

## Think Pair Share Method as a Tool to Increase Student Interest and Learning Outcomes

Meléndez Fernández <sup>1</sup>, Jacob Quintana <sup>2</sup>, Walker Dominic <sup>3</sup>, Liu Darius <sup>4</sup>, White Alexandra <sup>5</sup>

<sup>1</sup> Ateneo de Manila University, Philippines

<sup>2</sup> Pontifical Catholic University of Peru, Peru

<sup>3</sup> University of Novi Sad, Serbia

<sup>4</sup> Ateneo de Manila University, Philippines

<sup>5</sup> Singapore Management University, Singapore

**Corresponding Author:** Meléndez Fernández, E-mail; [melendez28@gmail.com](mailto:melendez28@gmail.com)

### Article Information:

Received December 10, 2022

Revised December 19, 2022

Accepted December 25, 2022

### ABSTRACT

Given the development of learning in this day and age, many schools are using the Think Pair Share type cooperative learning method. Therefore, researchers conducted a study, to see the development of increasing student interest and learning outcomes in using the Think Pair Share method. The type of research conducted by researchers is a quantitative research method with a survey model and in-depth interviews. The results of this study, the Think Pair Share method, can increase students to think and respond. It is a factor of increasing a student's knowledge or ability to respond to questions and increasing the growing sense of helping each other, for example in doing group work. The conclusion of this research is that after applying the cooperative method of Think Pair Share type, the level of cooperation and knowledge of students has increased, but there are still some students who have not experienced an increase in terms of interest or learning outcomes. The limitation of this researcher is that researchers have not been able to find ways to overcome students who have not improved in terms of interest or learning outcomes, therefore researchers hope that future researchers can find ways to overcome students who have not improved

**Keywords:** *Improving Student, Interest, Share Method*

Journal Homepage

<https://ejournal.staialhikmahpariangan.ac.id/Journal/index.php/wp/>

This is an open access article under the CC BY SA license

<https://creativecommons.org/licenses/by-sa/4.0/>

How to cite:

Fernández, M., Quintana, J., Dominic, W., Darius, L., & Alexandra, W. (2022). Think Pair Share Method as a Tool to Increase Student Interest and Learning Outcomes. *World Psychology*, 1(3), 211-228. <https://doi.org/10.55849/wp.v1i3.386>

Published by:

Sekolah Tinggi Agama Islam Al-Hikmah Pariangan Batusangkar

## INTRODUCTION

Education is an effort to carry out teaching and learning activities (Donnelly et al., 2020). Which is based on three things, namely there are teachers, students, and materials.

The purpose of education is to create an active learning process, and can improve the ability of students. (Chrobak-Bień et al., 2018; Darabi et al., 2019; Donnelly et al., 2020). Active, Productive, Innovative, and Creative (Ekomadyo & Riyadi, 2020; Goumi & Besançon, 2019; [n/a], 2021), with aspects of Cognitive, Affective, Psikomotor. As contained in the EDUCATION ACT NO 12 YEAR 2012 In paragraph one, researchers can understand that education is a planned conscious effort to create a learning atmosphere and active learning process. Increase self-potential in order to have religious spiritual strength, self-control, personality, noble character, intelligence, skills, community, nation, and state. (Freedman, 2018; Lee & Anderman, 2020; Vetsch et al., 2018). The learning process can be carried out with cooperation. Cooperation is one of the elements to achieve learning goals, both cooperation between teachers and teachers, teachers and students, and teachers and parents.

One of the factors for the implementation of the learning process is the teacher. (Abdullah et al., 2019; Bhatt et al., 2021). Because teachers play an important role in realizing the teaching and learning process (Alspach et al., 2019; Gao et al., 2020; Ullah et al., 2020). Teachers hold an important component in education (Emamian et al., 2019; Karygianni et al., 2020; Rasheed et al., 2020), teachers must have broad abilities and insights and teachers must also be able to create a learning process and prepare materials in a creative and innovative manner. Because if the teacher is not able to prepare material creatively and innovatively, then the teaching and learning process provided by the teacher will be boring. (Chaulin & Duplyakov, 2021; Nemčíková et al., 2020; Perko et al., 2019). Therefore, teachers are very tutored to be creative and innovative in choosing learning methods. The method chosen is not too monotonous into one discussion. (Assef & Steiner, 2020; Cabrera-Toledo, 2019; González-López et al., 2021). The success of a learning process goal depends on how to present and design a learning process. Teachers must be able to motivate and deliver material clearly in the learning process. (Klemperer et al., 2020; So et al., 2018; Zhao et al., 2019), so that the learning process runs well.

The success of the learning process depends on several factors, namely students, teachers, materials, curriculum, infrastructure and environmental factors. ("Front Matter," 2021; Lim et al., 2020, 2020). If these factors are met or run well, it will facilitate the learning process. (Ludwig et al., 2020; Van Vliet & Grosse, 2021). And this will result in the achievement of good and maximum learning outcomes. This achievement can improve the results and quality of student learning. But if these factors are not met, it can certainly hinder a learning process and will not be achieved at the educational goal. Therefore, a learning method is needed that can increase student interest and learning outcomes. So that it can make it easier for teachers, and cause benefits to both parties, namely teachers, and students. Therefore, the learning method needed is the Think Pair Share (TPS) type Cooperative method. Because this method can eliminate students' boredom and boredom while learning.

In the learning process, it is better to use Cooperative learning methods instead of Conventional. Because if you use conventional learning methods (Delarue et al., 2020; Oster, 2019; Pratt, 1999), then only one party plays an active role. That is, only the

teacher, and students only play a passive role in receiving the learning material conveyed by the teacher. (Xia et al., 2020). Then it can lead to boredom, inactivity, and lack of interest in participating in the learning process. Cooperative learning method is a method that prioritizes active cooperation, mutual cooperation and discussion to solve problems. Cooperative methods can also be interpreted as any broad concept in the form of group work either led by the teacher, or only directed by the teacher. (Díaz et al., 2019; Thomas et al., 2019; Xia et al., 2020). This method includes all students, where this method uses a way of joint discussion. The joint discussion learning model or paired discussion is the Think Pair Share (TPS) type Cooperative learning model. Because the discussion method can increase cooperation between students. Uniting opinions and optimizing participation attitudes, as well as fostering students' social attitudes.

Think Pair Share is a type of Cooperative Learning that aims to improve student interaction and response patterns. This method is an alternative to traditional methods used in the classroom. For example, the lecture method, one-way question and answer, where the teacher asks the students, is one of the efforts or attempts to replace the discussion pattern in the classroom. The Cooperative Method with the Think Pair Share (TPS) model can increase student interest and learning outcomes. (Mundelsee & Jurkowski, 2021; Wuryandani & Herwin, 2021). Interest is a desire to do an activity, which is continuous and if doing this causes pleasure. In this learning model, students are more active in solving or solving a problem. (Jiang et al., 2021; Mouton et al., 2018). The teacher only guides or gives ways on how to solve or resolve the problem. In this method students will need more motivation so that they have high confidence that they can solve problems. This learning model also familiarizes students to be able to think in discussions, so that students' thinking patterns are not monotonous in one thing or one discussion.

Student interest and achievement often fluctuate (Bai et al., 2020; Dekel, 2018). The decline can be seen from the way teachers choose learning methods and models used to deliver material in class. Teachers must be able to choose a good learning model. Teachers must also pay attention to the limitations of students or the teacher himself. In observing the learning process and the problems that students often face. It is not visible directly. Therefore, with the existence of Lesson Study or teacher professional development strategy. Where the purpose of the existence of Lesson Study is to optimize student services in the learning process. This will make it easier for teachers to observe the teacher's students. Because the teacher is assisted by several observers in making observations to students (Khomsin et al., 2019; Li et al., 2020). So that teachers can find out what problems students experience during the learning process.

The researcher refers to the research conducted by Nurmiati (2018). He concluded, that if using the Think Pair Share (TPS) method can help students in increasing student motivation and learning outcomes in the ongoing learning process. With a percentage increase in motivation and student learning outcomes have increased. Classical completeness or (KKM) is 88.88%. Meanwhile, according to Suparo (2007), he stated that with the Think Pair Share method, students can think independently in solving the problems given by the teacher. research conducted by Mardiyana and Triyanto (2012),

they stated that the increase in student achievement provided by the teacher through the Cooperative method with the Think Pair Share (TPS) model was as good as the Cooperative method of the Team Assisted Individualization (TAI) model. Team Assisted Individualization (TAI) is a method that divides students into several small groups with different backgrounds of thinking. (Zhang et al., 2018; Zou et al., 2020). In order for students to exchange ideas or opinions, one group consists of 4 to 6 people. Both methods are better than conventional methods, both for students with high, medium, and low interest in learning.

The reason the researcher chose the title of this study is, because as a prospective educator, of course, the researcher needs a learning method to increase student interest and learning outcomes. So that researchers can become active, productive, educative, and creative teachers, and can become professional teachers. In addition, researchers want to know the development of the Think Pair Share method and increase student interest and learning outcomes. Because at this time many teachers or schools are applying or using the Think Pair Share (TPS) method, because they feel there is an increase in student interest and learning outcomes by applying this method. However, researchers still have limitations or shortcomings in conducting this research. The shortcomings or limitations of researchers in this study are, researchers have not been able or have not found a way for students' interest and learning outcomes to increase evenly.

## **RESEARCH METHODOLOGY**

In this study, researchers chose a Quantitative method with a Survey model and in-depth interviews. (Barck-Holst et al., 2021; Nemčíková et al., 2020). In this study there are 2 models of quantitative methods. Quantitative methods are methods that collect data. The first is the Survey model (Wu et al., 2021), namely by distributing questionnaires or questionnaires via the WhatsApp application. Distributing questionnaires or questionnaires is a very effective and efficient way in the process of collecting data that will be measured numerically. The second model is the in-depth interview model. This model is often used by researchers in conducting research using Descriptive Quantitative methods. Interview is the process of collecting data through questions and answers involving 2 people. The questions asked are related to the interests in the research. In the Quantitative method, the type of interview process used must be in a well-structured form.

The purpose of the researcher choosing this method is so that the researcher can easily measure an object of measurement. (Chang et al., 2020). Because the results of this measurement can help see the relationship between observations and the results of data taken quantitatively. By using this method, researchers can also understand the quality of a phenomenon or a problem that can later be used as a reference for comparison. Quantitative methods generally form from a general mindset to a specific mindset. (Smith et al., 2020). In this case, researchers try to find new knowledge to test the certainty of knowledge on the problems that researchers experience. Apart from that, the purpose of the Quantitative method is to have several basic points in it. The first point is that it aims to develop a model in mathematical form. Where this method does not only measure or

observe one phenomenon (Martynowych et al., 2020). But this method also discusses what theories exist in the research being conducted.

The process carried out in this study is, starting from formulating the problem of the problems that will be observed by the researcher. Then there will be a hypothesis, which is an assumption that is not certain because it is still presumptive. After that the research conducts Research Design or research design (Radianti et al., 2020). Then the researcher conducts a Research Site or research site (Mikkelsen et al., 2019; Xu et al., 2020). The research site is a container or place where the researcher must capture the object of the research being conducted. Furthermore, the researcher chooses the subject or research respondent, namely looking for parties who will be sampled in a study. Then proceed with distributing questionnaires or questionnaires via the WhatsApp application. (Mancosu & Vegetti, 2020). The next step is to collect data that researchers can get from distributing questionnaires or questionnaires to parties who are sampled in the study. The final stage is writing or recording conclusions to become a theory or discussion of this research.

## **RESULT AND DISCUSSION**

After the researchers conducted a survey, it can be concluded that many teachers and students agree that the Think Pair Share method can help and improve interest and learning outcomes. Approximately 41% of the results from distributing the questionnaire stated strongly agree. And 50% agreed, and 9% disagreed. Researchers can see that the Think Pair Share method is an effective method to use in the learning process. because this method has many benefits and good improvements for students. For example, it can increase student cooperation and student response. This is what researchers get from distributing questionnaires distributed via WhatsAap. This is what researchers get from some of the questions in the questionnaires that have been distributed by researchers. This method can also help teachers be more active and creative. The Think Pair Share method can also help students discuss and exchange ideas or opinions. The Think Pair Share method can increase students' knowledge and response. This method can also prevent student boredom and boredom during the learning process. And there are still many advantages that can be obtained in the learning process using the Think Pair Share Method.

The educational process or learning process requires appropriate and effective methods. The use of the Think Pair Share method is very effective and appropriate. Because this method can help teachers or students in the learning process. This method is very influential on the development or improvement of student interest and learning outcomes. This method can also help teachers to be more creative and innovative. Because if the learning process is wrong in choosing a learning method, students will tend to play a passive role. Because the one who plays a lot of roles is the teacher, so this can make students bored and less active in the learning process. That is what caused the researcher to choose the research title about the learning method, namely the Cooperative

method with the Think Pair Share model. Therefore, the results of the research conducted by the researcher will be explained as follows

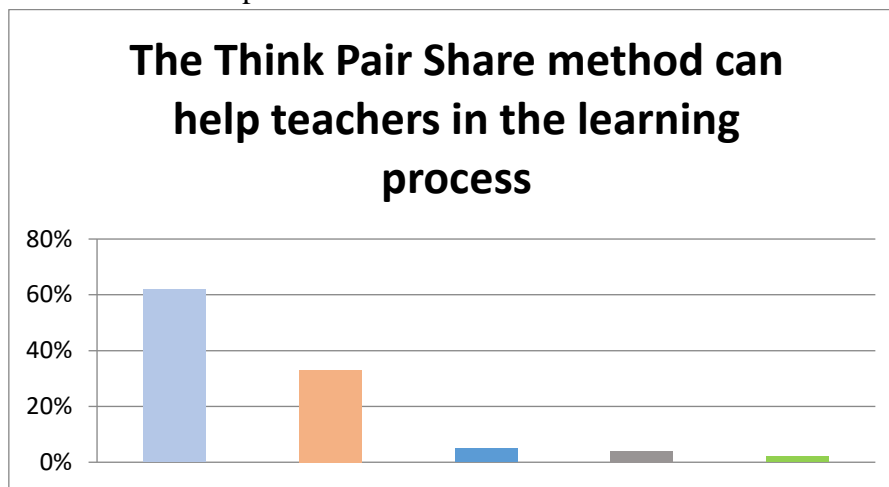


Figure 1: Think Pair Share method can help teachers in the learning process

The percentage results from the diagram above are those who feel strongly agree 32%, agree 62%, moderately agree 5%, disagree 4%, disagree 3%. Therefore, the respondent diagram above states that many agree that the Think Pair Share method can help the learning process at school, so teachers should choose this TPS method. Because the Think Pair Share method is very effective if used as a reference for learning methods. This method involves both parties, so that teachers and students play an active role together. So that the teacher is helped in terms of managing the class well. And can prevent the monotony of the teacher in explaining the material or the students' indifference about what the teacher explains. If in the learning process the teacher can manage the class well, then the goal of education is achieved. Therefore, a learning method chosen by a teacher is very influential on the learning process. a well-chosen learning method will produce a good benefit as well. so that no party is disadvantaged in the learning process.

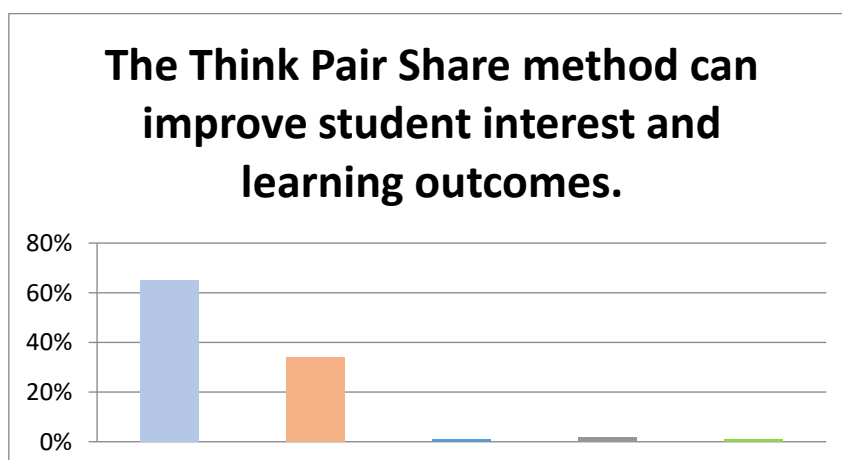
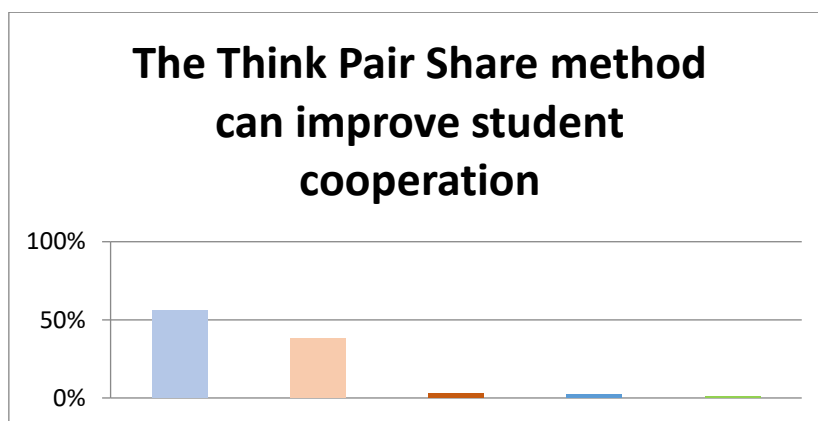




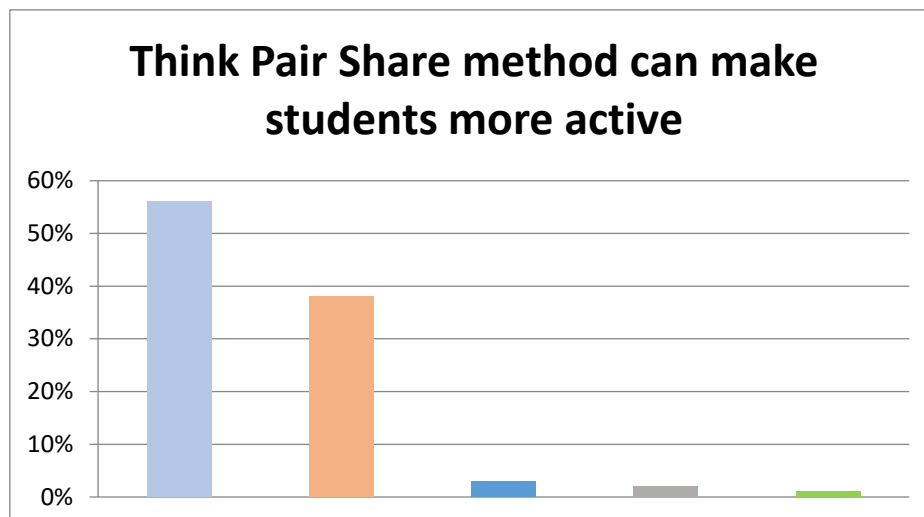
Figure 2: Think Pair Share method can increase students' interest and learning outcomes.

The percentage results of the diagram above are strongly agree 31%, agree 60%, moderately agree 4%, disagree 5%, and disagree 1%. It can be seen from the diagram above that many agree that the Think Pair Share method can increase student interest and learning outcomes. The teacher's goal is to educate and provide knowledge to students. Therefore, to produce smart students, teachers must be able to build students' desire or interest in learning. Because this is the main factor in creating smart and accomplished students. If student interest is not awakened or increased, it will cause laziness and curiosity. So that it can create students who are conservative or do not develop students' mindsets. If students' interest has increased they will be excited in the learning process. This can improve learning outcomes both in material and theory.



The Think Pair Share method can improve student cooperation.

The percentage results above are strongly agree 38%, agree 56%, moderately agree 3%, disagree 2%, disagree 1%. It can be concluded that many agree that the Think Pair Share method can increase student cooperation. Because this Think Pair Share method is defined as any broad concept in the form of group work either involving the teacher or with teacher guidance. Because this method includes all students, because the method uses a discussion system. Where it can increase student cooperation in solving a problem. This method can also unite opinions and optimize attitudes of tolerance and participation and improve students' social attitudes. With this method, students are trained to be independent by means of discussion so that it can add or expand students' minds and knowledge. Cooperation or social attitudes are very important both in the world of education and in the community. Therefore, teachers must teach or familiarize students about cooperation and social attitudes from an early age.



The Think Pair Share method can make students more active.

The percentage description of the diagram above is strongly agree 36%, agree 57%, moderately agree 4%, disagree 2%, disagree 1%. It can be concluded that many agree that the Think Pair Share method can make students more active. Because in this learning process students conduct discussions, then present. And this method makes students more active such as asking questions, refuting, adding, and exchanging opinions. Even according to researchers, the Think Pair Share method is still used by students when they do lectures. Where in this method we are trained to be clever and courageous to convey opinions, and speak or public speaking. Because public speaking is very important both in the world of education or in the world of work. Even public speaking is very useful for everyday life in society. Behind that when discussing or expressing opinions, it must be good at choosing and sorting out the words used. Where if you are having a discussion, you should not use harsh words or words that offend the opponent of the discussion.

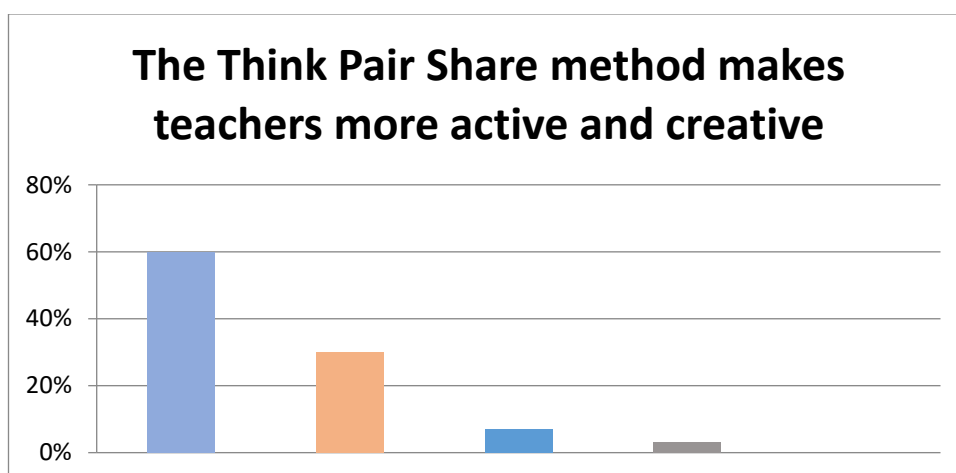


Figure 5: The Think Pair Share method can make teachers active and creative



The percentage descriptions from the diagram above are strongly agree 30%, agree 60%, moderately agree 7%, disagree 3%, and disagree 0%. It can be seen that many agree that the Think Pair Share method makes teachers more active and creative. Because to create a good class requires a teacher who is creative and active and professional. This method can increase the activeness and creativity of the teacher. A creative teacher will make students excited in the learning process. Creative teachers can build a cooler and more interesting classroom atmosphere. If the teacher is not active and creative, the classroom atmosphere will feel bored and monotonous. So that students' interest in learning decreases, even they will feel lazy. So the teacher is the main key to creating a cool and creative class, because creative teachers produce good classes and students who are full of inspiration or who like to be creative. Teachers who can manage the classroom well are active, creative, innovative, and productive teachers.

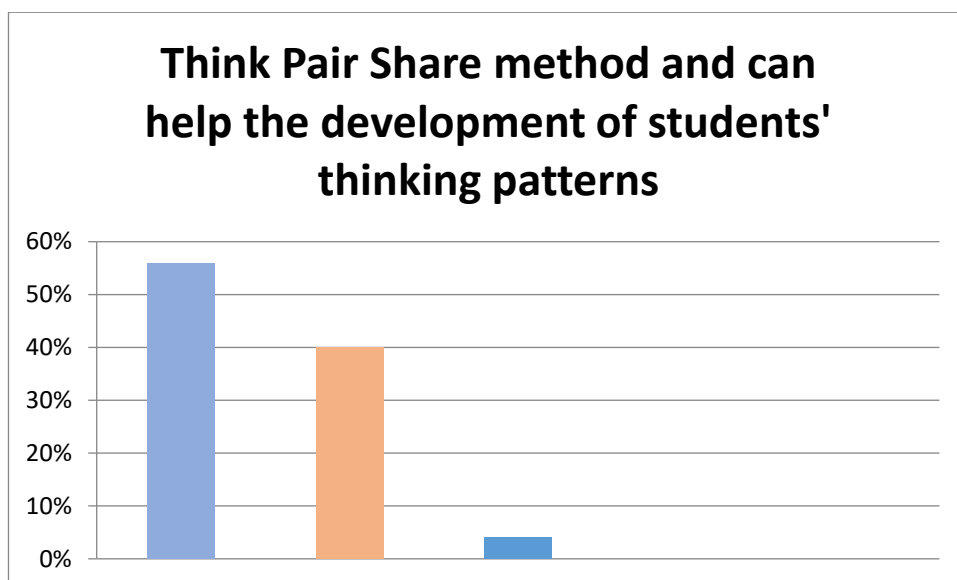


Figure 6: The Think Pair Share method can help improve students' mindset.

The percentage description of the diagram above is strongly agree 40%, agree 56%, moderately agree 4%, disagree 0%, disagree 0%. Based on the diagram above, it can be seen that many agree that the Think Pair Share method helps develop students' mindset. Where the Think Pair Share method uses a discussion system. This is what can help the development of students' mindset. Because in this method students are required to solve their own problems, then discuss together, then students exchange opinions so that students' knowledge and mindset are honed or developed. Although students have the freedom to argue and discuss this must still be guided by the teacher. It is during the discussion that students are trained to think and argue. Therefore, the Think Pair Share method is very good for improving students' mindset. With this method students become more active, creative and independent.

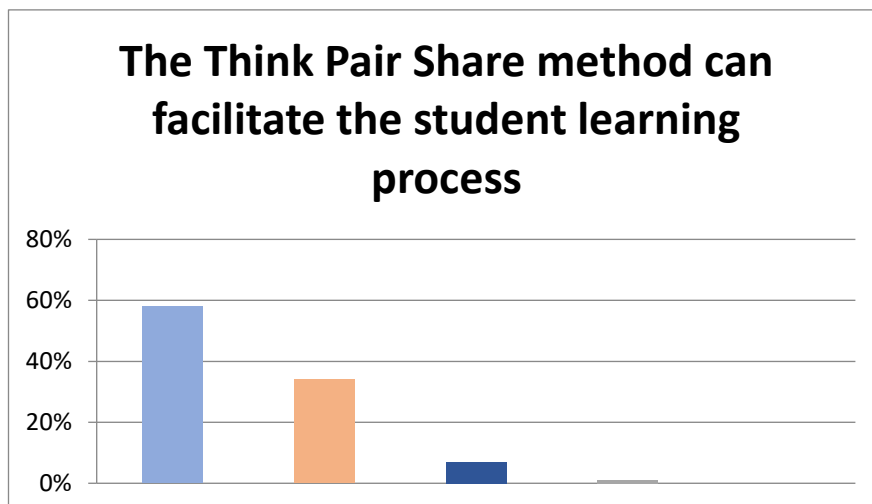
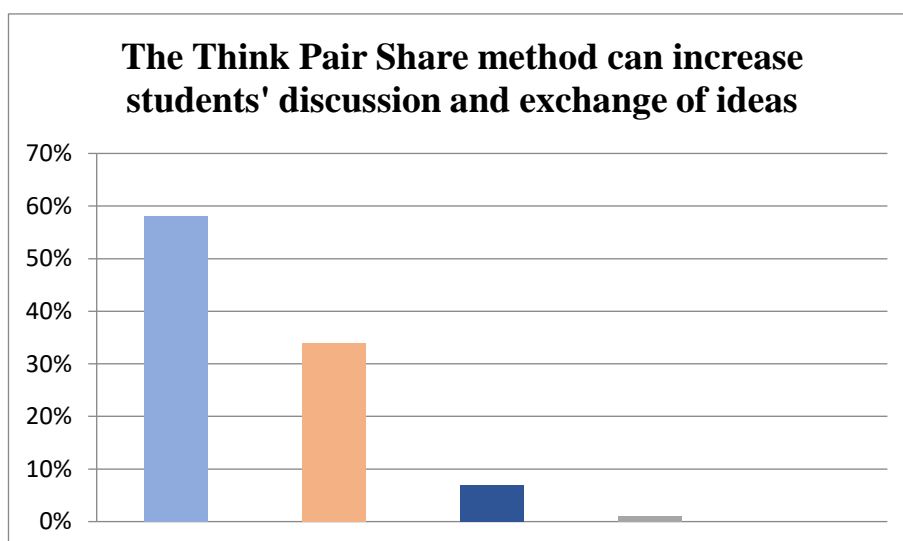


Figure 7: The Think Pair Share method can facilitate the student learning process

The percentage description of the diagram above is strongly agree 34%, agree 54%, moderately agree 9%, disagree 1%, disagree 0%. Based on the percentage of the diagram above, many agree that the Think Pair Share method can facilitate the student learning process. Because this process makes students independent, so that if a teacher is absent or a meeting students are able to discuss alone in class. In addition to facilitating the learning process, this method also teaches independence and discipline. This method can prevent obstacles that often occur in the learning process. For example, the sense of boredom and boredom that students often experience. The passive role of students, and the monotony of the teacher. These obstacles are what often trigger the failure of the learning process. but with the Think Pair Share method this problem can be overcome. So that the learning process runs smoothly without obstacles.



The Think Pair Share method can increase student discussion and exchange ideas

The percentage description of the diagram above is strongly agree 34%, agree 58%, moderately agree 7%, disagree 1%, disagree 0%. Based on the percentage results

of the diagram above, many agree that the Think Pair Share method can increase students to discuss and exchange ideas. Because this method uses a discussion and group system. Because this system teaches students to respect the opinions of friends and discuss what we know and accept what we don't know. Sometimes there are some children who have a high self-centered attitude so they do not want to accept opinions or are difficult to discuss. This can have a bad impact and harm to the child. Therefore, in this school, students are taught to discuss and exchange opinions. So that they have the nature of respecting other people's opinions and tolerance and high social attitudes.

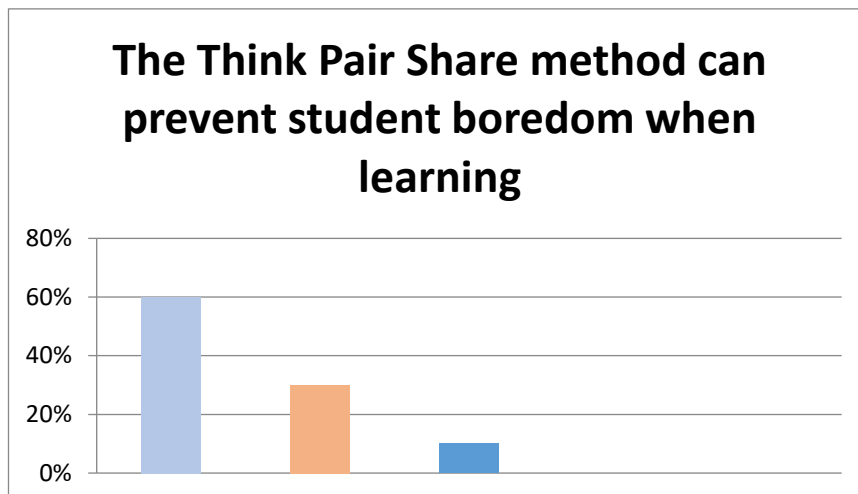


Figure 9: The Think Pair Share method can prevent student boredom while learning

The percentage description of the diagram above is strongly agree 30%, agree 60%, moderately agree 10%, disagree 0%, disagree 0%. Based on the percentage description above, it can be seen that many agree that the Think Pair Share method can prevent student boredom while learning. Because in this method students play a very important role in the learning process. Where students are required to be active and creative so that this can prevent students from being bored or bored while learning. If the teacher is not good at choosing learning methods, it will cause students to be bored or bored while making students lazy. Because in this method the teacher is taught to be creative. With creative teachers it can increase the enthusiasm of students, so they don't easily feel bored and bored. This Think Pair Share method really causes many benefits and advantages in the student learning process. Boredom is often the main factor in declining student interest and results.

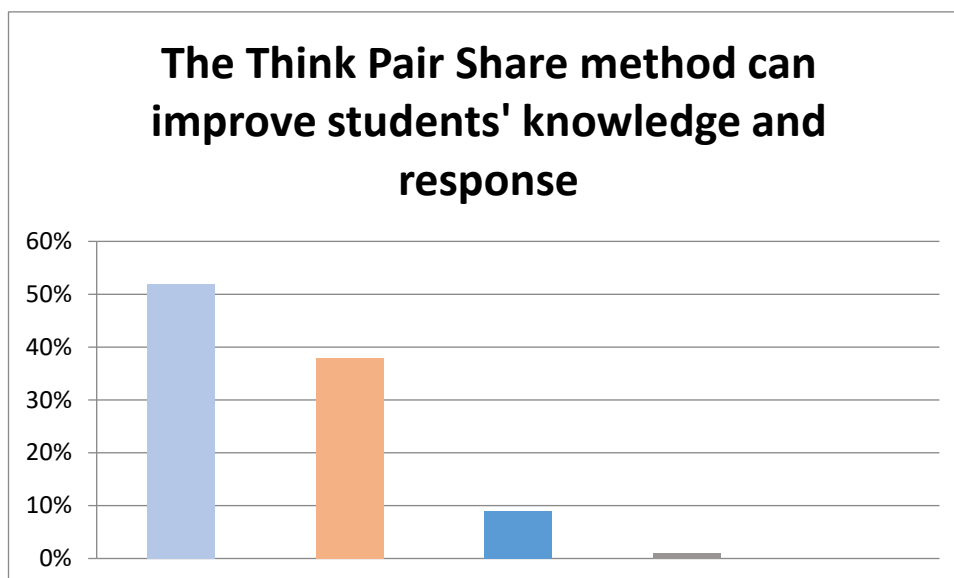


Figure 10. Think Pair Share method can improve students' knowledge and response

The percentage description of the diagram above is strongly agree 38%, agree 52%, moderately agree 8%, disagree 2%, disagree 0%. The results of the percentage description of the diagram above state that many agree that the Think Pair Share method can increase student knowledge and response. Where in this method students are taught to exchange opinions so that they can convey what they know and know what they don't know. This can increase students' knowledge, from what they previously did not understand to understand. And this method teaches students to respond to questions asked by the teacher, or even questions asked by friends. And students can also respond or refute friends' statements if they feel there is a mistake regarding the material conveyed by friends. So that students become responsive in responding to a problem. So that they have a critical spirit towards the problems that occur.

## CONCLUSION

After the researchers conducted the research, it can be concluded that the Think Pair Share method is an effective method used in the learning process. This method can increase student interest and learning outcomes. This method involves both parties, namely teachers and students. This method is a strong factor in increasing students' knowledge and ability to respond to questions as well as mutual respect and mutual assistance. Because this method uses a system of discussion and group work, the teacher is only tasked with supervising and guiding students during the discussion process. Therefore, a good method is very important to the student learning process. A good method will produce a good result. This TPS method helps students and teachers become more active and creative. With this method, students are also trained to dare to speak and convey what they know. This is very important for students in everyday life both for their education and future. This method can prevent students from playing a passive role. If students play a passive role, it can cause boredom and boredom when learning. So that it

can increase student curiosity about a problem or a problem that is being discussed. This Think Pair Share method can also improve the tolerance, participation and social attitudes of these students. So that these students have a concern or quick response in responding to a problem.

## **ACKNOWLEDGEMENT**

Teachers in schools should use the Think Pair Share method as a reference in carrying out the learning process. but not all teachers use this method. Even though this method is very effective if used as a method of learning students at school. Because researchers see that there are still some teachers who are indifferent to the student learning process. because if a teacher is wrong in choosing a learning method, it will have an impact on students so that the class is not well managed. If that happens students will tend to be bored and bored. Even they will be inactive, where in fact the student has a high ability and creativity that is hampered because of boredom and boredom so that it lowers student interest. Because the student's interest decreases, it will reduce student learning outcomes. therefore the teacher must be good at choosing the methods used in the learning process. Creative teachers can produce creative and accomplished students. In this method, students are also required to have mutual respect and tolerance, have an attitude of participation and be responsive in responding to teacher questions. So that the classroom atmosphere is more active and creates productive students.

## **REFERENCES**

- Abdullah, M. F., Lai, W. S., & Ridzuan, S. (2019). Analisis Penyampulan Data (DEA) Dua Peringkat dalam Mengenal Pasti Faktor Penentu Kecekapan Teknik Firma Pembuatan Pengangkutan. *Sains Malaysiana*, 48(4), 901–908. <https://doi.org/10.17576/jsm-2019-4804-23>
- Alspach, E., Lussier, D. M., & Schreiber, R. D. (2019). Interferon  $\gamma$  and Its Important Roles in Promoting and Inhibiting Spontaneous and Therapeutic Cancer Immunity. *Cold Spring Harbor Perspectives in Biology*, 11(3), a028480. <https://doi.org/10.1101/cshperspect.a028480>
- Assef, F. M., & Steiner, M. T. A. (2020). Ten-year evolution on credit risk research: A systematic literature review approach and discussion. *Ingeniería e Investigación*, 40(2). <https://doi.org/10.15446/ing.investig.v40n2.78649>
- Bai, H. X., Hsieh, B., Xiong, Z., Halsey, K., Choi, J. W., Tran, T. M. L., Pan, I., Shi, L.-B., Wang, D.-C., Mei, J., Jiang, X.-L., Zeng, Q.-H., Egglin, T. K., Hu, P.-F., Agarwal, S., Xie, F.-F., Li, S., Healey, T., Atalay, M. K., & Liao, W.-H. (2020). Performance of Radiologists in Differentiating COVID-19 from Non-COVID-19 Viral Pneumonia at Chest CT. *Radiology*, 296(2), E46–E54. <https://doi.org/10.1148/radiol.2020200823>
- Barck-Holst, P., Nilsson, Å., Åkerstedt, T., & Hellgren, C. (2021). Coping with stressful situations in social work before and after reduced working hours, a mixed-methods study. *European Journal of Social Work*, 24(1), 94–108. <https://doi.org/10.1080/13691457.2019.1656171>
- Bhatt, S., Sharma, J. B., Kamboj, R., Kumar, M., Saini, V., & Mandge, S. (2021). Design and Optimization of Febuxostat-loaded Nano Lipid Carriers Using Full Factorial

- Design. *Turkish Journal of Pharmaceutical Sciences*, 18(1), 61–67. <https://doi.org/10.4274/tjps.galenos.2019.32656>
- Cabrera-Toledo, L. (2019). Una discusión disciplinaria y epistemológica de la geopolítica y su aplicación al caso suramericano. *Cinta de Moebio*, 66, 366–379. <https://doi.org/10.4067/s0717-554x2019000300366>
- Chang, C., Zhang, Z., Gao, N., & Meng, Z. (2020). Improved infrared phase measuring deflectometry method for the measurement of discontinuous specular objects. *Optics and Lasers in Engineering*, 134, 106194. <https://doi.org/10.1016/j.optlaseng.2020.106194>
- Chaulin, A. M., & Duplyakov, D. V. (2021). (Cardiac troponins: Current data on the diagnostic value and analytical characteristics of new determination methods). *Cor et Vasa*, 63(4), 486–493. <https://doi.org/10.33678/cor.2021.041>
- Chrobak-Bień, J., Gawor, A., Paplaczek, M., Małecka-Panas, E., & Gąsiorowska, A. (2018). The influence of socio-demographic and clinical factors on the process of acceptance of the disease among patients with ulcerative colitis. *Polish Journal of Surgery*, 90(5), 1–5. <https://doi.org/10.5604/01.3001.0012.1753>
- Darabi, H., Richter, T., & Mortensen, P. (2019). Neolithization Process in the central Zagros: Asiab and Ganj Dareh Revisited. *Documenta Praehistorica*, 46, 44–57. <https://doi.org/10.4312/dp.46.3>
- Dekel, D. R. (2018). Review of cell performance in anion exchange membrane fuel cells. *Journal of Power Sources*, 375, 158–169. <https://doi.org/10.1016/j.jpowsour.2017.07.117>
- Delarue, F., Lacker, D., & Ramanan, K. (2020). From the master equation to mean field game limit theory: Large deviations and concentration of measure. *The Annals of Probability*, 48(1). <https://doi.org/10.1214/19-AOP1359>
- Díaz, S., Settele, J., Brondízio, E. S., Ngo, H. T., Agard, J., Arneth, A., Balvanera, P., Brauman, K. A., Butchart, S. H. M., Chan, K. M. A., Garibaldi, L. A., Ichii, K., Liu, J., Subramanian, S. M., Midgley, G. F., Miloslavich, P., Molnár, Z., Obura, D., Pfaff, A., ... Zayas, C. N. (2019). Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science*, 366(6471), eaax3100. <https://doi.org/10.1126/science.aax3100>
- Donnelly, J. P., Chen, S. C., Kauffman, C. A., Steinbach, W. J., Baddley, J. W., Verweij, P. E., Clancy, C. J., Wingard, J. R., Lockhart, S. R., Groll, A. H., Sorrell, T. C., Bassetti, M., Akan, H., Alexander, B. D., Andes, D., Azoulay, E., Bialek, R., Bradsher, R. W., Bretagne, S., ... Pappas, P. G. (2020). Revision and Update of the Consensus Definitions of Invasive Fungal Disease From the European Organization for Research and Treatment of Cancer and the Mycoses Study Group Education and Research Consortium. *Clinical Infectious Diseases*, 71(6), 1367–1376. <https://doi.org/10.1093/cid/ciz1008>
- Ekomadyo, A. S., & Riyadi, A. (2020). Design in Socio-technical Perspective: An Actor-Network Theory Reflection on Community Project ‘Kampung Kreatif’ in Bandung. *Archives of Design Research*, 33(2), 19–37. <https://doi.org/10.15187/adr.2020.05.33.2.19>
- Emamian, S., Lu, T., Kruse, H., & Emamian, H. (2019). Exploring Nature and Predicting Strength of Hydrogen Bonds: A Correlation Analysis Between Atoms-in-Molecules Descriptors, Binding Energies, and Energy Components of Symmetry-Adapted Perturbation Theory. *Journal of Computational Chemistry*, 40(32), 2868–2881. <https://doi.org/10.1002/jcc.26068>

- Freedman, S. (2018). Forgiveness as an educational goal with at-risk adolescents. *Journal of Moral Education*, 1–17. <https://doi.org/10.1080/03057240.2017.1399869>
- Front Matter. (2021). In *Exergy* (pp. i–ii). Elsevier. <https://doi.org/10.1016/B978-0-12-824372-5.09986-3>
- Gao, Y., Chen, Z., Zhu, Y., Li, T., & Hu, C. (2020). New Insights into the Generation of Singlet Oxygen in the Metal-Free Peroxymonosulfate Activation Process: Important Role of Electron-Deficient Carbon Atoms. *Environmental Science & Technology*, 54(2), 1232–1241. <https://doi.org/10.1021/acs.est.9b05856>
- González-López, M. E., Laureano-Anzaldo, C. M., Pérez-Fonseca, A. A., Arellano, M., Robledo-Ortíz, J. R., & Universidad de Guadalajara. (2021). A discussion on linear and non-linear forms of Thomas equation for fixed-bed adsorption column modeling. *Revista Mexicana de Ingeniería Química*, 20(2), 875–884. <https://doi.org/10.24275/rmiq/Fen2337>
- Goumi, A., & Besançon, M. (2019). 2 B kreativ’ or not to be creative: Textisms and texters’ creativity. *European Review of Applied Psychology*, 69(4), 100470. <https://doi.org/10.1016/j.erap.2019.100470>
- Jiang, Z., Xu, J., Gorlin, M., & Dhar, R. (2021). Beautiful and Confident: How Boosting Self-Perceived Attractiveness Reduces Preference Uncertainty in Context-Dependent Choices. *Journal of Marketing Research*, 58(5), 908–924. <https://doi.org/10.1177/00222437211033179>
- Karygianni, L., Ren, Z., Koo, H., & Thurnheer, T. (2020). Biofilm Matrixome: Extracellular Components in Structured Microbial Communities. *Trends in Microbiology*, 28(8), 668–681. <https://doi.org/10.1016/j.tim.2020.03.016>
- Khomsin, Mutiara Anjasmara, I., Guruh Pratomo, D., & Ristanto, W. (2019). Accuracy Analysis of GNSS (GPS, GLONASS and BEIDOU) Obsevation For Positioning. *E3S Web of Conferences*, 94, 01019. <https://doi.org/10.1051/e3sconf/20199401019>
- Klemperer, E. M., West, J. C., Peasley-Miklus, C., & Villanti, A. C. (2020). Change in Tobacco and Electronic Cigarette Use and Motivation to Quit in Response to COVID-19. *Nicotine & Tobacco Research*, 22(9), 1662–1663. <https://doi.org/10.1093/ntr/ntaa072>
- Lee, Y. J., & Anderman, E. M. (2020). Profiles of perfectionism and their relations to educational outcomes in college students: The moderating role of achievement goals. *Learning and Individual Differences*, 77, 101813. <https://doi.org/10.1016/j.lindif.2019.101813>
- Li, Y., Wang, H., & Zhang, X. (2020). Dense Points Aided Performance Evaluation Criterion of Human Obsevation for Image-based 3D Reconstruction. *2020 10th Institute of Electrical and Electronics Engineers International Conference on Cyber Technology in Automation, Control, and Intelligent Systems (CYBER)*, 246–251. <https://doi.org/10.1109/CYBER50695.2020.9278959>
- Lim, H., Kim, H. S., Qazi, R., Kwon, Y., Jeong, J., & Yeo, W. (2020). Advanced Soft Materials, Sensor Integrations, and Applications of Wearable Flexible Hybrid Electronics in Healthcare, Energy, and Environment. *Advanced Materials*, 32(15), 1901924. <https://doi.org/10.1002/adma.201901924>
- Ludwig, S. C., Roos, S., Rollie, C. J., & Baines, D. (2020). Long-term changes in the abundance and breeding success of raptors and ravens in periods of varying management of a Scottish grouse moor. *Avian Conservation and Ecology*, 15(1), art21. <https://doi.org/10.5751/ACE-01568-150121>



- Mancosu, M., & Vegetti, F. (2020). What You Can Scrape and What Is Right to Scrape: A Proposal for a Tool to Collect Public Facebook Data. *Social Media + Society*, 6(3), 205630512094070. <https://doi.org/10.1177/2056305120940703>
- Martynowych, D., Veysset, D., Maznev, A. A., Sun, Y., Kooi, S. E., & Nelson, K. A. (2020). Multi-frame interferometric imaging with a femtosecond stroboscopic pulse train for observing irreversible phenomena. *Review of Scientific Instruments*, 91(3), 033711. <https://doi.org/10.1063/1.5140446>
- Mikkelsen, M., Rimbault, D. L., Barker, P. B., Bhattacharyya, P. K., Brix, M. K., Buur, P. F., Cecil, K. M., Chan, K. L., Chen, D. Y.-T., Craven, A. R., Cuypers, K., Dacko, M., Duncan, N. W., Dydak, U., Edmondson, D. A., Ende, G., Ersland, L., Forbes, M. A., Gao, F., ... Edden, R. A. E. (2019). Big GABA II: Water-referenced edited MR spectroscopy at 25 research sites. *NeuroImage*, 191, 537–548. <https://doi.org/10.1016/j.neuroimage.2019.02.059>
- Mouton, B., Loop, L., Stiévenart, M., & Roskam, I. (2018). Confident Parents for Easier Children: A Parental Self-Efficacy Program to Improve Young Children's Behavior. *Education Sciences*, 8(3), 134. <https://doi.org/10.3390/educsci8030134>
- Mundelsee, L., & Jurkowski, S. (2021). Think and pair before share: Effects of collaboration on students' in-class participation. *Learning and Individual Differences*, 88, 102015. <https://doi.org/10.1016/j.lindif.2021.102015>
- [n/a], G. (2021). The Artistry and Creative Process in the Making of Malang Masks in East Java | Kesenian dan Proses Kreatif dalam Penciptaan Topeng Malang di Jawa Timur. *SPAFA Journal*, 5. <https://doi.org/10.26721/spafajournal.2021.v5.636>
- Nemčíková, M., Krogmann, A., Oremusová, D., Ambrosio, V., & Mróz, F. (2020). Sv. Cyril a Metod a ich reflexia v krajine Slovenska. *Konštantínove Listy/Constantine's Letters*, 13(1), 224–236. <https://doi.org/10.17846/CL.2020.13.1.224-236>
- Oster, E. (2019). Unobservable Selection and Coefficient Stability: Theory and Evidence. *Journal of Business & Economic Statistics*, 37(2), 187–204. <https://doi.org/10.1080/07350015.2016.1227711>
- Perko, D., Ciglič, R., & Hrvatin, M. (2019). The usefulness of unsupervised classification methods for landscape typification: The case of Slovenia. *Acta Geographica Slovenica*, 59(2). <https://doi.org/10.3986/AGS.7377>
- Pratt, R. G. (1999). Seismic waveform inversion in the frequency domain, Part 1: Theory and verification in a physical scale model. *GEOPHYSICS*, 64(3), 888–901. <https://doi.org/10.1190/1.1444597>
- Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. *Computers & Education*, 147, 103778. <https://doi.org/10.1016/j.compedu.2019.103778>
- Rasheed, R. A., Kamsin, A., & Abdullah, N. A. (2020). Challenges in the online component of blended learning: A systematic review. *Computers & Education*, 144, 103701. <https://doi.org/10.1016/j.compedu.2019.103701>
- Smith, E. N., Young, M. D., & Crum, A. J. (2020). Stress, Mindsets, and Success in Navy SEALs Special Warfare Training. *Frontiers in Psychology*, 10, 2962. <https://doi.org/10.3389/fpsyg.2019.02962>
- So, K. K. F., Oh, H., & Min, S. (2018). Motivations and constraints of Airbnb consumers: Findings from a mixed-methods approach. *Tourism Management*, 67, 224–236. <https://doi.org/10.1016/j.tourman.2018.01.009>

- Thomas, H., Qi, C. R., Deschaud, J.-E., Marcotegui, B., Goulette, F., & Guibas, L. (2019). KPConv: Flexible and Deformable Convolution for Point Clouds. *2019 IEEE/CVF International Conference on Computer Vision (ICCV)*, 6410–6419. <https://doi.org/10.1109/ICCV.2019.00651>
- Ullah, A., Munir, S., Badshah, S. L., Khan, N., Ghani, L., Poulson, B. G., Emwas, A.-H., & Jaremko, M. (2020). Important Flavonoids and Their Role as a Therapeutic Agent. *Molecules*, 25(22), 5243. <https://doi.org/10.3390/molecules25225243>
- Van Vliet, G., & Grosse, S. D. (2021). Dépistage néonatal de l'hypothyroïdie congénitale et de l'hyperplasie congénitale des surrénales: Bénéfices et coûts d'un programme de santé publique à succès. *Médecine/Sciences*, 37(5), 528–534. <https://doi.org/10.1051/medsci/2021053>
- Vetsch, J., Wakefield, C. E., McGill, B. C., Cohn, R. J., Ellis, S. J., Stefanic, N., Sawyer, S. M., Zebrack, B., & Sansom-Daly, U. M. (2018). Educational and vocational goal disruption in adolescent and young adult cancer survivors. *Psycho-Oncology*, 27(2), 532–538. <https://doi.org/10.1002/pon.4525>
- Wu, Z., Pan, S., Chen, F., Long, G., Zhang, C., & Yu, P. S. (2021). A Comprehensive Survey on Graph Neural Networks. *IEEE Transactions on Neural Networks and Learning Systems*, 32(1), 4–24. <https://doi.org/10.1109/TNNLS.2020.2978386>
- Wuryandani, W., & Herwin, H. (2021). The effect of the think–pair–share model on learning outcomes of Civics in elementary school students. *Cypriot Journal of Educational Sciences*, 16(2), 627–640. <https://doi.org/10.18844/cjes.v16i2.5640>
- Xia, W., Shao, J., Guo, Y., Peng, X., Li, Z., & Hu, D. (2020). Clinical and CT features in pediatric patients with COVID-19 infection: Different points from adults. *Pediatric Pulmonology*, 55(5), 1169–1174. <https://doi.org/10.1002/ppul.24718>
- Xu, W., Zhang, Y., Li, X., Wang, X., Ma, F., Zhao, J., & Zhang, Y. (2020). Extraction and statistics of discontinuity orientation and trace length from typical fractured rock mass: A case study of the Xinchang underground research laboratory site, China. *Engineering Geology*, 269, 105553. <https://doi.org/10.1016/j.enggeo.2020.105553>
- Zhang, S., Li, X., Zong, M., Zhu, X., & Wang, R. (2018). Efficient kNN Classification With Different Numbers of Nearest Neighbors. *IEEE Transactions on Neural Networks and Learning Systems*, 29(5), 1774–1785. <https://doi.org/10.1109/TNNLS.2017.2673241>
- Zhao, J., Qi, J., Huang, Z., Meliopoulos, A. P. S., Gomez-Exposito, A., Netto, M., Mili, L., Abur, A., Terzija, V., Kamwa, I., Pal, B., & Singh, A. K. (2019). Power System Dynamic State Estimation: Motivations, Definitions, Methodologies, and Future Work. *IEEE Transactions on Power Systems*, 34(4), 3188–3198. <https://doi.org/10.1109/TPWRS.2019.2894769>
- Zou, X., Chen, K., Zou, J., Han, P., Hao, J., & Han, Z. (2020). Single-cell RNA-seq data analysis on the receptor ACE2 expression reveals the potential risk of different human organs vulnerable to 2019-nCoV infection. *Frontiers of Medicine*, 14(2), 185–192. <https://doi.org/10.1007/s11684-020-0754-0>

---

**Copyright Holder :**

© Meléndez Fernández et al. (2022).

**First Publication Right :**

© World Psychology

**This article is under:**

