

Development of Electronic Student Worksheets Using Nearpod and the RADEC Learning Model in Social Science Subjects in Elementary Schools

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Abstract: The fact that LKPD is still presented to students at school in the form of handouts printed by teachers is the inspiration for this research. The aim of this research is to create an E-LKPD product using the Nearpod application built on the RADEC platform. Development research using the ADDIE development model is this type of research. Research tools include questionnaires, tests, interviews, and documentation. The results of the elementary school level E-LKPD supported by the RADEC-based Nearpod application are classified as very valid. In the very practical field on the practicality questionnaire, both teacher response scores and student scores are very practical. The N-Gain score % test is applied to the efficacy category. So the resulting E-LKPD can be said to meet the criteria of being correct, useful and effective in improving student learning outcomes. The percentage test of the N-Gain score in the effective category is used to measure effectiveness. Therefore, it can be said that the E-LKPD implemented has fulfilled all valid, practical and effective criteria for improving student learning outcomes in science and science subjects using the Nearpod application based on radec as well as interest and enthusiasm for learning.

Keywords: E-LKPD; Nearpod Application; RADEC

Introduction

Learning activities that start from one subject, a concept that is connected to other ideas are carried out in a planned or spontaneous manner (Syarif et al., n.d.). This can be done in one or more disciplines using different educational activities. Because the information is provided in a clear context, increases students' understanding of cross-curricular subjects, and develops basic abilities, the implementation of integrated thematic learning in elementary schools seeks to help students concentrate more on a theme (Armady, 2017).

Teachers, schools and learning models must be developed comprehensively so that students can successfully achieve learning goals. Apart from that, teachers must also be able to create educational activities (Amini, R., & Sanayah, 2021). Students must be the center

of all learning activities, behaving as active learners, not as passive recipients of knowledge. Apart from that, the learning process must be interactive, collaborative and active (Elfia Sukma et al. 2017). To increase the quantity and quality of learning, teachers must master their lesson plans. Teachers must carry out the learning process using Teaching Modules as a roadmap and standards. Therefore, 21st century skills have a number of aspects that require the application of technology (Pratiwi, 2021).

Teachers are critical in providing feedback to students about their learning. This is because the teacher's responsibility is very heavy in supporting and directing students in creating learning activities that can improve and boost students' interest in learning (Simbolon, 2016). Usually teachers give homework to elementary school children in the form of printed

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worksheets or assignments that require them to complete LKS books. It's important to incorporate technological advancements into it for that (Khaira et al., 2020). E-LKPD or also called electronic student worksheets is one of them. E-LKPD can be used to organize and improve the learning environment. Apart from that, by utilizing E-LKPD, learning efficiency also increases (Rosa Andria et al. 2020).

As an alternative to making E-LKPD for learning, the Nearpod application is an online information tool. Students can take part in interactive learning with the help of a web-based tool called Nearpod. Schools can encourage active learning in these circumstances through resources, quizzes, learning films, and evaluations. Teachers and students can easily take advantage of this program (Sarginson and McPherson, 2021). In addition, when students are involved in learning activities, the learning paradigm also influences them. A learning model is a description of a type of learning that describes the PBM model from the beginning of the learning activity to its conclusion (Anida & Eliza, 2020).

Ilyas conducted research in 2022 using the Nearpod application, and the results showed that the software helped students increase their enthusiasm for learning, which ultimately increased concentration and engagement. In 2021 Badriyah will also conduct learning using the nearpod application with the aim of improving students' critical thinking skills through learning outcomes. Thus, using the Nearpod application can be said to be quite useful for educational activities (Ichsan et al., 2021).

The RADEC model is an educational exercise that can engage students and stimulate their creativity. By using the RADEC approach, students can meet high standards, actively engage in independent learning, develop communication and teamwork skills, and assist other students in their learning. understanding of the subject. Completing tasks in this learning paradigm does not require a long time because it is done in stages (Primer, YES, Sopandi, W., & Hidayah, 2019). As shown by Ari Novendra's research in 2021 with increased student motivation and learning outcomes after using the radec model, this radec learning makes students active in learning from the start of the learning activity to its completion (Anida & Eliza, 2020).

To assess the situation in the field, researchers conducted a preliminary inspection of two elementary schools in Padang Pariaman Regency. Examining the problem, student needs, and traits discussed in the introduction. The results of these observations show that students are less involved in academic activities and only copy teacher notes or other materials. Ismail, R., Rifma, & Fitria, 2021 also identified this problem: students only accept what is explained by the teacher

and students have not been trained to research information from reading in books. Therefore, there is little opportunity for students to interact with the subjects they are studying or to show that they understand them.

Findings from observations show that although teachers use LKPD to carry out learning activities, students can only use them to a certain extent. There has been no improvement in students' skills in asking questions and filling in LKPD results at school. Most of the time in class, LKPD is used in the form of questions that require conceptual understanding, therefore student work on LKPD is only in the form of content responses. LKPD is usually only used as a tool to improve student learning, not proficiency (Salam et al., 2023). Teachers still distribute printed handouts containing LKPD in them to students in class. Researchers also spoke with teachers during interviews, and they revealed that the LKPD currently only has a name and does not have an LKPD identity. If the worksheet is made using today's technology, is as attractive as possible, and is adapted to the subject being studied or to show understanding of the material, it will be meaningful for students. models that can increase student involvement in their education. When LKPD is integrated with- technology, the result is E-LKPD or electronic student worksheets (Sosramaiton & Yeni Erita, 2022).

Research completed by Elijah in 2022 that the Nearpod application can make learning more focused is one of many studies that are in line with what researchers have done. The research conducted by Rose in 2020, namely E-LKPD, was very useful for understanding information about Rahmia's texts and research. Learning outcomes using the RADEC approach can help students' cognitive abilities in 2021.

It can be seen from the E-LKPD which has never been created using the Nearpod application and integrated with the RADEC learning model, so this research is an update from previous research. Technology-enhanced learning and active student participation increase students' learning motivation. Education that fosters students' creativity and imagination can facilitate students' understanding of learning. Students can use this nearpod application to guide their learning in an engaging way and stimulate their creativity (Aji et al., 2023). RADEC learning model is included. The Read, Answer, Discuss, Explain, and Create (RADEC) learning model is a learning model that adopts stages as the name of the model. To increase student understanding, researchers used the RADEC phase of the ELKPD learning process. Therefore, the feasibility of E-LKPD using the Nearpod application built on the RADEC platform in the third grade of elementary schools is being studied by researchers.

The research carried out by Badriyah (2021) which took the form of an online mode of learning based on research in training students' critical thinking in the Hadith Quir'an subject at MI Nuirul Huida 2, Mojokeirto City. The results of the research indicate that this Neiarpod-based Online Learning Model balancing product is feasible and intuitively effective for training students' critical thinking in the subject of Quir'an Hadith. The similarities of this research are (1) using the Neiarpod application, (2). The aims of this research are (1) This research discusses the balance of Neiarpod-based Online Learning Mode in training students' critical thinking. (2) The subject of this research is Hadith Quir'an.

Research carried out by Rahmia Tuilljanah and Risda Amini (2021) which resulted in the RADEiC Learning Model as an Alternative in Increasing Higher Order Thinking Skills in Science Learning in Elementary Schools. The research results indicate that the Radeic learning model is one of the alternatives and is one of the important things that must be balanced in order to increase students' HOTS abilities. The similarities with this research model are the same as those of the RADEiC model. want to meitodei systeimatic reiview namelyi study of the related articles in an experimental and theoretical manner (2) This study discusses the implementation of HOTS questions in elementary school, (3) The learning material in this study focuses on science only.

Based on the description of relevant research above, the neiarpod application is very suitable for use as a supporter of learning activities. The presence of the neiarpod application could be a breakthrough in the world of teaching, especially in elementary schools, that by using this method it can improve student learning outcomes.

Method

This research is part of R&D development research. An original and useful final product is the goal of this research. This research produces E-LKPD for fourth grade elementary school students based on RADEC and Nearpod. The ADDIE approach, which consists of five stages—analyze, design, develop, implement, and evaluate—is the one used in this research (Branch, 2009). Because the ADDIE approach not only applies products in the field but also incorporates product evaluation throughout the development process, this approach was chosen by the researchers for this study. The ADDIE model is a procedure that acts as a guiding framework in complex situations and is ideal for creating educational materials and other learning resources (Yuliana Nasrullah et al, 2021). Research design techniques in Figure 1.

General data collection methods Interviews and documentation were used in this investigation. To obtain more in-depth information regarding the challenges in delivering lesson material, interviews were conducted with teachers. Through the use of a checklist model observation sheet instrument, researchers and teachers are able to collect data during observations. Writing, photos and videos were used as documentation during data collection to support this research. Four academics and one teacher validator provided feedback on ELKPD learning media items using the nearpod application.

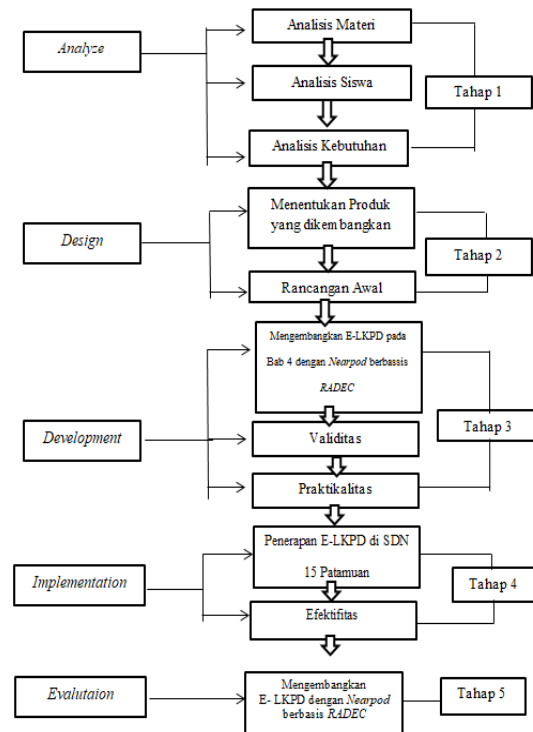


Figure 1. Clearly outlines the research design.

Table 1. Percentage and Interpretation Criteria Score

Percentage	Criteria
81 -100	Very valid
61 - 80	Valid
41 - 60	Sufficiently valid
21 - 40	Less valid
0 - 20	Very in valid

(Riduwan, 2012)

Result and Discussion

Researchers conducted research by creating E-LKPD using Nearpod based on RADEC for fourth grade elementary school children with the ADDIE development model based on information and problems found in the field (Branch, 2010):

Analyze

The analysis is based on data obtained from surveys of teachers and students in two third grade classes, observation sheets, and interview guide sheets. Based on initial investigations in the two elementary schools, researchers observed the students and found a number of challenges, including the fact that they were less involved in learning and only used the teacher's

materials or information when recording information. Because the LKPD used in elementary schools is mostly in the form of questions and answers and does not show real progress in students' abilities, teachers use them in learning activities, but there are limits to how students can use them. Interview findings between researchers and teachers are shown in Table 2.

Table 2. Interview With the Teacher

Questions	Answers
What difficulties did you experience in the learning process?	Not a difficulty, perhaps one of the obstacles faced was students who lacked concentration on reading and understanding the material because students tended to chat during learning activities.
Are the students active during the lesson, teacher?	Some are active, some are not. However, it tends to be inactive because students only record information or material from the teacher. Already.
Have you used LKPD in integrated thematic learning?	No, LKPD is used only in one subject or two. And have never used learning worksheets for 3 subjects.
When you carry out thematic learning in one study which consists of 3 subjects, do you use learning worksheets for the 3 subjects?	Never.
Have you ever made an E-LKPD that can be used individually by students where the E-LKPD contains KI, KD, learning objectives, materials, learning videos, and evaluation	Never.
What do you think if we use the E-LKPD in learning theme 6?	I think that's great. For renewal of students in learning, E-LKPD may be liked by students because it attracts students' attention and can also increase students' willingness to read.

Elementary school teachers have used LKPD in learning, but only printed LKPD are presented by teachers, and have not used technology in learning, according to observation findings using checklist sheets. Meanwhile, teachers have not implemented a learning approach in class that can arouse students' interest in learning.

In the current digital era, technological advances in life have forced learning to develop (Agung et al, 2022). To overcome problems in schools based on the results of student analysis and needs analysis, researchers created integrated theme E-LKPD with the help of the RADEC-based Nearpod application. Researchers also conduct research and produce products. analysis that takes into account indicators, learning objectives, learning materials, as well as CP and TP analysis. This learning material in Chapter 4 Changing Forms of Energy is divided into three topics: Topic 1 ("Transformation of Energy around us"), topic 2 ("Stored energy") and Topic 3 ("Energy in motion") which together form six learning.

Design

The Nearpod application for learning makes it easier for teachers to provide interactive learning

reinforcement to their students. Teachers and students can share experiences in learning activities through the Nearpod application, which allows students to actively participate in their education (Mofeed et al., 2022). The final step in this process is the creation of E-LKPD using the Nearpod application based on RADEC content based on the conformity of CP and TP with the content requirements of the Merdeka Curriculum mixed with teacher books and student books used in learning activities. Title, research guidelines, main materials, additional data, and activities or work procedures are just some of the parts that make up E-LKPD (Asmaranti, 2018).

Development Material Validation

Three material experts, two lecturers, and one elementary school teacher filled in the material validation test data. The tool used is a validation questionnaire sheet. By using the RADEC-based Nearpod program, the validator assesses both the material elements and the E-LKPD. The results of the validation test for material feature categories are shown in Table 3.

Table 3. Results of the Validation Test for the category of Material Aspects

The validator in the material category expert	Percentage (%)
I	93
II	95
III	93
Total Percentage(%)	281
Average Percentage(%)	93
Category	Very Valid

The average percentage of material validation (based on the data above) is 93%, which is included in the very valid category, indicating that the E-LKPD using the RADEC-based Nearpod application developed by researchers is suitable for use and tested for its suitability in this material aspect.

Language Validation

Evaluation and approval of work produced by linguists, especially a professor who is a linguist. As a research tool, researchers used a language validation questionnaire. The results of the E-LKPD language validation have a success rate of 95% with a very valid category. Conclusion: The E-LKPD built by researchers using the RADEC-based Nearpod application is suitable for use and has been evaluated for its practicality from a linguistic aspect.

Media Validation

Linguists are lecturers who are language experts who provide product reviews and validation. A questionnaire about media validation was used by the researchers. Based on the results of language validation, the E-LKPD that researchers support with the RADEC-based Nearpod application can be used effectively and its validity has been verified. As can be seen from these results, this E-LKPD received a score of 85% in the very valid category.

Implementation

After the integrated E-LKPD product had gone through a validation and revision process and was deemed valid and practical to test, the researchers conducted product trials with RADEC-based Nearpod at the implementation stage. Fourth grade students were the subjects of a large group experiment in one elementary school and two small group trials by researchers. Teachers can encourage student-centered learning by utilizing E-LKPD developed with the RADEC learning model. In addition, the RADEC learning paradigm provides students with a directed process and motivates them to actively participate in the learning process. Muhammad Erwinto and others (2012). This idea is in accordance with the initial aim of

the learning model, namely to overcome the problems associated with passive learners among children. Tables 4 and 5 show the results of the practicality test evaluation carried out by researchers during the research.

Table 4. Result of The Teacher Practicality Test

Use of Class III Teachers	Percentage (%)
Teacher at SD I	89
Teacher at SDN II	92
Teacher at SDN III	92
Total Percentage(%)	272
Average Percentage(%)	91
Category	Very practical

Table 5. Student Practicality Test Result

Users (Class III Students)	Percentage(%)
Student at SDN I	85
Students at SDN II	89
Student at SDN III	91
Total Percentage (%)	265
Average Percentage(%)	88
Category	Very practical

With a score of 91% from the teacher's perspective and 88% from the student's perspective, both teachers and students agree that the level of practicality is very practical. Please note that the Nearpod program created by RADEC and distributed via E-LKPD is very useful and suitable for third grade elementary school students. This view, Nufus, is relevant for 2018. Smartphones or computers can be used to access E-LKPD from anywhere, and students can immediately answer questions and see their grades.

Evaluation

At this point, researchers assess the procedure, which is one of the four parts of the ADDIE process, from analysis to implementation. The aim of this action is to improve E-LKPD. By looking at the suggestions given by the validator for E-LKPD, these steps can be identified. Material, language and media are the three components of validation. Ideas and input are as stated in number 7.

The output of this project is an integrated themed E-LKPD that utilizes the nearpod application built on RADEC. Manufacturing structure informs product design. This e-LKPD can help teachers and students in learning procedures in class IV elementary schools to improve the quality of learning, make students happier, and ensure that children do not get bored while studying. Established in 2019: Riana said that by incorporating E-LKPD into educational activities, it can help students become more motivated to learn.

Therefore, testing is necessary to transform the developed product into a quality product, namely to

evaluate its correctness, applicability and efficacy. This exam It is very important for you to take this exam. The quality of the integrated thematic E-LKPD was evaluated first before being tested in grade IV elementary school using the RADEC-based nearpod application. Two lecturers and a teacher with M.Pd education who teach at an elementary school act as specialist doctors who certify the study results. As part of the validation procedure, the validator fills out a questionnaire provided by the researcher. Research is validated by authorities in the language, media, and materials disciplines. Validators offer comments in addition to assessments and recommendations about researchers' E-LKPD.

Table 6. Integrated Thematic E-LKPD Evaluation Result Aspects assessed by Advice or input obtained from experts the validator

Material	1.Adjust the material based on the indicators in the lesson plan Adjust the procedure for writing E-LKPD Add an interesting picture in the explanation of the material
Language	1. Pay attention to the type of font that is easy to read and attractive to students, a bright background, and use standard and effective sentences according to the EYD
Media/graphics	1. Give variations on the size of the letters 2. Replace the background with a cool eye color

To determine the validity of a product, validation results are collected. These results show that the product developed meets the validity requirements of both the language and materials used as well as the graphics/media, including appearance, sound. Based on the analysis of the results of this media validation questionnaire, a media validation value of 85% was obtained with the most valid predicate. The linguistic aspect which was also considered very valid received a score of 90% and the material aspect received a score of 92%. An investigation into the practicality of E-LKPD was carried out based on the results of teacher and student response questionnaires after using E-LKPD using the RADEC-based Nearpod application. The results obtained are as follows: a) Teacher Response Questionnaire; Questionnaires are used to measure the usability and attractiveness of E-LKPD.

Based on the practicality test results of the three teachers, the instructor gave an average E-LKPD score of 91% using the RADEC-based nearpod application. Based on the established product assessment classification rules, the teacher's reply to E-LKPD using the RADEC-based nearpod application was obtained in the very practical category. b) Student Response Questionnaire. Student response questionnaires were used to assess the usefulness of teaching aids in terms of usability, usability and aesthetics of the E-LKPD. The E-LKPD used by students has an average score of 88%. student responses when using the learning material categorization guidelines created, the resulting E-LKPD learning meets very good standards.

Table 7. Recapitulation of Pre-test and Post-test & results of N-Gain score analysis

School Name	Pretest	Posttest	N-Gain Score	Category	N-Gain Presevt	Category
SDN 1	52	88	0.76	High	75.25	Efective
SDN II	57	90	0.76	High	76.12	Efective
SDN III	60	91	0.77	High	76.70	Efective
Amunt	170	268	2.28	High	228.08	Efective
Average	56.53	89	0.76		76.03	

Test the usefulness of the data sources used to compile student learning outcomes using Pre-test and Post-test tools, namely before and after following the ELKPD learning process by utilizing the RADEC-based nearpod application. If the components for assessing student learning outcomes meet the KKM (Minimum Completeness Criteria) with 85% completeness or more, then the product is considered effective. Researchers conducted a pre-test and post-test in three elementary schools after carrying out the results of the N-Gain Score analysis which can be seen in table 8, to determine the effectiveness of E-LKPD using the RADEC-based nearpod application in integrated thematic learning in elementary schools on learning outcomes.

From the justification above, it can be concluded that E-LKPD using the researcher's application—the RADEC-based Nearpod application—can improve student learning outcomes. The e-LKPD used was created using RADEC syntax. The RADEC learning model encourages students' development of various 21st century skills, including critical, creative, collaborative and communicative thinking, as well as increasing environmentally friendly attitudes and behavior in everyday life (Hana Lestari et al., 2022). This electronic-LKPD can help students understand electronic learning materials that can be used with computers, laptops, smartphones or cell phones, as well as the study materials. E-LKPD can also help students develop

certainty in facing the challenges of 2020 (Agus & Suparman). Therefore, we can draw the conclusion that this research strengthens previous research. Student interest and involvement in learning activities can be raised by teaching with E-LKPD using the radec learning model which is reliable, practical and effective.

Conclusion

Fourth grade elementary school students can learn to use ELKPD with the help of the nearpod application based on the Radec learning paradigm. When E-LKPD is used to carry out learning, students become more involved and active in learning. When compared before using E-LKPD, student learning outcomes have increased after using it.

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Conceptualization, D. D. S. R ; methodology, S.Y.A: validation, Y. V. M. Z ; and formal analysis, H.F.A.K.D.

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Conflicts of Interest

The authors declare no conflict of interest.

References

- Abdullah, M. I., Inayati, D., & Karyawati, N. N. (2022). Nearpod use as a learning platform to improve student learning motivation in an elementary school. *Journal of Education and Learning (EduLearn)*, 16(1), 121-129. <https://doi.org/10.11591/edulearn.v16i1.20421>
- Aji, G. S., Darmadi, D., & Rohmawati, Y. I. (2023). Improving Learning Outcomes and Student Responses Through Project Based Learning Model On Light And Optical Instruments. *Jurnal Penelitian Pendidikan IPA*, 8(1), 35-42. <https://doi.org/10.26740/jppipa.v8n1.p35-42>
- Amini, R., & Saniyah, S. (2021). Pengembangan Modul Pembelajaran IPA Berbasis Picture And Picture di Sekolah Dasar. *Jurnal Basicedu*, 5(2), 835-884. Retrieved from <https://jbasic.org/index.php/basicedu/article/view/769>
- Anida, A., & Eliza, D. (2020). Pengembangan Model Pembelajaran Saintifik Berbasis Kearifan Lokal untuk Perkembangan Kognitif Anak Usia 5-6 Tahun. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 5(2), 1556-1565. <https://doi.org/10.31004/obsesi.v5i2.898>
- Armadi, A. (2017). Pendekatan Scientific dalam Pembelajaran Tematik Terpadu di SD. *Jurnal Autentik*, 1(1), 55-67, 25489119. <https://autentik.stkipgrisumenep.ac.id/index.php/autentik/article/view/6>
- Asmaranti, W., & Pratama, G. S. (2013). Desain Lembar Kerja Peserta Didik (LKPD) Matematika Dengan Pendekatan Saintifik Berbasis Pendidikan Karakter. *Prosiding Seminar Nasional Etnomatnesia*, 639-646. <https://jurnal.ustjogja.ac.id/index.php/etnomatnesia/article/view/2395>
- Badriyah, L. (2021). Pengembangan Model Online Learning. *Jurnal Penelitian*, 1, 1-124.
- Branch, R. M. (2010). Instructional design: The ADDIE approach. In *Instructional Design: The ADDIE Approach*. Springer Science & Business. Media. <https://doi.org/10.1007/978-0-387-09506-6>
- Ichsan, M., Yusrizal, Y., & Mursal, M. (2021). Development of Student Worksheets Based on React Model to Increase Student Motivation in Newton's Law Materials. *Jurnal Penelitian Pendidikan IPA*, 7(3), 364-369. <https://doi.org/10.29303/jppipa.v7i3.710>
- Imran, M. E., Sopandi, W., Mustafa, B., & Riyana, C. (2021). Improving primary school teachers' competence in teaching multi-literacy through RADEC-based training programs. *Cypriot Journal of Educational Sciences*, 16(6), 3033-3047. <https://doi.org/10.18844/cjes.v16i6.6494>
- Julian, R., & Suparman. (2019). Analisis Kebutuhan E-LKPD Untuk Menstimulasi Kemampuan Berpikir Kritis dalam Memecahkan Masalah. *Proceeding of the 1st Steem*, 1(1), 238-243. Retrieved from <http://seminar.uad.ac.id/index.php/STEEEM/article/view/2802>
- Khaira, N., Yusrizal, Y., Gani, A., Syukri, M., Elisa, E., & Evendi, E. (2020). Development of Student Worksheets Based on Comics to Improve Students' Motivation and Learning Outcomes on Material Vibration, Waves and Sound. *Jurnal Penelitian Pendidikan IPA*, 6(2), 143-151. <https://doi.org/10.29303/jppipa.v6i2.424>
- Lestari, H., Ali, M., Sopandi, W., Wulan, A. R., & Rahmawati, I. (2022). The Impact of the RADEC Learning Model Oriented ESD on Students' Sustainability Consciousness in Elementary School. *Pegem Egitim ve Ogretim Dergisi*, 12(2), 113-122. <https://doi.org/10.47750/pegegog.12.02.11>

- Meilana, S. F., & Aslam, A. (2022). Pengembangan Bahan Ajar Tematik Berbasis Kearifan Lokal di Sekolah Dasar. *Jurnal Basicedu*, 6(4), 5605–5613. <https://doi.org/10.31004/basicedu.v6i4.2815>
- Musa, M. A. A., & Al Momani, J. A. (2022). University Students' Attitudes towards using the Nearpod Application in Distance Learning. *Journal of Education and E-Learning Research*, 9(2), 110–118. <https://doi.org/10.20448/jeelr.v9i2.4030>
- Nasrullah, Y., Akbar, Z., & Supena, A. (2021). Pengembangan Media Komik untuk Meningkatkan Pemahaman Kesiapsiagaan Bencana Banjir pada Anak. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 6(2), 832–843. <https://doi.org/10.31004/obsesi.v6i2.1540>
- Nufus, H., Khadun, I., & Nazar, M. (2018). Pengembangan Lembar Kerja Peserta Didik (Lkpd) Interaktif Berbasis Software Ispring Pada Materi Larutan Penyangga. *Prosiding Seminar Nasional MIPA IV Universitas Syiah Kuala Banda Aceh*, 46–53. <http://conference.unsyiah.ac.id/SN-MIPA/4/paper/view/2412>
- Pratama, Y. A., Sopandi, W., & Hidayah, Y. (2019). Model Pembelajaran Radec (Read- Answer-Discuss-Explain And Create): Pentingnya Membangun Keterampilan Berpikir Kritis Dalam Konteks Keindonesiaan. *Indonesian Journal of Learning Education and Counseling*, 2(1), 1–8. <https://doi.org/10.31960/ijolec.v2i1.99>
- Pratiwi, N., & Mustadi, A. (2021). Hots-Based Learning in 2013 Curriculum: Is it Suitable? *JPI (Jurnal Pendidikan Indonesia)*, 10(1), 128. <https://doi.org/10.23887/jpi-undiksha.v10i1.22781>
- Purnama, A., & Suparman, S. (2020). Studi Pendahuluan: E-LKPD Berbasis PBL untuk Meningkatkan Kemampuan Literasi Matematis Peserta Didik. *JKPM (Jurnal Kajian Pendidikan Matematika)*, 6(1), 131. <https://doi.org/10.30998/jkpm.v6i1.8169>
- Salam, A. A. K., Abdullah, H., & Amin, B. D. (2023). Development of REACT-Oriented Student Worksheets to Improve Physics Learning Outcomes. *Jurnal Penelitian Pendidikan IPA*, 9(1), 462–471. <https://doi.org/10.29303/jppipa.v9i1.249>
- Sarginson, D., & McPherson, S. (2021). Nearpod: An innovative teaching strategy to engage students in pathophysiology/pharmacology. In *Journal of Nursing Education* (Vol. 60, Issue 7, pp. 422–423). <https://doi.org/10.3928/01484834-20210616-13>
- Sasmito, A. P., & Sekarsari, P. (2022). Enhancing Students' Understanding and Motivation During Covid-19 Pandemic via Development of Virtual Laboratory. *Journal of Turkish Science Education*, 19(1), 180–193. <https://doi.org/10.36681/tused.2022.117>
- Simbolon, N. (2016). Faktor-faktor yang mempengaruhi minat belajar peserta didik. *Elementary School Journal Pgsd Fip Unimed*, 1(2), 1–23. Retrieved from <https://ejournal.bbg.ac.id/tunasbangsa/article/view/625>
- Sosramaiton & Yeni Erita. (2022). Pengembangan Lkpd Tematik Terpadu Berbasis Pendekatan Saintifik Berbantuan Aplikasi Nearpod Di Kelas 3 Sekolah Dasar. *Jurnal Cakrawala Pendas*, 8(4), 1308–1317. <https://doi.org/10.31949/jcp.v8i4.3149>
- Sukma, E., Mahjuddin, R., & Habibi, M. (2018). Literacy media models in improving reading skill of early class students in elementary school. *Journal of Counseling and Educational Technology*, 1(2), 33. <https://doi.org/10.32698/041>
- Syafitri, R. A., & Tressyalina. (2020). The Importance of the Student Worksheets of Electronic (E-LKPD) Contextual Teaching and Learning (CTL) in Learning to Write Description Text during Pandemic COVID-19. *Proceedings of the 3rd International Conference on Language, Literature, and Education (ICLLE 2020)*. <https://doi.org/10.2991/assehr.k.201109.048>
- Syarif, A. F., Mania, S., Abrar, A. I. P., & Nur, F. (n.d.). Pengembangan LKPD Berbasis Model Kooperatif Think Pair- Share Untuk Meningkatkan Aktivitas Belajar. <https://doi.org/10.29303/jppipa.v9i3.2881>
- Tulljanah, R., & Amini, R. (2021). Model Pembelajaran RADEC sebagai Alternatif dalam Meningkatkan Higher Order Thinking Skill pada Pembelajaran IPA di Sekolah Dasar: Systematic Review. *Jurnal Basicedu*, 5(6), 5508–5519. <https://doi.org/10.31004/basicedu.v5i6.1680>