (Gunadi et al., 2022).

However, statistics is often perceived as a challenging subject. Field studies conducted during the odd semesters of the 2021/2022 academic year reveal several issues: (1) low student interest in learning; (2) insufficient resilience when faced with complex topics; (3) frequent student protests and despair regarding assignments; and (4) unpreparedness during lectures and presentations. These observations indicate that both resilience and learning motivation in statistics courses require improvement. This finding is consistent with previous research highlighting students' difficulties in grasping statistics material (Hamdunah et al., 2020; Kusumadyahdewi & Kusumarasdyati, 2021).

Interviews with students from the Ivet Counseling Study Program revealed that many students (1) found certain statistical concepts difficult to understand, (2) were dissatisfied with assignments from lecturers, and (3) were unfamiliar with deep learning strategies, believing that their choice of the BK study program exempted them from math courses. Assignments are intended to help students grasp the essence of the material and understand its development, use, and significance (Estrella et al., 2019). The interviews indicated that low resilience and motivation hinder students' ability to persevere, negatively impacting their learning outcomes.

To address these issues, lecturers need to implement more innovative teaching strategies, such as the lesson study approach combined with positive reinforcement techniques. Lesson study is a collaborative method involving groups of educators who design, implement, and evaluate lessons together (Jones, 2022), including observing and reflecting on teaching practices (Kihara et al., 2021). It offers a platform for lecturers to share ideas and improve lesson planning (Rahayu et al., 2012).

Students' fighting spirit in learning can be developed by providing positive examples of overcoming difficulties, thereby helping them become more resilient in any situation. One effective technique for this is positive reinforcement. Positive reinforcement can enhance students' self-regulation, time management, goal-setting, and self-evaluation skills (Lapaz & Bello, 2020).

Previous research supports the efficacy of lesson study and positive reinforcement in education. Lesson study has been shown to improve understanding, motivation, group learning interest, communication skills (Abdullah et al., 2017), enthusiasm, and overall learning outcomes (Sairo, 2021). Positive reinforcement has been effective in boosting student enthusiasm and focus (Sumiati et al., 2019; Kim et al., 2016) and is a constructive disciplinary practice that emphasizes enhancing desirable behaviors rather than merely punishing undesirable ones (Lynnette et al., 2021). However, research on the combination of lesson study and positive reinforcement techniques remains limited. Despite the potential of these integrated approaches to enhance student resilience and motivation, empirical studies are scarce. Therefore, this study aims to investigate the effect of combining lesson study with positive reinforcement techniques on improving resilience and learning motivation in statistics courses.

METHODOLOGY

This research is experimental in nature and was conducted at Ivet University from July to November 2022. It employed a one-group pretest-posttest design, using only an experimental class without a control group. Forty-seven first-semester students from the Guidance and Counseling Study Program at Ivet University were selected randomly using simple random sampling.

The study utilized resilience and learning motivation scales and observation sheets as instruments. Hypothesis testing involved comparing pre-test and post-test scores for resilience and learning motivation using a paired sample t-test. This test aimed to assess differences in the average scores of students' resilience and learning motivation before and after the intervention.

RESULT AND DISCUSSION

Students are expected to become independent learners who effectively manage study strategies and time, enabling them to face various academic challenges (Cameron & Rideout, 2020). However, students today exhibit distinct characteristics compared to previous generations (Plochocki, 2019). Seemiller and Grace (2017) noted that while Generation Z shares some traits with the millennial generation, the current campus environment has not fully addressed their learning needs, interests, and preferences. Lecturers must understand these diverse student characteristics to design learning experiences that accommodate these differences (Holzer et al., 2022). This is crucial, given that students often experience higher levels of depression and anxiety compared to the general population (Price, 2023).

This study aimed to assess the impact of lesson study combined with positive reinforcement techniques on students' resilience and learning motivation in statistics courses. The study was conducted over six meetings, including pre-test, post-test, and practicum sessions, with each meeting lasting 150 minutes.

The research employed a combination of lesson study approaches and positive reinforcement techniques. According to Rapanta et al. (2021), innovative learning methods can enhance student engagement and facilitate the achievement of learning goals.

The lesson study method involves five stages: goal setting, lesson planning, lesson research (testing the effectiveness of learning), post-lesson discussion, and reflection (Fujii, 2014). Lesson study learning steps with positive reinforcement techniques are presented in Figure 1.

Figure 1.
Lesson Study Stages with Positive Reinforcement Techniques

At the goal-setting stage, the lecturer identifies problems students encounter in learning, analyzes the long-term objectives of the statistics course, and assesses the gaps between these goals and current learning conditions related to resilience and student motivation. The findings indicate that students struggle with understanding statistical material and exhibit low levels of resilience and motivation. The long-term goal for the statistics course is to provide students with experience in analyzing and interpreting research data, utilizing various testing techniques, both parametric and non-parametric, to aid them in completing assignments and theses effectively.

During the lesson planning stage, the team of statistics lecturers designs the learning experience based on the established objectives, incorporating lesson study with positive reinforcement techniques. Lecturers assign tasks including performing statistical tests on problems and data provided, compiling research case examples, formulating hypotheses, testing these hypotheses using statistical methods, and interpreting and drawing conclusions from the results. The learning tools developed at this stage include Semester Learning Plans, student worksheets, learning videos, resilience questionnaires, learning motivation questionnaires, and learning implementation questionnaires. These tools are reviewed with other lecturers who act as observers to create effective learning scenarios.

At the research lesson stage, the lecturer delivers the lesson according to the prepared plan while other lecturers observe and collect data based on assessment indicators outlined in the observation sheets for learning implementation, resilience, and motivation.

In the post-lesson discussion stage, the lecturer team reviews and discusses the observation results and findings from the learning process. Finally, during the reflection stage, the team reflects on the evaluation outcomes and makes improvements for future learning.

In this study, a pre-test was administered to assess students' initial conditions before the learning commenced. Students were then divided into several groups and given problems related to statistical concepts in educational research. Case examples, illustrated with study-related data, were provided for group discussion. Lecturers offered positive reinforcement, such as praise, prizes, or additional points, to students who actively participated in group discussions and presentations. They also guided students in constructing their own knowledge. At the end of the lesson, a post-test was conducted to measure changes in resilience and learning motivation before and after the implementation of positive reinforcement techniques.

The lesson aimed not only to improve understanding of the material but also to familiarize students with the application of statistics in educational research. This approach was designed to enhance students' ability to think critically, develop their skills, and solve problems in future research.

The use of lesson study with positive reinforcement techniques encouraged collaboration, concept construction, problem-solving, opinion expression, and increased student activity and cognitive speed. Problem-solving activities aimed to enhance students' academic resilience, potentially leading to improved academic outcomes (García-Crespo et al., 2021).

In this learning model, the lecturer served multiple roles: problem presenter, questioner, dialogue facilitator, problem solver, and supporter. Support and encouragement were provided to enhance students' inquiry and intellectual abilities.

Practical statistical testing (normality test, homogeneity test, t-test, ANOVA, and linear regression test) using the SPSS program was integrated into the learning process. During practicum activities, students were guided to build their understanding based on their practical work, supported by a literature review from research articles and books, enabling them to draw conclusions from their findings.

Figure 2 presents the comparison of average pre-test and post-test scores for resilience and learning motivation.

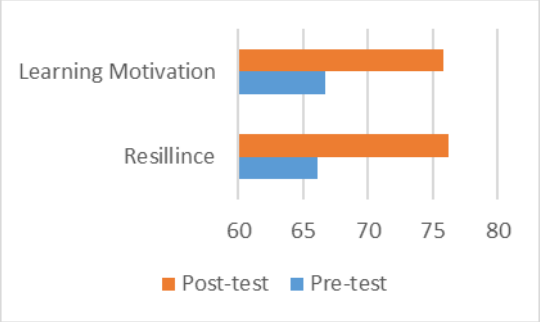

Figure 2.
Comparison of Pre-test and Post-Test Scores for Resilience and Learning Motivation

Based on Figure 2, there was an increase in the average scores for resilience and student learning motivation before and after implementing lesson study learning with positive reinforcement techniques. To determine whether this increase was statistically significant, a paired sample t-test was conducted. This test compared the average pre-test and post-test scores. Prior to performing the t-test, a normality test was conducted. The results of the normality test for pre-test and post-test average scores are presented in Table 1. The paired sample t-test results for these scores are shown in Table 2.

Table 1
Results of Normality Test Average Pretest and Posttest Scores of Resilience and Learning Motivation

Data	Probability (significance)	(p) Sig	Information
Pre-test Resilience	0,556	p > 0,05	Normal
Post-test Resilience	0,062	p > 0,05	Normal
Pre-test Learning Motivation	0,441	p > 0,05	Normal
Post-test Learning Motivation	0,889	p > 0,05	Normal

Table 2
Results of Paired Sample T-Test Mean Scores of Pre-Test and Post-Test Resilience and Learning Motivation

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre-test Resillience - Post-test Resillience	-9.91489	9.43820	1.37670	-12.68605	-7.14374	-7.202	46	.000
Pair 2	Pre-test Learning Motivation - Post-test Learning Motivation	-9.19149	7.32369	1.06827	-11.34181	-7.04117	-8.604	46	.000

Based on Table 1, the significance value obtained from the normality test was greater than 0.05 (Sig > 0.05), indicating that both pre-test and post-test data for resilience and student learning motivation are normally distributed. According to Table 2, the significance value from the paired sample t-test was less than 0.05 (Sig < 0.05), leading to the rejection of the null hypothesis (Ho). This result indicates a significant increase in resilience and learning motivation following the implementation of lesson study learning with positive reinforcement techniques.

These findings are further supported by observational data on resilience and motivation throughout the learning process. Observations of resilience focused on five aspects: (1) satisfaction in life, (2) empathy, (3) friendliness, (4) self-management, and (5) self-regulation. A comparison of learning motivation observations from meetings 1 to 4 is presented in Figure 3.

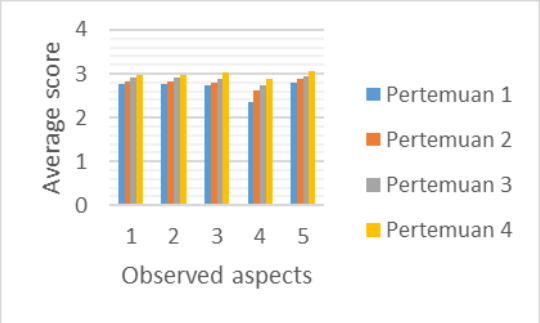

Figure 3.
Comparison of Resilience Observation Results in Each Meeting

In the observation of learning motivation, ten aspects were evaluated: (1) attendance at lectures, (2) utilization of learning resources, (3) attention during lectures, (4) completeness of notebooks, (5) ability to cooperate in groups, (6) participation in group discussions, (7) skills in presentations, (8) activeness in asking questions, (9) ability to answer questions, and (10) responsibility in assignments. A comparison of the learning motivation observations from meetings 1 to 4 is presented in Figure 4.

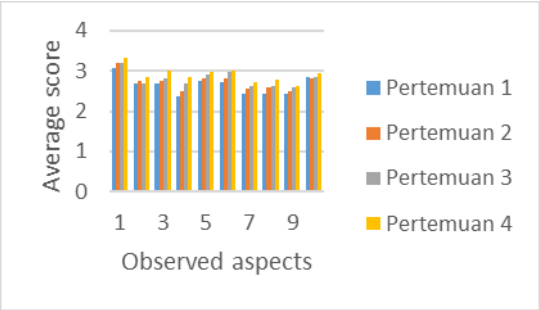

Figure 4.
Comparison of The Results of Observations of Learning Motivation in Each Meeting

Based on Figures 3 and 4, there was an observed increase in the average scores for each aspect of resilience and learning motivation across the meetings. This improvement can be attributed to the implementation of lesson study with positive reinforcement techniques, which has made students more active, independent, resilient, and engaged. The assignments given, including practicums and discussions, required students to collaborate on problem-solving, thus providing opportunities for developing critical thinking skills and independent knowledge construction, making their learning more meaningful. These activities also heightened students' motivation, as the challenging nature of the tasks designed by lecturers stimulated interest (Cho et al., 2021).

Lesson study creates space and time for teachers to collaborate, reflect on their teaching practices, build self-confidence, and develop impactful learning strategies (Kihara et al., 2021). Additionally, providing rewards as positive reinforcement effectively fosters positive behavior and resilience in students, compared to traditional punishment systems (Lapaz & Bello, 2020). Positive reinforcement also enhances interaction between lecturers and students (Fitriati et al., 2020), which is crucial for effective learning.

Learning motivation significantly influences student outcomes (Widyastuti & Muyana, 2019) and is a key determinant of successful learning (Kariadinata et al., 2019). Low motivation can result in poor understanding of statistical concepts, while high motivation typically leads to more efficient completion of learning tasks and goal achievement (Ramli, 2014).

CONCLUSION

The research findings indicate that the implementation of lesson study with positive reinforcement techniques effectively enhances student resilience and motivation in statistics courses. This is evidenced by the increased average scores in resilience and learning motivation compared to pre-test scores. Additionally, the results of the paired sample t-test, with a significance value (p) of 0.000 for both resilience and learning motivation, confirm that the null hypothesis (Ho) is rejected. This demonstrates a significant increase in both resilience and learning motivation following the application of lesson study with positive reinforcement techniques.

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