JPPIPA 10(3) (2024)

Jurnal Penelitian Pendidikan IPA

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

Shared Type Integrated Learning Tools for Human Respiratory System Material and Vibration Concepts for Students at SMPN 1 South Bulango

Rahayu Nusi[1] , Masra Latjompoh[1]*, Citron S. Payu[1]

[1] Department of Science Education, Faculty of Mathematics and Natural Sciences, Gorontalo State University, Indonesia.

Received: November 13, 2023
Revised: January 23, 2024
Accepted: March 25, 2024
Published: March 31, 2024

Corresponding Author:
Masra Latjompoh
masralatjompoh@ung.ac.id

DOI: 10.29303/jppipa.v10i3.6112

Abstract: This research aims to examine the feasibility of *shared* type integrated science learning tools based on aspects of validity, practicality and effectiveness. This research uses the type of Borg and Gall R&D development modified by Sugiyono (2017). Data collection techniques are by means of observation, questionnaires and tests. The results of the validity of learning tools (RPP, LKPD, TES) obtained an average of 95.6%, 92.4% and 95.3% in the very valid category. The students' response to the *shared type of integrated science learning tools* obtained a percentage of 92.9% in the very good category. The percentage of student activity achieved was 82.7% in the very good category. And student learning outcomes obtained an N-Gain of 0.63 with medium criteria. From the data obtained, it can be concluded that the integrated science learning device type, shared material on the human respiratory system and the concept of vibration, has met the criteria of being valid, practically effective, so it is suitable for use in science learning at school.

Keywords: Human respiratory system; Shared; Vibration concept

Introduction

Education is a necessity that must be implemented in the current era. According to Soesilo et al. (2022), that education is the key to all progress and development of quality life, with education humans can realize all their potential both as individuals and as members of society. Meanwhile, according to Sujana (2019), education is an effort to help the souls of students, both physically and mentally, from their natural nature towards a humane and better civilization.

The existence of schools is an institution that is responsible for educating quality students and is the main agenda in planning and implementing a country's education. Norlena (2015), states that schools are educational institutions where people with knowledge are produced. Schools, which are places for students to study, continue to experience development along with developments in natural science and technology.

One initiative to improve educational standards in schools is the process of improving the teaching and learning process (Wahyudi et al., 2020). Teachers must continue to follow the progress of new educational ideas because staff members hold important positions for human resource development (Siregar, 2019). Schooling contains the meaning of a way of life in nurturing each person to have life choices and a complete life (Sutrisna et al., 2020).

Natural Sciences (IPA) or often known as science is one of the sciences that plays an important role in supporting the progress of science and technology. This makes the government as the organizer of education in Indonesia always strive to improve the quality and quality of education, especially in science learning. Trianto (2010) states that science is a subject that emphasizes objective scientific methods, namely observation, problem formulation, formulating hypotheses, testing hypotheses through experiments, drawing conclusions and discovering theories and concepts. Meanwhile, Muttaqin et al. (2022), states that science or science is a science that studies natural phenomena which include living and non-living things

How to Cite:
Nusi, R., Latjompoh, M., & Payu, C. S. (2024). Shared Type Integrated Learning Tools for Human Respiratory System Material and Vibration Concepts for Students at SMPN 1 South Bulango. *Jurnal Penelitian Pendidikan IPA*, *10*(3), 1229–1236. https://doi.org/10.29303/jppipa.v10i3.6112

or science about life and science about the physical world.

Science includes three basic fields of science, namely biology, chemistry and physics. In the 2013 curriculum development guidelines, it is stated that science learning at the junior high school level is carried out on an integrated basis, in this case science learning in junior high schools is developed as an *integrative subject science*, which combines various aspects, namely the domains of attitudes, knowledge and skills.

Learning is a process of interaction between students and teachers and learning resources in a learning environment, in learning there is a process of acquiring knowledge and forming attitudes (Suardi, 2018). Learning is also said to be the process of providing guidance or assistance to students in carrying out the learning process (Pane et al., 2017). Whether a learning achievement is successful or not depends on how the learning process has been experienced by the students themselves, apart from that it cannot be separated from the teacher who applies learning models and methods that encourage students to learn and if everything has been achieved well then the results obtained to be maximum.

The learning model is an important component used in the learning process. One of the learning models used is integrated learning, in essence integrated learning according to Malawi (2019) is learning that connects interrelated material within one concept. Integrated learning is an approach that is oriented towards learning practices that are appropriate to children's developmental needs (Zaenatun et al., 2021). Integrated learning can also effectively help students to connect interrelated concepts so as to provide a meaningful learning experience (Amini et al., 2019).

There are 10 models that plan integrated learning according to Fogarty, one of which is the *shared type of integration.* The shared type learning model is a learning model that combines or integrates two subjects that complement each other and in planning or teaching creates a focus on concepts, skills and attitudes that are interconnected with each other under one theme (Nikmah et al., 2019). Apart from that, according to Suryaningsih (2016), the learning model using the shared type integrated learning model is very good. This shows that the shared type integrated learning model can increase students' understanding of concepts and science process skills.

Through active learning, the teacher as a facilitator is tasked with facilitating ongoing learning so that there needs to be innovation in learning, such as the learning tools used so that students feel comfortable and happy studying science without neglecting the material that students must master. Based on the results of observations at SMPN 1 South Bulango, integrated learning is still rarely implemented in an integrated manner, in fact integrated learning has never been implemented, where in schools it has not been integrated into overlapping materials and most of the achievement of competency standards and basic competencies in science subjects is still carried out in accordance respective fields of study without integration within them. Another fact found in the field is that the learning tools in schools have not yet reached the complete level of complete learning tools in schools, and there needs to be improvements in the preparation of other tools both technically and from the aspect of studying the curriculum. Therefore, efforts that can be made are to improve learning tools, especially regarding the material on the human respiratory system and the concept of vibration, by developing a learning tool, namely shared type integrated science lesson plans and LKPD, and it is hoped that with the existence of integrated science learning tools teachers and students can be helped in This means understanding the concept and saving time.

Based on the background that has been described, this article will discuss "Development of Integrated Science Learning Tools for *Shared Type* Material on the Human Respiratory System and the Concept of Vibration". It is hoped that this research can produce a viable product based on valid, practical and effective aspects.

Method

Research is research and R&D development to produce new products that can be used in the learning process. According to Okpatrioka (2023), R&D development aims to produce valid research products through a testing process in the field to produce appropriate products. The development model used for the R&D development of Sugiyono's modified borg and gall consisting of a preliminary study, learning device design, validation, revision and then testing. This model was chosen because it can be used to develop various products such as learning tools.

This research was carried out at SMP Negeri 1 Bulango Selatan class VIII with a limited number of students in the trial of 10 students and a wide trial in two classes with a total of 35 students. Data collection instruments used validation sheets (Validity), class management sheets and student response questionnaires (Practicality), as well as student activity sheets and student learning outcomes (Effectiveness). Next, the data was analyzed based on descriptive data analysis techniques using a Likert scale.

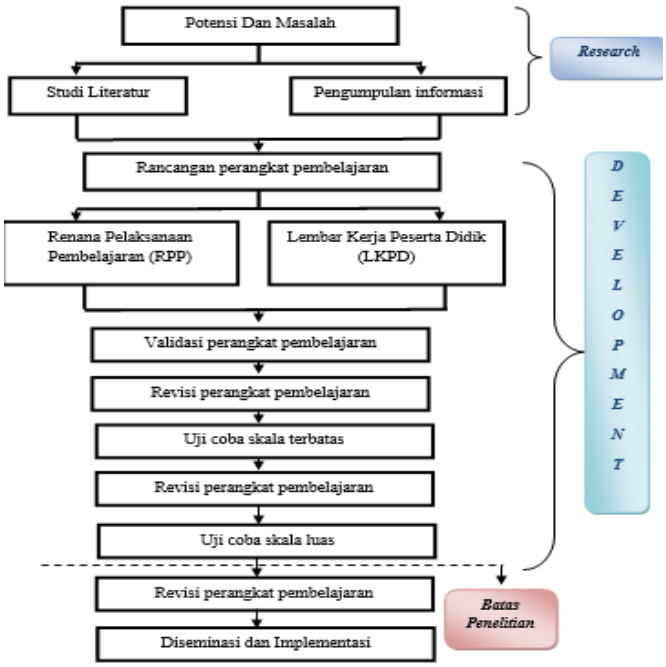

Figure 1. Sugiyono's modified R&D research design

Results and Discussion

The results of this development research were obtained from the steps in developing the borg and gall model modified by Sugiyono which resulted in an integrated science learning device product with a shared type of respiratory system material and vibration concepts which will be described as follows.

Research Stage

At the initial stage of potential and problems, researchers carried out two components of analysis, namely literature studies and gathering information based on observations or observations of learning activities. At this stage, it was found that when learning was taking place, some students still lacked confidence and responsibility in carrying out assignments and also needed improvements in the preparation of other equipment, both technically and in terms of curriculum assessment.

Development Stage

At this stage, researchers carry out design by determining the content of learning tools and creating learning tools (RPP and LKPD). After the product has been designed, a validation test is carried out by three validators, namely material experts and practitioners, then the learning device is revised according to comments and suggestions from the validators which produces a valid and feasible device. The following validation results are presented as follows.

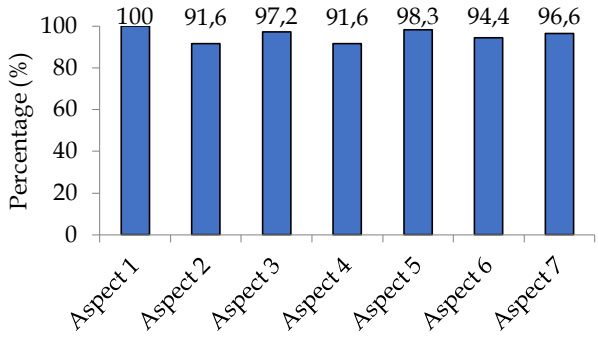

Figure 2. Graph of RPP validation results

Figure 2 shows that the results of all aspects obtained very valid criteria in the score range of 86% - 100% based on assessments from the three validators. In this way, the integrated science lesson plan is suitable for use with a note of slight revision. The results of the LKPD validation are presented as follows.

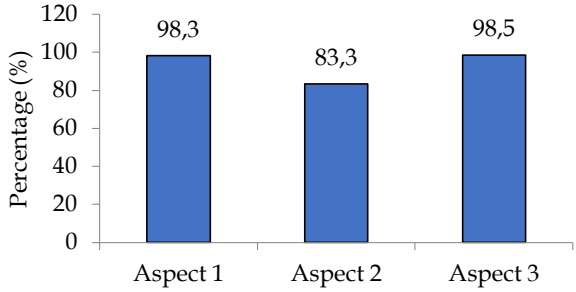

Figure 3. Graph of LKPD validation results

Figure 3 shows that aspect 1 and aspect 3 obtained very valid criteria with a score range of 86%-100%. Meanwhile, aspect 2 obtained valid criteria with a score range of 71%-85%. The assessment results of the three validators show that the integrated science LKPD developed is suitable for use with slight revisions. Apart from the RPP and LKPD, the THB validation results are presented as follows.

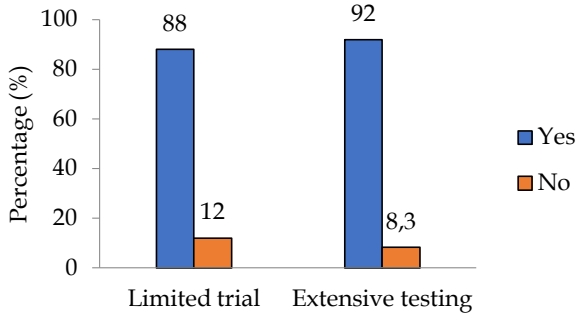

Figure 4. Graphic of THB validation results

Figure 4 shows that all aspects obtained valid criteria in the score range of 86%-100%. With the assessment of the three validators, THB is suitable for use with slight revisions. The results of the validation of the device have been declared valid so that in the next stage the device is tested.

At the trial stage, researchers conducted product trials on students to see the practicality of the learning tools obtained from analysis of classroom management data and also student response questionnaires. The results of the data obtained can be seen as follows.

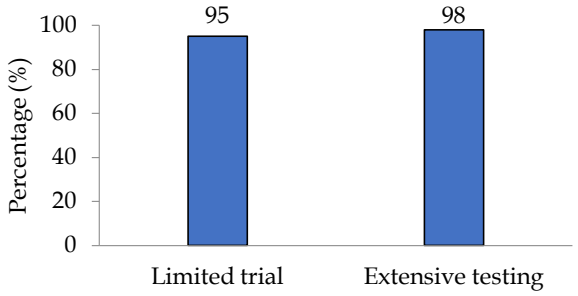

Figure 5. Graph of average percentage of class management

Based on Figure 5, it can be seen that the average percentage of classroom management has increased from the results of limited trials to extensive trials. This can be seen because in limited trials with a total of 10 students from meeting 1 to meeting 3 reached an average of 95% and in Extensive testing with 35 students achieved an average of 98%. The results of this analysis show that the tools developed to manage the learning process have been achieved and have an improvement range of 95%-98% which is included in the "very good" category.

The results of the questionnaire analysis of student responses to the learning tools developed were obtained through a student response questionnaire sheet consisting of positive statements containing 13 statements. The following are the results of the analysis of student responses.

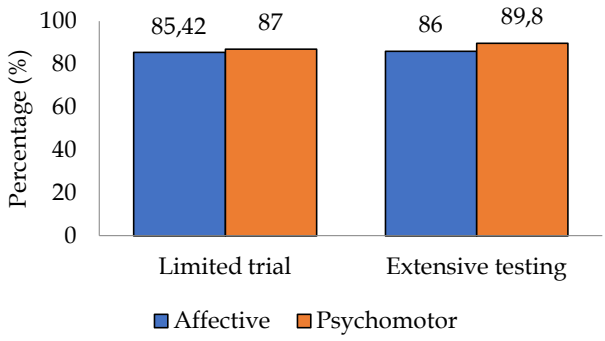

Figure 6. Graph of the average percentage of student responses

Based on the graph shown in Figure 6, it shows that the learning tools developed received a good response from students. It can be said that there has been an increase in student responses from limited trials to extensive trials with a range of scores for those who answered "yes", namely 88% -92% which is in the "very good" category, while for those who answered "no" it was in the range of 12%. -8.3%. This means that the results of students' responses have met the practicality criteria so that they are practical to use in the learning process.

At the trial stage, apart from looking at the practicality, the effectiveness of the learning tools being developed was obtained from the individual pretest and posttest student activity observation sheets and learning outcomes (THB). The data results obtained can be seen as follows.

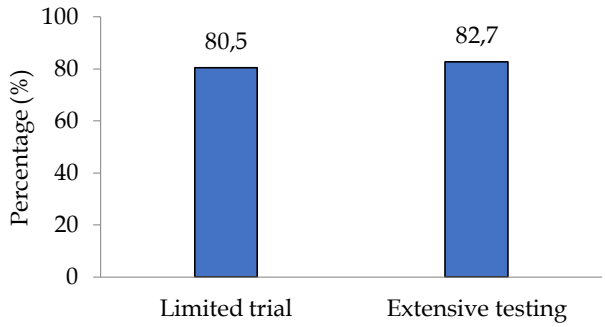

Figure 7. Graph of the average percentage of student activity

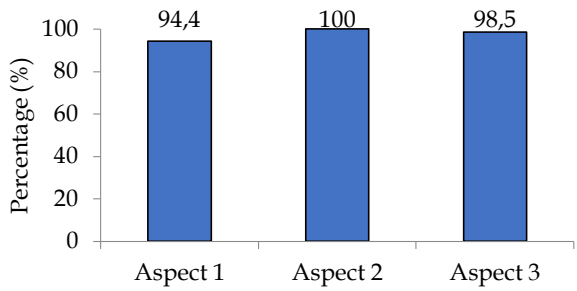

Figure 8. Graph of average affective and psychomotor scores

Assessment of student activities was carried out by 3 observers during 3 meetings during ongoing learning activities, apart from that, student activities were in the form of affective and psychomotor assessments in the integrated learning process carried out. Based on Figure 7, the results of student activity have increased from limited trials to extensive trials with a value range of 80.5%-82.7% which includes the "very good" criteria. This is also supported by the affective and psychomotor assessments which can be seen in Figure 8 with the results of the affective assessment data, namely a value range of 85.42%-86% and also the results of the psychomotor assessment data, namely a

value range of 87%-89.8%. It can be concluded that the results of students' activities on the *shared type of integrated science learning tools* are effective to use.

The results of the test data on student learning outcomes were obtained from the individual pretest and posttest learning outcome assessment sheets which were arranged based on question indicators that were adjusted to the learning indicators. THB was given to 10 students in the limited trial and 35 students in the wide trial. The following is the average N-Gain score against the pretest and posttest scores which are shown as follows.

Table 1. N-Gain Learning Results in Limited Trials

%Pretest	%Posttest	N-Gain	Information
10	55	0.51	Currently

Table 2. N-Gain Learning Results in Extensive Trials

Class	Pretest	Posttest	N-Gain	Note
VIII.A	21	68	0.63	Medium
VIII.B	17	67	0.63	Medium
Average			0.63	Medium

Based on Table 1, it shows that in the limited trial the average pretest result was 10%, while the average posttest value was 55%, so the N-gain value obtained was 0.51, which is included in the "medium" category. Meanwhile, in the extensive trial, it is shown in Table 2 that class VIII.A had an average pretest score of 21% and a posttest score of 68%, while class VIII.B had an average pretest score of 17% and an average posttest score of 67%. %, then the overall average value of N-gain obtained is 0.63% which is included in the "medium" category. It can be concluded that from Table 1 and Table 2 there are differences in scores from limited trials to extensive trials on student learning outcomes in terms of knowledge.

Validation of learning tools based on validation carried out by experts is valid for use in the shared type integrated science learning process on the concept of vibration and the human respiratory system. Winatha (2018), also explained that in the learning media validation process, its suitability will be validated by 2 validators to determine the suitability of the media. The validator will validate and provide suggestions if the media is deemed unfit (Aryani et al., 2019). Validation of learning media goes through the stage of improvement or revision of the content of the material and parts used so that the final results are suitable for use (Amir, 2023). This is in line with research Badrulaini et al. (2020) that the development of learning tools that have been validated by experts if they reach the valid to very valid category means that the learning tools developed can be tested.

Based on research by Nafsih et al. (2019), that in their research, of the ten indicators for assessing the suitability of content in integrated science teaching materials, there were two categories, namely very valid and valid. The very valid category ranges from 84 to 96 and those in the valid category have a value of 72. The average value obtained for the content feasibility component is 87. Thus the content feasibility component is in the very valid category.

Validation is carried out to determine the suitability of the content, presentation, integration, approach and language of the learning tools developed (Maruni et al., 2022). Validation is a process to test the conformity of the module with the competency that is the learning target (Hardianti et al., 2020).

The practicality of learning tools in the form of RPPs and LKPD is assessed from classroom management along with how students respond to those developed practically for use in line with research by Rahayu et al. (2019) that practical criteria refer to questions about the clarity of learning tools for teachers and students. And the learning tools developed are said to be effective as demonstrated by student activities and learning outcomes tests that are in accordance with the KKM.

According to Risabethe et al. (2017), practicality assessments are carried out after the learning media is validated. In the Practicality assessment, it will be tested on students where the trial phase is carried out in 2 stages, namely the limited trial phase which is carried out to determine student responses and field trials as research subjects which are carried out during the learning process (Anyan et al., 2020). Furthermore, Putra et al. (2020), explains that the assessment results from the limited trial will be considered with input and suggestions from previous validators so that they do not conflict.

Based on the results obtained from practicality testing results, similar to research from Nugraha et al. (2022) students amounted to 3.64 which was categorized as very practical. The results of the LKPD analysis showed that the average practicality score by teachers was 3.80 which was categorized as very practical/feasible and the average practicality score by students was 3.79 which was categorized as very practical.

The results of this research and development are also in line with the theory put forward by Khasna et al. (2023), that when testing the level of practicality of a material, consider whether the teaching material must be an attractive and usable product. The practicality test assessment indicators used are ease of use, attractiveness and efficiency, in accordance with the expert's opinion (Bahtiar et al., 2018). Practical results

will show that the resulting teaching materials are attractive because they have a variety of colors, pictures and graphs, not just filled with text. Teaching materials are also practical and easy to use (Permatasari et al., 2019).

Based on the research results from the effectiveness assessment that have been obtained, which are in line with the results obtained by Jannah et al. (2023), that the results of the effectiveness of science teaching materials in improving the scientific explanation abilities of junior high school students obtained an n-gain result of 0.62 in the moderate improvement category and the average student response was 93.64% in the very good category.

Based on research from Pratiwi et al. (2023), that the effectiveness assessed is a measure of the success of implementing teaching materials which have an effect on improving students' scientific literacy skills. Research that assesses effectiveness will take pretest and posttest data (Yuliati, 2013). According to Yupinus et al. (2020), the pretest is carried out before treatment and students study independently using textbooks, while the posttest is carried out after students receive treatment using modules.

Effectiveness is defined as the level of success achieved from implementing a development product as measured by student learning outcomes (Uno et al., 2022). In accordance with the opinion of Kusumawati et al. (2020) that the use of teaching materials is considered effective if there is a significant increase in students' abilities as demonstrated by the n-gain test. The preparation of the content must also be clear and in accordance with the expected objectives so that learning can run effectively (Khadijah et al., 2020). Nurdin et al. (2023), also added that a product is declared effective if from the analysis of student learning outcomes an individual learning mastery score of at least 75 is obtained (according to the KKM) and classically a minimum of 80%.

Conclusion

Based on the results of research on the development of a shared type of integrated science learning device with material on the human respiratory system and the concept of vibration, it was concluded that, The validity of the shared type of integrated science learning device developed is based on the results of 3 validators regarding suggestions, comments and opinions on the validation results sheet stating that the device what has been developed is valid (with slight revisions) so it is suitable for testing and the practicality of the shared type integrated science learning tool developed, based on the results of class management and student response questionnaires, shows that it has met the practical criteria for use in the learning process. As well as the effectiveness of the Shared type integrated science learning device being developed, it is based on the results of student activities and the learning outcomes tests obtained show that it has met the effective criteria for use in the learning process.

Acknowledgments
The author would like to express his thanks to all parties within the Gorontalo State University campus, the Faculty of Mathematics and Natural Sciences, the Science Education Department and the school environment at SMP Negeri 1 South Bulango who have participated in this research.

Author Contributions
Conceptualization, ML, and CSP; methodology, ML, CSP; software, R.N.; validation, TA, CJL, and WM; formal analysis, RN; investigation, RN; resources, RN; data curation, RN; writing—original draft preparation, RN; writing—review and editing, RN; visualization, R.N.; supervision, WM; project administration, RN; funding acquisition, YY All authors have read and agreed to the published version of the manuscript.

Funding
This research received no external funding.

Conflicts of Interest
The authors declare no conflict of interest.

References

Amini, R., & Lena, M. S. (2019). The Effectiveness of Integrated Learning Model to Improve Elementary School. *Unnes Science Education Journal*, *8*(1), 64–68. https://doi.org/10.15294/usej.v8i1.15486

Amir, N. A. (2023). Development of Flipbook-Based Emodule Learning Media to Increase Class VII Middle School Students' Reading Interest in Solar System Material. *Integrated Science Journal*, *7*(1), 103–117. https://doi.org/10.35580/Ipaterpadu.V7i1.25375

Anyan, A., Ege, B., & Faisal, H. (2020). Development of Interactive Learning Media Based on Microsoft Power Point. *JUTECH : Journal of Education and Technology*, *1*(1). https://doi.org/10.31932/jutech.v1i 1,690

Aryani, P. R., & Akhlis, I. (2019). Application of the Guided Inquiry Learning Model in the Form of Augmented Reality to Students to Increase Interest and Understanding of Science Concepts. *Unnes Physics Education Journal*, *8*(2), 91–101. https://doi.org/10.15294/upej.v8i2.33309

Badrulaini, B., Zulkarnain, Z., & Kartini, K. (2020). Pengembangan Perangkat Pembelajaran Berbasis

Masalah untuk Memfasilitasi Kemamapuan Pemecahan Masalah matematis pada Materi Barisan dan Deret Kelas XI SMA. *JURING (Journal for Research in Mathematics Learning)*, *3*(4), 343. https://doi.org/10.24014/juring.v3i4.10454

Bahtiar, Rahayu, Y. S., & Wasis. (2018). Developing Learning Model P3E to Improve Students' Critical Thinking Skills of Islamic Senior High School. *Journal of Physics: Conference Series*, *947*, 012067. https://doi.org/10.1088/1742-6596/947/1/012067

Hardianti, H., Copriady, J., & Haryati, S. (2020). Model Pembelajaran PBL Dipadu Strategi NHT Untuk Memotivasi dan Meningkatkan Hasil Belajar Peserta Didik. *Chemistry Education Review (CER)*, *3*(2), 109. https://doi.org/10.26858/cer.v3i2.13315

Jannah, A. W., Wahyuni, S., & Rusdianto, R. (2023). Pengembangan E-Book IPA Berbasis Flip Pdf Professional Untuk Meningkatkan Kemampuan Scientific Explanation Siswa SMP. *EDUSAINTEK: Jurnal Pendidikan, Sains Dan Teknologi*, *10*(1), 259–275. https://doi.org/10.47668/edusaintek.v10i1.517

Khadijah, S., Ismail, S., & Resmawan, R. (2020). Pengembangan Bahan Ajar Berbasis Penalaran pada Materi Sudut Pusat dan Sudut Keliling Lingkaran. *Al-Khwarizmi: Jurnal Pendidikan Matematika Dan Ilmu Pengetahuan Alam*, *8*(1), 1–12. https://doi.org/10.24256/jpmipa.v8i1.838

Khasna, F. T., & Fatmawati, A. (2023). Development of P3e Model Science Teaching Materials Oriented to Experimental Methods to Train Science Process Skills and Critical Thinking Skills for Elementary School Students. *Citra Bakti Educational Scientific Journal*, *10*(3), 557–568. https://doi.org/10.38048/Jipcb.V10i3.1190

Kusumawati, R., & Kurniawan, P. (2020). Development of Algebraic Structure Teaching Materials with Guided Discovery to Improve Abstraction and Writing Mathematical Proof Skills. *Journal of Medicine : Journal of Mathematics Education IKIP Veteran Semarang*, *4*(1), 197–204. https://doi.org/10.31331/medicivesveteran.v4i1.1010

Malawi, I. (2019). *Integrated Learning Theory and Applications*. Solo: CV. Ae Media.

Maruni, M., Latjompoha., M., & Yusufa, F. M. (2022). Validity Test of the Connected Type Integrated Model Learning Tool Oriented to Case Studies on Environmental Pollution Material to Demonstrate Students' Thinking Abilities. *Jambura Edu Biosphere Journal*, *4*(1), 86–93. https://doi.org/10.34312/Jebj

Muttaqin, M. Z. H., Sarjan, M., Rokhmat, J., Muliadi, A., Azizi, A., & Ardiansyah, B. (2022). Understanding the Nature of Science (Essentials of Science) for Science Teachers: Solutions to Multidimensional Science Learning. *Scientific Journal of Educational Vehicles*, *8*(21), 8–15. https://doi.org/10.5281/Zenodo.7272704

Nafsih, N. Z., Afrizon, R., & Asrizal. (2019). Validation Results of Integrated Science Teaching Materials Containing Scientific Literacy on the Theme of the Role of Energy in Living Creatures for Class VII Middle School Students. *Journal Pillar Of Physics Education*, *12*(2), 105–112. https://doi.org/10.24036/5228171074

Nikmah, S., Nuroso, H., & Reffiane, F. (2019). Pengaruh Model Pembelajaran Terpadu Tipe Shared Berbantu Media Pop- Up Book Terhadap Hasil Belajar. *Jurnal Pedagogi Dan Pembelajaran*, *2*(2), 264. https://doi.org/10.23887/jp2.v2i2.17920

Norlena, I. (2015). Schools as Formal Organizations (Relationships Between Structures). *Tarbiyah Islamiyah: Scientific Journal of Islamic Religious Education*, *5*(2), 43–55. https://doi.org/10.18592/Jtipai.V5i2.1831

Nugraha, P. Y. L., Suastra, I. W., & Astawan, I. G. (2022). Pengembangan Perangkat Pembelajaran IPA Berorientasi HOTS Pada Siswa Kelas V SD. *PENDASI: Jurnal Pendidikan Dasar Indonesia*, *6*(2), 102–110. https://doi.org/10.23887/jurnal_pendas.v6i2.1315

Nurdin, N., Adnan, A., & Muis, A. (2023). Uji Keefektifan Lembar Kerja Peserta Didik Berorientasi Higher Order Thinking Skills Pada Materi Evolusi Kelas XII di SMA Negeri 4 Wajo. *BIODIK*, *9*(1), 104–109. https://doi.org/10.22437/bio.v9i1.18678

Okpatrioka. (2023). Research and Development (R&D) Innovative Research in Education. *Dharma Acariya Nusantara: Journal of Education, Language and Culture*, *1*(1), 86–100. https://doi.org/10.47861/jdan.v1i1.154

Pane, A., & Darwis Dasopang, M. (2017). Belajar dan Pembelajaran. *FITRAH:Jurnal Kajian Ilmu-Ilmu Keislaman*, *3*(2), 333. https://doi.org/10.24952/fitrah.v3i2.945

Permatasari, I., Ramdani, A., & Syukur, A. (2019). Pengembangan Bahan Ajar IPA Berbasis Inkuiri Terintegrasi Sets (Science, Environment, Technology And Society) pada Materi Sistem Reproduksi Manusia. *Jurnal Pijar Mipa*, *14*(2), 74–78. https://doi.org/10.29303/jpm.v14i2.1256

Prastiwi, R., Buchori, A., & Purnamasari, I. (2023). Pengembangan Modul IPA Seri AKM Berbasis Masalah Untuk Meningkatkan Kemampuan

Literasi Sains Siswa Kelas V SD. *Didaktik : Jurnal Ilmiah PGSD STKIP Subang*, *9*(04), 1055–1064. https://doi.org/10.36989/didaktik.v9i04.1663

Putra, E. A., Sudiana, R., & Pamungkas, A. S. (2020). Development of a Smartphone Learning Management System (S-LMS) as a Mathematics Learning Media in High School. *Kreano, Journal of Creative Innovative Mathematics*, *11*(1), 36–45. https://doi.org/10.15294/kreano.v1

Rahayu, C., Eliyarti, E., & Festiyed, F. (2019). Kepraktisan Perangkat Pembelajaran Berbasis Model Generative Learning dengan Pendekatan Open-ended Problem. *Berkala Ilmiah Pendidikan Fisika*, *7*(3), 164. https://doi.org/10.20527/bipf.v7i3.6139

Risabethe, A., & Astuti, B. (2017). Development of Learning Media to Increase Learning Motivation and National Spirit Character of Fifth Grade Elementary School Students. *Journal of Character Education*, *8*(1). https://doi.org/10.21831/jpk.v7i1.1 5498

Siregar, S. F. (2019). Meningkatkan Hasil Belajar Siswa Pada Pelajaran Ilmu Pengetahuan Alam di Kelas VII-2 Melalui Pendekatan Pembelajaran Cara Belajar Siswa Aktif di SMP Negeri 29 Medan. *JURNAL BIOLOKUS*, *2*(2), 217. https://doi.org/10.30821/biolokus.v2i2.539

Soesilo, T. D., Kristin, F., & Setyorini, S. (2022). Pengaruh Penerapan Model Pembelajaran Terhadap Kemandirian Belajar di Masa Pandemi Covid-19 pada Peserta Didik di SMA dan SMK Kota Salatiga. *Satya Widya*, *37*(2), 79–91. https://doi.org/10.24246/j.sw.2021.v37.i2.p79-91

Suardi, M. (2018). *Learning and Learning*. Yogyakarta: Deepublish.

Sujana, I. W. C. (2019). Fungsi dan Tujuan Pendidikan Indonesia. *Adi Widya: Jurnal Pendidikan Dasar*, *4*(1), 29. https://doi.org/10.25078/aw.v4i1.927

Suryaningsih, Y. (2016). Implementasi Pembelajaran Terpadu Tipe Shared untuk Meningkatkan Kecerdasan Spiritual Siswa. *Bio Educatuo*, *1*(1), 65–71. http://dx.doi.org/10.31949/be.v1i1.437

Sutrisna, G. B. B., Sujana, I. W., & Ganing, N. N. (2020). Pengaruh Model Project Based Learning Berlandaskan Tri Hita Karana Terhadap Kompetensi Pengetahuan IPS. *Jurnal Adat Dan Budaya Indonesia*, *1*(2), 84–93. https://doi.org/10.23887/jabi.v2i2.28898

Trianto. (2010). *Developing a Thematic Learning Model*. Jakarta: PT Selamat Pustaka.

Uno, W. A., Halim, I., & Syahriyanto, S. (2022). Pengembangan Media Pembelajaran Pop Up Book Berbasis Kearifan Lokal Pada Pembelajaran Tematik Tema 5 Pengalamanku Sub Bab Pengalamanku Di Tempat Wisata. *EDUSAINTEK: Jurnal Pendidikan, Sains Dan Teknologi*, *8*(2), 268–284. https://doi.org/10.47668/edusaintek.v8i2.371

Wahyudi, A. A., & Hadaming, H. (2020). Pengaruh Penerapan Model Pembelajaran Talking Stick Terhadap Peningkatan Hasil Belajar Matematika di Sekolah Dasar. *JRPD (Jurnal Riset Pendidikan Dasar)*, *3*(1), 8–16. https://doi.org/10.26618/jrpd.v3i1.3303

Winatha, K. R. (2018). Pengembangan E-modul Interaktif Berbasis Proyek Mata Pelajaran Simulasi Digital. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *15*(2), 188. https://doi.org/10.23887/jptk-undiksha.v15i2.14021

Yuliati, L. (2013). Effectiveness of Integrated Science Teaching Materials on Middle School Students' Higher Level Thinking Abilities. *Indonesian Journal of Physics Education*, *9*, 53–57. https://doi.org/10.15294/jpfi.v9i1.2580

Yupinus, L., Ichsan, I., & Ardiawan, Y. (2020). Pengembangan Perangkat Pembelajaran Matematika dengan Pendekatan Matematika Realistik pada Pokok Bahasan Tabung untuk SMP Negeri 2 Nanga Taman Kelas IX. *Square : Journal of Mathematics and Mathematics Education*, *2*(1), 61. https://doi.org/10.21580/square.2020.2.1.5380

Zaenatun, A., Setiani, A. A., Farrah, R., Widyastuti, R., & Aeni, A. N. (2021). Pengaruh Pembelajaran Terpadu Terhadap Hasil Belajar Siswa di Sekolah Dasar. *Jurnal Inovasi Pendidikan Dan Pembelajaran Sekolah Dasar*, *5*(2), 183. https://doi.org/10.24036/jippsd.v5i2.115170