Profile of Learning Outcomes and Student Activity in Learning Natural Sciences at SMPN 2 Karangawen

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Abstract: This article as a literature review aims to understand the characteristics of learning achievement and the level of student participation in the Natural Sciences learning process. At SMPN 2 Karangawen. The fact that in the field many students experience difficulties when learning and are not active when there is material they don't understand, this is what prompted researchers to find out the learning outcomes and student activity in science learning at SMPN 2 Karangawen. This research uses descriptive qualitative methods and the subjects of this research involve 31 students in class IX of SMPN 2 Karangawen. Sample selection in this research was carried out using a simple random sampling method. Information collection was carried out using the activity questionnaire method and recording learning outcomes. In this research, descriptive statistical analysis techniques were used to analyze the data. The findings show: 1) Recording of science learning outcomes through the classroom observation method is quite 42%. 2) The profile of student activity in science learning can be categorized as less active because only 2 instruments are included in the good category, namely seen from the results of visual activities 53% and writing activities 71%. At the same time, there are 3 indicators that fall into the category, namely oral activities 63%, listening activities 65%, and activity metrics 57%.

Keywords: Aktiveness; Learning outcomes and science learning

Introduction

Amaliah (2016) and Asbar et al. (2023) in her research, she stated that the level of students' understanding of science learning is low because students tend to be inactive in the learning process, while teachers dominate all learning activities. Education is very vital in the life of every individual. Education not only helps humans become more qualified, but is also a crucial element in efforts to build a country. The learning process does not only take place in the classroom. Apart from efforts to strengthen human resources (HR) and develop the economic sector of a country, many skilled people can become the driving force for the country's progress. Thus it is clear that education aims to train qualified people. The

educational process in schools takes place in the form of teaching and learning. The main essence of learning is student learning. Learning means changing and improving cognitive, emotional, and psychomotor abilities to achieve high learning outcomes. Students' cognitive abilities can be demonstrated through their activities, independence, and learning abilities in class. Carrying out teaching and learning activities to improve students' cognitive abilities is not easy.

Natural science, also known as natural science, is a field of study that includes observation, experimentation, and research on natural phenomena. This science covers a variety of disciplines, including physics, chemistry, biology, and astronomy. The main goal of natural science is to understand how the universe works and why natural phenomena occur. This science

focuses on research on natural events and the systems of the universe, covering fields of study such as physics, chemistry, biology, and geology. Natural science learning is a crucial component of teaching in schools. educational curriculum to understand the universe and natural phenomena that occur around us. According to Suyadi (2014), Handayani et al. (2015) and Syahmani et al. 2022) Natural Science Learning (IPA) emphasizes providing direct learning experiences through the application and improvement of process skills and scientific attitudes. Natural Science (IPA) involves various subjects such as physics, chemistry, biology, and geology. According to Wisudawati (2017), Tawil & Liliasari (2013), and Devi (2010) This aspect includes mentality, which can generate interest in phenomena, objects, living organisms, and their causal relationships; methods, allowing steps through scientific procedures in solving problems; results of science such as data, bases, theories, and laws; and use, namely applying scientific procedures related to science concepts in everyday life.

Science learning approaches usually emphasize experimentation, observation, and problem solving. Effective science learning combines these approaches and methods to stimulate students' interest in science and develop important skills such as critical thinking, problem solving, and collaboration. Learning outcomes are achievements, progress or accomplishments achieved by students during the learning process. This term covers various aspects, from understanding concepts to mastering skills, including the development of attitudes and values. Learning outcomes reflect the extent to which students can absorb learning materials and apply them in relevant contexts. According to Saifi et al. (2024), Susanto et al. (2016), Ariyani et al. (2023), and Ogilvie (2009), learning outcomes are changes that occur in students, both concerning cognitive, affective and psychomotor aspects as a result of learning activities.

In the world of education, learning outcomes include several aspects, including cognitive, affective, and psychomotor aspects. In the learning process, these aspects are always emphasized and formed by educators, in this case teachers as mentors or sources of knowledge for students at school. Student activities play an important role in the learning process. Student performance can be demonstrated through various activities such as participating in class discussions, doing homework seriously, asking questions to clarify understanding, and interacting actively in learning. These activities play an important role in helping students deepen their understanding of the subject matter and develop the skills needed for academic success. According to Usman (2016), Anwar (2018), Suyanto et al. (2013), Mulyasa (2011), Alexandro et al.

(2021), Conradty et al. (2020), Karwati et al. (2014), learning activities are divided into five activities, namely: (1) visual, (2) oral; (3) listening, (4) movement, and (5) writing. Learning activities like this can stimulate and develop students' talents and interests.

Some things that can affect how active students are in class include teaching methods, classroom atmosphere, student interest in the lesson, and support from teachers and classmates. Therefore, teachers need to create a learning atmosphere that will motivate and support student participation. Activeness in this case refers to physical and mental involvement in the learning process in order to achieve success in the process (Maharani & Kristin, 2017; Ridwan et al., 2023; Maret & Syarifuddin, 2021; Yuliasari, 2023; Sari, 2023; Pramiasari et al., 2022; Olivia et al., 2022; Purnama et al., 2022; Srirahayu et al., 2018; Rerung et al., 2017; Ewisahrani et al., 2020; Rahayu et al., 2015; Bayuningsih et al., 2017). Strategies that can increase student activeness include: 1) Using a variety of interesting and diverse teaching techniques, such as group discussions, collaborative projects, or game-based learning, 2) can improve students' learning experiences. Providing supportive and optimistic input to encourage active involvement. 3) Creating a friendly and supportive classroom environment, where students feel safe to participate without fear of demeaning criticism. 4) Connecting learning materials with students' personal interests and experiences in order to increase their participation. 5) The use of technology in the learning process aims to increase reach and arouse students' interest through platforms that they like. By implementing these strategies, educators can help increase students' levels of engagement, thereby creating a dynamic and productive learning environment.

Active involvement of students in the learning process is important in learning activities. Involving students directly in understanding, interpreting, and applying the information provided in the learning process. Active learning goes beyond simply receiving information, involving processes, critical thinking, and application of concepts. According to Paolina (2015) states that active learning occurs when the material is relevant to students' lives. The level of involvement in learning can vary from one student to another, depending on a number of factors such as interest in the subject, learning patterns, enthusiasm, and learning situations. However, there are several methods that can be used to increase participation in the learning process: active participation, project-based learning, discussion and debate, cooperative learning, application of concepts, reflection, use of technology. By incorporating these plans into teaching methods, teachers can create a learning environment that encourages students to be

active in the learning process, strengthen their understanding, and improve academic achievement.

Research conducted by Maulyda et al. (2020), Wilkinson et al. (2018), Triana et al. (2019), Sur et al. (2016), Dina (2019), Na'im et al. (2024), Cholily et al. (2020), found this when conducting observations in class III of SD Inpres Ana Gowa. Some students seemed less focused when the teacher explained and they temporarily ignored the tasks given. To achieve quality learning standards, teachers can ensure that the learning methods used are in accordance with student needs and the teaching and learning process.

The facts in the field state that many students experience difficulties during learning and are not active when there is material that is not well understood, the majority of students have poor learning outcomes in science subjects, this is because students are afraid to ask questions and students' lack of understanding of the material presented is also a factor in low student learning outcomes, poor teacher communication will also have an impact on students who are not actively asking questions, this is what prompted researchers to find out the learning outcomes and student activity in science learning at SMPN 2 Karangawen.

Method

This study used a questionnaire to measure the level of student participation and data recording to track student learning progress. The research method used was descriptive based on numbers, by applying purposive sampling, a sample of 31 students in class IX B at SMPN 2 Karangawen was obtained.

The data collection process was carried out by using questionnaires and Natural Science learning reports produced by subject teachers. The results of this study were examined using descriptive statistical analysis methods. In order to obtain optimal results and a picture

in the form of data that describes the profile of learning outcomes and student activity in science learning.

Result and Discussion

From the results of the research that has been carried out, the following data were obtained.

Table 1. Average Student Learning Outcomes

	Score
Minimum score	55
Maximum score	86
Average	73.84
Std. deviation	9.568
Total	2289

From the average results above, the minimum value of student learning outcomes is 55, the maximum value is 86, with an overall average of 73.84 and a Standard Deviation of 9.568 and a total value of 2289.

Table 2. Student Learning Outcomes

Score interval	Category	Description	Total	%
91-100	A	Very good	0	0.0
81-90	B	Good	8	25.8
72-80	C	Enough	13	41.9
< 71	D	Less	10	32.26
		Total	31	100

From the results of student learning, it is known that students with a range of 91-100 scores are 0%, meaning that there are no students who have a score in the category "A", 81-90 is 25.8%, meaning that 8 students get a score in the category "B", 72-80 is 41.9%, meaning that 13 students get a score in the category "C", and <71 is 32.3%, meaning that 10 students get a score in the category "D". This shows that only 8 students from a sample of 31 students got a score in the category "B" (Good) while 23 students are still considered to need to improve their learning outcomes.

Table 3. Results of Student Activity in Visual Activity Category

Question Category	Answer				Total
	3AM	2AM	1AM	3ATM	
Pay attention to the teacher	13	18	0	0	31
Observing the experiments carried out	11	20	0	0	31
Observing the Lesson slides	11	18	2	0	31
Observing the demonstration carried out by the teacher	13	17	1	0	31
Average	12.00	18.25	0.75	0.00	124.00
Percentage (%)	39	59	2	0	100

Meanwhile, the results of the survey discussing student activities in science learning at SMPN 2 Karangawen in the visual activity category obtained results as in table 3.

From the results of the survey of the category of visual activities carried out in science learning, it was stated that as many as 39% of students fulfilled the 3 aspects referred to in visual activities, 59% fulfilled the 2 aspects referred to in visual activities, 2% of students

only fulfilled 1 aspect in visual activities, these results prove that the results of the survey of visual activities carried out in science learning are in the good category.

The results of the survey discussing student activity in science learning at SMPN 2 Karangawen in the oral activity category obtained results as in table 4. From the survey results of the oral activity category carried out in science learning, it was stated that as many as 15% of students fulfilled the 3 aspects referred to in oral activities, 22% fulfilled the 2 aspects referred to in oral activities, 37% of students only fulfilled 1 aspect in oral activities and 26% of students did not fulfill the 3 aspects referred to in oral activities, these results prove that the results of the survey of oral activities carried out in science learning are in the less active category.

Table 4. Results of Student Activity in the Oral Activity Category

Question Category	Answer				Total
	3AM	2AM	1AM	3ATM	
Willingness to ask questions	5	8	10	8	31
Willingness to answer	4	10	14	3	31
Expressing opinions	5	6	9	11	31
Discuss with friends	5	3	13	10	31
Average	4.75	6.75	11.50	8.00	124.00
Percentage (%)	15	22	37	26	100

Table 5. Results of Student Activity in the Listening Activity Category

Question Category	Answer				Total
	3AM	2AM	1AM	3ATM	
Listening to the teacher	5	8	11	7	31
Listening to lesson materials	5	3	16	7	31
Listening to group discussions	7	3	12	9	31
Listening to a friend's explanation	6	6	11	8	31
Average	5.75	5.00	12.50	7.75	124.00
Percentage (%)	19	16	40	25	100

The results of the survey discussing student activity in science learning at SMPN 2 Karangawen in the listening activity category obtained results as in table 5. From the results of the survey of the listening activity category carried out in science learning, it was stated that as many as 19% of students fulfilled the 3 aspects referred to in listening activities, 16% fulfilled the 2 aspects referred to in listening activities, 40% of students only fulfilled 1 aspect in listening activities, and 25% of students did not fulfill the 3 aspects referred to in listening activities. These results prove that the results of the survey of listening activities carried out in science learning fall into the less active category.

The results of the survey discussing student activity in science learning at SMPN 2 Karangawen in the writing category obtained results as in table 6. The results of the survey discussing student activeness in science learning at SMPN 2 Karangawen in the matrix activity category obtained results as in table 7.

Table 6. Results of Student Activity in Writing Activity Category

Question Category	Answer				Total
	3AM	2AM	1AM	3ATM	
Taking notes on lesson materials	8	23	0	0	31
Carry out a task	6	23	2	0	31
Making a summary and conclusion	7	22	2	0	31
Recording the results of group work	9	20	2	0	31
Average	7.50	22.00	1.50	0.00	124.00
Percentage (%)	24	71	5	0	100

Table 7. Student Activity Results Metrix Activity Category

Question Category	Answer				Total
	3AM	2AM	1AM	3ATM	
Conducting experiments with the group	3	7	16	5	31
Preparing the tools for the experiment	6	6	11	8	31
Using tools properly	6	5	11	9	31
Tidying up the experimental equipment	5	15	6	5	31

Question Category	Answer				Total
	3AM	2AM	1AM	3ATM	
Average	5.00	8.25	11.00	6.75	124.00
Percentage (%)	16	27	35	22	100

From the survey results of the matrix activity category conducted in science learning, it was stated that as many as 16% of students fulfilled the 3 aspects referred to in the matrix activity, 27% fulfilled the 2 aspects referred to in the matrix activity, 35% of students only fulfilled 1 aspect in the matrix activity and 22% did not fulfill the 3 aspects referred to in the matrix activity, these results prove that the results of the survey of writing activities conducted in science learning fall into the less active category.

Conclusion

From the results of the research that has been conducted, the researcher concluded that seen from the results of the science learning conducted, it states that the profile of science learning outcomes in class XI students at SMPN 2 Karangawen is that students with good learning outcome qualifications have a percentage of 25.8% and the rest are students with the category of needing learning improvement as much as 74%. While the results of the student activity profile in science learning can be categorized as less active because only 2 instruments are included in the good category, namely seen from the results of visual activities 53% and writing activities 71% while there are 3 indicators that fall into the less category, namely oral activities 63%, listening activities 65%, and metrix activities 57%.

Conflicts of Interest
All author declares that there is no conflicts of interest.

References

Alexandro, R., Misnawati, & Wahidin. (2021). *Profesi Keguruan (Menjadi Guru Profesional).* Palangka Raya: Guepedia.

Amaliah. (2016). Penerapan Pendekatan Keterampilan Proses untuk Meningkatkan Hasil Belajar Sains Alat Pernapasan pada Manusia Dan Hewan Kelas V SDN 3 Toaya. *Jurnal Kreatif Tadulako*, 4(8). https://journal.unnes.ac.id/sju/index.php/article/view/28247

Anwar, M. (2018). *Menjadi Guru Profesional*. Jakarta: Prenadamedia Group.

Ariyani, S. N., Jumyati, Yuliyanti, Nulhakim, L., & Leksono, S. M. (2023). Scientific Approach to Learning Science in Elementary Schooles. *Jurnal Penlitian IPA*, 9(8), 6659-6666. https://doi.org/10.29303/jppipa.v9i8.3680

Asbar, R. F., Marta, R., & Fadhilaturrahmi. (2023). Peningkatan Keterampilan Proses Sains dengan Menggunakan Model Somatic Auditory Visual Intelectual (SAVI) di Sekolah Dasar. *Jurnal Ilmiah Pendidikan Madrasah Ibtidaiyah*, 7(1), 1-12. https://doi.org/10.35931/am.v7i1.1452

Bayuningsih, A. S., Usodo, B., & Subanti, S. (2017). Analysis of Junior High School Students' Problem-solving Ability Reviewed Froms Self-regulaterd Learning. *International Journal of Science and Applied Science: Conference Series*, 2(1), 51-56. http//doi.org/10.20961/ijsascs.v2i1.16678

Cholily, Y. M., Kamil, T. R., & Kusgiarohmah, P. A. (2020). Secondary School Students' Error of Term of Algebraic Forms Based on Mathematical Communication. *Aksioma: Jurnal Program Studi Pendidikan Matematika*, 9(2). http//dx.doi.org/10.24127/ajpm.v9i2.2687

Conradty, C., & Bogner, F. X. (2020). STEAM Teaching Professional Development Work: Effects on Student. *Smart Learning Environments*, 7(1). https://doi.org/10.1186/s40561-020-00132-9

Devi, K. P. (2010). *Metode-Metode dalam Pembelajaran Ilmu Pengetahuan Alam.* Bandung: Pusat Pengembangan dan Pemberdayaan Pendidik dan Tenaga

Dina, Z. H., Ikhsan, M., & Hajidin, H. (2019). the Improvement of Communication and Mathematical Disposition Abilities Through Discovery Learning Model in Discovery Learning Model in Junior High School. *Journal of Research and Advances in Mathematics Education*, 4(1), 11-22. https://doi.org/10.23917/jramathedu.v4i1.6824

Ewisahrani, Widia, Fathurrahmaniah, Arwan, Haris, A., & Islamiah, M. (2020). Penerapan Model Project Based Learning untuk Meningkatkan Pemahaman Konsep IPA Siswa SMP. *Jurnal Pendidikan Ilmu Pengetahuan Alam*, *1*(2), 1-4. https://doi.org/10.56842/jp-ipa.v1i2.11

Handayani, A. Y., Nur, M., & Rahayu, Y. S. (2015). Pengembangan Perangkat Pembelajaran IPA SMP dengan Model Inkuiri untuk Melatihkan Keterampilan Proses pada Materi Sistem Pencernaan Manusia. *Jurnal Pendidikan Pascasarjana Universitas Negeri Surabaya*, 4(2), 681-692. https://doi.org/10.26740/jpps.v4i2.p681-692

Karwati, E, & Priansa, J. D. (2014). *Manajemen Kelas (Classroom Management) Guru Profesional yang Inspiratif, Kreatif, Menyenangkan dan Berprestasi.* Bandung: Alfabeta

Maharani, Desta, O., & Kristiani, F. (2017). Peningkatan Keaktifan dan Hasil Belajar IPA Melalui Model Pembelajaran Problem Based Learning (PBL). *Wacana Akademik Majalah Ilmiah Pendidikan*, *6*(29), 29. Retrieved from https://journal.unnes.ac.id/sju/index.php/articl e/view/21351

Maulyda, A. M., Hidayati, V. R., Erfan, M., Umar, & Sutisna, D. (2020). Kesalahan Komunikasi Matematis (Tertulis) Siswa Ketika Memahami Soal Cerita. *Jurnal karya Pendidikan Matematika*, *7*(1), 1-7. https://doi.org/10.26714/jkpm.v7i1.2020.

Maret, M.., & Syarifuddin, H. (2021). Penggunaan Model Pembelajaran Problem Based Learning untuk Meningkatkan Aktivitas dan Hasil Belajar Matematika Siswa Kelas VI Sekolah Dasar. *JEMS (Jurnal Edukasi Matematika dan Sains)*, *9*(1), 106-112. https://doi.org/10.25273/jems.v9i1.8746

Mulyasa, E. (2011). *Menjadi Guru Profesional: Menciptakan Pembelajaran Kreatif dan Menyenangkan*. Bekasi: Rosda

Na'im, Z. N., & Mukhlis, M. (2024). Exploratian of Students' Mathematical Communication Abilities. *Jurnal Riset Pendidikan Matematika*, *11*(1), 41-52. https://doi.org/10.21831/jrpm.v11i1.66639

Ogilvie, C. A. (2009). Changes in Students' Problem-solving Strategies in a Course that Includes context-rich, Multifaceted Problem. *Physical Review Special Topich Physics Education Research*, *5*, 020109. https://doi.org/10.1103/PhysRevSTPER.5.020102

Olivia, M., Ananda, D., & Indarini, E. (2022). Kajian Meta Analisis: Meningkatkan Hasil Belajar Siswa Sekolah Dasar dengan Model Problem Based Learning. *Edukasiana: Jurnal Inovasi Pendidikan*, *1*(3), 126-134. https://doi.org/10.56916/ejip.v1i3.130

Paolina, A. (2015). Enhancing teaching Effectiveness and Student Learning Outcome. *Journal of Effective Teaching*, *15*(1), 14. Retrieved from https://www.uncw.edu/cte/et

Pramiasari, A. D., Muslim, A., & Supriatna, S. (2022). Problem Based Learning in Elementary School: The Study of Curiosity and Mathematics Communication Ability. *Jurnal of Innovation and Research in Primary Education*, 1(1), 1-6. https://doi.org/10.56916/jirpe. v1i1.27

Purnama, A., Kamarudin, & Hairudin (2022). Peningkatan Hasil Belajar Melalui Model Pembelajaran Probelem Based Learnng (PBL) Siswa Kelas VI SD Negeri 276 Latappere. *Pinisi Journal Pendidikan Guru Sekolah Dasar*, *2*(3). https://doi.org/10.70713/pjp.v2i3.30012

Rahayu, R., Endang, W., & Laksono, F. X. (2015). Pengembangan Perangkat Pembelajaran Berbasis Problem Based Learning di SMP. *Jurnal Kependidikan*, *45*(1), 29-43. https://doi.org/10.21831/jk.v45i1.7184

Ridwan, M. F. A., Anjarini, T., & Ngaziziah, N. (2023). Multimedia Interaktif Berbasis Problem Based Learning pada Materi Ciri-ciri Makhluk Hidup Bagi Siswa Sekolah Dasar. *Edukasiana: Jurnal Inovasi Pendidikan*, *2*(1), 56-63. https://doi.org/10.56916/ejip.v2i1.218

Rerung, N., Sinon, I. L., & Widyaningsih, S.W. (2017). Penerapan Problem Based Learning (PBL) untuk Mneingkatkan Keaktifan Belajar Peserta Didik SMA pada Materi Usaha dan Energi. *Jurnal Ilmiah Pendidikan Fisika Al-Biruni*, *6*(1), 47-55. https://doi.org/10.24042/jpifalbiruni.v6i1.597

Saifi, A. G., Zuhair, N. K., & Affouneh, S. (2024). the Effect Using Community- Based Learning Program in Science Students' Achievent According to Kolb's Learning Styles. *Social Sciences and Humanities Open*, *10*(1), https://doi.org/10.1016/j.ssaho.2024.101125

Sari, M., & Rosidah, A. (2023). Implementasi Model Problem Based Learning (PBL) Terhadap Hasil Belajar IPS SD. *Jurnal Ilmiah Pendidikan Indonesia*, *2*(1), 8-17. https://doi.org/10.56916/jipi.v2i1.307

Srirahayu, E., Palobo, M. N. N., Riyana, M., & Johanis, D. (2018) Penerapan Pendekatan Scientific dengan Model Problem Based Learning untuk Meningkatkan Sikap dan Prestasi Belajar IPAS Peserta Didik SMP Negeri 9 Marauke. *Jurnal Magistra*, *5*(1), 15-25. Retrieved from https://journal.unnes.ac.id/sju/index.php/articl e/view/268213993

Sur, B., & Delice, A. (2016). the Examination of Teacher Student Communication Process in the Classroom: Mathematical Communcation Process Model. *SHS Web of Conferences*, 26:01059. https://doi.org/10.1051/shsconf/20162601059

Susanto, E., & Retnawati, H. (2016). Perangkat Pembelajaran Matematika Bercirikan PBL untuk Mengembangkan Hots Siswa SMA. *Jurnal Riset Penidikan Matematika*, *3*(2), 189-197. https://doi.org/10.20831/jrpm.v3i2.10631

Suyadi. (2014). "Efektifitas Pengembangan Perangkat Pembelajaran Presedur Pemahaman Konsep yang Dimodifikasi dalam Pembelajaran IPA SD. *Jurnal Pendidikan Dasar*, *4*(1).

Suyanto, & Jihad, A. (2013). *Menjadi Guru Profesional: Strategi Meningkatkan Kualifikasi dan Kualitas Guru di Era Global*. Jakarta: Erlangga.

Syahmani, Rusmansyah, & Kartika, D. (2022). Meningkatkan Kognisi dan Keterampilan Metakognisi Peserta Didik pada Konsep Kelarutan dan Hasil Kali Kelarutan. *Quantum Jurnal Inovasi Pendidikan Sains*, *13*(1), 49. https://doi.org/10.20527/quantum.v13i1.11691

Tawil, M., & Liliasari. (2013). *Berpikir Kompliks dan Implementasi dalam Pembelajaran IPA*. Makasar: Universitas Negeri Makasar.

Triana, M., & Zubainur, C. M. (2019) Students Mathematical Communcation Ability Through the Brain-Based Learning Approach Using Autograph. *Journal of Research and Advances in Mathematics Education*, *4*(1), 1-10. https://doi.org/10.23917/jramathedu.v4i1.6972

Usman, M. U. (2016). *Menjadi Guru Professional*. Bandung: Remaja Rosdakarya.

Wilkinson, L. C., Bailey, A. L., & Maher, C. A. (2018). Students Mathematical Reasoning, Communication and Language Representations: A Video Narative Analysis. *Ecnu Review of Education*, *1*(3), 1-22. https://doi.org/10.30926/ecnuroe2018010301

Wisudawati, A. W., & Sulistyowat, E. (2017). *Metodologi Pembelajaran IPA*. Jakarta: PT. Bumi Aksara.

Yuliasari, I. (2023). Model Pembelajaran Problem Based Learning untuk Meningkatkan Hasil Belajar IPS SD. *Buletin Ilmiah Pendidikan*, *2*(2), 171-178. https://doi.org/10.56916/bip.v2i2.514