

## The effect of the team games tournament learning model assisted by question card media on student learning outcomes

Najihan Arizka \*, Khairuna

Biology Education Department, Faculty of Tarbiyah and Teacher Training, Universitas Islam Negeri Sumatera Utara, Medan, North Sumatera, Indonesia

\*Corresponding Author Email: [najihan.arizka@uinsu.ac.id](mailto:najihan.arizka@uinsu.ac.id)

### Article Information

#### Keyword:

Learning model; Team games tournament; Cooperative; Student learning outcomes; Human reproductive system

#### Kata Kunci:

Model pembelajaran; *Team games tournament*; Kooperatif; Hasil belajar siswa; Sistem reproduksi manusia

#### History:

Received : 07/07/2022

Accepted : 05/08/2022

### Abstract

This study aimed to improve student learning outcomes and determine the effect of the Team Games Tournament (TGT) learning model assisted by question card media on human reproductive system material. This study employed a quantitative research type, with a quasi-experimental research design. Class XI science 1 student totalled 36, and class XI science 2 students totalled 36, with research instruments consisting of hand-held elective tests administered during post-test and pre-test. Using version 20 of the SPSS software, descriptive and paired simple t-test analyses of data were conducted. The average pre-test scores for the experimental group were 24.17, whereas those for the control group were 22.78. The average post-test scores of the experimental group were 80.14, on the other hand, those of the control group were 69. In the paired simple t-test, the 2-tailed sign value was  $0,00 < 0,05$ , and the  $t_{count} > t_{table}$  which was  $47,61 > 2,03$ . This demonstrates that the TGT learning model assisted by media question cards can enhance learning outcomes and significantly impact the biology learning process. TGT learning aided by question cards may be one way for educators to optimise learning processes and outcomes.

#### Abstrak

Penelitian ini bertujuan untuk mengetahui pengaruh model pembelajaran Team Games Tournament (TGT) berbantuan media question card pada materi sistem reproduksi manusia dan meningkatkan hasil belajar peserta didik SMA kelas XI IPA. Jenis penelitian berupa penelitian kuantitatif dengan desain penelitian berupa quasi eksperimen. Sampel penelitian yaitu siswa kelas XI IPA 1 berjumlah 36 siswa dan kelas XI IPA 2 berjumlah 36 siswa dengan instrument penelitian berupa tes pilihan berganda yang diberikan saat dilakukan uji post-test dan pre-test. Analisis data berupa analisis deskriptif dan uji paired simple t-test dengan bantuan *software* SPSS versi 20. Adapun hasil rata-rata pre-test pada kelas eksperimen yaitu 24,17 dan pada kelas kontrol yaitu 22,78. Hasil rata-rata post-test kelas eksperimen yaitu 80,14 dan kelas kontrol yaitu 69,72. Pada uji paired simple t-test nilai sig. 2-tailed  $0,00 < 0,05$  dengan nilai  $t_{hitung} > t_{tabel}$  yaitu  $47,61 > 2,03$ . Hal ini menunjukkan bahwa model pembelajaran TGT berbantuan media question card dapat meningkatkan hasil belajar siswa dan juga memiliki pengaruh yang signifikan dalam proses pembelajaran biologi. Pembelajaran TGT berbantuan question card dapat menjadi salah satu solusi bagi guru untuk mengoptimalkan proses dan hasil belajar.

## A. Introduction

Education is a process that causes positive changes in a student's behavior and can gradually alter their cognitive, affective, and psychomotor skills (Rahmat, 2014). Education was one of the issues from the past that required more attention from people (Salamah, 2018). Therefore, to maintain quality education, ongoing education must incorporate periodic changes.

Currently, it is believed that education in Indonesia has not achieved optimal results. Based on 2011 data presented by the Education Development Index Indonesia, which indicates that the education success rate is attracting attention, Indonesia ranks 69<sup>th</sup> out of 127 countries. Furthermore, in 2012, UNESCO reported that Indonesia's education success rate had decreased and it was ranked 64<sup>th</sup> out of 120 countries (Hamsir, 2017). Based on these two pieces of information, it is clear that the quality of educational success in Indonesia is relatively low. Therefore, it has become one of the country's major problems and requires more attention.

Teaching and learning activities cannot be separated as long as there is education. This activity consists of interactions between students and teachers to achieve a specific objective (Pallot et al., 2017). When educational interaction occurs, something educational is produced in the learning process, supported by elements that can characterise its occurrence. These elements include materials, methods, media, sources, evaluations, objectives, students and teachers, and a safe environment (Hanafy, 2014).

During teaching and learning activities, students should not become passive observers who sit silently and do not participate. Not only does a student acquire knowledge or listen to the content when an instructor presents it, and however they also actively participate in learning (Lesilolo, 2019). A phenomenon that occasionally occurs throughout the teaching and learning process in place learning does not pertain to the student center but solely to the instructor center.

During the learning process, research results in Southeast Asia frequently uncover paradigms by employing traditional models, sometimes called the lecture method. Very few educators implement a student-centered learning method (Pasaribu & Simatupang, 2020). James M. Cooper remarked, "A teacher is a person entrusted with the responsibility of assisting others in learning and adopting new behaviours." A teacher is more qualified to instruct than someone not in his specialty (Zunidar, 2019).

Student learning achievement is the result students obtain in the form of an evaluation of the transformation of their behavior after a series of lessons that assesses their knowledge, attitudes, and abilities (Nurrita, 2018). Consequently, expanding and enhancing the entire learning process is essential, and this can be accomplished by fostering teacher-student interactions (Jayawardana, 2017). After evaluation, the outcomes of the pupils' learning accomplishments become apparent. Therefore, multiple-choice exams are objective among various learning outcomes tests (Kadir, 2015). According to Daud (2012), two variables can determine students' learning achievement: external and internal factors.

There are numerous domains of knowledge that supplement the educational world. Biology is one of these disciplines. Biologically has distinct characteristics when viewed from various vantage points (Sudarisman, 2015). The disparities in these qualities make students believe that biology is a complicated topic. Since there are difficult-to-understand books incorporating Latin, some students consider biology classes to be rote learning. This assumption causes students to typically record the material presented by the instructor (Jayawardana, 2017).

Conventional learning models or lectures are not effective when used in biology learning, and this is due to students being silent and only listening to the material being presented. In addition, applying the conventional model provides few opportunities for students to be active and conventional learning does not facilitate students to exchange opinions. Consequently, students need a learning method that generates their interest in learning and provides flexibility to review more deeply about the biological sciences (Muldayanti, 2013).

By paying attention to frequently occurring situations, it is necessary to practice learning models that can make students more agile and motivated during learning procedures that enhance learning achievement. Utilising the cooperative learning model is one way to accomplish this. Additionally, cooperative learning promotes the success of groups focused on individual achievement (Simangunsong & Kusumaningsih, 2009). The cooperative learning model begins with small groups of students collaborating to optimise a series of learning processes to achieve specific goals (Firdaus, 2016). One of them is a Team Games Tournament-type cooperative learning model.

David D. V. and Keith created the learning model for the Team Games Tournament. David

DeVries and Keith Edwards characterised the model as a synthesis of the learning model (Sudimahayasa, 2015). The learning model for the Team Games Tournament is derived from a series of cooperative learning models. The distinguishing characteristic of the TGT model is placing students in diverse groups of four to five individuals. Variations are irrespective of race, ethnicity, or intelligence level. Several TGT learning processes encourage student engagement, and several learning processes have been packaged into academically-oriented tournaments. The primary components of the Team Games Tournament model are presenting information, forming teams, playing games, hosting tournaments, and granting rewards.

The Team Games Tournament model encourages students to collaborate; those with above-average intelligence can assist those with low learning ability. Consequently, all students will have relationships (Solihah, 2016). In the Team Games Tournament model, it is hoped that students' academic abilities are not the only outcome. Nevertheless, another outcome will be the development of student cooperation for mastery of the teacher-provided material. Thus, this partnership exemplifies the Team Games Tournament (TGT) cooperative model (Rosady et al., 2018). According Kristiana et al. (2017), the Team Games Tournament learning model has been implemented in various subject areas. The obtained results are highly applicable to mathematics and science lessons.

Question card media can be utilised when learning activities are conducted using the Team Games Tournament learning model. Using media during the learning process can make learning activities more engaging and facilitate students' comprehension of the material (Gunarta, 2019). A component of the learning model facilitates the utilisation of media. Ardani states (Astuti et al., 2019) that "the question card learning media or question card is a visual media in the form of 10 x 10 cm paper containing questions related to the topic that will be discussed." The application of question card media excites students. The spirit of responsibility, cooperation, competition, and student learning participation can be strengthened by additional factors.

According to Kristina's research (2017), The percentage obtained in this study is that the experimental class achieved 76,66% results, and the control class achieved 54,54%. These results show that a positive influence was found when applying the media-assisted Team Games Tournament learning model to lead to student

activity and student learning achievement. In the research of Herlina et al. (2019), the results of the t-test with the sign  $0,001 \% < 0,05$ . Thus, these results prove that there is a positive impact when using Team Games Tournament learning assisted by visual type media. According to Solihah (2016), when applying the TGT learning model, the student's learning outcomes were superior to the STAD model.

From the three studies, it is known that when applying the TGT model succeeded in improving student learning outcomes. This research was conducted at Public Senior High School 21 Medan with a different place and research subject from previous research, namely using the TGT learning model with question card media, and there were differences in the material and subjects taught. This research focuses on the subject matter of the biology of the human reproductive system. Another difference lies in the research method used and how to obtain the data.

Based on the observations of biology teachers in Class XI Science at Public Senior High School 21 Medan, it was determined that student achievement in learning biology was low. The 65 achievement value of students demonstrates this. Based on the results obtained, it was clear that the student's scores do not fulfill the Minimum Mastery Criteria (KKM). The minimum requirements for students were 75. This was believed to be the result of an ineffective learning process, a lack of interest in learning biology, low learning motivation, and the continued use of the lecture method, which limits students to merely receiving the material presented.

On the foundation of this description, this study aimed to improve the learning outcomes of Class XI Science students regarding the reproductive system. Moreover, to determine whether there is a significant effect on student learning outcomes when using the Team Games Tournament (TGT) learning model assisted by question card media is believed to be a learning model in improving student learning outcomes.

## **B. Material and Method**

The research was conducted in March 2022 at Public Senior High School 21 Medan. This study employed the type of quantitative research, with a quasi-experimental design. The sampling utilised the Non Probability Sampling technique. Subjects were taken from the control and experimental groups set; thus, they could not be moved.

The research subjects comprised 72 students of Class XI Science. Class XI Science 2 (experimental class) consists of 36 students applying the TGT

learning model, and class XI Science 1 consists of 36 students (control class) adopting conventional learning.

The test instrument was in the shape of multiple choice. The test utilised was 20 items that underwent reliability, item difficulty and differentiating tests before the questions were used. The questions were based on references from Bloom's Taxonomy which contained elements of C1: knowledge, C2: understanding, C3: application, C4: analysis, C5: evaluation, and C6: creation.

There were three stages involved in the learning process. In the first stage, each class was given a preliminary exam to assess students' initial comprehension ( $O_1$ ). During the second stage, the experimental class utilised the TGT learning model with question card (X) media. In contrast, learning in the control class is conducted using a conventional model. Subsequently, in the final stage, a post-test was administered to assess students' final comprehension ( $O_2$ ).

**Table 1 Research Design**

Experimental Group (Class XI Science 2)	$O_1$	X	$O_2$
Control Group (Class XI Science 1)	$O_1$		$O_2$

The measuring instrument for analysing the data was applied as descriptive statistics to measure the average value of the participants' pretest and post-test results. In inferential statistics, there were normality, homogeneity, and hypothesis tests. The data could be calculated using the Statistical Product and Service Solutions software version 20.

## C. Results and Discussion

### 1. Descriptive statistics

Results of student statistics can be seen in table 2. The experimental class pre-test (XI Science 2) results are 24.17. The average score on the pre-test for the control group is 22.78, the average post-test score for the experimental group is 80.14, and the average post-test score for the control group is 69.72.

**Table 2 Descriptive Statistical Results**

	N	Min.	Max.	Mean
Pre-Test Experimen	36	0	45	24.17
Post-Test Experimen	36	55	100	80.14
Pre-Test Control	36	5	55	22.78
Post-Test Control	36	55	90	69.72

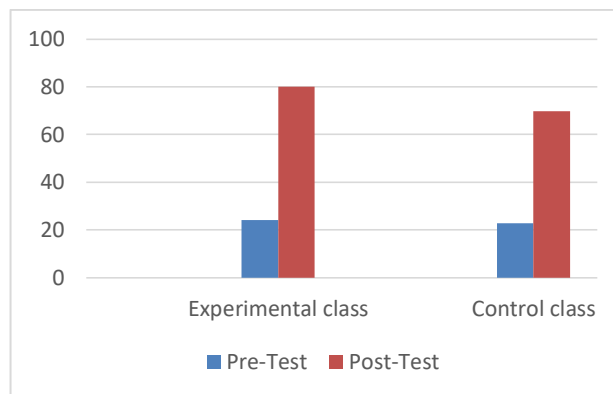


Figure 1 Early and Final Learning Outcomes

The figure 1 is derived from the descriptive statistical data presented in table 2. Based on the figure 1, the results of the pre-and post-tests of students revealed significant differences between the two classes, with the experimental class having the highest results.

### 2. Data Analysis Requirements

Normality testing was the first stage in the testing process. This test was used to examine the obtained data. If the level of Sign. > 0,05 = data is normally distributed. The normality test obtained from student learning outcomes has differences. However, both distributions are normal. The normality test is illustrates in tables 3 and 4.

**Table 3 Normality Test of Experiment Class**

		Pre-Test	Post-Test
N		36	26
Mean		24.27	80.14
Normal Parameters <sup>a,b</sup>	Std. Deviation	10.790	10.723
	Absolute	.142	.175
	Most Extreme Positive Differences.	.108	.129
	Negative	-.142	-.175
Kolmogorov Smirnov Z		.851	1.049
Asymp. Sign. 2-tailed		.463	.221

Table 3 displays the results of the normality test for the experimental class. Class XI Science 2 (experimental class) based on the pretest results of students with a sign value ( $0,46 > 0,05$ ) and the post-test results of students with a sign value ( $0,22 > 0,05$ ).

Table 4 displays the results of the control class normality test. Class XI Science 1 (control class) students found a sign value on the pretest ( $0,35 > 0,05$ ) and on the posttest ( $0,20 > 0,05$ ) for

control class students in class XI Science 1 (control class).

**Table 4 Normality Test of Control Class**

		Pre-test	Post-test
N		36	26
Mean		22.78	69.72
Normal	Std.	11.048	10.278
Parameters <sup>a,b</sup>			
	Deviation		
	Absolute	.155	.177
Most Extreme Differences	Positive	.155	.177
	Negative	-.096	-.119
Kolmogorov-Smirnov Z		.929	1.062
Asymp. Sig. 2-tailed		.354	.209

Homogeneity test to determine whether there are differences in the data population variance. If the significance value is  $> 0.05$ , it can be said that the data comes from a homogeneous variant. According to the homogeneity test based on table 5, the data were distributed homogeneously. Students learning outcomes revealed the sign value ( $0,41 > 0,05$ ).

Hypothesis recognition was conducted after testing for normality and homogeneity. Processing data in this test employing Paired Simple t-test. When  $\text{Sign. (2-tailed)} < 0,05$ , subsequently, impact with the TGT model used.

**Table 5 Homogeneity test**

Levenes Statistic.	df1	df2	Sig.
.669	1	51	.417

**Table 6 Paired Simple T-test**

	Mean.	Std. Deviation.	Std. Error Mean.	Paired Differences		t	df	Sign. (2-tailed)
				95% Confidences Interval of the Differences.				
				Lower.	Upper.			
PreTest, PostTest Experimental (TGT).	-55.972	7.053	1.175	-58.359	-53.586	-47.617	35	0.000
PreTest, PostTest Control.	-49.944	7.298	1.216	-49.414	-44.475	-38.598	35	0.000

Table 6 demonstrates that the learning achievement hypothesis test results reach the sign value. (2-tailed 0.05), which is ( $0.00 < 0.05$ ), if  $t_{hitung} > t_{tabel}$  is ( $47,61 > 2,03$ ). The study's finding indicated, using the Team Games Tournament learning model assisted by question card media affected students' learning outcomes.

The research was conducted at Public Senior High School 21 Medan, located on Keramat Indah/Selambo Ujung Street, Amplas, Percut Sei Tuan District, North Sumatera. The initial stage of the research was carried out by researchers conducting the preparation stage by submitting a letter of permission to the school. Subsequently, carry out the observation stage, and prepare learning devices until learning begins.

At the time of the study, the early phases of the pretest ability test was administered in each classroom. The experimental class was administered the TGT learning paradigm with the aid of question card media. The lecture method was employed by the control class. A post-test with comparable questions was administered after the final stage.

Based on the research results obtained regarding students' learning achievement in the experimental class by applying the Team Games Tournament (TGT) model, it is superior to the

control class by applying the conventional learning model. This is supported by research (Lestari et al., 2018) stating, "By applying the TGT type cooperative learning model can improve student learning outcomes". Sugiata, 2019 stated that "applying the Team Games Tournament learning model can increase student learning achievement and the value of achieving the Minimum Mastery Criteria (KKM)".

By employing the TGT learning model assisted by question card media, the results produced differ from those of earlier studies in that student learning outcomes improve. This demonstrated that the TGT learning model assisted by question card media exemplified its specific biology lesson on the human reproductive system.

When the TGT model and question card media were applied to the learning process in Class XI Science 2, students were more engaged and pleased. Furthermore, learning was not difficult to comprehend. TGT model encouraged student learning in groups without status distinctions. Students engaged in continual interaction to comprehend the concept, allowing even those with below-average intelligence to comprehend the offered material. The learning that occurred using the TGT model, which includes game and tournament activities, inspired students to study

seriously and enthusiastically and created a healthy competitive spirit, honesty, and involvement during the learning process.

This explanation is based on the advantages of the Team Games Tournament learning model; as stated by (Taniredja et al., 2011), which states that the use of the TGT learning model has advantages, including that students can express their opinions, have self-confidence, increase learning motivation, better understand the material, students are more easily able to interact with one another. The likelihood of students interfering with one another is reduced. The increase in learning outcomes is relevant Wilujeng (2013) definition of learning, which states that a person who engages in activities will experience changes in their abilities.

After the meeting, the group with the most points will be rewarded; thus, each group will compete to collect points to win prizes. This motivates students to be enthusiastic about learning. This is consistent Simangunsong & Kusumaningsih (2009) assertion that awarding groups of students with the best learning outcomes can motivate them to engage in learning.

The application of the lecture method in Class XI Science 1 (control) rendered students passive and devoid of enthusiasm for learning; only students with average abilities raised question when they did not comprehend the material.

There were sufficient differences in learning activities. Applying the Team Games Tournament (TGT) learning model has demonstrated that students tend to be more active and serious when learning. On the other hand when applying traditional learning, students were typically more passive. The new environment motivated students to engage in learning activities.

## D. Conclusion

After the learning process, the results enhanced the science students' learning outcomes in eleventh grade. However, the obtained learning outcomes vary significantly. The experimental class received treatment with the Team Games Tournament (TGT) learning model assisted by the question card media, resulting in pre-test scores of 24,17, on the other hand, the control class received a score of 22,78. After calculating the post-test value for the experimental class, the difference in the overall results was 80,14, on the other hand, the post-test for the control class was 69,72. Based on the findings, the Team Games Tournament (TGT) learning model assisted by question card media in the subchapter of the human reproductive system was significantly impacted. This was demonstrated by the T-test results indicating Sig. 2-tailed (0,00 <

0,05) with  $t_{count} < t_{table}$  (2,03 < 47,61), then  $H_a$  was accepted, and  $H_0$  was rejected. When employing effective learning models in conjunction with the subject matter being taught. Consequently, it is expected that education will improve in Indonesia and that students will receive the best possible education and not view biology as difficult subject.

## E. Acknowledgement

The writer offers praise and thankfulness to Allah Subhanahu wa Ta'ala for his innumerable grace, pleasure, direction, and simple means provided daily. The writer acknowledges that while preparing this journal article, the writer received a great deal of assistance and support from various parties. Therefore, with all sincerity and humility, the writer wishes to convey the writer's profound appreciation to Mrs. Khairuna M.Pd, who contributed to the refinement of this research is acknowledged. Mrs Lusiana Rumapea, M.Pd., and Mrs Delvi Armi Fitria Silitonga, biology teachers at Public Senior High School 21 Medan. Subsequently, My large family, particularly my parents: Mr Zaini, S.Ag and Mrs Ira Juwita, who continue to assist the researcher in completing this journal article, and lastly, Fikri Wahyudi and his colleagues for their encouragement and willingness to assist and accompany researchers conducting this examination.

## F. References

- Astuti, T., Suwatra, I. W., & Tegeh, I. M. (2019). Pengaruh model pembelajaran kooperatif tipe CRH berbantuan media question card terhadap hasil belajar IPA. *Indonesian Journal of Educational Research and Review*, 2(2), 240-251. <https://doi.org/10.23887/ijerr.v2i2.17633>
- Daud, F. (2012). Pengaruh kecerdasan emosional (EQ) dan motivasi belajar terhadap hasil belajar biologi siswa SMA 3 Negeri Kota Palop. *Jurnal Pendidikan dan Pembelajaran*, 19(2), 243-255.
- Firdaus, A. M. (2016). Efektivitas pembelajaran matematika melalui penerapan model pembelajaran kooperatif tipe snowball throwing. *Beta Jurnal Tadris Matematika*, 9(1), 61. <https://doi.org/10.20414/betajtm.v9i1.1>
- Gunarta, I. G. (2019). Pengaruh model pembelajaran tgt berbantuan media question card terhadap hasil belajar IPA. *Jurnal Pedagogi Dan Pembelajaran*, 1(2), 112-120. <https://doi.org/10.23887/jp2.v1i2.19338>
- Hamsir, H. (2017). Penerapan metode eksperimen terhadap hasil belajar fisika peserta didik SMA Negeri 1 Turatea Kabupaten Jeneponto. *Jurnal Penelitian Dan Penalaran*, 4(1), 732-741.
- Hanafy, M. S. (2014). Konsep belajar dan pembelajaran. *Lentera Pendidikan*, 17(1), 66-79.

- <https://doi.org/10.24252/lp.2014v17n1a5>  
Jayawardana, H. B. . (2017). Paradigma pembelajaran biologi di era digital. *Jurnal Bioedukatika*, 5(1), 12-17.
- <https://doi.org/10.26555/bioedukatika.v5i1.5628>  
Kadir, A. (2015). Menyusun dan menganalisis tes hasil belajar. *Al-Ta'dib*, 8(2), 70-81.
- Kristiana, I., Nurwahyunani, A., & Sulistya Dewi, E. R. (2017). Pengaruh model pembelajaran tgt menggunakan media puzzle terhadap keaktifan dan hasil belajar kognitif siswa pada materi sistem ekskresi siswa kelas VIII MTsN 1 Semarang. *Bioma: Jurnal Ilmiah Biologi*, 6(2), 78-92. <https://doi.org/10.26877/bioma.v6i2.1740>
- Lesilolo, H. J. (2019). Penerapan teori belajar sosial Albert Bandura dalam proses belajar mengajar di sekolah. *KENOSIS: Jurnal Kajian Teologi*, 4(2), 186-202. <https://doi.org/10.37196/kenosis.v4i2.67>
- Lestari, S., Hariyani, S., & Rahayu, N. (2018). Pembelajaran kooperatif tipe tgt (Team Games Tournament) untuk meningkatkan hasil belajar matematika. *Pi: Mathematics Education Journal*, 1(3), 116-126. <https://doi.org/10.21067/pmej.v1i3.2785>
- Muldayanti, N. D. (2013). Pembelajaran biologi model STAD dan TGT ditinjau dari keingintahuan dan minat belajar siswa. *Jurnal Pendidikan IPA Indonesia*, 2(1), 12-17. <https://doi.org/10.15294/jpii.v2i1.2504>
- Nurrita, T. (2018). Pengembangan media pembelajaran untuk meningkatkan hasil belajar siswa. *Jurnal Misykat*, 3(1), 171. <https://media.neliti.com/media/publications/271164-pengembangan-media-pembelajaran-untuk-me-b2104bd7.pdf>
- Pallot, M., Christmann, O., Richir, S., Dupont, L., Boly, V., & Morel, L. (2017). ICE breaking: Disentangling factors affecting the performance of immersive Co-creation environments. *ACM International Conference Proceeding Series*, 11. <https://doi.org/10.1145/3110292.3110316>
- Pasaribu, P.A.P., & Simatupang, H. (2020). Pengaruh model pembelajaran project based learning (PjBL) terhadap hasil dan aktivitas belajar siswa pada materi pencemaran lingkungan di kelas X MIA SMAN 6 Binjai TP 2018-2019. *Jurnal Pembelajaran dan Matematika Sigma (Jpms)*, 6(1), 10-17. <https://doi.org/10.36987/jpms.v6i1.1655>
- Rahmat, A. (2014). *Pengantar pendidikan teori, konsep dan aplikasi*. Gorontalo: Ideas Publishing.
- Rosady, F., Lisa, Y., & Supiandi, M. I. (2018). Pengaruh model pembelajaran team game tournament (TGT) berbasis teka-teki silang terhadap hasil belajar kognitif siswa pada materi sistem pencernaan di kelas VIII Sekolah Menengah Pertama Negeri 2 Kelam Permai tahun pelajaran 2016/2017. *JPBIO (Jurnal Pendidikan Biologi)*, 2(1), 9-17. <https://doi.org/10.31932/jpbio.v1i1.207>
- Salamah, C. (2018). *Pendidikan dan pengajaran strategi pembelajaran sekolah*. Jakarta: PT Grasindo.
- Simangunsong, L., & Kusumaningsih, K. D. (2009). Pengaruh model pembelajaran teams-games-tournament (TGT) terhadap peningkatan hasil belajar biologi. *Jurnal Ilmiah Exacta*, 2(1), 83-98. [https://www.academia.edu/download/32696324/Leonard\\_Kiki-Faktor\\_Exacta\\_Vol.\\_2\\_No.\\_1.pdf](https://www.academia.edu/download/32696324/Leonard_Kiki-Faktor_Exacta_Vol._2_No._1.pdf)
- Solihah, A. (2016). Pengaruh model pembelajaran team games tournament (TGT) terhadap hasil belajar matematika. *SAP (Susunan Artikel Pendidikan)*, 1(1), 45-53. <https://doi.org/10.30998/sap.v1i1.1010>
- Sudarisman, S. (2015). Memahami hakikat dan karakteristik pembelajaran biologi dalam upaya menjawab tantangan abad 21 serta optimalisasi implementasi Kurikulum 2013. *Florea: Jurnal Biologi dan Pembelajarannya*, 2(1), 29-35. <http://doi.org/10.25273/florea.v2i1.403>
- Sudimahayasa, N. (2015). Penerapan model pembelajaran TGT untuk meningkatkan hasil belajar, partisipasi, dan sikap siswa. *Jurnal Pendidikan dan Pengajaran*, 48(1-3), 45-53. <https://doi.org/10.23887/jppundiksha.v48i1-3.6917>
- Sugiata, I. W. (2018). Penerapan model pembelajaran team game tournament (TGT) untuk meningkatkan hasil belajar. *Jurnal Pendidikan Kimia Indonesia*, 2(2), 78-87. <https://doi.org/10.23887/jpk.v2i2.16618>
- Taniredja, T., Faridli, E. M., & Harmianto, S. (2011). *Model-model pembelajaran inovatif*. Bandung: Alfabeta.
- Wilujeng, S. (2013). Peningkatan aktivitas dan hasil belajar siswa melalui model team games tournament (TGT). *Journal of Elementary Education*, 2(1), 45-53. <https://journal.unnes.ac.id/sju/index.php/jee/article/view/2073>
- Zunidar. (2019). Peran guru dalam inovasi pembelajaran. *Nizhamiyah*, 9(2), 41-56. <http://dx.doi.org/10.30821/niz.v9i2.550>