



Exploring The Impact of Self-Directed Learning and Effective Study Routines on Science Proficiency in Fifth-Grade Students

Maria Kartini¹ Erma Suryani Sahabuddin² Manggasali Manggasali³ Marselina Lipat Kian⁴ Yohana Sarina⁵ Emanuel Sangaji Kein⁶ Maria Margareta Hayoh⁷ Nona Sadra Burhan⁸ Rahmatiah⁹ Maria Kartini⁹ Nazwar Muslan¹⁰

¹SDK Habi

²Universitas Negeri Makassar

³SDN 062 Pallempong

⁴SD Inpres Sagu

⁵SDK 1 St. Tarsisius Lewoleba

⁶SDN Ongalereng

⁷SD Inpres Balela

⁸SDN Waiwerang

⁹SDN Karang Indah

¹⁰UPT SPF SDN Kompleks IKIP 1 Makassar

ermasuryani@unm.ac.id

Abstract. The present study is a quantitative research endeavor that aims to investigate the following research questions: (1) What is the overview of learning freedom in Science Class V and how does it relate to learning outcomes in elementary school? (2) What are the study habits of Science Class V students in elementary school? (3) How does the study habit variable relate to science learning outcomes in Class V elementary school? (4) Are Science students inclined to enjoy learning freedom, and if so, how does it relate to learning outcomes? The variables under scrutiny are learning freedom (x1), study habits (x2), and science learning outcomes (y). The population for this study is 76 students, while a sample of 60 was selected using random sampling techniques. Data was collected through questionnaires and documentation tools. Findings indicate that there is no statistically significant relationship between learning freedom and science learning outcomes among grade V students in Bulukumba Regency. Similarly, the study habit variable was found to have no significant influence on science learning outcomes among grade V students in Bulukumba Regency. Based on these results, it can be concluded that there is no significant relationship between independence, science learning habits, and science learning outcomes among students attending SD Negeri Bulukumba.

Keywords: Self directed learning, routines, science,

1 Introduction

Education is one of the roles that can realize the nation's ideals. Education has become a very important and fundamental aspect for everyone. Therefore, every person or individual has the right to receive training to improve the quality of citizens in various ways, School education is based on the curriculum. "Curriculum is the design and implementation of education and teaching". It is expected that the implementation of education allows students to carry out various learning activities to encourage growth and development by the established educational goals. Science subjects are one of the subjects inherent in elementary school teaching [1]–[3][4]

Ideal and effective science learning in elementary school must be able to develop various aspects such as aspects of cognition by learning to argue critically, creatively, and actively. These aspects should be able to solve natural science problems. Science learning outcomes are very important because they can describe the limits of students' abilities in following the learning process, knowing the learning objectives set, preparing students to face various changes and life and logically being able to develop critical, careful, rational, honest and effective thinking. These things can make it easier for teachers to determine the next steps that can be given to students [5][6].

One factor that can affect the success rate of science students is the learning freedom factor, which comes from the students themselves. In addition to learning freedom, study habits are one of the other factors that affect learning outcomes. Self-teaching, carried out by students at school and home, guides the formation of good study habits. Every student has different habits [4], [6], [7]. Some students have good study habits and some who don't. Students who have good habits will also look good for themselves. Herein lies the role of a teacher who can create and teach students learning habits, even if it is not easy.

Based on information obtained by researchers through an interview process with Class V B teachers in elementary schools. Bulukumba Regency was informed that students' freedom and learning habits are still quite low and require parental guidance and supervision. This is evident during the learning process and assignments, which still require parental guidance, and the role of the teacher in reminding the schedule of the limits of submitting assignments at all times, and sometimes some students are late but still do not. The students still do not have their responsibilities, as shown by some students who do not complete assignments despite being instructed[8]–[10]. The lack of freedom of students in doing assignments can be observed because some students do not submit assignments given by the teacher.

Self-study, discovery, and accumulation of knowledge and skills by learners with very limited help from their teachers. Merdeka Belajar is an active learning activity created through the provision of knowledge or competence to determine both learning time, place of study, learning methods, and evaluation of learning carried out by students. Based on an attitude of independence, students are expected to be able to choose their life path to be able to develop for the better [11]–[14]. Students can take initiative, overcome problems and obstacles, and have the confidence to do things independently without the help of others with a sense of responsibility. Freedom of learning is an awareness activity of students who want to learn from the environment without coercion, to be responsible as students in facing learning difficulties. Based on some of the considerations above, it can be concluded that freedom of learning is the ability of

students to learn actively without being forced by the environment to fulfil their obligations to a student when faced with various learning difficulties.

Freedom of learning not only applies to children but extends to all ages. Whenever people or individuals need to consolidate their independence and assume responsibilities according to the stages of development. But of course, the students have the drive to be independent and take responsibility for the tasks set. Therefore, it is very important to learn independence from the students [15], [16].

The indicators of learning freedom consist of six indicators, namely (1) dependence on others, (2) self-confidence, (3) disciplined behaviour, (4) sense of responsibility, (5) proactive behaviour, (6) self-control. Based on these six indicators, student independence can be observed or observed using indicators for, so this study uses these six indicators as guidelines for making research questionnaires.

While "students' study habits are consistent in their learning activities." There are several repetitive behaviors." The argument is that "a study habit is the behavior of a person who has been exposed over a relatively long period to characterize the learning activities they undertake". Learning habits are the learning behaviors of an individual, which are formed by doing them repeatedly or continuously and without coercion.

Based on the many opinions about the definition of study habits, it can be concluded that study habits are student learning behaviors that are repeated over a long period and are characteristic of their learning activities. Good student study habits should always be developed. Because if you don't have good habits, then the learning outcomes achieved by students will not be maximal, so it will affect their learning outcomes. Study habits are one of the factors that can improve student learning outcomes. To achieve optimal learning outcomes, students must have a systematic approach or method of learning. A good way of learning is a skill that students acquire through the process of practice in their learning efforts so that the habit is embedded in students.

Study habit indicators show that study habits that can affect learning outcomes include: (1) making schedules and their implementation; (2) reading and taking notes; (3) Revision of lecture materials; (4) concentration; and (5) labor.

Based on these five indicators, student independence can be observed or observed using the indicators found by Slammetto, so this study uses these five indicators as guidelines for making research questionnaires. Learning science is one of the subjects in elementary school. Science learning is a natural education concept that has a very broad reference to human life or living things. Science learning plays a very important role in the educational process and technological development. Science learning is expected to be able to guide students in terms of learning about themselves and the surrounding nature, as well as developing and applying them in everyday life.

Natural science is a human effort to know nature through a process that produces knowledge. Based on the above understanding, it can be concluded that learning science is a human effort to observe natural and physical phenomena to produce knowledge.

Based on the background of the problem and relevant research, prospective researchers are interested in conducting research entitled "Independence and the Impact of Student Study Habits on Science Learning Outcomes in Grade V Students of Bulukumba."

2 Methods

This research is quantitative in this approach, the data obtained are analyzed quantitatively/quantitatively. The purpose of science students is to determine the effect of independence and study habits on the learning outcomes of grade V elementary school by testing the hypothesis proposed by analyzing data processed with statistical packages for social studies [17].

2.1 Research Design

This quantitative research is a kind of non-experimental method. With multiple linear regression analysis, that is, to find out whether two or more independent variables (X) have a significant influence on the dependent variable (Y). The use of multi-line regression analysis provides an overview of the relationship between independent variables, namely learning independence (X1) and study habits (X2), with the dependent variable, learning outcomes (Y). In addition, correct data is also generated for the study. Sampling is carried out randomly or randomly, data collection with the help of research tools, and statistical data analysis to test certain hypotheses[17], [18].

2.2 Research Tools

The tool in this study is a questionnaire or questionnaire about student learning freedom and study habits, which comes from indicators collected by experts. The questionnaire in this study consisted of a closed questionnaire, in which respondents answered the answers given directly. The questionnaire measurement scale used in this study is like the Gutman scale with 2 choices, namely: yes and no. The preparation of questions in the questionnaire is based on grids made about students' learning freedom and study habits[17], [18].

2.3 Data Analysis

Data analysis techniques in this study are descriptive statistical analysis and deliberative statistical analysis. The purpose of proximate statistical analysis is to test the hypothesis using the t-test, which is to find out whether independence and study habits affect students' science learning outcomes[17], [18].

3 Results and Discussion

The results of this study describe the purpose of the research conducted, which is to determine the influence of independence and study habits on the learning outcomes of science students in grade V SDN Bulukumba.

The tool that researchers used to collect data on variables of learning freedom (x1) and study habits (x2) was collected conservatively in the form of *questionnaires or questionnaires using the Guttman scale*. While the achievement of science learning (Y) comes from the documentation of student science learning outcomes, in the

cognitive field it is obtained from the evaluation of class V teachers. The number of respondents in this study was 60 students.

The instrument used in this study was a questionnaire. To test the feasibility of the questionnaire, an instrument test is first performed. Device tests conducted in this study include validity tests and reliability tests.

The results of the calculation of the validity test of the learning freedom variable are values calculated and read from 20 statement objects contained in the questionnaire for the learning freedom variable (x_1). Of the 20 statement positions, there are 9 statement positions in the questionnaire that have a calculated value that is smaller than the table value, so it can be said that the position of 9 statements in the questionnaire is invalid, while the other 11 statement positions have valid status because they have a calculated value greater than the table value. For the study habit variable, the calculated value and readability of the 20 statement points contained in the questionnaire for the study habit variable (x_2). Of the 20 statement positions, there are 5 statement points in the questionnaire that have a calculated value that is smaller than the articulable value, so it can be said that 5 statements in the questionnaire are invalid, while the other 15 statement positions have valid status because they have a calculated value higher than the RBE value. 0.561. if the value is less than 0.6 ($0.561 < 0.6$). From this, it can be concluded that the questionnaire used to measure the variable of learning freedom (x_1) is not reliable.

The reliability test results of the work habit variable above (x_2) gave the *Krombach alpha value of 0.689*. where the value is greater than 0.6 ($0.689 > 0.6$). From this, it can be concluded that the questionnaire used to measure the study habit variable (x_2) is reliable.

Based on the results of descriptive statistical analysis, scientific learning outcomes were collected from 60 grade V students in elementary schools. Bulukumba County. The results of the descriptive analysis are a minimum student score of 73 points, a maximum student score of 98, and a total score of 5,414, with an average score of 90.23.

The table of regression analysis results above provides information about the variables that were inserted or discarded and the methods used. The variables captured in this case are the values of the variables Study Habit and Learning Freedom as independent variables, and *the method used is the input method*.

The next step is to use a statistical T-test or partial T-test, which examines the effect of an independent partial variable on the dependent variable. The independent variable in the study was learning freedom and study habits, while the dependent variable was the result of science learning in students.

Based on the table of partial t-test results, the calculated value and significance value of each independent variable are explained as follows: The calculated value for the learning freedom variable is 0.624, where the value is smaller than the kindergarten value of 2.002 ($0.624 < 2.002$) and the significance value obtained is 0.535. where the value is greater than the importance value $\alpha = 0.05$ ($0.535 > 0.05$). Based on these results, it was decided that H_A would be rejected and H_0 would be accepted, meaning that there was no significant influence between freedom of learning and science learning outcomes in grade V students of Bulukumba Regency. The calculated value for the study habit variable of 0.257, where the value is smaller than the table value of 2.002 ($0.257 < 2.002$) and the significance value obtained is 0.798. where the value is greater than the importance value of $\alpha = 0.05$ ($0.798 > 0.05$). Based on these results, it

was decided that HA would be rejected and H₀ would be accepted, which means there is no significant impact of study habits on science learning outcomes in grade V students in primary schools in Bulukumba District. Based on these results, it can be concluded that there is no significant influence between learning freedom and science learning habits on science learning outcomes[17]–[19].

The study entitled "The Impact of Independence and Study Habits on Science Learning Outcomes of Class V Students of SD Bulukumba Regency" aims to determine the influence of independence and study habits on the learning outcomes of science students in Class V SD Bulukumba Regency.

Research Tools, the tools used in this study are questionnaires. Questionnaires were used to measure variables of learning freedom and study habits. The questionnaire used contained 20 statement items for learning independence variables and 20 statement items for study habit variables.

Based on the results of the study, it was found that there was no significant influence between learning freedom and study habits on the learning outcomes of science students in Class V of SDN Bulukumba Regency. This is indicated by the calculated value for the Learning Freedom variable of 0.624 and the calculated value for the Learning Habit variable of 0.257. Both values are smaller than the t Table value of 2,002. In addition, the significance value of both variables is also greater than the value of $\alpha = 0.05$.

The results of this study showed that learning freedom and study habits did not have a significant effect on the learning outcomes of science students in grade V elementary school in Bulukumba Regency. This can be due to several factors, including the quality of research tools. The research tool used in this study was a questionnaire. The questionnaire still contains some invalid statements[3]. This can make the research results less accurate. In this study, the validity score for the learning freedom variable was 0.561, meaning only 56.1% of the statement items in the questionnaire were valid. The validity value for the study habit variable was 0.689, which means that 68.9% of the statement points in the questionnaire were valid. Low validity values can make research results less accurate. This is because an invalid statement element does not measure the variable you are trying to measure correctly. The respondents in this study were fifth-grade students of SDN Bulukumba Regency[4], [6], [7]. Students at this age still have a level of independence and study habits that are not yet fully formed. This can make the research results less accurate. In this study, the average age of respondents was 12.8 years. At this age, students are still in a phase of rapid physical, mental, and emotional development.

At this stage of development, students still need guidance and motivation from parents and teachers to get used to independent learning and learning.

Another factor. In addition to freedom and study habits, other factors can affect science learning outcomes, such as teacher factors, school factors, and environmental factors. These factors can have a significant impact on student learning outcomes. In this study, these other factors were not controlled. This can make the research results less accurate. Motivation is the most important factor in influencing learning freedom and study habits. Students who have high learning motivation are more motivated to learn independently and will get used to learning. Interest is a factor that can encourage students to learn[8], [20]. Students who are interested in a subject will be more interested in studying that subject. Attitude is the attitude or feeling of students towards

something, including learning. Students who have a positive attitude towards learning are more likely to be self-study and regular study. Intelligence is a person's ability to learn. Students who have high IQs find it easier to learn on their own and get used to it. Personality factors. Self-confidence is a student's confidence in their abilities. Students who have high self-confidence will be more courageous and accustomed to independent learning.

Family factors and parental support are very important factors in influencing students' freedom and study habits. Parents who support their children's learning encourage their children to learn on their own and develop independent study habits. Parenting is a way for parents to raise children. Democratic and supportive education encourages children to learn independently and develop habits of independent learning. Family economic conditions can also have an impact on students' learning freedom and study habits. Students who come from disadvantaged families find it more difficult to learn independently and are used to learning.[21][22]The learning method is the way the teacher delivers the subject matter. Proactive and innovative learning methods encourage students to learn on their own and get used to it. Adequate teaching facilities and infrastructure make it easier for students to learn independently and get used to independent learning. A conducive school environment encourages students to learn independently and instills in them the habit of independent study[23]–[26][27], [28]. Environmental factors and a conducive living environment will encourage students to learn and instill independent study habits[29]. A supportive social environment encourages students to learn freely and habitually A supportive cultural environment encourages students to learn freely and habitually learn. Optimism is a positive outlook for the future. Students who have a high level of optimism are more likely to learn independently and get used to it. Initiative is a student's ability to start something[21], [30], [31]. Students who have a high level of initiative are more accustomed to studying and learning independently. Learning style factors: Learning styles are the most effective way of learning for students. Students who know their learning style will find it easier to learn on their own and get used to it.

4 Conclusion

The picture of learning freedom among grade V students is still quite low because it still requires parental guidance and supervision. The picture of the study habits of students of grade V is still quite bad because parents and teachers have to constantly remind the schedule of deadlines for taking assignments, and sometimes they still do not. The learning outcomes of science students in class V are much higher, with an average score of 90.23. The result of this study is that there is no significant influence between independence and science learning habits on science learning outcomes in students in classes at SD Negeri Bulukumba Regency.

References

1. R. Niruri, R. Rakhmawati, R. Nurindah, and Y. Farida, "Efektifitas Media untuk Peningkatan Pengetahuan dan Sikap pada Perilaku Hidup Bersih-Sehat Siswa Sekolah Dasar saat Adaptasi Kebiasaan Baru Era," pp. 291–300, 2023, doi: 10.20961/jpscr.v8i2.56862.
2. M. Fetra Bonita Sari, Risda Amini, "Jurnal basicedu. Jurnal Basicedu," *J. Basicedu*, vol. 5, no. 5, pp. 3(2), 524–532, 2020, [Online]. Available: <https://journal.uii.ac.id/ajie/article/view/971>
3. A. A. Rahmahwati, M. T. Hidayat, M. S. Djazilan, and A. Akhwani, "Hubungan antara Kebiasaan Belajar dengan Hasil Belajar Pada Mata Pelajaran IPA di Sekolah Dasar," *J. Basicedu*, vol. 5, no. 5, pp. 3385–3392, 2021, [Online]. Available: <https://jbasic.org/index.php/basicedu/article/view/1348>
4. H. Hasan, "Peningkatan Aktivitas dan Hasil Belajar Siswa Kelas V pada Materi Mengenal Satuan Kecepatan, Jarak, dan Waktu melalui Pembelajaran Matematika Realistik di Sekolah Dasar Negeri Kedungcaluk I Kecamatan Krejengan," *J. Pembelajaran dan Ris. Pendidik.*, vol. 3, no. 2, pp. 185–189, 2023, doi: 10.28926/jprp.v3i2.869.
5. D. Elfrisca, E. Oktrifianty, and D. Fadhillah, "Keterampilan Berbicara Siswa Pada Pembelajaran Tematik Siswa Kelas V Sekolah Dasar," *J. Educ. FKIP UNMA*, vol. 9, no. 4, pp. 1863–1868, 2023, doi: 10.31949/educatio.v9i4.5827.
6. B. Putra Sanjaya, "Studi Literatur Kemandirian Belajar Siswa Sekolah Dasar Selama Pembelajaran Daring," *JIPD (Jurnal Inov. Pendidik. Dasar)*, vol. 5, no. 2, pp. 71–78, 2021, doi: 10.36928/jipd.v5i2.733.
7. Y. D. Nurrisakah, J. Joharman, and R. Hidayah, "Pengaruh Disiplin dan Kemandirian Belajar terhadap Hasil Belajar Matematika Siswa Kelas V Sekolah Dasar," *Kalam Cendekia J. Ilm. Kependidikan*, vol. 8, no. 2, 2020, doi: 10.20961/jkc.v8i2.41997.
8. R. U. Absari and Y. Nurdian, "Pendampingan Kebiasaan Baru Siswa SD Sebagai Upaya Peningkatan Kemandirian Belajar dari Rumah," *JPPM (Jurnal Pengabd. dan Pemberdaya. Masyarakat)*, vol. 6, no. 2, p. 253, 2022, doi: 10.30595/jppm.v6i2.8161.
9. D. K. Cakranegara, "PENDAS : Primary Education Journal," vol. 4, pp. 36–46, 2023.
10. D. Fuadi and Y. M. Hidayati, "Kemandirian Belajar Matematika Masa Pandemi Covid-19 pada Siswa Sekolah Dasar Sundari 1 □ , Djalal Fuadi 2 , Yulia Maftuhah Hidayati 3," vol. 6, no. 1, pp. 1389–1397, 2022.
11. R. Fithriyah, S. Wibowo, and R. U. Octavia, "Pengaruh Model Discovery Learning dan Kemandirian Belajar terhadap Hasil Belajar Siswa di Sekolah Dasar," *Edukatif J. Ilmu Pendidik.*, vol. 3, no. 4, pp. 1907–1914, 2021, [Online]. Available: <https://edukatif.org/index.php/edukatif/article/view/894>
12. M. Mutiaramses and Y. Fitria, "Pengembangan Komik Digital Berorientasi Problem Based Learning (PBL) untuk Meningkatkan Literasi Sains Siswa Sekolah Dasar," *J. Penelit. Pendidik. IPA*, vol. 8, no. 2, pp. 699–704, 2022, doi: 10.29303/jppipa.v8i2.1349.
13. H. Hariyono, "Implementasi Pembelajaran Berbasis Masalah Sains untuk Meningkatkan Hasil Belajar IPA Siswa Sekolah Dasar," *Gema Wiralodra*, vol. 13, no. 2, pp. 488–494, 2022, doi: 10.31943/gw.v13i2.289.
14. R. Hikmawati and D. A. Yonanda, "Keterkaitan Motivasi Belajar Siswa Dan Hasil Belajar Ipa Di Sekolah Dasar," *Mirabilis J. Biol. Educ.*, vol. 1, no. 2, pp. 22–27, 2022, doi: 10.56916/jm.v1i2.291.
15. P. L. Wairisal, E. Eljionnahdi, N. Susanto, and R. R. P. Megahati S, "Freedom to Learn and Freedom to Teach in Science Learning through ChatGPT: Systematic Literature Review,"

- J. Penelit. Pendidik. IPA*, vol. 9, no. 10, pp. 784–790, 2023, doi: 10.29303/jppipa.v9i10.5089.
16. E. R. M. Hastuti, S. Utama, H. Harsono, and A. Muhibbin, “Mentoring Program of Elementary School Principals in The Era of Learning Freedom,” *Proc. Int. Conf. Learn. Adv. Educ. (ICOLAE 2021)*, vol. 662, no. Icolae 2021, pp. 1158–1165, 2022, doi: 10.2991/assehr.k.220503.129.
 17. H. Taherdoost, “Validity and Reliability of the Research Instrument ; How to Test the Validation of a Questionnaire / Survey in a Research Hamed Taherdoost To cite this version : HAL Id : hal-02546799 Validity and Reliability of the Research Instrument ; How to Test the,” *Int. J. Acad. Res. Manag.*, vol. 5, no. 3, pp. 28–36, 2016, [Online]. Available: <https://hal.archives-ouvertes.fr/hal-02546799/document>
 18. H. Taherdoost, “Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research,” *SSRN Electron. J.*, no. January 2016, 2018, doi: 10.2139/ssrn.3205040.
 19. M. Ishtiaq, “Book Review Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). Thousand Oaks, CA: Sage,” *English Lang. Teach.*, vol. 12, no. 5, p. 40, 2019, doi: 10.5539/elt.v12n5p40.
 20. I. Larasati, J. Joharman, and M. Salimi, “Hubungan Kemandirian Belajar dan Hasil Belajar Matematika Siswa Sekolah Dasar di Kecamatan Buluspesantren,” *EduBasic J. J. Pendidik. Dasar*, vol. 2, no. 2, pp. 125–135, 2020, doi: 10.17509/ebj.v2i2.26999.
 21. T. Ramadhan, M. Arifuddin, P. Studi, P. Fisika, and F. Keguruan, “Pengembangan Bahan Ajar Model Quantum Teaching pada Materi Fluida Statis untuk Melatih Keterampilan Proses Sains Siswa How to cite : Statis untuk melatih keterampilan proses sains siswa,” *J. Ilm. Pendidik. Fis.*, vol. 4, no. 3, pp. 99–110, 2020, [Online]. Available: <https://jurnal.uns.ac.id/jdc/article/view/52593>
 22. J. F. Brown, “Replication studies: an essay in praise of ground-up conceptual replications in the science of learning,” *Educ. Res. Eval.*, vol. 27, no. 1–2, pp. 188–207, 2022, doi: 10.1080/13803611.2021.2022308.
 23. E. S. Sahabuddin, L. Liskawati, and S. Syamsiah, “Teaching Science Through Demonstrations: an Innovative Approach To Improve Students’ Environmental Science Literacy,” *Klasikal J. Educ. Lang. Teach. Sci.*, vol. 5, no. 1, pp. 138–147, 2023, doi: 10.52208/klasikal.v5i1.624.
 24. N. Nurfadillah, E. S. Sahabuddin, and W. K. Sari, “The Effect Of The Form Of Parental Participation On Students Motivation To Learn Science In Bayang Elementary School Makassar City,” *Int. J. Elem. Sch. Teach.*, vol. 1, no. 2, p. 98, 2022, doi: 10.26858/ijest.v1i2.23923.
 25. A. Syawaluddin, E. S. Sahabuddin, S. Nursiah, and M. N. Suparman, “The Effectiveness Of Online Learning On Student Learning Participation During The Covid-19 Pandemic,” *Int. J. Elem. Sch. Teach.*, vol. 2, no. 1, p. 82, 2022, doi: 10.26858/ijest.v2i1.34192.
 26. Y. Yustika, W. K. S. Achmad, and E. S. Sahabuddin, “The Effect Of Application Of Cooperative Learning Model Type Pair Check On Learning Outcomes Student In The Mathematics Lesson Class IV SDN 351 Kawasan Amma Toa Kecamatan Kajang Bulukumba District,” *Int. J. Elem. Sch. Teach.*, vol. 1, no. 1, p. 76, 2021, doi: 10.26858/ijest.v1i1.20303.
 27. A. Syawaluddin, “Mural visual media to enhance environmental caring character of elementary school students Midia visual mural para aprimorar o caráter de cuidado ambiental dos alunos do ensino fundamental,” pp. 30606–30620, 2023, doi: 10.34117/bjdv9n12-002.

28. B. Bahar, A. Amrah, L. Latri, M. Faisal, and E. S. Sahabuddin, "Penggunaan Media Puzzel Bagi Mahasiswa PGSD FIP UNM Parepare," *Publ. Pendidik.*, vol. 11, no. 2, p. 170, 2021, doi: 10.26858/publikan.v11i2.15158.
29. E. S. Sahabuddin, "The Use of Portfolio in the Implementation of Problem Based Learning Model to Improve Student Learning Outcomes," in *Proceedings of the 2nd International Conference on Education, Science, and Technology (ICEST 2017)*, Paris, France: Atlantis Press, 2017, pp. 193–196. doi: 10.2991/icest-17.2017.64.
30. J. Pócsová, A. Mojžišová, M. Takáč, and D. Klein, "The impact of the covid-19 pandemic on teaching mathematics and students' knowledge, skills, and grades," *Educ. Sci.*, vol. 11, no. 5, 2021, doi: 10.3390/educsci11050225.
31. C. C. Chang, T. C. Hirenkumar, and C. K. Wu, "The concept of ocean sustainability in formal education—comparative ocean literacy coverage analysis of the educational standards of India and the USA," *Sustain.*, vol. 13, no. 8, 2021, doi: 10.3390/su13084314.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

