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Increasing Interest in Learning Natural and Social Sciences of Grade III Elementary School Students Through a Problem Based Learning Model Assisted by Interactive Media

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Abstract
Students' interest in learning Natural and Social Sciences (IPAS) subjects in elementary schools remains relatively low, as indicated by the limited active participation of students during lessons, which affects the achievement of optimal learning outcomes. This issue is mainly caused by the lack of varied learning models and media, resulting in monotonous and less engaging learning activities. This study aims to improve the learning interest of Grade III students at SDN Tanjungrejo 05 in the IPAS subject through the application of the Problem Based Learning (PBL) model assisted by Educaplay Froggy Jumps, a web-based educational game. The research employed a Classroom Action Research (CAR) approach based on the Kemmis and McTaggart model, conducted in two cycles. Each cycle included four stages: planning, action implementation, observation, and reflection. Data were collected through observations of student activities and learning interest questionnaires administered before and after the actions. The collected data were analyzed using descriptive qualitative and quantitative techniques. The results indicated a significant increase in students' learning interest from the first to the second cycle. In the first cycle, the average learning interest reached 78%, increasing to 90% by the end of the second cycle. The use of the PBL model assisted by digital educational game media effectively enhanced students' attention, engagement, interest, and enjoyment in learning IPAS material. These findings suggest that integrating problem-based learning with interactive digital media can be an effective and enjoyable alternative strategy for increasing students' learning interest in elementary schools.

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Introduction

Basic education is a fundamental aspect that plays an important role in shaping the character and quality of human resources in the future (UNESCO, 2023). At the global level, basic education is one of the main pillars in the Sustainable Development Goals (SDGs), especially the fourth goal on quality education (United Nations, 2023). In the national context, basic education is a strategic part of preparing a generation that is adaptive to face the challenges of the era of globalization and technological development (Ministry of Education and Culture, 2022). Law Number 20 of 2003 concerning the National Education System emphasizes that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential (Republic of Indonesia, 2003). This shows that basic education not only aims to produce an intelligent generation, but also builds a strong and competitive character.

Interest in learning is an impulse in a person that is characterized by a feeling of pleasure, great attention, and motivation to learn something (Sirait in Martinus, 2024). Learning interests play an important role in determining the success of the learning process, because the higher the student's interest, the more likely they are to achieve optimal learning outcomes (Widayat in Martinus, 2023). In addition, recent research by Smith and Jones (2020) shows that students' learning interests are greatly influenced by learning methods, learning environments, and teachers' personal approaches. The right learning strategy has been proven to increase students' motivation and active participation, which has a direct impact on learning outcomes (Batistuta & Hardinata, 2024). Thus, interest in learning is an essential aspect that needs to be considered in the design of learning in elementary schools.

Based on the results of field observations at SDN Tanjungrejo 05, it was found that the interest in learning of grade III students in Natural and Social Sciences (IPAS) subjects is still relatively low. Most students are more passive, only listening to the teacher's explanation without the initiative to ask or answer questions (Prayoga et al., 2024). This is in line with the results of a study by Rahmayanti (2016) which states that students' low interest in learning is characterized by disinterest, boredom quickly, and reluctance to actively participate in learning activities. Furthermore, the results of the evaluation at the school show that there is still a lack of variety in the learning methods used by teachers, so that students quickly feel bored and lack enthusiasm (Batistuta & Hardinata, 2024). This condition indicates the need for innovation in learning strategies that can reawaken students' enthusiasm and interest in learning.

One of the relevant learning models applied to increase students' interest in learning is Problem-Based Learning (PBL) (Ardianti et al., 2021). PBL is a learning model that conditions students to face real problems that encourage them to think critically, creatively, and actively in finding solutions (Trianto, 2015). This approach refers to John

Dewey's thought that learning occurs through the interaction between stimuli and responses in the context of the real environment (Trianto, 2015). Popper (in Marra et al., 2014) also stated that life is a series of problem solving, so the PBL model is the right strategy to prepare students to face the dynamics of life. The results of research by Ardianti et al. (2021) show that the application of PBL can significantly increase student motivation and involvement.

In addition to the learning model, technology-based media plays a big role in increasing students' attractiveness to subject matter (Suryani, 2018). Elementary school-age children are at the concrete operational stage, where they need real visualization to make abstract concepts easier to understand (Piaget in Budiningsih, 2017). Arsyad (2017) explained that learning media functions as a tool for teachers in conveying learning messages in an interesting and interactive way. The use of digital-based educational media has been proven to increase students' motivation, attention, and understanding of the material taught (Sison, 2021). Therefore, the integration of interactive media in learning is one of the effective solutions to overcome students' low interest in learning.

Based on the author's experience when carrying out Field Experience Practice (PPL) at SDN Tanjungrejo 05, it was found that grade III students were less enthusiastic in participating in science learning. Most students appear passive, lack focus, and are reluctant to ask questions when the teacher explains the material (Prayoga et al., 2024). The lack of variety in learning methods and the sparseness of technology-based media integration cause students to quickly feel bored (Batistuta & Hardinata, 2024). In fact, IPAS material is very relevant to students' daily lives if presented with contextual methods and media (Ardianti et al., 2021). This condition encourages the author to look for alternative learning strategies that are more innovative and participatory.

Social studies subjects are often considered boring by students because there is too much material in the form of texts and long explanations (Batistuta & Hardinata, 2024). As a result, students are less interested and find it difficult to understand the concepts being taught. IPAS should be presented through a problem-based contextual approach to be closer to the daily lives of students (Trianto, 2015). Teachers have a role as facilitators who are tasked with creating an active, creative, and fun learning atmosphere (Suryani, 2018). With proper learning planning, social studies materials can be presented more interesting and able to increase students' interest and understanding (Arsyad, 2017).

Looking at the conditions at SDN Tanjungrejo 05, the problem of low interest in learning social studies in grade III students is a serious concern. The application of the Problem-Based Learning model combined with the interactive game media Educaplay Froggy Jumps is expected to increase student enthusiasm and involvement in learning (Batistuta & Hardinata, 2024). Educaplay Froggy Jumps is a web-based educational game that presents interactive and fun IPAS questions (Sison, 2021). Based on this description, the author decided to raise a research entitled "Increasing Interest in Learning Natural

and Social Sciences of Grade III Elementary School Students Through the Problem-Based Learning Model Assisted by Interactive Media Educaplay Froggy Jumps".

Method

This research is a Classroom Action Research (PTK) that aims to systematically improve the learning process and outcomes through a series of real actions in the classroom. The approach used is a mix method, which combines qualitative and quantitative approaches. The research design uses a spiral model from Kemmis and McTaggart which consists of four stages in each cycle, namely planning, implementation of actions, observation, and reflection. The research was carried out in two cycles in grade III of SDN Tanjungrejo 05 with a focus on actions in the form of increasing students' interest in learning in Natural and Social Sciences (IPAS) subjects through the application of the Problem Based Learning (PBL) model assisted by the media Educaplay Froggy Jumps. Qualitative data was collected through observation of student activities, field notes, and documentation, while quantitative data was obtained from a student learning interest questionnaire compiled using a four-choice Likert scale based on learning interest indicators according to Widayat (2023), namely attention, interest, engagement, and feelings of happiness. The research instrument was validated through expert judgment by two lecturers of elementary education experts and elementary school practitioners. The data analysis technique uses qualitative descriptive analysis for observation data and field notes, as well as quantitative descriptive analysis for questionnaire data by calculating students' actual scores and converting them into percentage categories according to Widoyoko (2009). Through this method, the research is expected to be able to provide a comprehensive picture of the increase in students' learning interest in each action cycle.

Results and Discussion

Results

The results of observations in grade III of Tanjungrejo State Elementary School 05 in the subject of Social Studies, it can be seen that students' interest in learning Social Science is still low. This condition occurs because teachers have not used game media in the learning process. The focus of this research is directed at the use of learning media that is more innovative and able to help achieve the goals of IPAS learning, namely developing students' potential to be more sensitive to social problems in society, have a positive mental attitude in improving social inequality, and be skilled in dealing with various daily problems. In addition, the application of more modern learning media is expected to increase students' interest in learning, so that learning goals can be achieved optimally.

Based on the data obtained, the researcher designed improvement actions to increase students' interest in learning through the application of the Problem Based Learning

model supported by technology-based game media, namely Educaplay Froggy Jumps, in science learning class III CHAPTER 7 "Stories from the Hometown". Topics covered include the History of Tradition or Culture in Indonesia and Traditional Values in Indonesia at SDN Tanjungrejo 05. The researcher carried out this action in two cycles, with the steps of planning, implementation, observation, and reflection. The application of the Problem Based Learning model with the help of interactive media based on technology games such as Educaplay Froggy Jumps has proven to be effective in increasing students' interest in learning, which can be seen from their higher enthusiasm in participating in learning and the creation of a more interactive classroom atmosphere with two-way communication. In addition, the increase in students' interest in learning can be seen from the results of the learning interest questionnaire which shows positive results after learning. More specifically, the increase can be seen in the graph of the percentage of students' learning interest which shows significant development from cycle 1 to cycle 2.

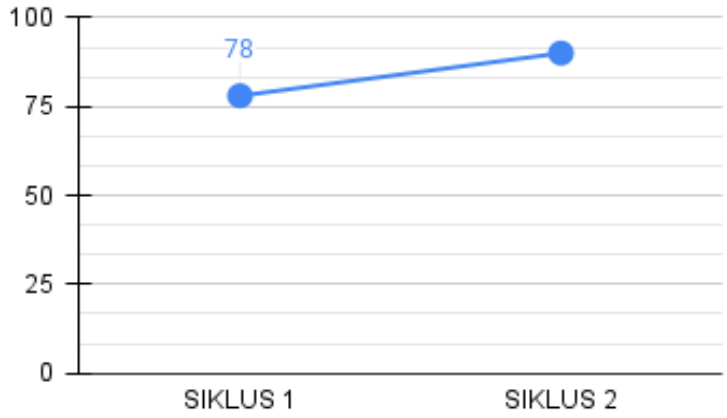

Figure 1. Increase in Students' Interest in Learning

Based on the images of the research results, it can be concluded that there was an increase in learning interest by 12% from cycle I to cycle II, where in cycle I the percentage of student interest in learning reached 78%, and increased to 90% in cycle II. These findings show that students' learning interests have developed positively during the implementation of the Problem Based Learning learning model with the help of technology-based game media, namely Educaplay Froggy Jumps. In detail, all indicators used in this study show an increase. Students' interest in learning is measured based on four indicators according to Safari in Ricardo & Melani (2017:190), namely: (1) feelings of pleasure, (2) student interest, (3) attention, and (4) student involvement. Each of these indicators has increased from cycle I to cycle II. In addition, an increase was also seen in the category of each indicator of learning interest. The following graph presents details of improvements in each of the indicators of student learning interest.

Table 1. Categories of Sentiment Indicators

No.	Category	CYCLE 1		CYCLE 2	
		Number of Students	Presentase	Number of Students	Presentase
1	Excellent	9	47	13	68
2	Good	3	15	4	21
3	Enough	5	26	2	11
4	Less	2	9	0	0
5	Low	0	0	0	0

In the indicator of feeling happy, there was an increase from cycle I to cycle II. In cycle I, the category "Very Good" was achieved by 9 students (47%), "Good" by 3 students (15%), "Sufficient" by 5 students (26%), and "Less" by 2 students (9%). After the evaluation and application of learning methods and the use of Educaplay Froggy Jumps media, the results in cycle II showed an improvement. In the indicator of feeling happy in cycle II, as many as 13 students (68%) were in the "Very Good" category, 4 students (21%) in the "Good" category, and 2 students (11%) in the "Sufficient" category out of all third grade students of SDN Tanjungrejo 05. Meanwhile, in the Attention indicator, there is also an increase from cycle I to cycle II, with details to be explained next.

Table 2. Categories of Attention Indicators

No.	Category	CYCLE 1		CYCLE 2	
		Number of Students	Presentase	Number of Students	Presentase
1	Excellent	8	42	12	63
2	Good	5	28	4	21
3	Enough	3	15	3	15
4	Less	3	15	0	0
5	Low	0	0	0	0

In the attention indicators, there was an increase from cycle I to cycle II. In the first cycle, 8 students (42%) were in the "Very Good" category, 5 students (28%) in the "Good" category, 3 students (15%) in the "Sufficient" category, and 3 students (15%) in the "Less" category. After evaluation was carried out through the application of learning methods and the use of Educaplay Froggy Jumps media, there was an increase in cycle II. In cycle II, as many as 12 students (63%) reached the "Very Good" category, 4 students (22%) were in the "Good" category, and 3 students (15%) were in the "Sufficient" category out of all third grade students of SDN Tanjungrejo 05. In addition, an increase also occurred in the indicators of interest, both from cycle I and cycle II, with details that will be explained in the following sections.

Table 3. Categories of Indicators of Interest

No.	Category	CYCLE 1		CYCLE 2	
		Number of Students	Presentase	Number of Students	Presentase
1	Excellent	10	53	13	68
2	Good	3	15	5	26
3	Enough	4	22	1	6
4	Less	2	10	0	0
5	Low	0	0	0	0

In the interest indicator, there was an increase from cycle I to cycle II. In the first cycle, as many as 10 students (53%) were in the "Very Good" category, 3 students (15%) in the "Good" category, 4 students (22%) in the "Sufficient" category, and 2 students (10%) in the "Less" category. After evaluation was carried out through the application of learning methods and the use of Educaplay Froggy Jumps media, the results in cycle II showed an increase. In cycle II, the interest indicator showed that 13 students (68%) were in the "Very Good" category, 5 students (26%) in the "Good" category, 3 students (9%) in the "Sufficient" category, with the note that there was one student (6%) who remained in the "Less" category, the same as in cycle I. All of this data came from grade III students of SDN Tanjungrejo 05. Improvements are also seen in the engagement indicators, with details of the comparison between cycle I and cycle II to be explained below.

Table 4. Categories of Engagement Indicators

No.	Category	CYCLE 1		CYCLE 2	
		Number of Students	Presentase	Number of Students	Presentase
1	Excellent	10	53	14	74
2	Good	4	21	4	21
3	Enough	3	15	1	5
4	Less	2	11	0	0
5	Low	0	0	0	0

In the involvement indicators, there was an increase in achievement from cycle I to cycle II. In the first cycle, as many as 10 students (53%) were in the "Very Good" category, 4 students (21%) in the "Good" category, and 3 students (15%) in the "Sufficient" category. After the evaluation and application of the Educaplay Froggy Jumps media, the results in the second cycle showed that as many as 14 students (74%) reached the "Very Good" category, 4 students (21%) were in the "Good" category, and 1 student (5%) was in the "Sufficient" category out of all third grade students of SDN Tanjungrejo 05.

Discussion

The implementation of this class action research consists of two cycles, each of which begins with a planning stage based on pre-cycle data. Initial observations showed that the interest in learning of third grade students of SDN Tanjungrejo 05 was still low, characterized by a lack of enthusiasm, low discussion participation, and dominance of conventional lecture methods. This finding is in line with the theory of learning motivation put forward by Deci & Ryan (2000) in Self-Determination Theory, that students' active involvement will increase if learning provides space for autonomy, competence, and social connectedness, which have not been fulfilled in pre-cycle conditions.

The Problem Based Learning (PBL) model was chosen because it conforms to the principles of constructivism according to Vygotsky (1978), which emphasizes that students build understanding through social interaction and real experiences. Educaplay Froggy Jumps interactive media is integrated into learning to increase student engagement through digital game-based activities. In cycle I, the observation results showed an increase in student enthusiasm, especially when using game media, with the highest group score reaching 80 and the lowest 65. However, obstacles were still found in the form of students' lack of focus during group discussions and difficulty understanding oral information. This strengthens the finding of Sari (2016) that elementary school children prefer direct activity-based learning rather than just listening to explanations.

In response to these conditions, in cycle II improvements were made by adding a variety of questions in the media and compiling the level of difficulty gradually. As a result, there was a significant increase in students' interest in learning, with the highest score reaching 95 and the lowest score of 70. Students also seem to be more active in asking questions (Fahmi, 2013), expressing opinions, and being more enthusiastic in solving problems according to their learning style (Auliana et al., 2021). These findings are in line with the opinion of Pangestu et al. (2020) that interactive media can accommodate the diversity of students' learning needs.

When compared to the results of Abidin & Purnamasari's (2023) research, which stated that game-based media is able to increase student participation by up to 85%, the achievement of 90% in this study shows higher effectiveness. However, these results need to be critically examined as they are influenced by classroom contexts, teacher involvement, and student characteristics that may not be uniform. In addition, Sandria et al. (2022) and Şenol & Akdağ (2018) also affirm that students' active involvement in problem-based learning and digital media is able to improve critical thinking skills and creativity. However, the study by Ma et al. (2023) states that the effectiveness of digital educational media can decrease if internet access is limited or devices are inadequate — a condition that escapes the discussion in this study. In fact, Educaplay Froggy Jumps

requires a stable internet connection, which can be an obstacle in schools with limited facilities.

Another limitation of this study is that the scope of the sample covers only one class in one school, so generalization of results to the wider population still needs to be proven through further research. In addition, the possibility of student participation bias due to enthusiasm for new media has not been fully controlled. For this reason, the next study needs to compare similar media in several schools with different infrastructure conditions, as well as test its durability over a longer period of time.

Overall, this study proves that the integration of the PBL model with Educaplay Froggy Jumps media is effective in increasing students' interest in learning science. This success is determined by the accuracy of the selection of media that suits the characteristics of the students, contextual problem-based learning, and group activities that encourage interaction between students. These results strengthen the theory of constructivism and learning motivation, while emphasizing the importance of teachers innovating technology-based media in active learning. As an implication, elementary school teachers are expected to use interactive digital media more regularly and integrate the PBL model to improve the quality of thematic learning. School policies should also start paying attention to the procurement of educational digital media that is adaptive to the needs of students and the condition of school infrastructure.

Conclusion

Based on the results of the research, it can be concluded that the application of the Problem Based Learning (PBL) model is effective in increasing the learning interest of elementary school students. Through active involvement in the process of seeking information and solving real problems, students gain first-hand knowledge and become accustomed to high-level thinking. The support of Educaplay Froggy Jumps technology-based game media also creates a fun and interactive learning atmosphere, thereby increasing students' interest and curiosity in learning materials. The increase in average learning interest from 78% in the first cycle to 90% in the second cycle shows the success of the implementation of this strategy. Therefore, it is recommended that elementary school teachers apply the PBL model regularly with the support of interactive digital media to increase interest in learning, and for further research can expand the study of the influence of PBL assisted by Educaplay on aspects of critical thinking skills, creativity, and learning outcomes, as well as develop similar media in various other subjects in elementary schools.

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Authors' Note

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

References

Abdu Mas'ud, S. (2019). Review of the implementation of Ptk based on a lesson study on FKIP lecturers at Khairun University of Ternate. Saintifik@, 1(2). http://ejournal.unkhair.ac.id/index.php/Saintifik/article/viewFile/1112/862

Abidin, Z., & Purnamasari, M. (2023). The role of teachers' social competence in fostering students' interest in learning (a non-negotiable must). Research and Development Journal of Education, 9(1), 513. https://doi.org/10.30998/rdje.v9i1.16900

Agustina, et al.2022, Pedagogical Content Knowledge Analysis of Science Teacher Books in Science Content of Elementary Schools Independent Curriculum. BASIC JOURNAL, 6(2) 9180 - 9187.

Andriyani, N. L., & Suniasih, N. W. (2021). Development of Learning Videos Based on Problem-Solving Characteristics of Animals and Their Habitats Contain in Science Subjects on 6th-Grade. Journal of Education, 5(1), 37–47. Ariyani et al. 359 https://doi.org/http://dx.doi.org/10.23887/jet.v5i1.32314.

Apriwati Resi. 2024. Analysis of the Problem Based Learning (PBL) Learning Model as an Increase in Students' Learning Interest in PPKn Learning in Elementary Schools.AL-DYAS: Volume 3, Number 2, June 2024; 852-858) https://doi.org/10.58578/aldyas.v3i2.3235.

Arsyad, Azhar. 2017. Learning Media. Jakarta : Rajagrafindo Persada

Arthur, J., Grainger, T., Wray, D., & Education, L. (2006). Learning to Teach in the Primary School. In Learning to Teach in the Primary School (First publ). Routledge. https://doi.org/10.4324/9780203007129

Auliana, D. F., Hakim, A. R., Triwayuningtyas, D., Yulianti, Y., Yaakob, M. F. M., & Wulandari, D. (2021). The Influence Of Interactional Teaching Style On The Independence Characters Of Elementary School Students. Al-Bidayah: Journal of

Islamic Basic Education, 12(2), 151–164. https://doi.org/10.14421/al-bidayah.v12i2.576

Baihaqi, M.R,, Rustono W.S., Lidinillah,D, A, M. (2018) Development of Nusantara Card Media for Social Studies Learning Class IV SDN on Ethnic and Cultural Diversity Material. Scientific journal of elementary school teacher education- Vol. 5, No. 2 (2018) 47-58 http://ejournal.upi.edu/index.php/pedadidaktika/index .

Batitusta,F, O&Hardinata,V. (2024). The Effect of the Implementation of Gadget-Based Educaplay Educational Game Media on the Learning Outcomes of Essay Writing. JIIP (Scientific Journal of Education) Volume 7, Number 3, March 2024.

Dekkers, R., Carey, L., & Langhorne, P. (2022). Making Literature Reviews Work: A Multidisciplinary Guide to Systematic Approaches. In Making Literature Reviews Work: A Multidisciplinary Guide to Systematic Approaches. https://doi.org/10.1007/978-3-030-90025-0

Fahmi, Z. (2013). Active Learning Indicators in the context of implementing the Active, Creative, Effective, and Fun Learning Approach (Pakem). Al-Ta lim Journal, 20(1), 278–284. https://doi.org/10.15548/jt.v20i1.24

Fatahullah, M. M., (2016). The Influence of Learning Media and Creative Thinking Ability on Social Studies Learning Outcomes. Journal of Basic Education Volume 7 Edition December 2, 2016

Law Number 20 of the Year (2003). About the National Education System, Jakarta: Ministry of National Education.

Ma, S., Tiruneh, D. T., & Spector, J. M. (2023). Critical thinking conceptualization in K-12: A case study of middle school teachers. Social Sciences and Humanities Open, 8(1), 100517. https://doi.org/10.1016/j.ssaho.2023.100517

Mulyaningrum., et.al, 2023. Increasing Interest in Learning Science Using the Problem Based Learning (PBL) Model with a Teaching at The Right Level (TaRL) Approach in Grade VII H SMPN 22 Semarang Students. Indonesian Science Educators Association, 920-932.

Pangestu, I. A., Yulianti, & Sulistyowati, P. (2020). Analysis of 21st Century Character Education in Grade V Students of SDN 3 Mulyoasri, Malang Regency. PGSD National Seminar UNIKAMA, 4 (September), 1–7. https://conference.unikama.ac.id/artikel/

Pratiwi & Sujarwo, 2024. The Effect of the Problem Based Learning (PBL) Model on Students' Learning Interest with the Help of Visual Media on the Weather Theme in Grade III of SD Negeri 104280 Pulau Gambar. Scientific Journal of Basic Education, 9(4), 299-308.

Rosyidah, I., & Fitriyani, T. (2020). Active Learning Type Card Sort Method in Improving Student Achievement. Atthulab: Islamic Religion Teaching and Learning Journal, 5(2), 175–182. https://doi.org/10.15575/ath.v5i2.9480

Sari, D. P. (2016). Development of LKPD Based on Generative Learning in Biology Learning. IAIN Repository Batusangkar, 7(2), 1–23.

Şenol, C., & Akdağ, M. (2018). The relation between prospective teachers' attitudes towards uncertainty and motivation in teaching. Education Sciences, 8(3). https://doi.org/10.3390/educsci8030122

Smith, J. (2019). The Impact of Technological Advancements on Education. Journal of Educational Technology, 15(3), 123-135.

Suciptaningsih, O. A., Fajarianto, O., & Rahayu, W. (2024). Assistance in creating metaverse-based renewable learning media for elementary school teachers. 13(2), 1385–1395.

Suseno, W., Yuwono, I., & Muhsetyo, G. (2017). Improvement of the activeness and learning outcomes of grade VIII students on the material of the two-variable linear equation system with TGT cooperative learning. Journal of Education: Theory, Research, and Development, 2 (10), 1298– 1307. http://journal.um.ac.id/index.php/jptpp/article/view/10061

Tarigan, et al. (2022). Ki Hajar Dewantara's Philosophy of Education and the Development of Education in Indonesia. Mahaguru: Journal of Elementary School Teacher Education Vol. 3– No. 1, year (2022), pages 149-159

Yulianti. (2019). Development Of Substance Material E-Booklet Media To Improve The Character Of Students Of Sd Islamic Global School Malang. Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology, 224(11), 122–130.