



## Improving Students' Learning Outcomes through PjBL Learning Models in Practices for Making of Casting Tape (*Manihot utilissima*) with The Assistance of Media Quiziz

Ade Daud Saepul<sup>1\*</sup>, Nina Helina<sup>2</sup>, Yoyon Sutresna<sup>2</sup>

<sup>1</sup>Pendidikan Biologi, Universitas Pakuan, Bogor, Indonesia

<sup>2</sup>Pendidikan Biologi, Universitas Galuh, Ciamis, Indonesia

\*Email: [ade.daud28@gmail.com](mailto:ade.daud28@gmail.com)

Received: 14 Maret 2023 Revised: 31 Maret 2023 Accepted: 25 April 2023

### Abstract

Learning is a process of changing behavior so that knowledge and skills are obtained to be better than before. Factors that influence the quality of an educational program include the quality of students, the availability of teaching materials, curriculum, facilities/infrastructure, class and school management, and so on. This study aims to prove that the project based learning model with quizizz media can improve student learning outcomes. This research is a class action research using a project-based learning model with the help of Quizizz. This research was conducted through two cycles. Luckily, the students seemed happy to carry out this project based learning and they started to do it in collaboration. Then collaboration grew the responsibility from each of them. Therefore it will have a positive impact on student progress. Moreover, it is true that the result gave an increase in student learning activities and student learning outcomes. The conclusion of this study is that the project based learning model with the help of Quizizz has succeeded in increasing student learning outcomes.

**Keywords:** project based learning; student activity; student learning outcomes; Quizizz

### INTRODUCTION

Learning is a process of changing behavior so that knowledge and skills are obtained to be better than before. Learning is essentially a "change" that occurs within a person after carrying out certain activities. Although in essence not all changes are included in the learning category and it can be interpreted that learning is a process of changing behavior as a result of interaction between individuals and the environment. Factors that influence the quality of an educational program include the quality of students, the availability of teaching materials, curriculum, facilities/infrastructure, class and school management, and so on. The selection and use of good teaching materials is an important factor in the quality of education, teaching materials in various forms are categorized as part of learning media (Rusmania, 2015; Bahri *et al.*, 2017; Yusuf, 2017). Based on this description, we can understand that there are many factors that affect the quality of education. To improve the quality of education in Indonesia, various efforts need to be made to improve these various factors. One of the factors that influence the quality of education is teaching materials or learning media and learning models.

Based on the results of observations that researchers made during the Science learning process there were still many students who obtained low scores in understanding the concept of Science,

especially in Biotechnology materials. this is because the teacher only delivers science lessons briefly without being given a learning model that fosters student creativity. One that is considered capable of improving student learning outcomes is project based learning. Project based learning is a learning model that involves a project in the learning process. Projects undertaken by students can be in the form of individual or group projects and carried out within a certain period of time collaboratively, producing a product, the results of which will then be displayed and presented. Project implementation is carried out collaboratively and innovatively, uniquely, which focuses on solving problems related to student life (Jagantara *et al.*, 2014; Kusumaningrum & Djukri, 2016; Sari & Angreni, 2018).

Project based learning is a method that uses contextual learning, in which students play an active role in solving problems, making decisions, researching, presenting and creating projects. Project-based learning is designed to be used on complex problems that students need to investigate and understand (Jagantara *et al.*, 2014; Fitri *et al.*, 2018; Sinta *et al.*, 2022). Besides that, to increase the interest of students, it must be accompanied by the use of innovative media. Currently, many developers provide various applications with advantages, one of which is the Quizizz application which provides an atmosphere of playing games when answering quiz questions given (Salsabila *et al.*, 2020; Rahmawati, 2021; Supriadi *et al.*, 2021). The Quizizz application is a web game service provider tool for playing online-based quizzes that can be included in the teaching and learning process because this application gives full access to making each question (Melissa *et al.*, 2016; Darisman *et al.*, 2020; Rahmawati, 2021). Quizizz can attract interest in learning and make the class more focused on learning material. Based on this background, this study aims to prove that the project based learning model with quizizz media can improve student learning outcomes.

## METHOD

The research used was Classroom Action Research where there were 8 classes in the population and took the research subject as a sample, namely only 1 class with 33 students. The factors studied in this study were student learning outcomes using the PJBL model in 3 meetings consisting of some model syntax. At the first meeting, namely basic questions, compiling product planning, compiling production schedules. The second meeting is to bring together project activities and progress. The third meeting is to test the results and evaluation of learning experiences. This classroom action research was carried out in two cycles. Each cycle is carried out with different material coverage but has the same characteristics, namely the concept of Biotechnology. Data collection was carried out in three ways, namely tests, observations, and questionnaires. in each cycle students are given a test to determine the level of success of student learning. The success indicator set in the research is that a student is declared complete in learning when he has achieved a score of 80. In the first cycle the tests were given conventionally using a written test, while in the second cycle the tests were given using the help of the Quizizz web developer. Meanwhile, observation and questionnaires are used to measure student activity.

Each cycle consists of four stages, the first is planning everything related to the PJBL learning model in the practice of making cassava tape by looking at the cognitive value in student learning outcomes using data collection techniques and data analysis techniques. Then the teacher gave a pre-test to the students, before the practicum started the teacher held a demonstration in front of the class to make it easier for students to do the practicum. Practicum utilizes simple tools and materials in the surrounding environment according to what is planned in the learning process. Then the teacher observes the practicum. All data obtained during the process of class action and observation were collected and analyzed for temporary purposes. The results of this analysis are used by researchers to take pictures of themselves. Furthermore, the results of this reflection are used as a reference for planning actions in the next cycle. And so on, these stages are carried out in cycles with different materials until student learning outcomes increase.

## RESULT AND DISCUSSION

Based on the results of research on student activity can be seen in table 1.

**Tabel 1.** The result of observations of student activity

Description	Cycle I	Cycle II
Observation Value	70.00	80.00

Based on table 1 the results of observations of student activity in the learning process cycle 1 get a value of 70.00. In this cycle the cooperation and interaction between students is low, students play more alone and are not focused during practicum, they do not dare to ask questions to the teacher, besides that students do not understand practicum instructions properly. Whereas in cycle II there was an increase in the results of student activity with the value obtained at 80.00. In this cycle students have started to interact with their friends, there is collaboration between students, focus on carrying out practicums and actively ask the teacher about things that are not clear in the learning process. These active students show a positive interest and a penchant for good results. Especially after collaboration with fellow students, this can hone soft skills as a student.

Collaboration skills are essential for students when facing the working world in 21st-century society. Collaboration enables groups to make better decisions than individually. A learning process in planning and working in groups, dealing with differences of opinions in discussions, and participating in discussions, such as giving suggestions, listening to other people talk, and supporting other people's opinions, are included in collaboration skills. Collaboration skills are also related to working effectively, an attitude of responsibility, and commitment to achieve common goals. Responsibility, which is the sense of responsibility that each member of the group has in carrying out their role to achieve common goals. Respecting others, i.e., mutual respect and respect for opinions, decisions, and roles that group members have carried out. Contribution, i.e., member participation in achieving group goals. Organize work, i.e., the division of member roles, and determine clear policies in teamwork. Working as a whole team, all members work together and perform their roles as part of the team, not working individually (Hairida *et al.*, 2021; Sugiharto & Hidayati, 2022).

Meanwhile the level of student learning outcomes can be seen in table 2.

**Tabel 2.** The result student learning outcomes

Description	Cycle I	Cycle II
Pretest	81,51	95,15
Posttest	78,78	100

From the results of the final test the average score of students in cycle I was 81.51%, an increase from the post-test in cycle I which was 70.00%. Students who passed the final exam totaled 26 students or as much as 86.00% of the total number of students while in cycle II the average value was 95.15%. This figure shows an increase from the post-test results in cycle I, which was 13.64%. Students who complete learning on the final test cycle II totaled 30 students which is the total number of students. This increase occurred because with the project based learning learning model the learning process that occurred was centered on students and the teacher only acted as a facilitator so that students played a more active role in solving problems, making decisions, conducting research, drawing conclusions, making reports, and presenting the results of their research (Rezeki *et al.*, 2015; Anis, 2020; Simangunsong *et al.*, 2022). In addition, the increase in results in cycle II also occurred due to the use of the Quizizz web developer as a medium for measuring student learning outcomes. Quizizz has been proven to be able to attract students' interest in learning by providing an atmosphere like playing games when answering questions related to learning materials (Darisman *et al.*, 2020; Salsabila *et al.*, 2020; Hidayati, 2021).

Based on the results above, it can be said that Quizizz is an interesting learning media. Learning media can be an alternative for experiencing material when field study can not be done. Field study as we know can gain a good result and experience for students. Like going to beach (Triacha *et al.*, 2021; Ratih *et al.*, 2021; Fatonah *et al.*, 2023; Mufida *et al.*, 2023) or even both field study and experiment in

laboratorium (Pertiwi & Saputri, 2020; Saputri & Pertiwi, 2021). Learning media that is utilized appropriately in the learning process will become a more effective and efficient support tool in achieving the learning objectives. In addition learning media will also increase student's learning motivation. Through Quizizz, students not only listen to the material description from the instructor but also actively observe, analyze, perform, and demonstrate. The current technological dynamics have achieved tremendous acceleration. In the digital era teachers are required to plan and create learning that is suitable for the needs of students as generation natives. Quizizz provides opportunities for students to be creative in understanding learning material. Students are motivated to experiment and even carry out unique steps by the stimulus generated from the e-learning media used. The combination of learning using e-learning media that is practiced in the classroom will strengthen the creative elements that students have found (Ariesta, 2019; Puspitarini *et al.*, 2019; Eliana *et al.*, 2022; Nurfitri *et al.*, 2022).

Project based learning is a teaching and learning strategy involving students in completing a project that has benefit for them to solve the problem in the middle of the community or environment. Combining project based learning by using instructional media, the learning process becomes more varied and students are doing more learning activities. Through practice activities, science educators can direct students towards scientific work. Moreover, teachers give the opportunity to understand and to recognize the environment, doing observation and establishment of a causal relationship, and also learning with hands-on activity. In addition, teachers can also improve the self-confidence and motivation of students, help them learn about themselves; develop their ability to solve problems, develop psychomotor and mental abilities; provide meaningful learning; improve the ability to think analytically; and supports the relationship between science and everyday life (Sumarni *et al.*, 2016; Sari, 2018; Gultom *et al.*, 2022).

## CONCLUSION

Based on the research results, there was an increase in activity from cycle I with a value of 70.00 to 80.00 in cycle two. This is because the interaction cycle of two students has increased. Then for student learning outcomes there was an increase of 13.64%, this proves that the project based learning model can improve student learning outcomes. Besides that, the increase in student learning outcomes is due to the use of Quizizz. So that the project based learning learning model with the help of Quizizz has succeeded in increasing student learning outcomes.

## REFERENCES

- Anis Wahdati Sholekah. (2020). Peningkatan Motivasi Dan Hasil Belajar IPA Materi Pencemaran Lingkungan Melalui Model PjBL Siswa Kelas VII SMPN 9 Salatiga. *Jurnal Pendidikan Mipa*, 10(1), 16–22. <https://doi.org/10.37630/jpm.v10i1.260>
- Ariesta, F. W. (2019). Effectiveness of E-Learning Media to Improve Learning Outcomes Natural Science in Primary Schools. *Journal of Education Research and Evaluation*, 3(2), 88. <https://doi.org/10.23887/jere.v3i2.17203>
- Bahri, A., Musmuliadi, N., & Palennari, M. (2017). Pembelajaran Efektif: Meningkatkan Hasil Belajar Peserta Didik Melalui Penggunaan Lembar Kerja Berbasis Penemuan Terbimbing. *Jurnal Penelitian Pendidikan INSANI*, 20(2), 73–79.
- Darisman, A. I. M., Suprpto, P. K., & Putra, R. R. (2020). Implementasi Aplikasi Quizizz Pada Materi Jaringan Tumbuhan. *Florea : Jurnal Biologi Dan Pembelajarannya*, 7(2), 68. <https://doi.org/10.25273/florea.v7i2.5297>
- Dyah Saputri, D., & Putri Pertiwi, M. (2021). Identifikasi Metabolit Sekunder dan Uji Proksimat Ekstrak Daging Keong Mas (*Pomacea canaliculata* L.) Identification of Secondary Metabolites and Proximate Analysis of Golden Apple Snails (*Pomacea canaliculata* L.) Meat Extract. 22(2), 101.
- Eliana, A. N., Sunardi, O., & Susanto, L. H. (2022). *Journal of Biology Education Research Development of Learning Media for E-Booklet Human Reproductive System Materials to Improve Cognitive Learning Outcomes of High School Students*. 3(2), 45–51.

- Fatonah, C. N., Ningtias, R. A., Pertiwi, M. P., & Rostikawati, R. T. (2023). *Keanekaragaman Spesies Bivalvia dan Gastropoda di Pantai Tanjung Rising Kepulauan Bangka Belitung*. 24(1), 57–64.
- Fitri, H., Dasna, I. W., & Suharjo, S. (2018). Pengaruh Model Project Based Learning (PjBL) Terhadap Kemampuan Berpikir Tingkat Tinggi Ditinjau dari Motivasi Berprestasi Siswa Kelas IV Sekolah Dasar. *Briliant: Jurnal Riset Dan Konseptual*, 3(2), 201. <https://doi.org/10.28926/briliant.v3i2.187>
- Gultom, A. S., Retnowati, R., & Yani, I. (2022). *Journal of Biology Education Research ( JBER ) Development of Science Literacy-based E-Booklet to Improving Students ' Critical Thinking Ability on Immune System Materials*. 3(1), 23–31.
- Hairida, H., Marmawi, M., & Kartono, K. (2021). An Analysis of Students' Collaboration Skills in Science Learning Through Inquiry and Project-Based Learning. *Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah*, 6(2), 219–228. <https://doi.org/10.24042/tadris.v6i2.9320>
- Hidayati, I. D. (2021). *Efektivitas Media Pembelajaran Aplikasi[1] I. D. Hidayati, "Efektivitas Media Pembelajaran Aplikasi Quizizz Secara Daring Terhadap Perkembangan Kognitif Siswa," vol. 4, no. 2, pp. 251–257, 2021.si Quizizz Secara Daring Terhadap Perkembangan Kognitif Siswa. 4(2), 251–257.*
- Jagantara, I. W. M., Adnyana, P. B., & Widiyanti, N. P. (2014). Pengaruh Model Pembelajaran Berbasis Proyek (Project Based Learning) Terhadap Hasil Belajar Biologi Ditinjau Dari Gaya Belajar Siswa SMA. *E-Journal Program Pascasarjana Universitas Pendidikan Ganesha Program Studi IPA*, 4(1), 1–13.
- Kusumaningrum, S., & Djukri, D. (2016). Pengembangan perangkat pembelajaran model project based learning (PjBL) untuk meningkatkan keterampilan proses sains dan kreativitas. *Jurnal Inovasi Pendidikan IPA*, 2(2), 241. <https://doi.org/10.21831/jipi.v2i2.5557>
- Melissa, M. M., Liupati, L. A., Silalahi, R. M., & Wikaningtyas, C. R. (2016). Students' Perspectives and Experiences About the Elements of Quiziz Gamification in Mathematics Learning During The Covid-19 Pandemic. *Jurnal Mercumatika : Jurnal Penelitian Matematika Dan Pendidikan Matematika*, 6(2), 1–23.
- Mufida, I., Pertiwi, M. P., & Rostikawati, R. T. (2023). Diversity of Echinoderms in Drini Beach Gunung Kidul, Yogyakarta. *Jurnal ILMU DASAR*, 24(1), 19. <https://doi.org/10.19184/jid.v24i1.30097>
- Nurfritri, Y., Retnowati, R., & Awaludin, M. T. (2022). Development of Digital Pocket Book for Disaster Mitigation Materials Coronavirus Disease 2019 (COVID-19) to Increase Student Resilience to Disasters. *Journal Of Biology Education Research (JBER)*, 3(1), 11–22. <https://doi.org/10.55215/jber.v3i1.3651>
- Puspitarini, Y. D., & Hanif, M. (2019). Using Learning Media to Increase Learning Motivation in Elementary School. *Anatolian Journal of Education*, 4(2), 53–60. <https://doi.org/10.29333/aje.2019.426a>
- Putri Pertiwi, M., & Dyah Saputri, D. (2020). Golden apple snail (*Pomacea canaliculata*) as an alternative protein source in Pasupati catfish (*Pangasius sp.*) fish feed. *Nusantara Bioscience*, 12(2), 162–167. <https://doi.org/10.13057/nusbiosci/n120212>
- Rahmawati, S. (2021). Students' Perceptions Toward Quizizz as an Online Learning Media. *PANYONARA: Journal of English Education*, 3(1), 62–70. <https://doi.org/10.19105/panyonara.v3i1.4282>
- Ratih, S. A., Pertiwi, M. P., & Rostikawati, R. T. (2021). Mollusk diversity in the intertidal zone of Menganti Beach, Kebumen, Central Java. *Depik*, 10(1), 23–29. <https://doi.org/10.13170/depik.10.1.18673>
- Rezeki, R. D., Nurhayati, N. D., & Mulyani, S. (2015). Penerapan metode pembelajaran project based learning (PjBL) disertai dengan peta konsep untuk meningkatkan prestasi dan aktivitas belajar siswa pada materi .... *Jurnal Pendidikan Kimia*, 4(1), 74–81.
- Rusmania, N. (2015). Pengembangan Bahan Ajar Berbasis Ensiklopedia Ilmu Pengetahuan Sosial pada Materi Kerajaan Hindu-Budha dan Islam untuk Peningkatan Motivasi Belajar. *Nhk 技研*, 151, 10–17. <https://doi.org/10.1145/3132847.3132886>
- Salsabila, U. H., Habiba, I. S., Amanah, I. L., Istiqomah, N. A., & Difany, S. (2020). Pemanfaatan

- Aplikasi Quizizz Sebagai Media Pembelajaran Ditengah Pandemi Pada Siswa SMA. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi/JIITUJ/*, 4(2), 163–173. <https://doi.org/10.22437/jiituj.v4i2.11605>
- Sari, I. K. (2018). The effect of problem-based learning and project-based learning on the achievement motivation. *Jurnal Prima Edukasia*, 6(2), 129–135. <https://doi.org/10.21831/jpe.v6i2.17956>
- Sari, R. T., & Angreni, S. (2018). Penerapan Model Pembelajaran Project Based Learning (PjBL) Upaya Peningkatan Kreativitas Mahasiswa. *Jurnal VARIDIKA*, 30(1), 79–83. <https://doi.org/10.23917/varidika.v30i1.6548>
- Simangunsong, H. H., Aulia, I., Hrp, A., Azhari, N. S., Afdilani, N., & Tanjung, I. F. (2022). *Jurnal PTK dan Pendidikan Penerapan Project Based Learning (Pjbl) Untuk Meningkatkan Hasil Belajar Siswa Kelas XII IPA 1 SMA N 2 Percut Sei Tuan Pada Materi Gen*. 8(2), 107–115. <https://doi.org/10.18592/ptk.v8i2.6806>
- Sinta, M., Sakdiah, H., Novita, N., Ginting, F. W., & Syafrizal, S. (2022). Penerapan Model Pembelajaran Project Based Learning (PjBL) untuk Meningkatkan Kemampuan Berpikir Kreatif Siswa pada Materi Hukum Gravitasi Newton di MAS Jabal Nur. *Jurnal Phi Jurnal Pendidikan Fisika Dan Fisika Terapan*, 3(3), 24. <https://doi.org/10.22373/p-jpft.v3i3.14546>
- Sugiharto, B., & Hidayati, N. (2022). Reflection on Student Collaboration Skills Assessment by Biology Teachers. *Jurnal Penelitian Pendidikan IPA*, 8(3), 1102–1107. <https://doi.org/10.29303/jppipa.v8i3.1258>
- Sumarni, W., Wardani, S., Sudarmin, S., & Gupitasari, D. N. (2016). Project based learning (PBL) to improve psychomotoric skills: A classroom action research. *Jurnal Pendidikan IPA Indonesia*, 5(2), 157–163. <https://doi.org/10.15294/jpii.v5i2.4402>
- Supriadi, N., Tazkiyah, D., & Isro, Z. (2021). Penerapan Aplikasi Quizizz Dalam Pembelajaran Daring Di Era Covid-19. *Jurnal Cakrawala Mandarin*, 5(1), 42. <https://doi.org/10.36279/apsmi.v5i1.101>
- Triacha, Z. I. E. C., Pertiwi, M. P., & Rostikawati, R. T. (2021). Echinoderms Diversity in Cibuaya Beach Ujung Genteng, West Java. *Jurnal Ilmu Dasar*, 22(1), 9–18.
- Yusuf, B. B. (2017). Konsep Dan Indikator Pembelajaran Efektif. In *Jurnal Kajian Pembelajaran dan Keilmuan* (Vol. 1, Issue 2, pp. 13–20).