IJRES International Journal of Research in Education and Science

www.ijres.net

Exploring Mathematics Teachers' Experiences, Attitudes, and Perceived Competence in Lesson Study

Jereme Astaño [1 *], Shaina Broma [2]

[1] Bicol University Graduate School, Legazpi City, Albay 4500, Philippines, 0009-0002-6956-0535
[2] Maonon High School, Ligao City, Albay 4504, Philippines, 0009-0000-5493-371X
* Corresponding author: Jereme Astaño (jereme.astano@bicol-u.edu.ph)

Article Info

Article History

Received:
4 June 2025

Revised:
18 November 2025

Accepted:
23 December 2025

Published:
1 January 2026

Keywords

Attitudes
Lesson study
Perceived competence
Experiences

Abstract

Teachers have adopted lesson study to enhance learning outcomes and promote continuous professional development in one of the divisions in the province of Albay, Philippines. However, despite its implementation, there is a lack of empirical data describing teachers' experiences in lesson study for improving the approach. Thus, the current inquiry determines teachers' significant experiences, attitudes, and perceived competence toward lesson study. A mixed-methods approach was employed on the thirty-four teacher respondents, and the data were obtained through surveys and focus group discussions. Qualitative data were analyzed thematically, while quantitative data were calculated and interpreted using descriptive statistics. Results indicate that higher participation among female teachers than male teachers was observed, with most participants having at least a Bachelor's degree and three or more years of teaching experience. Teachers in the lesson study reported significant experiences, including (1) impacts on teaching practices, (2) collaboration and professional development, and (3) challenges and reflections in the lesson study process. Meanwhile, respondents' attitudes prioritize teacher-student interaction over social expectations and recognition from superiors. Additionally, data revealed high perceived competence in reflection on learning outcomes, followed by subject knowledge, instructional skills, and teaching strategies. Lastly, this current scholarly work provides essential insights that help develop a comprehensive program and policy framework for effectively implementing lesson study in the locality.

Citation: Astaño, J. & Broma, S. (2026). Exploring mathematics teachers' experiences, attitudes, and perceived competence in lesson study. *International Journal of Research in Education and Science (IJRES), 12*(1), 20-34. https://doi.org/10.46328/ijres.5043

ISSN: 2148-9955 / © International Journal of Research in Education and Science (IJRES).

Introduction

Teaching is often regarded as both an art and a science, embodying a blend of creativity, intuition, and systematic knowledge. Thus, teachers must have the ability to connect with students to support and deeply foster open communication to improve learning outcomes. Munna and Kalam (2021) describe teaching and learning as transferring knowledge from teachers to students. Moreover, this practice involves combining elements within the process, such as establishing the learning objectives, developing resource materials, implementing the strategy, and assessing the learning outcome. In brief, this process requires preparation from the school administration, teachers, and academic stakeholders. Walker (2008) states that effective teachers are prepared, positive, creative, fair, and compassionate educators. Furthermore, a teacher is often regarded as resourceful and patient towards the needs of the students. However, many teachers also describe various challenges in teaching, such as workload, the education system, respect, and school climate (Bozkuş, 2020). Teachers also resolve these problems by having open dialogues with the administration, having a support system, and being adaptable, including being innovative. On the other hand, according to the OECD (2023a) and OECD (2023b), the Philippines receives a low score in science and mathematics in the Program for International Student Assessment 2022. Similarly, Mullis et al. (2020) report low scores for the country in the Trends in International Mathematics and Science Study (TIMSS) 2019. In the examinations, learners are evaluated using 21st-century skills, such as critical thinking, creativity, and problem-solving. Thus, these issues lead to learning gaps and possible research opportunities to explore various teaching and learning approaches, such as the implementation of lesson study.

According to Yoshida (2012), lesson study is an approach where teachers in a team collaborate on a target area of development in students' learning by designing, teaching, observing, and evaluating lessons. This practice is also described as a teacher's professional development that continually invests their time, knowledge, and skills to improve and implement lesson study in schools. As a result, the cyclic nature of lesson study provides insights into the refinement of the lessons that are beneficial in addressing specific issues in the classroom. According to Lomibao (2016), lesson planning in the Philippines is a practice made by an individual teacher, and it is considered isolated work on how to implement, what materials to use, and how students should be evaluated. Moreover, this indicates that the efficiency and effectiveness of the teaching and learning process depend on the teacher's capability and quality. Hence, enhancing the ability of teachers is crucial in improving learning outcomes. One approach being done is the implementation of a lesson study, a practice originally from Japan.

In lesson study (LS), as described by Lomibao (2016), teachers in teams with specific objectives collaborate in a cycle to investigate a lesson. This group includes teacher-participants and a Knowledgeable One (KO), an expert in content and pedagogy. This approach involves planning the Research Lesson (RL), where teachers collectively study the content, determine required competencies, decide on delivery strategies, prepare instructional materials, and design a lesson plan to enhance student achievement. The KO supervises and facilitates, enabling more advanced teachers to support their colleagues. Meanwhile, several studies show that lesson studies provide positive results in the teaching process, such as having a supportive network of teachers (McMahon & Hines, 2008), improve classroom management (Altınsoy, 2021), developing mathematical methods, and fostering cooperative learning, which can improve the training of preservice teachers (Elipane, 2011), and enhanced

representation of specific content compared to the current state of practice (Juhler, 2018). However, several challenges are also noted, such as failed collaboration (Sims & Walsh, 2009), time constraints (Chassels & Melville, 2009), and difficulty in understanding the fundamental processes of lesson study (Espinosa et al., 2018).

On the other hand, according to a news release from UP NISMED (2012), twenty (20) mathematics teachers from Ligao National High School in Albay participated in a seminar workshop on lesson study for teaching mathematics through problem-solving with GeoGebra. This event was held at the University of the Philippines National Institute for Science and Mathematics Education Development (UP NISMED) in UP Diliman in 2011. The workshop aims to enhance the teachers' knowledge and skills in implementing lesson study in their schools, focusing on integrating GeoGebra into mathematics instruction.

Additionally, in 2013, NISMED staff conducted a 2-day visit to the school to mentor science teachers. These events led to the division-level implementation of lesson study. Notably, the Division of Ligao City has implemented lesson studies in various disciplines, and various teacher trainings were conducted. However, empirical data is needed to account for the significant experiences, attitudes, and perceived competence of teachers involved in the lesson study to provide crucial insights into developing effective policies and directions to improve the implementation of the approach specific to the local context. Notably, few to no investigations attempt to describe teachers' experiences in the locality, which is the focus of the current investigation.

Research Questions

The following research questions were formulated to guide the investigation.

1. What are the demographic profiles of the teachers involved in implementing lesson study in terms of gender, education, and length of teaching experience?
2. What are the significant experiences of the teachers in lesson study?
3. What are the attitudes and perceived competence of teachers toward lesson study?

Method

This study employed a mixed-methods approach to describe the teachers' significant experiences, including their attitudes and perceived competence in lesson study. In this manner, the researchers were able to explore and precisely characterize the surveyed population regarding the implementation of lesson study in the study locale. Notably, the proponents utilized two methods of data collection: focus group discussion (FGD) and a survey questionnaire. The participants in this study consist of teachers currently teaching and implementing lesson study. Furthermore, the participants were selected based on their qualifications to address the research questions effectively. A purposive sampling technique was employed to select the participants in the study. Specifically, the respondents are the thirty-four teachers involved in implementing the lesson study in junior high school mathematics in the Division of Ligao City in the School Year 2023-2024. The study protocol was registered on the Open Science Framework (OSF): https://doi.org/10.17605/OSF.IO/NUKHS.

Research Instruments

Focus Group Interview Guide

The objective of the focus group discussion was to describe the significant experiences of teachers in the implementation of lesson study. In addition, four (4) open-ended questions were developed, including the discussion format according to the guidelines provided by Krueger and Casey (2009) and Reichert et al. (2021). Sample questions included: (1) *How did participating in the Lesson Study impact your teaching practices and pedagogical strategies?* and (2) *What challenges did you encounter during the Lesson Study implementation, and how did you address them?* The researchers utilized this instrument to supplement and corroborate the data gathered in the study. Additionally, five evaluators have validated the focus group discussion guide and questions using the 4-point scale validation tool that classified the questions into four categories: *highly relevant* (4), *quite relevant* (3), *somewhat relevant* (2), or *not relevant* (1). The researchers adopted the tool of Astaño and Macasinag (2025) to assess the discussion guide regarding clarity, comprehensiveness, and grammar. Furthermore, jurors proposed modifications to the questions, and revisions were incorporated. Evaluators in this study reported that focus group discussion questions have a value of 1.00 for all content validity indices (CVI). The evaluation suggests that the evaluators universally agreed that the instrument was appropriate, relevant, and capable of assessing the teacher's significant experience implementing lesson study.

Survey Questionnaire

This instrument was employed to determine the attitudes and perceived competence of the teachers toward lesson study. Notably, this tool was adopted from the study of Jhang (2019) with the author's permission. The questionnaire consists of three parts: (1) profile of the respondents, (2) attitudes towards lesson study, and (3) perceived competence. The respondents' profile consists of questions about gender, educational attainment, and length of work experience. Moreover, to determine the involvement of the teachers in lesson study, a question was also added based on the original instrument with options provided, such as complete participation, partial participation, and non-participation. Additionally, the second part was on the attitudes toward lesson study, consisting of 12 items about the aims and advantages of lesson study, development in the teaching profession, student performance, improvement in school reputation, and the pursuit of recognition from superiors. Moreover, the questionnaire utilized the 5-point scale response options ranging from 1 "strongly disagree" to 5 "strongly agree". As documented by the author, two distinct factors were named after the validation analysis: attitudes toward self-development and attitudes toward the pursuit of external recognition. These factors have a reported Cronbach's alpha coefficient of 0.95 and 0.89, respectively.

The second part of the survey focused on perceived competence and was measured using a 10-item scale. The questions encompassed perceived pedagogical professional competence, including subject knowledge, instructional skills, student learning, individual differences, instructional designs, teaching strategies, instructional resources, and various assessment methods. These items were rated using the 5-point scale, similar to the attitude scale. Factor analysis demonstrates that the items essentially form a single dimension with an alpha coefficient of 0.91 (Jhang, 2019).

Administration of the Survey and Conduct of Focus Groups

The questionnaire was deployed via Google Forms and provided to the respondents' emails. Data were automatically recorded in Google Sheets, and four weeks were allocated for collecting responses from the identified participants based on the researchers' sampling. The proponents obtained informed consent from teacher-respondents for ethical considerations following Republic Act 10173 or the Data Privacy Act of 2012 (DPA). Moreover, the names of participants were optional in the survey questionnaire. Likewise, selected respondents were invited to the focus groups via Google Meet.

Analysis of Qualitative Data

After collecting qualitative data through focus group discussions, the researchers conducted a thematic analysis to identify and interpret response patterns. Using inductive coding, themes were derived directly from the data without prior assumptions, allowing insights to emerge organically. This approach helped structure observations into meaningful narratives relevant to the study. The proponents performed the qualitative analysis guided by the framework of Braun and Clarke (2006) and Nowell et al. (2017). Lastly, to ensure the trustworthiness of the qualitative data, the results were validated by the respondents and reviewed by a peer researcher with relevant experience and publications, using the same thematic analysis process.

Statistical Treatment

The quantitative data collected in the survey during the investigation were organized and analyzed in tabular format using Google Sheets. This includes mean scores, standard deviations, frequencies, and percentages. Mean Scores. The data obtained from specific parameters on attitudes in lesson study and perceived competence were used to compute the mean scores. Standard deviations were calculated on attitudes towards self-development, external recognition, and perceived competence to measure the variation or dispersion in the responses in each parameter. The data obtained from the involvement in lesson study, gender, education, and length of teaching experience were described using frequencies and percentages. Moreover, the Interclass Correlation Coefficient (ICC) is a metric used to gauge the reliability of measurements or ratings. To assess inter-rater reliability using ICC, having two or more raters evaluate a set number of study subjects is ideal. In the current investigation, absolute agreement in the participants' responses was computed using the interclass correlation coefficient, and the variables measured were attitudes toward self-development, attitudes toward external recognition, and perceived competence. Lastly, values ranging from 0.5 to 0.75 indicate moderate agreement, 0.75 to 0.9 suggest good agreement, and values above 0.90 represent excellent agreement (Koo & Li, 2016).

Results and Discussion

Profile of the Teachers Involved in the Implementation of Lesson Study

The information gathered in this study, specifically the profile of the teachers involved in the lesson study, is crucial to understanding the respondents' specific educational context and characteristics. Furthermore, according

to Grimaccia et al. (2022), the respondents' profiles are necessary to understand the features that define the population that participated in the survey. Lastly, the given data provides insight into identifying patterns that may influence the studied variables. The distribution of the gender of the respondents was presented (see Table 1), and it can be noted that more female teachers (58.8%) participated in the study. Meanwhile, the males have a turnout value of 41.2%. In addition, the researchers also asserted that not all respondents could provide their responses due to their occupied schedules during the data collection period in the last quarter of the school year. However, this data provides insight into the fact that more female teachers are involved in some implementation of lesson studies, which is consistent with the investigations of Lim et al. (2016) and Jhang (2019). On the other hand, the data indicates that a significant majority (91.2%) of the respondents have a Bachelor's degree. In comparison, a smaller proportion (8.8%) have obtained a Master's degree in education. Further, while a bachelor's degree provides foundational knowledge and skills in teaching, a Master's degree often equips educators with more advanced pedagogical strategies, research skills, and subject matter expertise.

Table 1. Demographics of the Respondents in the Lesson Study Implementation

Profile	**Category**	**Frequency**	**Percentage**
Gender	Male	14	41.2%
	Female	20	58.8%
Educational Attainment	Bachelor's Degree	31	91.2%
	Master's Degree	3	8.8%
Length of Teaching Experience	Less than three years	27	79.4%
	Three years and above	7	20.6%
Involvement in Lesson Study	Non	9	26.5%
	Partial	2	5.9%
	Complete	23	67.6%

The fact that most respondents only have bachelor's degrees but have first-hand experience in lesson study in the current inquiry suggests that these teachers have had significant opportunities for professional development. Additionally, this experience demonstrates a commitment to continuous improvement and adaptation of teaching practices, which are essential for fostering effective learning environments. Interestingly, 79.4% of the participants, or 27 individuals, have three or more years of teaching experience. According to the literature, teaching experience has a positive relationship with students' achievements (Wayne & Youngs, 2003). Specifically, Clotfelter et al. (2006) reported that the length of teaching experience was positively related to students' achievement in mathematics and reading. Further, this study also provided essential information indicating that teachers have already gained adequate experience to contribute effectively to lesson study in their

respective institutions. This rich experience among the respondents ensures that the findings of the current investigation are grounded in practical knowledge and professional expertise, enhancing the reliability and relevance of the current inquiry.

The data also displayed the types of involvement in the lesson study. It shows that twenty-three respondents had complete participation, while two (2) had partial participation. Lastly, nine (9) were nonparticipants. The high percentage of complete participation suggests a strong commitment and involvement from most respondents, potentially leading to more consistent implementation of lesson study practices and greater collaborative practices among teachers. The partial participation observed in two respondents indicates some barriers or limitations that must be addressed to ensure full engagement. Meanwhile, nonparticipants are viewed as the reference category in the current study, which is consistent with the methodology of Jhang (2019).

Significant Experiences of the Teachers in Lesson Study

John Dewey suggests that significant educational experience can be defined as an event or situation that has a lasting impact on learning and development or expands perspective. Meanwhile, according to Kostiainen et al. (2018), meaningful experiences are worthwhile learning experiences. This study used interview data from focus groups to describe the significant experiences. The summary of the themes that emerged from the thematic analysis of the experiences of teachers in the lesson study was presented (see Table 2). Three (3) themes were described, supported by sample responses: (1) *impact on teaching practices*, (2) c*ollaboration and professional development*, and (3) *challenges and reflections in the lesson study process*.

The first theme that emerged from the analysis was the impact on teaching practices; this general idea refers to the changes and improvements in teaching methods, strategies, and overall instructional effectiveness resulting from participation in a lesson study. As highlighted in the responses provided in the table, lesson study significantly impacts teaching practices. This includes considering different types of learners, modifying lessons to meet learners' needs, refining instructional techniques, and developing appropriate questions to foster higher-order thinking skills (HOTS). This theme is consistent with Lewis's (2016) study, which described the implementation of the lesson study as highlighting the integration of high-quality tasks and materials, including the development of students' thinking. Likewise, Wessels (2018) also reported that lesson studies showed teachers advancing to higher levels with an increased emphasis on mathematical logic and student reasoning.

Another theme that emerged was collaboration and professional development. This central idea refers to the teachers working together to plan, observe, and analyze lessons to improve teaching practices and student learning outcomes. Additionally, it provides opportunities for ongoing professional growth and learning, enhancing teachers' knowledge, skills, and practices. As shown in the sample responses, it is evident that lesson study fosters collaboration, and that is essential in sharing ideas, expertise, and best practices. The quotations also demonstrated that lesson study is not conducted by a single person but by a group of teachers specializing in the subject. This approach allows for diverse perspectives and expertise, leading to the development of more effective teaching activities.

Table 2. Emergent Themes on the Experiences of Teachers in Lesson Study

Themes	Sample Responses
Impact on teaching practices	*"It allows me to consider the different types of learners."* *"Through Lesson Study (LS), the lesson has been modified to address the needs of the students in learning the given topic."* *"...teachers can refine instructional techniques, identify areas for improvement…"* *"I have applied the flow or sequence of LS in my regular classes. The different strategies in administering group activity were adopted, as well, which resulted in higher participation among students."* *"It helps me identify appropriate questions to ask to develop HOTS among the learners."* *"...has a positive impact on students, and they are motivated to look for the answers in different ways they can."*
Collaboration and professional development	*"One good thing about LS is that it was not only made by one person but by a group of teachers who specialize in the subject, and creating an activity that will encourage student participation is just easy."* *"Collaborating with colleagues has given us the chance to share the best practices we have inside our classrooms."* *"Collaborating with colleagues during LS helps me to learn new strategies that will enhance my teaching."* *"allows educators to deepen understanding of the subject matter through discussions, exploration of alternative teaching approaches, and the examination of student responses."*
Challenges and reflections on the lesson study process	*"Designing an effective research plan was the greatest challenge we encountered in LS. Teachers had their teaching styles, and we had to design a lesson that was relevant to the learners."* *"The only problem is its tedious preparation. From planning, pre-implementation, implementation, and post-implementation."* *"Lesson Study helps us understand the importance of teaching. What went well, and what do we have to do to improve the practice."* *"...encourages reflection on teaching methods, and promotes a deeper understanding of student learning"* *"If the activity on the motivation part is not relatable to students, you will find difficulty in eliciting responses."* *"It is really painful to hear criticism after doing your best, but through an open heart and mind, I was able to appreciate it because, at the end of the day, it is only for the better."*

Moreover, a teacher also elucidated that professional development is evident when educators deepen their understanding of the subject matter through discussions, explore alternative teaching approaches, and examine student responses. Notably, the emergent theme of collaboration and professional development in lesson study is supported by different literature. Kanellopoulou and Darra (2013) asserted that cooperation between teachers and supervisors affects students' performance. Additionally, increased collaboration and in-depth reflection were observed, including positive changes in teaching practices and focus on learning from practice (Lucas, 2014). Likewise, Leavy and Hourigan (2016) reported the development of the pedagogical knowledge of the preservice teachers in the lesson study.

The last theme from the thematic analysis is the challenges encountered and reflections in the lesson study process. This theme refers to the difficulties faced by the respondents in the lesson study, such as implementation issues, student engagement problems, or unexpected outcomes, as well as reflections on these challenges, which may involve insights gained, adjustments made, or strategies developed for future improvement. The responses provided in the table described the challenges in lesson study, such as the need for effective research plans, tedious preparation, fear of post-evaluation, and the coherence of activities to the context and students. Moreover, participants also reflect that lesson study helps them understand the importance of teaching, including what worked well and what improvement in their practice is needed. Furthermore, respondents expressed that they could appreciate the stages or phases of the lesson study, making the teaching and learning process more meaningful and productive for teachers and learners.

This particular theme is corroborated by the study of Aquino and Bautista (2023) on the impact of practices in lesson study. Based on the qualitative findings, time constraints pose a significant challenge in implementing lesson study. Specifically, teachers require additional time for preparation and managing the extra workload involved in implementation. This may contribute to teachers' resistance to engaging in lesson study. Another problem teachers face is the fear of judgment during evaluation. Consistent with the given responses in the table, the teacher encountered constructive criticism from peers. Aquino and Bautista suggest that teachers facing this challenge may feel anxious about evaluation or judgment, leading to further resistance and hindering their full participation in lesson study. Other challenges were documented, such as more understanding, trust, and collaboration.

In summary, the significant experiences of mathematics teachers in lesson study are documented: (1) impact on teaching practices, (2) collaboration and professional development, and (3) challenges and reflections on the lesson study process. Lastly, these themes were supported by different literature on the impact, practices, and challenges of implementing lesson study in various subjects and contexts.

Attitudes and Perceived Competence of Teachers in Lesson Study

Attitude is the tendency of an individual to respond positively or negatively to a person, claim, idea, situation, or object. In addition, the perception of competence is either self-referenced or norm-referenced to complete a specific task or set of tasks (Harter, 1982; Vargas-Sánchez et al., 2016). In this study, attitude and perceived

competence were described utilizing the survey questionnaire adopted from Jhang (2019). Likewise, the variables with their corresponding mean scores, standard deviations, and the absolute agreement among respondents using the interclass correlation coefficient (ICC) for multiple raters were presented (Table 3).

Table 3. Attitudes and Perceived Competence of Teachers in Lesson Study

Variables	Mean (SD)
Attitudes towards self-development (ICC=0.998)	
Teaching profession	4.03 (1.49)
Recognized profession	3.94 (1.46)
Collaborative ability	4.15 (1.52)
Knowledge structure	4.00 (1.48)
Knowledge base	4.03 (1.49)
Multiple assessments	4.00 (1.48)
Student learning	4.06 (1.50)
Teacher-student interaction	4.18 (1.53)
Student performance	4.03 (1.49)
Attitudes towards external recognition (ICC=0.997)	
School Reputation	3.91 (1.44)
Social expectation	3.85 (1.44)
Recognition from superiors	3.88 (1.45)
Perceived competence on (ICC= 0.994)	
Subject knowledge	4.21 (1.12)
Instructional skills	4.21 (1.12)
Individual differences	4.18 (1.11)
Curriculum	4.15 (1.13)
Design of instructional activities	4.18 (1.11)
Stimulation of learning motives	4.09 (1.11)
Teaching strategies	4.21 (1.12)
The use of educational resources	4.06 (1.10)
Multiple assessment methods	4.09 (1.08)
Reflection on learning outcomes	4.24 (1.13)

Respondents (n) = 34; Interclass Correlation Coefficient (ICC) values between 0.5 and 0.75 indicate moderate agreement, values between 0.75 and 0.9 indicate good agreement, and values greater than 0.90 indicate excellent agreement (Koo & Li, 2016).

Data shows that respondents agree that teacher-student interaction (4.18) is crucial in the implementation of lesson study rather than focusing on social expectations (3.85) and recognition from superiors (3.88). This result indicates

that respondents prioritize student-centered approaches as a valuable factor in lesson study. Similarly, teacher-student interaction promotes a collaborative learning culture, recognizing this attitude as an element in improving the teaching and learning process. Ayuwanti et al. (2021) emphasized the significance of teacher-student interactions in learning. Ayuwanti and colleagues highlighted that such interactions significantly influence students' mathematical understanding. Further, these insights shed light on the importance of prioritizing these relationships in implementing lesson study in teaching mathematics.

Meanwhile, as implied by the respondents, social expectations (3.94) are considered less important in implementing the lesson study. Instead, teachers are more inclined to prioritize aspects like collaboration and student learning, as indicated by the mean scores of 4.15 and 4.06. This result is consistent with the study of Canceran (2022), where improvements in the teaching and learning process, including collaboration, are essential in the lesson study cycle. In addition, the author explained that this approach will likely increase benefits to professional growth, including pedagogical and content knowledge. Likewise, Aquino and Bautista (2023) reported that lesson study provides confidence in teaching and improves the collaborative process of designing lessons that engage students.

On the other hand, the respondents indicated that, on average, teachers involved in lesson study scored highest in perceived competence regarding reflection on learning outcomes (4.24), followed by subject knowledge (4.21), instructional skills (4.21), and teaching strategies (4.21). However, respondents scored lowest in using educational resources inside and outside the school. These results were corroborated by the studies of Voss et al. (2011) and Depaepe and König (2018), which highlighted that the main components of teacher competence include classroom management, effective teaching methods, classroom assessment, setting clear learning objectives, lesson planning and evaluation, including the adaptability in managing heterogeneous learning groups. The interclass correlation coefficient of 0.99 suggests that the respondents have excellent agreement in all variables surveyed in the investigation. In summary, in the context of the current investigation, the respondents have reported that the effectiveness of lesson study relies on several key elements: strong teacher-student interactions, which drive collaboration that refines the teaching approaches; a deep understanding of the subject to design practical and relevant lessons, consistent reflection on student learning and diverse instructional teaching strategies that promote continuous improvement in lesson study implementation.

Conclusion

This study aimed to describe the experiences of junior high school mathematics teachers in implementing the lesson study in the Division of Ligao City, Albay, Philippines. The study recorded a higher participation rate in lesson study among female teachers compared to male teachers. Most participants have a bachelor's degree and three or more years of teaching experience. Mathematics teachers participating in lesson study shared significant experiences, including (1) impacts on teaching practices, (2) collaboration and professional development, and (3) reflections on challenges encountered during the lesson study process. Meanwhile, respondents' attitudes prioritize teacher-student interaction over social expectations and recognition from superiors in lesson study implementation. Teachers involved in lesson study demonstrate high perceived competence in reflection on

learning outcomes, followed by subject knowledge, instructional skills, and teaching strategies.

Limitations and Recommendations for Future Studies and Practices

Despite the promising results of the study, several limitations were identified. Based on the findings and conclusions, the following recommendations are suggested for consideration:

1. One limitation of the current study is its small sample size, which may affect the generalizability of the findings. Additionally, the respondents were exclusively mathematics teachers, which limits the scope of perspectives and may not fully represent teachers' experiences from other subject areas in implementing lesson study. Future investigations are encouraged to compare teachers from different disciplines in implementing lesson studies, as this would provide a broader insight into their experiences.
2. The insights gained from this study could serve as a foundation for developing a program within the school to address challenges encountered in implementing lesson studies. This program could include targeted professional development sessions, collaborative planning opportunities, and ongoing support mechanisms for teachers.
3. Research scholars are encouraged to utilize snowball sampling, also known as chain-referral sampling, a non-probability sampling technique wherein existing participants recruit future participants from their social networks. This method helps expand the sample gradually, much like a snowball, and increases the likelihood of including individuals who may not have been reached through conventional convenience sampling methods.
4. Future researchers may consider employing multiple logistic regressions to analyze the factors influencing teacher involvement in lesson study. This statistical approach could provide valuable insights into the characteristics and attitudes that contribute to successful participation in lesson study, helping to inform future implementation strategies and policies.
5. Future studies may also be conducted on students following the implementation of the lesson study to determine its effects on academic variables such as achievement, motivation, engagement, and problem-solving skills. These investigations could provide valuable insights into how teacher collaboration and instructional improvements impact student learning outcomes.
6. Comparative studies with other divisions or educational institutions are encouraged to determine the challenges and best practices in implementing lesson study. By comparing experiences across different contexts, educators can better understand the factors contributing to successful lesson study implementation and adapt these practices to their settings.

References

Altınsoy, E. (2021). Lesson Study as an Intervention to Develop Prospective English Language Teachers' Classroom Management Skills. *International Journal of Asian Education*, *2*(3), 398–414. https://doi.org/10.46966/ijae.v2i3.189

Aquino, M. U., & Bautista, R. G. (2023). Impact of Lesson Study Practice on the Teaching Practices of Teachers in a Schools-District of Quirino, Philippines. *American Journal of Educational Research*, *11*(11), 746–

751. https://doi.org/10.12691/education-11-11-3

Astaño, J. Ll., & Macasinag, Ma. L. M. (2025). The use of engineering design process-oriented activities with GRASPS model integration in grade 11 Genetics. *International Research Journal of Science, Technology, Education, and Management*, *5*(1), 1–22. https://doi.org/10.5281/zenodo.15192704

Ayuwanti, I., Marsigit, M., & Siswoyo, D. (2021). Teacher-student interaction in mathematics learning. *International Journal of Evaluation and Research in Education (IJERE)*, *10*(2), 660–667. https://doi.org/10.11591/ijere.v10i2.21184

Bozkuş, K. (2020). Examining the Problems Faced by Teachers: The Case of Şanlıurfa. *Journal of Theoretical Educational Science*, *13*(3), 505–529. https://doi.org/10.30831/akukeg.623710

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Canceran, J. C. (2022). Perception on Lesson Study of Junior High School Teachers in the New Normal Education. *International Journal of Academic and Applied Research (IJAAR)*, *6*(10), 42–146. http://ijeais.org/wp-content/uploads/2022/10/IJAAR221024.pdf

Chassels, C., & Melville, W. (2009). Collaborative, Reflective, and Iterative Japanese Lesson Study in an Initial Teacher Education Program: Benefits and Challenges. *Canadian Journal of Education*, *32*(4), 734–763. https://eric.ed.gov/?id=EJ883522

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2006). Teacher-Student Matching and the Assessment of Teacher Effectiveness. *The Journal of Human Resources*, *41*(4), 778–820. https://www.jstor.org/stable/40057291

Depaepe, F., & König, J. (2018). General pedagogical knowledge, self-efficacy and instructional practice: Disentangling their relationship in pre-service teacher education. *Teaching and Teacher Education*, *69*, 177–190. https://doi.org/10.1016/j.tate.2017.10.003

Elipane, L. E. (2011). Incorporating lesson study in pre-service mathematics teacher education. *Proceedings of the 35th Conference of the International Group for the Psychology of Mathematics Education*, *2*, 305–312. https://animorepository.dlsu.edu.ph/faculty_research/4965/

Espinosa, A. A., Datukan, J., Butron, B., & Tameta, A. D. (2018). Perceptions of pre-service chemistry teachers on the utilization of productive lesson study as a framework for teaching and learning. *International Journal for the Scholarship of Teaching and Learning*, *12*(1), 1–7. https://doi.org/10.20429/ijsotl.2018.120109

Grimaccia, E., Naccarato, A., & Gallo, G. (2022). Web Surveys: Profiles of Respondents to the Italian Population Census. *Springer Proceedings in Mathematics & Statistics*, *406*, 531–546. https://doi.org/10.1007/978-3-031-16609-9_32

Harter, S. (1982). The Perceived Competence Scale for Children. *Child Development*, *53*(1), 87–97. https://doi.org/10.2307/1129640

Jhang, F. H. (2019). Teachers' attitudes towards lesson study, perceived competence, and involvement in lesson study: evidence from junior high school teachers. *Professional Development in Education*, *46*(1), 1–15. https://doi.org/10.1080/19415257.2019.1585383

Juhler, M. V. (2018). Pre-service teachers' reflections on teaching a physics lesson: How does Lesson Study and Content Representation affect pre-service teachers' potential to start developing PCK during reflections on a physics lesson. *Nordic Studies in Science Education*, *14*(1), 22. https://doi.org/10.5617/nordina.2433

Kanellopoulou, E.-M., & Darra, M. (2013). The Implementation of the Lesson Study in Basic Teacher Education: A Research Review. *Higher Education Studies*, *9*(3), 65–78. https://doi.org/10.5539/hes.v9n3p65

Koo, T. K., & Li, M. Y. (2016). A Guideline of Selecting and Reporting Intraclass Correlation Coefficients for Reliability Research. *Journal of Chiropractic Medicine*, *15*, 155–163. https://doi.org/10.1016/j.jcm.2016.02.012

Kostiainen, E., Ukskoski, T., Ruohotie-Lyhty, M., Kauppinen, M., Kainulainen, J., & Mäkinen, T. (2018). Meaningful learning in teacher education. *Teaching and Teacher Education*, *71*, 66–77. https://doi.org/10.1016/j.tate.2017.12.009

Krueger, R. A., & Casey, M. A. (2009). *Focus Groups: A Practical Guide for Applied Research* (4th ed.). SAGE Publications, Inc.

Leavy, A. M., & Hourigan, M. (2016). Using lesson study to support knowledge development in initial teacher education: Insights from early number classrooms. *Teaching and Teacher Education*, *57*, 161–175. https://doi.org/10.1016/j.tate.2016.04.002

Lewis, C. (2016). How does lesson study improve mathematics instruction? *ZDM Mathematics Education*, *48*, 571–580. https://doi.org/10.1007/s11858-016-0792-x

Lim, C. S., Kor, L. K., & Chia, H. M. (2016). Revitalising mathematics classroom teaching through Lesson Study (LS): a Malaysian case study. *ZDM Mathematics Education*, *48*, 485–499. https://doi.org/10.1007/s11858-016-0779-7

Lomibao, L. S. (2016). Enhancing mathematics teachers' quality through Lesson Study. *SpringerPlus*, *5*, 1–13. 1590. https://doi.org/10.1186/s40064-016-3215-0

Lucas, M. (2014). Lesson study, a means for fostering collaborative reflection: effects on the self-efficacy and teaching practices of developmental education college success course instructors [Thesis Manuscript]. In *keep.lib.asu.edu* (pp. 1–319). https://keep.lib.asu.edu/items/152505

McMahon, M. T., & Hines, E. (2008). Lesson Study with Preservice Teachers. *Mathematics Teacher*, *102*(3), 186–191. https://doi.org/10.5951/MT.102.3.0186

Mullis, I. V. S., Martin, M. O., Foy, P., & Hooper, M. (2020). *TIMSS 2019 International Results in Mathematics and Science*. Boston College, TIMSS & PIRLS International Study Center. https://timssandpirls.bc.edu/timss2019/international-results/

Munna, A. S., & Kalam, M. A. (2021). Teaching and learning process to enhance teaching effectiveness: literature review. *International Journal of Humanities and Innovation (IJHI)*, *4*(1), 1–4. https://doi.org/10.33750/ijhi.v4i1.102

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, *16*(1), 1–13. https://doi.org/10.1177/1609406917733847

OECD. (2023a). PISA 2022 Results (Volume I). In *Programme for international student assessment*. OECD Publishing. https://doi.org/10.1787/53f23881-en

OECD. (2023b). PISA 2022 Results (Volume II). In *Programme for international student assessment*. OECD Publishing. https://doi.org/10.1787/a97db61c-en

Reichert, J., Gilbreath, J., & Kerz, M. (2021). *A guide to conducting focus groups*. Illinois Criminal Justice Information Authority. https://icjia.illinois.gov/about/publications/a-guide-to-conducting-focus-groups/

Sims, L., & Walsh, D. (2009). Lesson Study with preservice teachers: Lessons from lessons. *Teaching and Teacher Education*, *25*(5), 724–733. https://doi.org/10.1016/j.tate.2008.10.005

UP NISMED. (2012). *Ligao National High School trains for lesson study*. http://news.nismed.upd.edu.ph/2012/04/ligao-national-high-school-trains-for.html

Vargas-Sánchez, A., Plaza-Mejía, M. Á., & Porras-Bueno, N. (2016). Attitude. In *Encyclopedia of Tourism* (pp. 58–62). Springer, Cham. https://doi.org/10.1007/978-3-319-01384-8_11

Voss, T., Kunter, M., & Baumert, J. (2011). Assessing teacher candidates' general pedagogical/psychological knowledge: Test construction and validation. *Journal of Educational Psychology*, *103*(4), 952–969. https://doi.org/10.1037/a0025125

Walker, R. (2008). Twelve Characteristics of an Effective Teacher A Longitudinal, Qualitative, Quasi-Research Study of In-service and Pre-service Teachers' Opinions. *Educational Horizons*, *87*(1), 61–66. https://files.eric.ed.gov/fulltext/EJ815372.pdf

Wayne, A. J., & Youngs, P. (2003). Teacher Characteristics and Student Achievement Gains: A Review. *Review of Educational Research*, *73*(1), 89–122. https://doi.org/10.3102/00346543073001089

Wessels, H. (2018). Noticing in Pre-service Teacher Education: Research Lessons as a Context for Reflection on Learners' Mathematical Reasoning and Sense-Making. *Invited Lectures from the 13th International Congress on Mathematical Education. ICME-13 Monographs*, 731–748. https://doi.org/10.1007/978-3-319-72170-5_41

Yoshida, M. (2012). Mathematics lesson study in the United States: Current status and ideas for conducting high quality and effective lesson study. *International Journal for Lesson and Learning Studies*, *1*(2), 140–152. https://doi.org/10.1108/20468251211224181