

# Increase in students' activeness by implementing lesson study with the team games Tournament Learning Model (TGT)

Restu Prihatin<sup>1\*</sup>, Muzzazinah<sup>1</sup>, Riezky Maya Probosari<sup>2</sup>

<sup>1</sup>Department of Biology Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Surakarta 57126, Central Java, Indonesia

<sup>2</sup>Department of Science Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Surakarta 57126, Central Java, Indonesia

\*Corresponding author, email: yayin\_pbio@fkip.uns.ac.id

## Article History

Received: 1 May 2025

Revised: 26 May 2025

Accepted: 15 June 2025

## Keywords

Lesson study

Team Games Tournament

Activeness

## Abstract

This study aims to (1) increase student learning activity through the implementation of Lesson Study with the Team Games Tournament (TGT) learning model, and (2) describe the process of implementing Lesson Study with the TGT model in the classroom. The research employed a descriptive qualitative approach. The data sources included learning activities, informants (a biology teacher and 26 students of class X MIA 2), and supporting documents such as syllabi, lesson plans, and learning recordings. The sampling technique used was purposive sampling. Data were collected through observation, interviews, and document analysis. The research team consisted of expert lecturers, a model teacher, and observers. The validity of the data was ensured through triangulation of methods and data sources, while data were analyzed using descriptive qualitative techniques. The results showed that Lesson Study-based learning using the TGT model and varied learning media worksheets in the first cycle, quiz cards in the second cycle, and gift boxes in the third cycle was effective in increasing student learning activity. Students became more active in discussions, competitions, and collaborative tasks. The main obstacles encountered were scheduling difficulties between researchers and experts, limited classroom facilities such as the absence of an LCD projector, and the small classroom size which hindered observation. To overcome these issues, the researcher recorded learning sessions and shared videos through social media platforms like WhatsApp, allowing expert teams and students to access and evaluate the learning process effectively.

## 1. Introduction

Quality education can be achieved when there is positive communication in the learning process. Communication between teachers and students, students and students, and between teachers and teachers (Hidayat & Eliasa, 2024). Biology learning is related to systematically discovering and understanding the natural world (Kristyowati, 2016). Biology learning must be process-oriented, requiring students to learn actively rather than being product-oriented (Ulfa, S., 2018). Learning experiences can only be obtained if students actively interact with their environment (Hanipah et al., 2022).

An analysis of the biology learning activities in class X MIA 2 at Muhammadiyah 1 Karanganyar High School reveals that the majority of these activities are characterized by a high degree of inactivity or passivity. Student activity is defined as an integral component of the learning process, encompassing physical, mental, intellectual, and emotional dimensions. It involves the execution of cognitive, affective, and psychomotor tasks and responsibilities assigned by the instructor (Murni, 2021). A comprehensive review of the relevant literature reveals that student learning activities encompass a wide array of modalities, including visual activities, motor activities, writing activities, oral activities, mental activities, listening activities, emotional activities, and drawing activities (Hamalik, 2010). Preliminary observations of student activity in the classroom revealed that the level of student engagement was moderate, with an activity percentage of 32%. These results were obtained based on a multifaceted research approach, including in depth interviews with teachers and students, observational studies by the research team, and a thorough document analysis. These data were then meticulously translated into eight indicators of activity, as follows: visual activities 37%,

motor activities 33%, writing activities 23%, oral activities 33%, mental activities 32%, listening activities 35%, emotional activities 29%, and drawing activities 35%. Student activity in the learning process not only facilitates the transfer of knowledge from teachers to students but also engenders positive behavioral changes in students in learning (Rozi et al., 2024).

The implementation of learning activities has been demonstrated to enhance student engagement and foster teacher creativity in the development of learning models. Specifically, lesson study-based learning activities have been identified as a promising approach (Risnanosanti et al., 2020). Lesson study has been defined as a collaborative and continuous learning assessment model for building learning communities (Lewis, 2016). The implementation of lesson study activities commences with the planning stage, which aims to design student-centered learning that encourages students to participate actively in the learning process. The subsequent stage is the implementation (do) of learning to apply the learning design. The third stage is characterized by a period of introspection and evaluation of the implemented learning strategies (Daryanto, 2012).

The interactive learning process is meticulously designed to engage students' cognitive, visual, auditory, and psychomotor abilities (Azizah & Jemain, 2023). A pedagogical model that has been demonstrated to stimulate student activity is the TGT (Teams Games Tournament) cooperative learning model (Fadillah et al., 2024). TGT cooperative learning is a learning model that involves all students, irrespective of their status, and involves peers as tutors, incorporating elements of games (Slavin, 2009). The TGT learning process is multifaceted, encompassing class presentations, team discussions, games, tournaments, and team awards, thereby ensuring optimal student engagement (Umrotunnikmah et al., 2022). The integration of games into learning activities has been shown to promote a more relaxed learning environment, while concurrently fostering a sense of responsibility, cooperation, and learning involvement (Rachmawaty & Sunarti, 2015).

The purpose of this study was to implement lesson study using the TGT learning model and increase student engagement at Muhammadiyah 1 Karanganyar High School in the 2019/2020 academic year. The learning model influences student activities during the teaching and learning process. The learning model used must be adapted to the material being taught and the conditions of the students so that students can be actively involved and motivated to learn and the learning objectives can be achieved. The lesson study learning activity with the TGT learning model is expected to increase the activity of students in class X MIA 2 at Muhammadiyah 1 Karanganyar High School so that it can make a positive and beneficial contribution to students, teachers, and the school in achieving learning objectives.

## 2. Method

The method used in this study was descriptive qualitative with lesson study. The study was conducted in class X MIA 2 at Muhammadiyah 1 Karanganyar Senior High School in the 2019/2020 academic year. The data sources used included biology teachers as informants, the 2013 curriculum syllabus KD 3.2 and 4.2, and student observation guidelines. The research subjects consisted of 26 students in class X MIA 2 at Muhammadiyah 1 Karanganyar High School in the 2019/2020 academic year. The technique for selecting research subjects used purposive sampling, where the researcher directly selected the samples to be studied (Firmansyah & Dede, 2022). Data collection used interviews, observation, and analysis of archives and documents. The data validity test technique used triangulation methods.

The research employed a descriptive qualitative method predicated on the semantic relationship between research problems. The implementation of lesson study using the TGT (Teams Games Tournament) learning model was carried out collaboratively with the participation of teachers, researchers, students, and a team of experts. The lesson study activity was carried out in three cycles. The stages of the lesson study consisted of planning (plan), implementation (do), and reflection (see). The implementation stage employed the TGT learning model, incorporating learning steps such as presentations, group discussions, games, tournaments, and team rewards. The implementation stages are illustrated in Figure 1.

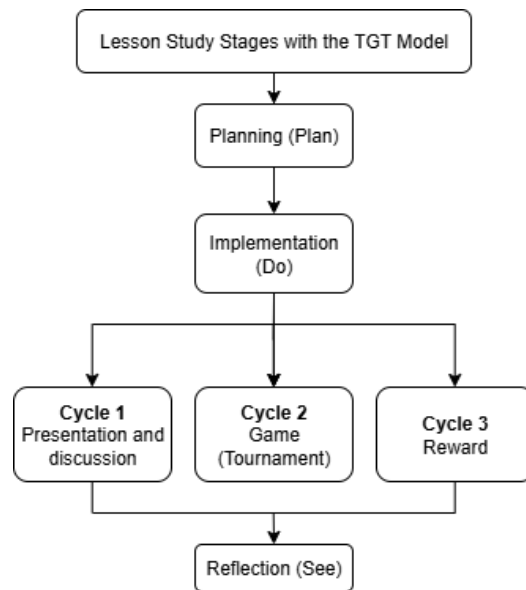


Figure 1. Stages of lesson study using the TGT learning model

### 3. Results and Discussion

#### 3.1. Result

The implementation of the lesson study framework in this research was carried out through three primary stages: planning (plan), implementation (do), and reflection (see). Each stage of the process was executed in collaboration between researchers, model teachers, mentor teachers, and observers. The objective of this collaborative effort was to enhance the efficacy of the learning process and student engagement. Through the implementation of lesson study activities, educators were empowered to design, implement, and evaluate the learning process on an ongoing basis, thereby cultivating a more effective and student-centered learning model (Fauziah et al., 2025).

##### 3.1.1. Planning Stage

The planning stage was carried out to identify the initial learning conditions and problems faced by students in understanding the material (Putri & Wati, 2020). This activity began with classroom observation to obtain a real picture of student learning activities, their involvement in discussions, and the learning strategies used by teachers (Yulianto et al., 2017). Based on the results of these observations, the researchers then held discussions to determine relevant solutions and collaboratively develop a learning plan. The results of the planning stage were manifested in the form of learning tools in the form of a syllabus and lesson plans tailored to Basic Competencies (KD) 3.2 and 4.2 in the subject of Biodiversity. The lesson plans were designed systematically to include learning objectives, material, activity steps, and the models and methods to be applied, namely the Team Games Tournament (TGT) cooperative learning model within the lesson study framework. Through this stage, teachers and the research team had clear guidelines for implementing learning oriented towards increasing student activity and collaboration in the classroom.

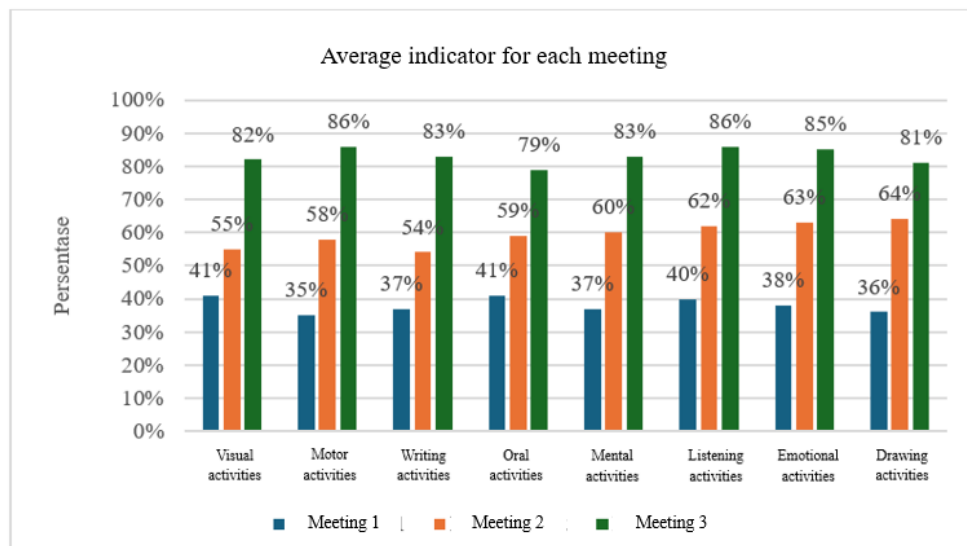
##### 3.1.2. Implementation Stage

The implementation stage (do) was carried out with reference to the lesson plan that had been prepared beforehand. The researcher acted as the model teacher, while the observers and expert team played a role in observing student activities during the learning process. The learning activity began with an opening by the teacher to create a conducive learning atmosphere and prepare students to participate in the activity. Next, learning was carried out using the Team Games Tournament (TGT) model. The TGT cooperative learning model helps students work together to understand the material through heterogeneous group division and educational games (Supoyo et al., 2018). The application of TGT in this lesson study aims to increase student activity, social interaction, and responsibility in the learning process (Ningsih et al., 2025). In addition, the observation activities carried out by the team provide direct input on the learning process so that its strengths and weaknesses can be identified.

### 3.1.3. Reflection Stage

The reflection stage (see) is carried out after the learning process is complete. The activity begins with the model teacher presenting the findings related to student activity criteria, which are the indicators of the study, as well as the achievement of predetermined targets. The findings presented by the observer include student responses, the effectiveness of the TGT model implementation, and the obstacles encountered. Reflective discussions are conducted openly between the model teacher, observers, and the expert team to provide suggestions for improvement for the next learning session. Through this reflection stage, teachers gain new insights into more effective learning strategies and are able to identify concrete steps to improve the quality of learning and student activity in the next cycle.

The results of the lesson study implementation using the TGT learning model were obtained through observation, interviews, and analysis of archives and documents using student learning activity indicators consisting of eight aspects, namely visual activities, motor activities, writing activities, oral activities, mental activities, listening activities, emotional activities, and drawing activities. A recapitulation of the activity of students in class X MIA 2 during the three cycles is shown in Figure 2, which illustrates an increase in each aspect of student activity.



**Figure 2. Percentage of Student Activity in Each Aspect**

Figure 2 shows that there was an increase in the average activity level of students in each meeting. The visual activities aspect showed an increase of 41%, from 41% in the first meeting to 82% in the third meeting, indicating that students were more focused on paying attention to the teacher's explanations and learning media. The motor activities aspect experienced the highest increase of 51%, from 35% in the first meeting to 86% in the third meeting. This increase indicates that students were more physically active in participating in group learning activities and educational games. Writing activities increased by 46%, from 37% to 83%, showing that students were more active in taking notes and writing down the results of group discussions.

There was also an increase in oral activities by 38% from 41% to 79%, indicating that students were more confident in expressing their opinions and engaging in verbal communication during the learning process. Mental activities increased by 46% from 37% to 83%, indicating that students were more active in critical thinking and analyzing the problems given. In addition, the listening activities aspect also increased by 46% from 40% to 86%, indicating that students were more focused on listening to explanations from teachers and their groupmates.

Emotional activities increased by 47% from 38% to 85%, indicating an increase in enthusiasm, enjoyment, and motivation among students in participating in learning activities. Meanwhile, drawing activities increased by 45% from 36% to 81%, indicating that students were more creative in illustrating material concepts through visual activities such as charting or illustration. Overall,

these results illustrate that the application of Lesson Study with the Team Games Tournament (TGT) learning model has a positive effect on increasing student activity in various aspects of learning.

### **3.2. Discussion**

The implementation of lesson study using the team games tournament (TGT) learning model can increase the activity of students at Muhammadiyah 1 Karanganyar High School. Lesson study activities have characteristics of effective professional development and provide a way for teachers to learn from each other about good learning processes, learning methods that can increase learning motivation, and continuity between activities so as to increase student learning activities (Coenders & Verhoef, 2019). Through this activity, teachers not only improve the quality of learning but also identify methods and strategies that can increase student motivation and learning activities.

Lesson study is carried out in a series of cycles consisting of planning (plan), implementation (do), and reflection (see). In the planning stage, teachers and the lesson study team, consisting of researchers, mentor teachers, observers, and a team of experts, develop learning tools in the form of a syllabus and lesson plans tailored to the subject of biodiversity. These tools are developed based on the results of discussions and suggestions from observers obtained during the initial observation process. Lesson study activities enable teachers to collaborate in designing effective and solution-oriented learning to address problems encountered in the classroom (Lewis, 2016).

#### **3.2.1. Application of Lesson Study Using the Team Games Tournament (TGT) Learning Model**

Lesson study activities using the team games tournament (TGT) learning model begin with an open lesson in which the model teacher conducts the lesson according to the plan that has been prepared. The learning model used is TGT, which combines group learning activities and tournament-based educational games. Lesson study encourages a small group of teachers to work together in designing, implementing, and improving the learning process based on actual observations in the classroom. (Cerbin & Kopp, 2006).

During the learning process, the teacher presents the material to the students, followed by group discussion activities. Each group consists of 5 to 6 students who are formed heterogeneously based on different academic abilities, genders, and races. The teacher provides worksheets as discussion material and gives clear instructions on how to use the worksheets. The discussion activity ends with a tournament activity where the teacher asks several questions that require students to compete with each other to answer. This activity encourages active participation, competitive spirit, and student involvement in the learning process (Dalilah & Utami, 2025). In addition, the teacher also gives students the opportunity to express their opinions and reflections on the material that has been learned.

Lesson study is not a specific teaching method or strategy, but rather a professional development approach that allows for the application of various teaching methods or strategies in accordance with the situation, conditions, and problems faced by students (Lewis et al., 2006). In this study, lesson study was implemented through the Team Games Tournament (TGT) learning model, which consists of five main syntaxes, namely: (1) class presentation, (2) group discussion, (3) games, (4) tournaments, and (5) rewards. The implementation of the learning syntax was observed through a syntax implementation sheet provided by the researcher before the teaching and learning activities took place (Lestari & Afifah, 2018).

During the discussion stage, students interacted and worked together to understand the material through the exchange of ideas, mutual assistance between more capable students and those who were still experiencing difficulties, and building a common understanding. This process fostered a sense of responsibility and awareness that cooperative learning is an interesting and meaningful activity (Gayatri, 2009).

The game and tournament stages are carried out by involving representatives from each group to compete at the game table. Each game table is filled with students with relatively similar academic abilities so that the competition is balanced (Gayatri, 2009). In its implementation, the TGT model can be combined with the use of learning media that serve as tools to clarify concepts, overcome

sensory, space, and time limitations, and increase the effectiveness of the learning process (A. Lestari et al., 2015). The application of the TGT collaborative learning model can improve students' memory of the material they have learned and provide opportunities for students to learn freely in groups, so that students can exchange ideas, compare opinions, and convey ideas to discover concepts and build their own knowledge (Supoyo et al., 2018).

### **3.2.2. Improvement in every aspect of student activity**

#### **a. Visual activities**

Visual activities are one indicator of student activity, which includes watching videos or looking at pictures of biodiversity shown by the teacher, reading relevant learning materials, and paying close attention to the teacher's explanations. In the first meeting, the level of students' visual activity reached 41%, which is in the moderate category (25%–75%). In the second meeting, it increased to 55% (moderate category), and in the third meeting, it reached 82%, which is in the high category (>75%). This increase shows the development of students' concentration and interest in learning over time. These findings are in line with the results of Lee et al. (2019), which state that an increase in visual activity is an important indicator of increased student concentration and engagement in the learning process. Thus, it can be concluded that the application of the TGT learning model within the Lesson Study framework is able to create more visually appealing learning and increase student focus on biodiversity material.

#### **b. Motor activities**

Motor activities include students' physical involvement, such as forming study groups, discussing worksheets, and presenting the results of discussions (Lee et al., 2019). Student activity levels in motor activities increased significantly in each meeting. The percentage of student activity achievement in the first meeting was 35%, which is in the moderate category (25%-75%), the second meeting was 58%, which is in the moderate category (25%-75%), and the third meeting was 86%, which is in the high category (>75%). This increase is supported by the opinion of Supoyo et al. (2018), that the TGT model is able to foster a spirit of healthy competition that encourages students to move actively and participate directly in learning.

#### **c. Writing activities**

Writing activity indicators include taking notes on lesson material, writing conclusions from discussions, and completing worksheets according to the teacher's instructions (Lee et al., 2019). Student activity levels in writing activities increased significantly in each meeting. The percentage of student activity achievement in the first meeting was 37%, which is in the moderate category (25%-75%), the second meeting was 54%, which is in the moderate category (25%-75%), and the third meeting was 83%, which is in the high category (>75%). This increase reflects that students are increasingly diligent in writing and more involved in recording important information during learning. These results indicate an increase in individual responsibility in documenting learning outcomes independently.

#### **d. Oral activities**

Oral activities relate to students' ability to express opinions, ask questions, answer teachers' questions, and participate in group discussions (Lee et al., 2019). The percentage of student activity achievement in the first meeting was 41%, which is in the moderate category (25%-75%), the second meeting was 59%, which is in the moderate category (25%-75%), and the third meeting was 79%, which is in the high category (>75%). This shows an increase in students' ability to express opinions, ask questions, and answer teachers' questions. Although the increase was relatively lower than other aspects, it still showed progress in students' courage and oral communication skills. In line with the research by Ningsih et al. (2025), speaking activities in cooperative learning develop more optimally when students feel safe and valued in their groups.

#### **e. Mental activities**

Mental activities include critical thinking skills, teamwork, problem solving, and responding to other groups' presentations (Lee et al., 2019). The percentage of student activity achievement in the first meeting was 37%, which is in the moderate category (25%-75%), the second meeting was 60%, which is in the moderate category (25%-75%), and the third meeting was 83%, which is in the high category (>75%). This increase shows that students were more active in thinking critically,

analyzing, and strategizing in answering questions during the tournament activities. This condition is in line with the opinion of Coenders & Verhoef (2019), who explain that lesson study allows teachers and students to build a deeper conceptual understanding through a process of reflection and joint problem solving.

**f. Listening activities**

Mental activities include critical thinking skills, teamwork, problem solving, and responding to other groups' presentations (Lee et al., 2019). The percentage of student activity achievement in the first meeting was 37%, which is in the moderate category (25%-75%), the second meeting was 60%, which is in the moderate category (25%-75%), and the third meeting was 83%, which is in the high category (>75%). This increase shows that students were more active in thinking critically, analyzing, and strategizing in answering questions during the tournament activities. This condition is in line with the opinion of Coenders & Verhoef (2019), who explain that lesson study allows teachers and students to build a deeper conceptual understanding through a process of reflection and joint problem solving.

**g. Emotional activities**

The emotional activities aspect can be seen from the enthusiasm and spirit of students in participating in learning activities, discussions, and tournaments (Lee et al., 2019). The achievement of student activity in the emotional activities aspect in each meeting experienced a significant increase. The percentage of student activity achievement in the first meeting was 38%, which is in the moderate category (25%-75%), the second meeting was 63%, which is in the moderate category (25%-75%), and the third meeting was 85%, which is in the high category (>75%). This increase shows a positive attitude during the activities. The competitive yet enjoyable learning environment in TGT contributed to stimulating students' intrinsic motivation, as emphasized by Lestari & Afifah (2018) that the game element in TGT created learning conditions that fostered a sense of joy and a desire to achieve.

**h. Drawing activities**

The drawing activities aspect assesses students' ability to illustrate biodiversity concepts through charts, sketches, or illustrations (Lee et al., 2019). Student activity levels in the drawing activities aspect increased significantly in each meeting. The percentage of student activity achievement in the first meeting was 36%, which is in the moderate category (25%-75%), the second meeting was 64%, which is in the moderate category (25%-75%), and the third meeting was 81%, which is in the high category (>75%). This increase shows that students are becoming more creative in visualizing the biological concepts they have learned. This shows that TGT-based learning not only improves conceptual understanding but also develops students' visual creativity.

## **4. Conclusion**

Based on the discussion, it can be concluded that student activity can be improved by implementing Lesson Study with the Team Games Tournament (TGT) learning model for students at Muhammadiyah 1 Karanganyar High School in the 2019/2020 academic year. The results of the study show an increase in student learning activity in each cycle, where in the initial observation, student activity was at a low level, and after the study, the results showed that student activity was at a high level. The increase in student activity was demonstrated by positive changes in attitude and behavior shown by students during the learning process. These changes included: students preparing themselves before the start of the lesson; students actively discussing in groups; students actively expressing their opinions and asking questions to the teacher; students diligently taking notes on the material presented by the teacher; students being able to present well in class; and students being able to carry out the tournament well and in an orderly manner.

## **Author Contributions**

All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

## **Funding**

No funding support was received.

## Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## References

- Azizah, N., & Jemain, Z. (2023). Implementasi Pembelajaran Interaksi Berbasis Teknologi. *Implementasi Pembelajaran Interaksi Berbasis Teknologi*, 1(4), 165–170.
- Cerbin, W., & Kopp, B. (2006). Lesson study as a Model for Building Pedagogical Knowledge and Improving Teaching. *International Journal of Teaching and Learning in Higher Education*, 18(3), 250–257
- Coenders, F., & Verhoef, N. (2019). Lesson Study: Professional Development (PD) for Beginning and Experienced Teachers. *Professional Development in Education*, 45(2), 217–230
- Dalilah, W. K., & Utami, I. I. S. (2025). Pandangan Guru Terhadap Penerapan Pembelajaran TGT Berbasis Digital dalam Mata Pelajaran IPS Di Sekolah Dasar. *Jurnal Pengajaran Sekolah Dasar*, 4(1), 103–117. <https://doi.org/https://doi.org/10.56855/jpsd.v4i1.1575>
- Daryanto, M. R. (2012). *Model Pembelajaran Inovatif*. Yogyakarta: Penerbit Gava Media.
- Fadillah, D. N., Suharyanto, S., & Untari, P. R. (2024). Efektivitas Model Pembelajaran Kooperatif Tipe Teams Games Tournament (TGT) dalam Meningkatkan Keaktifan Siswa: Studi Kasus pada Mata Pelajaran IPAS di Sekolah Dasar. *Ainara Journal (Jurnal Penelitian Dan PKM Bidang Ilmu Pendidikan)*, 5(3), 319–325. <https://doi.org/10.54371/ainj.v5i3.487>
- Fauziah, S., Nurnia Amaliah, S., Munawaroh, S., & Roichanah, S. (2025). Peningkatan Kompetensi Pedagogik dan Profesional Guru Melalui Pelatihan Berbasis Lesson Study di Sekolah Dasar. *Journal of Innovation Research and Knowledge*, 4(12), 9127–9136.
- Firmansyah, D., & Dede. (2022). Teknik Pengambilan Sampel Umum dalam Metodologi Penelitian: Literature Review. *Jurnal Ilmiah Pendidikan Holistik (JIPH)*, 1(2), 85–114. <https://doi.org/10.55927/jiph.v1i2.937>
- Gayatri, Y. (2009). Cooperative Learning Tipe Team Game Tournaments (TGT) sebagai Alternatif Model Pembelajaran Biologi. *Didaktis*, 8(3), 59–67.
- Hamalik. (2010). *Perencanaan Pengajaran Berdasarkan Pendekatan Sistem*. Jakarta: Bumi Aksara.
- Hanipah, A. D., Amalia, T. N., & Setiabudi, D. I. (2022). Jurnal sosial huoviani, Dwimaniora dan pendidikan. *Education: Jurnal Sosial Humaniora Dan Pendidikan*, 2(1), 41–51.
- Hidayat, R., & Eliasa, E. I. (2024). Dampak komunikasi dalam membangun hubungan positif antara guru dan siswa: Kajian sistematis literatur. *Jurnal Pendidik Indonesia*, 5(2), 98–107. <https://doi.org/10.61291/jpi.v5i2.58>
- Kristyowati, P. (2016). Pembelajaran Literasi Sains Melalui Pemanfaatan Lingkungan. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, 9(2), 183–191.
- Lee, J., Song, H.-D., & Hong, A. (2019). Exploring Factors, and Indicators for Measuring Students' Sustainable Engagement in e-Learning. *Sustainability*, 11(4), 985
- Lestari, A., Widiyatmoko, A., Alimah, S., & Juliyani, I. (2015). Sounds Learning Using Teams Games Tournament with Flash Card As Media At The 13th Junior High School Of Magelang. *Jurnal Pendidikan IPA Indonesia*, 4(2), 177–184
- Lestari, R., & Afifah, N. (2018). Penerapan Lesson study untuk Meningkatkan Kemampuan Dasar Mengajar Mahasiswa Pendidikan Biologi Universitas Pasir Pengaraian. *J. Ind. Bio. Teachers*, 1(1), 37–41
- Lewis, C. (2011). *Teachers and teaching in Japan: Professional Mecca or pressure cooker?* In Y. Zhao (Ed.), *Handbook of Asian education* (pp. 231–246). New York: Routledge.
- Lewis, C. (2016). How does Lesson study Improve Mathematics Instruction? *ZDM - Mathematics Education*, 48(4), 571–580
- Lewis, C., Perry, R., & Murata, A. (2007). How Should Research Contribute to Instructional Improvement? The Case of Lesson Study. *Educational Researcher*, 35(3), 3–14
- Lewis, C., Perry, R., Hurd, J., & O'Connell, M. P. (2006). Lesson study comes of age in North America. *Phi Delta Kappan*, 88(4), 273–281
- Murni, N. F. (2021). Upaya Meningkatkan Keaktifan Siswa Dalam Proses Pembelajaran. *Science, Engineering, Education, and Development Studies (SEEDS): Conference Series*, 5(1), 7–11.
- Ningsih, W., Sari, M. E., & Prasetyo, H. (2025). Penerapan Model Pembelajaran Cooperative Learning Tipe Teams Games Tournament (TGT) untuk Menumbuhkan Keaktifan Belajar Siswa Kelas 4 pad Mata Pelajaran IPAS. *Pendas : Jurnal Ilmiah Pendidikan Dasar*, 10(3), 246–259.
- Putri, P. O., & Wati, E. (2020). Implementasi Model Pembelajaran Team Game Tournament(Tgt) Untuk Meningkatkan Aktifitas Belajar Siswa. *Intersections*, 5(1), 38–45. <https://doi.org/10.47200/intersections.v5i1.514>
- Rachmawaty, & Sunarti. (2015). Penerapan Model Pembelajaran Teams Games Tournament (TGT) Berbantuan Kartu Soal untuk Meningkatkan Hasil Belajar dan Aktivitas Siswa pada Materi Hidrokarbon Di Kelas X-5 SMAN 4 Banjarmasin. *Jurnal Inovasi Pendidikan Sains*, 6(2), 87–95.

- Risnanosanti, R., Syofiana, M., & Hasdelyati, H. (2020). Kemampuan Berpikir Kreatif Matematis Siswa Dan Model Pembelajaran Problem Solving Berbasis Lesson Study. *Indiktika: Jurnal Inovasi Pendidikan Matematika*, 2(2), 168–178. <https://doi.org/10.31851/indiktika.v2i2.4137>
- Rozi, F., Fajri, Z., & Nuraini, Y. P. I. (2024). Penggunaan Metode Question Student Have Dalam Meningkatkan Keaktifan Belajar Siswa. *At-Ta'lim: Jurnal Pendidikan*, 10(1), 67–82.
- Slavin, R. (2010). Cooperative Learning. Bandung: Nusa Media.
- Supoyo, A., Fauziah, Y., & Wulandari, S. (2018). Persepsi Siswa terhadap Penerapan Model Pembelajaran Kooperatif Tipe Teams Games Tournament (TGT) dan Hubungannya dengan Hasil Belajar IPA Biologi pada Siswa Kelas VII MTs Darul Hikmah Pekanbaru. 12, 1–9.
- Ulfa, S., W. (2018). Mentradisikan Sikap Ilmiah dalam Pembelajaran Biologi. *Jurnal Biolokus*, 1(1), 1–10.
- Umrotunnikmah, M., Khusnah, L., & Nasir, M. F. A. (2022). Penerapan Model Kooperatif TGT untuk Meningkatkan Kualitas Pembelajaran PPKn terhadap Kelas IV di MI NU Raudlatus Shibyan 02 Kudus. *Jurnal Inovasi Pendidikan Madrasah Ibtidaiyah*, 4(1), 29–38.
- Yulianto, A., Fatchan, A., Asnita, I., & K. (2017). Pembelajaran Projekct Based Learning Berbasis Lesson Study untuk Meningkatkan Keaktifan. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 3(2), 448–453.