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The Implementation of the Think Pair Share (TPS) Learning Model to Improve the Student's Motivation and Learning Outcomes in the Bioenergy Course

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Abstract: For improving the Bioenergy course learning outcomes, the Think Pair Share (TPS) Learning Model are implementing in this research with qualitative descriptive research methods. The research results show that the average student learning motivation = 3.69 which is also categorizing as good in the implementation, the student's learning outcomes in the Bioenergy course for the individual proportion index (P) for the 28 students = 0.82 ≥ 0.80, and the class proportion index (P) = 1.00 ≥ 0.80, the meaning are that the individual and class completeness have complete and achieve in the good category. From the result research can show that the TPS can make the Bioenergy course easy to understand both conceptually and in terms of application in the life, make the student discussions interesting, increase the learning motivation, and make the students as the center of learning. The learning model like this, it is going to follow up in the various activities and continuously to improve the quality of higher education in our country and nation.

Keywords: The Think Pair Share (TPS) Learning Model; the Student's Motivation; the Student's Learning Outcomes; the Bioenergy Course.

Introduction

In the era of globalization, the students must have good competence to face the challenges and competition, therefore it is necessary to create an atmosphere that supports quality learning to improve the student abilities. The quality learning is an alternative solution, apart from the achieving good cognitive learning outcomes, it is also able to produce the student characters that reflect the four pillars of education established by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). In order for education to produce the outputs that have superior competence in the dealing with the various problems and realities of life, the formulates four pillars of education as a support for the education system are: 1) the learning to know, 2) learning to do, 3) learning to be, and 4) learning to live together (Suhifatullah, 2022). The lecturers must be able to apply various innovative learning models in class to create interesting, active and enjoyable learning for students. This condition makes their can easily understand and apply the material presented in the class learning. The Bioenergy is renewable energy obtained from biological sources, generally biomass. Biomass is an organic material that stores sunlight energy in the form of chemical energy. Biomass as fuel generally takes the form of wood, wood industry waste, straw, and agricultural products such as sugar cane which can be processed into fuel. In a narrower definition, bioenergy is a synonym for biofuel, which is fuel derived from biological sources. In a broader scope, bioenergy also includes biomass. Bioenergy is energy produced from biomass, but bioenergy is not biomass itself. This explains similar with the research that states the bio energy, derived from biomass like plants and organic waste, promises a

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reliable, cost-effective, and ecofriendly energy source (Hasnain Qamar et al., 2024). The others of the research also state the biomass potential supply in the meeting contemporary energy demand, biofuels, and their production as a renewable alternative to change the fossil (Mignogna et al., 2024). The students who are the next generation must have this competency in order to be able to conserve energy on our earth.

One of the creative and innovative learning innovations that can be applied to support the four pillars of UNESCO education is the Think Pair Share (TPS) learning model. The TPS is a cooperative learning strategy in which the students first the think independently about a question or problem, then pair up to discuss their ideas, and finally share the results of their discussion with the entire class. This model increases the student participation, self-confidence, and understanding of the material because the students are actively involved in the solving problems with their group mates. The TPS is an instructional strategy that can be used to promote and support student participation and enhance learning (Guenther & Abbott, 2024). The use of the TPS learning integrated with the other learning can show the responses of the interest and learning motivation that are included in the good category, so that competence and learning outcomes are achieved (Efendi. N, 2024). The other result research states the TPS can improve the learning achievement students, percentage of student learning completeness, student learning activities, and teacher activities in progress learning (Ikhwanta. T, 2022). The phases (stages) of the Think Pair Share (TPS) learning model are: 1) Introduction (Conveying Goals and Motivation), with activities: a) The lecturer conveys the learning objectives and topics to be discussed and b) The lecturer motivates the students and ensure their understanding of the material and competencies that must be mastered, 2) Think, with activities: a) The lecturer asks questions or problems related to the lesson., and b) The students are asked to think independently within a certain time to develop individual ideas and thoughts, 3) Pair, with activities: a) The students pair up with their friends to discuss their answers or independent thinking, and b) The aim is to increase understanding through discussion and sharing of ideas, 4) Share, with activities: a) Each pair shares the results of their discussion in front of the class., and b) The lecturer facilitates discussions, provides clarification, and encourages other students to provide feedback or questions, 5) Conclusion and Evaluation, with activities: a) The lecturer concludes the material based on the results of student discussions, and b) The lecturer also gives appreciation for student participation. The TPS could improve the student interest and science learning outcomes in the classroom with the result action the average percentage of student interest increased from 73.43% in the first cycle to 79.82% in the second cycle, and index (P) individual= 0,86 and index (P) class= 1.00 (Wassar & Verena, 2025). Based on the conditions above, this research aims to improve the motivation and learning out comes in the implementation of the TPS learning model in the Bioenergy course.

Method

This research used the descriptive qualitative research type by implementing the TPS learning model in the Bio Energy course for the even semester of the 2024/2025 academic year in the Science Education study program, Universitas Muhammadiyah Sidoarjo (UMSIDA) with the total of the 28 students. To find out the student's motivation responses to the lectures and TPS learning model, they were analyzed using the Attention, Relevance, Confidence and Satisfaction (ARCS) questionnaires or known as the ARCS Keller questionnaire (Nur & Kurniawan, 2022). The implementation of the research activity starts from the February 26 to July 31, 2025.

This research uses the 4D development method with the following research stages:

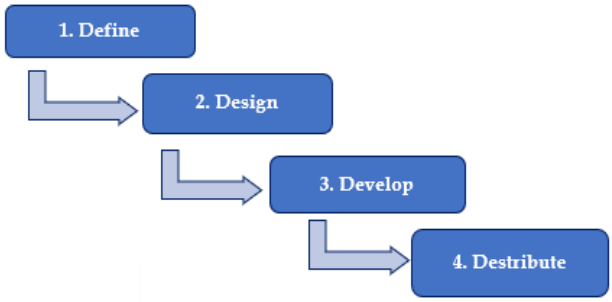

Figure 1. Stages of 4D Research Thiagarajan (Muzaki, 2024).

From the Figure 1 can explain that the Thiagarajan development research stages include 4 stages: 1) the define stage or initial stage, this stage is carried out to determine the needs, characteristics and problems faced by learners. At this stage the researcher carries out observations and theoretical studies, theoretical studies are carried out to find solutions to the problems faced by students during learning, 2) the second stage is design, this stage functions to make it easier for researchers to design and develop TPS learning that is adapted to the learning tools for the Bio energy course, 3) the third stage is develop, at this stage the TPS learning model that is adapted to the learning tools begins to be created and product validation is carried out by learning expert validators. After completion, the researcher conducted an interview, the result at this stage was the TPS learning

model which was adapted to the bioenergy course, 4) the distribute, the product results could be the TPS learning model implemented in the bioenergy course for classroom learning. For the completeness of the learning outcomes, use the completeness analysis with the individual and class completeness index (P), namely if the individual and class proportion index (P) = 1.00 ≥ 0.80 (Tefa et al., 2024). Apart from that, the analysis of the completion assessment also refers to the student academic guidebook (Universitas Muhammadiyah Sidoarjo, 2024). For analysis learning outcomes so uses the pre-test and post-test to the completeness students in their competencies. This aligns with the research showing that tests are given based on the assumption that each individual or student has different learning abilities. Therefore, the lectures or teachers acting as the evaluators should not hesitate to conduct evaluation activities (Siregar. A, et al., 2023).

Result and Discussion

Result

Regarding the student's motivation response in the TPS learning model and lecturer, the results of the Attention, Relevance, Confidence and Satisfaction (ARCS) questionnaire show that the average student motivation = 3.69 which is also categorizing as good, shown in Figure 2.

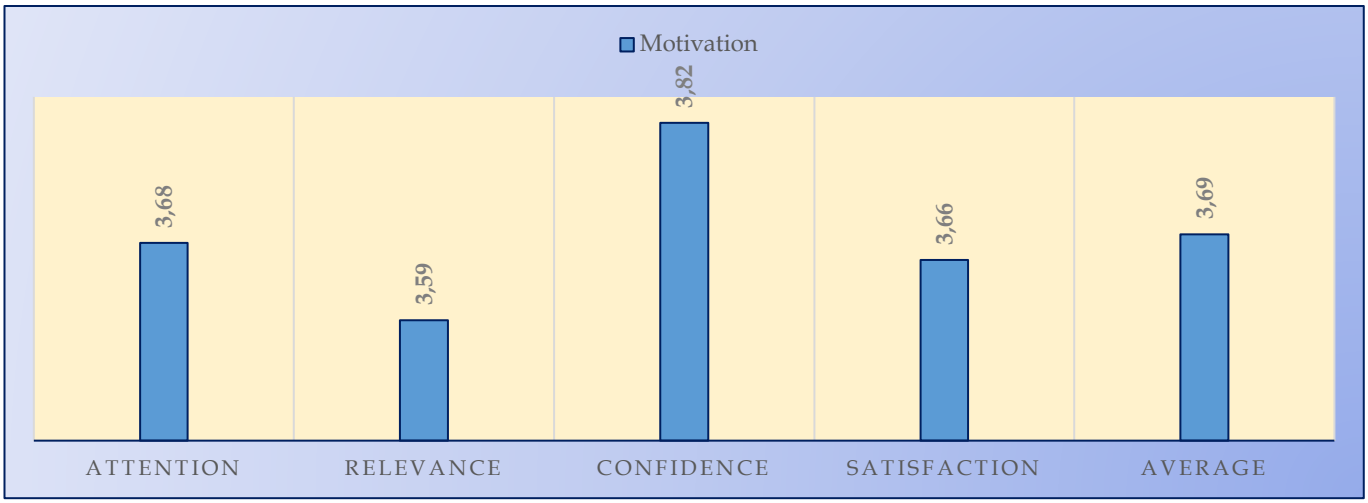

Figure 2. The Attention, Relevance, Confidence and Satisfaction (ARCS) Questionnaire Graphic Diagram Learning Teaching Students for the TPS Learning Model in the Bioenergy Course Even Semester Academic Year 2024/2025.

The implementation of TPS learning can show in the Figure 3.

a) The Implementataion of the Think Pair Share (TPS) Learning Model in the Bioenergy Course.

b) The Share Phase on the Think Pair Share (TPS) in front the class by the Student Teams.

Figure 3. The Implementation Think Pair Share (TPS) Learning Model in the Bioenergy on the Class.

The results of the learning out comes in the Bioenergy course for the even semester of the 2024/2025 academic year after the implementation Think Pair Share (TPS) learning model, it shows that the results of the average completion of the student learning outcomes, the individual proportion index (P) for the 28 students = 0.82 ≥ 0.80 in the post-test, this result is better than the individual proportion index (P) for the 28 students = 0.62 ≥ 0.80 in the pre-test before the TPS learning model implementation, the meaning is that the individual completeness has the complete and achieve in the good category, for each the student's index score and the average can show in the Figure 4. The learning outcomes are the individual efforts to improve their competencies as the students for life, the individual learning outcomes in the Bioenergy course show the good and positive results. This condition is in line with the research which states that learning outcomes are changes in the behavior individuals, these changes can be in the form of attitudes or skills obtained from the experiences they receive. These learning outcomes can be based on the GPA received by the students at the end of learning (Hilmiatussadiah.K.G., 2020).

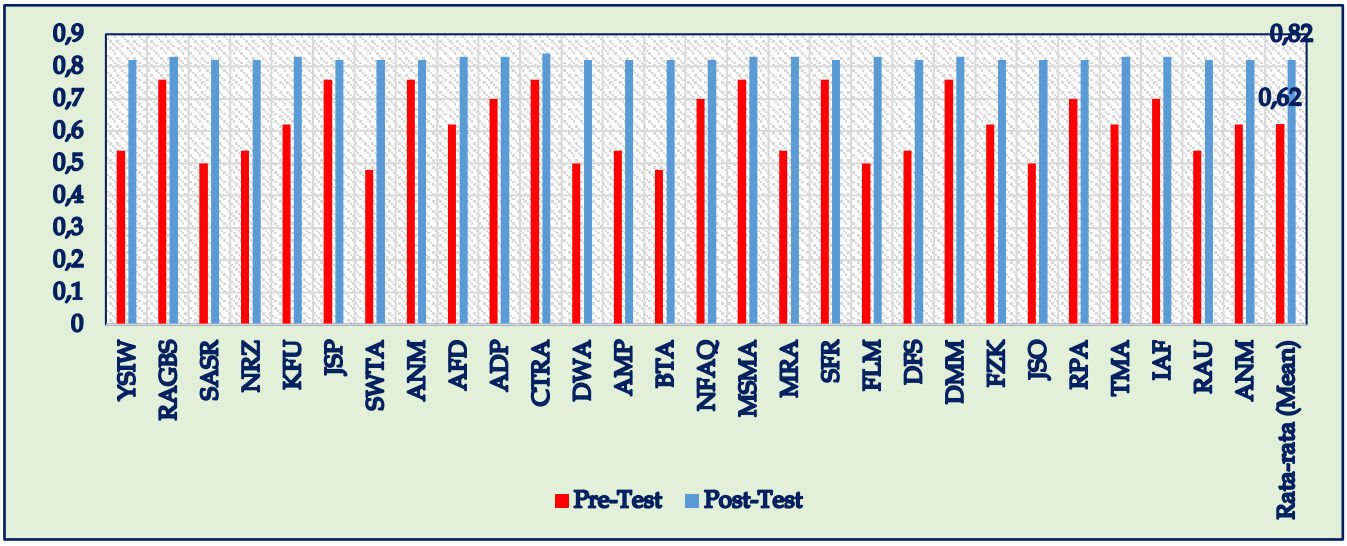

Figure 4. The Proportion Index (P) of the Individual Completeness of the Student Learning Outcomes through the Bioenergy Course in the Think Pair Share (TPS) Learning Model.

From the data in the Figure 5 shows that after the lecture implement the Think Pair Share (TPS) learning model is the class proportion index (P) = 1.00 ≥ 0.80 in the post-test, they are the 28 students complete their learning and the 0 (zero) student is not complete, the meaning is that the class completeness has the complete and achieve in the good category.

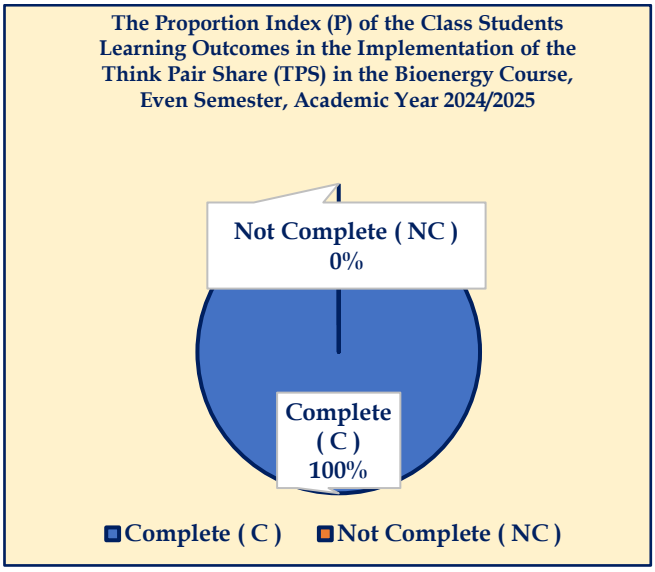

Figure 5. The Proportion Index (P) of the Class of the Completeness of the Student Learning Outcomes for the Implementation Think Pair Share (TPS) in the Bioenergy Course.

The emergence of the renewable energy sources such as solar and wind has intensified competition, requiring companies to innovate, adapt to the green technologies, and diversify their energy sources to remain relevant in the transition to clean energy. These competencies must be mastered and good by the students as graduates who will work in the various renewable energy based the companies and other sectors (Kristiawan et al., 2025).

Discussion

The Results of the Motivation Students in the Bioenergy Course.

Regarding the student's motivation response in the TPS learning model and lecturer, so the results of the Attention, Relevance, Confidence and Satisfaction (ARCS) questionnaire show that the average student motivation = 3.69 which is also categorizing as good, shown in the Figure 1. Based on this research results, it can state that the motivation to learn in attending lectures is good. This situation is in linear with the result research which state that the he use of the TPS was effective toward student's reading achievement can support the student's motivation and confidence have been increased (Rosalia & Candraloka, 2023), the TPS has been provide immediate feedback to students on their understanding and lecturers (teachers) on the extent of pupil understanding, so it helps in the modifying both teaching and learning (Manasa, et al., 2023), and this learning model is more effective when compared to the cycle 7E, STAD, inquiry, guided inquiry, and jigsaw models if it applied in the exact, social, or linguistic sciences courses whether combined with learning media or not (Fian & Misbah (2023), and the use the TPS and learning motivation models together has a positive interaction and made the very strong and significant to learning achievement students (Srinarwati, 2021). The activeness that reflects the student's motivation in the participating of the teaching and learning activities in this lecture can be shown in Figure 2. The students and lecturer show active to develop the discussion, give the arguments, ask the

question, explain the answers. This condition is linear with the result research state that the benefits of small group learning and the development of higher-order thinking skills.

The others result research also state: 1) the TPS is a teaching strategy thought to increase in the class participation, especially with shy students. After thinking for themselves, students talk to their seatmate to exchange their ideas and finally show their willingness to participate in the class by raising their hand. In the present field study, we tested TPS showed the variation ideas, the Think-Share (TS); first think, then raise hand) and Share (S); directly raise hand, and have been indicated the importance of peer collaboration for in the class (Mundelsee & Jurkowski, 2021), 2) the TPS can increase the students to think and respond, such as: the student's knowledge or ability to respond to the questions and increasing the growing sense of helping each other. and the cooperation and knowledge of the students have been increased in the teams doing group work (Fernandez, et al., 2022), 3) the TPS can be increased or deemed effective through the soliciting or brainstorming ideas so is useful in broadening the students' understanding of literature lessons because in the share phase the students by simply changing the way they share information in front of the class and the lecturer (teacher) have been engineered a variety of creative modifications to having students share out in front of the whole class to ensure equity in who is talking and to help students feel more comfortable speaking (Cooper, et al., 2021).

The Results of the Student's Learning Outcomes.in the Bioenergy Course.

From the research above can have been stat that the TPS learning model can create the learning be active, innovative, interesting, collaborative discussion, social communicative, that can increase the student's interest and motivation to learn and improve the student competency and learning outcomes so that they are able to compete in the era of globalization which requires student expertise in various fields, especially those related to science. This is linear with the result research that states the TPS can improve student learning outcomes during the learning process. The increase in student learning outcomes can be seen from the test results for each cycle, the student learning outcomes in cycle I were 53% in the low category while student learning outcomes in cycle II were 86% in the high category (Berlia, et al., 2023). The others research also state that the TPS can be increased the result learning in the evident from the average improvement the motivation in the cycle I of 22.10 to 25.22 in cycle II and the class completeness learning out comes the students in the cycle I of 82.93 increased to 95.12 in the cycle II (Sukelasmini, 2019). The student's enthusiasm for the learning and their performances on the standardized tests have been increased when implemented the TPS learning model paradigm, they are better able to understand the material being taught when using thus learning (Pardosi, T. M, 2022). The TPS learning model which is applied can be to improve the student learning outcomes consisting of the 2 cycles is carried out in accordance with research procedures, namely, planning, implementation, observation and reflection so that there is an increase of 11.09% (Fiara, et al, 2023).

The result research above also to show that the TPS can make the Bioenergy courses easy to understand both the conceptually and in terms of application in the life, make the student discussions interesting, increase the learning motivation, and make the students as the center of learning. This is in line with the research results which state that improving the student learning outcomes in the Bioenergy courses can be achieved through an active learning approach (Satriawan & Muhammad Subhan, 2022). This learning model needs to be followed up in various activities and continuously to improve the quality of higher education in our country and nation.

Conclusion

The Think Pair Share (TPS) learning model is cooperative learning with implementation three phase: think, pair, and share in the Bioenergy course with expert lecturer have been collaborative classes and improvement the motivation study student's which is very good and needs to be continuously developed because it is proven that with the implementation of this learning, the average student's motivation learning = 3.69 which are also included in the good category and the results of student learning completion in the Bioenergy course show that for the individual proportion index (P) of the 28 students = 0.82 ≥ 0.80 and the class proportion index (P) = 1.00 ≥ 0.80, the meaning is that the individual and class completeness have the complete and achieve in the good category. The TPS can make the Bioenergy courses easy to understand both the conceptually and in terms of application in the life, make the student discussions interesting, increase the learning motivation, and make the students as the center of learning. This learning model is going to follow up in the various activities and continuously improve the quality of higher education in our country and nation. The activities of the lecturer in classroom management are necessary to make interest learning, the learning doesn't only depend on the student participation but needs to be continued innovative and creative in the increase the quality of the learning and to support the competent generation.

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N. Efendi: methodology, analysis, writing original draft preparation, evaluation, review, editing, and corresponding author.

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Conflicts of Interest
The authors declare that there is no conflict of interest regarding the publication of this paper.

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