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21st Century Skills Oriented Science Learning Worksheets for Elementary Schools

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ABSTRAK

Rendahnya hasil belajar IPA pada kelas V sekolah dasar menuntut tenaga pendidik untuk melakukan inovasi dalam pengembangan perangkat pembelajaran. Kajian ini bertujuan untuk mengembangkan LKPD yang berorientasi terhadap keterampilan abad ke-21 yang valid serta efektif. Penelitian ini menggunakan model ADDIE, yang tersusun atas lima tahapan, yaitu: Analysis; Design, Development; Implementation; dan Evaluation. Studi ini mengambil subjek media LKPD berorientasi keterampilan abad 21, sedangkan objek penelitian pengembangan adalah validitas isi media, respon siswa, respon guru, dan efektivitas media. Studi ini mempergunakan metode analisis deskriptif kualitatif serta kuantitatif. Metode pengumpulan data yaitu observasi, wawancara, dan tes unjuk kerja untuk menilai produk siswa. Instrumen yang digunakan untuk mengumpulkan data yaitu pedoman wawancara, lembar rating scale, dan pedoman unjuk kerja untuk menilai produk siswa. Hasil uji validitas media memperoleh skor dari ahli media sebesar 0,90, ahli materi sebesar 0,92, respon siswa siswa sebesar 94%, dan respon guru sebesar 98% dengan predikat/kualifikasi sangat baik. Hasil ini sejalan dengan tujuan kajian untuk memperoleh LKPD yang valid serta efektif. Disimpulkan bahwa LKPD berorientasi keterampilan abad 21 pada muatan IPA dinyatakan valid dan efektif dalam pembelajaran guna meningkatkan hasil belajar IPA siswa kelas V Sekolah Dasar.

ABSTRACT

The low learning outcomes of science in grade V elementary schools require educators to innovate in developing learning tools. This study aims to develop LKPD oriented toward 21st-century skills that are valid and effective. This research uses the ADDIE model, which comprises five stages: Analysis, Design, Development, Implementation, and Evaluation. This study took the subject of 21st-century skills-oriented LKPD media, while the objects of development research were media content validity, student responses, teacher responses, and media effectiveness. This study utilizes qualitative and quantitative descriptive analysis methods. The data collection methods were observation, interviews, and performance tests to assess student products. The instruments used to collect data were interview guidelines, rating scale sheets, and performance guidelines to assess student products. The results of the media validity test obtained scores from media experts of 0.90 and material experts of 0.92, student responses of 94%, and teacher responses of 98% with very good predicate/qualification. These results align with the study objectives to obtain valid and effective LKPDs. It is concluded that the 21st-century skills-oriented LKPD on science content is declared valid and effective in learning to improve the science learning outcomes of fifth-grade elementary school students.

1. INTRODUCTION

Educational developments occurring in Indonesia have resulted in several curriculum changes. Indonesia has implemented a new curriculum, namely the independent curriculum, but several schools in Indonesia still use the 2013 curriculum. In the 2013 curriculum, learning activities use integrative thematics, scientific methods, and authentic assessments. Integrative thematic is a combination of several subjects in the form of one theme, and the scientific approach is an approach through asking questions, trying, and reasoning. Authentic assessment is when insight, skills, and attitude competence can be measured by the process and results (Sobri & Ningrum, 2015; Syafi'ah & Laili, 2020). One learning theme is composed of basic competencies and indicators that cover several different subjects. An example of a subject included in the thematic class five elementary school is science subjects. In thematic learning activities, science material emphasizes mastery of knowledge, and students' psychomotor skills are also important in learning science (A. H. Rahayu & Anggraeni, 2017; Subali & Mariyam, 2013). In elementary school learning, especially in science learning, psychomotor skills must be developed, especially process skills. The psychomotor domain is one of the keys for teachers to achieve an active learning process because, in this case, it is not just the theory that students get, but achieving success and broad thinking, having new

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ideas to master what they have learned is important for students to provide space for students to construct their thoughts, be able to learn more creatively and actively and create an interesting and meaningful impression so that the desired learning activity goals in science learning activities can be achieved (Hikmawati, 2012; Wirdaningsih et al., 2017). However, nowadays, it is found that many students prefer to avoid science learning because they perceive this science learning activity as a subject matter that is very difficult and unpleasant for students. Teachers need to implement innovation in learning activities to encourage students to be interested in science both at and outside school (N. Azizah et al., 2022; Khoirun Naimah, 2022).

Previous research states that in today's science learning, especially in science learning activities in elementary schools, teachers appear to be more inclined to apply conventional techniques, there is low variety when teaching, and there needs to be more use of learning media. Teachers need to use modeling, which can stimulate student activity. They rarely invite students to do practical work, which lowers students' learning motivation; they need to be more active in asking questions and expressing opinions (Endah, 2017; Yestiani & Zahwa, 2020). A lack of use of methods causes this; teachers rarely even invite students to carry out learning activities such as practicums, making a product or skill to encourage students to think creatively, and there needs to be more use of varied learning media for students. Other research also shows that in the science learning process, science learning activities are more focused on the cognitive domain only. Several teachers consider assessment in the form of numbers to be sufficient and represent the achievement of the objectives of learning activities, so most teachers consider assessing students' psychomotor domains less important. It causes the concentration of mental abilities that students learn only on memory and insight; of course, it can reduce activity skills and creativity (S. N. Pratiwi et al., 2019; Setyoningrum & Supriyanti, 2019). Some of the results of this research confirm that the results of science learning, especially in the psychomotor domain at the elementary school level, still need to be higher. Based on data obtained from observation activities carried out by researchers, it was found that science learning outcomes in the realm of psychomotor skills for fifth-grade students were still relatively low, and they had not obtained optimal learning outcomes with a percentage of 56.25% below the minimum completion criteria that had been established. Thus, to overcome this, various learning tools are needed to make students more motivated and interested, give rise to students' creative ideas, and make it easier for them to learn the material the teacher conveys.

21st-century skills schools are required to apply 21st-century skills, generally termed 4C; 21st-century skills are important to develop in the learning process (Monika et al., 2022; Septikasari & Frasandy, 2020). The 21st-century or 4C skills are communication, collaboration, critical thinking, problem-solving, and creativity. Teachers, as educators, are expected to be able to develop and apply 21st-century or 4C skills. Teachers' lack of understanding regarding 21st-century skills causes teachers not to apply 21st-century or 4C skills in classroom learning. With these conditions, students become less able to think critically in solving a problem and think creatively in finding new ideas both in practicum and in making a product or skill related to science learning material, so that student learning outcomes in the psychomotor domain are especially low in science subjects (Jannah & Atmojo, 2022; Muttaqin & Rizkiyah, 2022). Developing good and optimal learning aligned with the 21st-century must be integrated with the learning tools prepared by the teacher (Soleh & Arifin, 2021; Yulianti & Wulandari, 2021). Thus, teachers must use learning tools to develop student learning outcomes in the affective, cognitive, and psychomotor domains.

One of the learning tools that educators can use to develop student learning outcomes in the psychomotor domain is a learning tool in the form of Student Worksheets. Teachers rarely use Student Worksheets in elementary schools; most teachers still need to use the Student Worksheet learning tool in learning activities (Santi et al., 2022; Santoso, 2017). Teachers mostly only use learning resources in the form of textbooks at school. Usually, after the teacher has finished explaining a material, the teacher will assign students to solve several problems related to the material in the book that has been explained. The teacher assigns students to work on it and then collects the assignment. Of course, this makes students bored and not interested in working, so students' concentration will be disturbed (A. N. Azizah & Nugraheni, 2020; Dahlia, 2022). In carrying out this assignment, students can understand or apply 21st-century skills or what is usually called 4Cs, such as understanding and mastering communication, collaboration, and critical thinking in solving problems contained in the questions, and students can have creative skills. Through the development of Student Worksheets that are oriented towards 21st-century skills in science content for fifth-grade students at SD Negeri 1 Bunutin, it is hoped that students can understand the learning activities presented by the teacher so that the aims and objectives of learning activities can be achieved.

2. METHOD

The research method used is development research with ADDIE modeling. This modeling comprises five stages: analysis, design, development, implementation, and evaluation. The steps for implementing the development in this study were carried out in line with the development of ADDIE modeling, starting with the analysis stage, composed of four activities: needs analysis, student characteristics analysis, curriculum analysis, and media analysis. Then, the design stage, which includes preparing the media design that will be developed, consists of two activities: material review and product design. The third stage is development, namely the process of realizing the product design that has been designed in the design stage. Next is the implementation stage, where product trials are carried out during development in this study. The final stage is evaluation in the form of a formative evaluation, which is carried out if there are improvements at each stage of the development activity, and a summative evaluation is also carried out (Cahyadi, 2019; Hidayat & Nizar, 2021; Setiadi & Nurma Yuwita, 2020).

In the development stage, the subject studied is Student Worksheet media oriented towards 21st-century skills. The objects in the development stage are content validity, effectiveness, teacher response, and student response. In the trial stage, the subjects studied were 16 fifth-grade students at SD Negeri 1 Bunutin, Bangli District, Bangli Regency. Meanwhile, the object of the trial is the learning outcomes in the psychomotor aspect. The data collection method used in this study is the questionnaire and performance method. Questionnaires are used to collect data about the validity of products being developed. Performance is used to collect data regarding product effectiveness. The grid for each instrument used to collect data can be seen in Table 1, Table 2, Table 3, Table 4, and Table 5.

Table 1. Material Content Expert Instrument Grid

No.	Aspect	Indicator
1	Curriculum	1. Clarity of subject identity. 2. Confor21st-century ity of competency achievement indicators with basic competencies. 3. Alignment of learning activity materials with competency achievement indicators.
2	Content Quality	4. Clarity of learning activity materials and systematic design. 5. The truth of the science material concept regarding heat's effect on objects' temperature. 6. Align material with Basic Competencies, indicators, and objectives of learning activities. 7. The suitability of student worksheets oriented towards 21st-century skills is clear and easy to understand. 8. Student worksheets oriented toward 21st-century skills are developed in a complete, clear, and easy-to-understand way.
2	Accuracy Matters	9. Accuracy of concepts and definitions. 10. Accuracy of the problem of the influence of heat on the temperature of objects on the Student Worksheet.
3	Use of Language	11. The instructions for using the Student Worksheets presented are easy to understand. 12. The language used uses good and correct Indonesian rules.
4	Latest Material and Problems	13. The use of problems includes daily life. 14. The material presented on the Student Worksheet is up-to-date and relevant to everyday life. 15. Materials provide relevant learning experiences.

Table 2. Media Expert Instrument Grid

No.	Aspect	Indicator
1	Display of Student Worksheets	1. Completeness and clarity of the contents of the Student Worksheet. 2. Clarity of the title of the Student Worksheet. 3. Clarity of instructions for Student Worksheets. 4. Clarity of Language. 5. Appropriate size and type of letters.

No.	Aspect	Indicator
		6. Image clarity.
		7. Design student worksheet media.
2	The Attractiveness of Student Worksheets	8. Suitability of image layout.
		9. Use of grammar.
		10. Image attractiveness.
		11. The color combination of the student worksheets looks attractive.
3	Utilization and Management of Student Worksheets	12. Encourage student activity in the learning process.
		13. Clarity of instructions for using Student Worksheets.
		14. Conformity with elements of 21st-century skills.
4	Evaluation	15. Drawing conclusions
		16. There is reflection and harmony in the stages of activity.

Table 3. Practitioner Instrument Grid

No.	Aspect	Indicator
1	Student Worksheet Presentation	1. Clarity of instructions for using Student Worksheets.
		2. Ease of use of Student Worksheets.
		3. The attractiveness of the appearance or presentation of Student Worksheets.
		4. Clarity of each Student Worksheet item.
2	Visual	5. Attractive colors, backgrounds, and images.
		6. Clarity of images on Student Worksheets.
3	Typography	7. Accurate text size.
		8. Selection of text type.
4	Assessment	9. Suitability of the questions presented with the material presented.
5	Material	10. Suitability of Student Worksheets with learning objectives.
		11. Accuracy of the statement/problem included.
		12. 12. Encourage students to find their problems and solutions.
		13. Student Worksheets motivate students to learn.
6	Language	14. Harmony of language with Indonesian rules
		15. The sentences used are easy to understand

Table 4. Student Response Instrument Grid

No.	Aspect	Indicator
1	Display of Student Worksheets	1. Image clarity.
		2. The size and style of the letters are clear.
		3. Attractive student worksheet designs.
		4. The combination of student worksheet coloring is harmonious and looks attractive.
		5. Suitability of text and image layout.
		6. Attractiveness of images in Student Worksheets.
2	Content Quality	7. The explanation of the material in the Student Worksheet can be understood easily.
		8. The questions on the Student Worksheet are easy to understand.
		9. Student Worksheet questions and sentence structures are easy to understand.
3	Ease of Student Worksheets	10. The language used is easy to understand.
		11. Ease of use of Student Worksheets.

Table 5. Psychomotor Skills Performance Instrument Grid

No.	Aspect variables	Aspect
		1. Prepare tools and materials.
		2. Use of raw materials from used goods
1	Psychomotor	3. Neatness in making simple products.
		4. The product being developed is in line with its future function.
		5. Skills in conducting experiments on making pan protectors.

The results obtained were then converted to validity criteria, as seen in Table 6.

Table 6. Aiken Validity Criteria

Score Range	Predicates/Qualifications
V ≤ 0.4	Low Validity
0.4 < V < 0.8	Medium Validity
V ≥ 0.8	Very High Validity

(Retnawati, 2016)

The level of achievement of teacher and student responses was converted using the PAP conversion of achievement level on a four-scale to determine the predicate or qualification of teacher and student responses. The conversion table is as follows, as shown in Table 7.

Table 7. PAP Conversion Table for Four Scale Achievement Levels

Achievement Level	Predicates/Qualifications
76% - 100%	Very good
56% - 75%	Good
40% - 55%	Not good
0 – 39%	Bad

(Muna & Wardhana, 2021)

Next, a product effectiveness test is carried out. Effectiveness tests are used to observe success in learning activities (Prayoga et al., 2022; Tegeh et al., 2019). This 21st-century skills-oriented student worksheet can be declared effective if the student worksheet can have an impact on psychomotor learning outcomes in science content, theme 7 sub-theme 2, learning with material on the effect of heat on the temperature of objects, in fifth-grade elementary school students, who where psychomotor learning outcomes in science content for fifth-grade students can increase between before and after using learning tools, namely Student Worksheets oriented towards 21st-century skills. A t-test was used to analyze the product's effectiveness with the help of the IBM SPSS Statistics program.

2. RESULT AND DISCUSSION

Result

Analysis Stage. The analysis was done through direct observation and interviews with the fifth-grade homeroom teacher at SD Negeri 1 Bunutin. In this elementary school, teaching materials are limited to books published by the Ministry of Education and Culture. It has an impact on student learning outcomes, especially in science lessons. The analysis results show that most fifth-grade students at SD Negeri 1 Bunutin have yet to reach the Minimum Completeness Criteria standard in science psychomotor skills. Of the 16 students, only 7 reached the Minimum Completion Criteria standard in science psychomotor skills. Psychomotor skills practicum is rarely done, even only once a month. The obstacle teachers face is limited time for practicum because more time is used to teach the material. To overcome these obstacles, researchers propose using Student Worksheets as a design that can accommodate the lack of lesson time and improve students' psychomotor skills.

Design Stage. At the design stage, researchers formulate and design solutions to overcome the problem of lack of lesson time to complete dense material. At this stage, a design for this research is created. The resulting Student Worksheet product consists of 9 sheets of documents that take fifth-grade science content. This Student Worksheet is oriented toward 21st-century Skills. The material is taken from Theme 7, "Events in Life," Sub-theme 2, "National Events Regarding the Proclamation of Independence," Lesson 1 on "The Effect of Heat on the Temperature of Objects," This Student Worksheet is by basic competency 4.7, which involves experimenting with the effect of heat on objects and making a report on the experiment's results. Student Worksheets are equipped with instructions for use and tasks that must be done. Students' worksheets are done in groups by paying attention to the 4C aspects (Critical Thinking and Problem Solving, Collaboration, Creativity, and Communication) in completing assignments. This design is based on the results of an analysis of problems that occur in the field. The following are several designs in the form of product images for the development of 21st-century Skills Oriented Student Worksheets on Science Content for Fifth Grade Students at SD Negeri 1 Bunutin, which can be seen in Figure 1, Figure 2, Figure 3, and Figure 4.

Figure 1. Front Cover

Figure 2. Basic Competencies, Indicators, and Objectives

Figure 3. Learning Activities

Figure 4. Reflection

Development Stage. The development stages are carried out after expert validity tests are carried out. This development stage is carried out by improving the validity of test results by experts. After conducting expert validity tests, improvements are made according to directions and input from material and media experts. The validity test in this study is seen from two main aspects: testing the validity of learning tools from material and media experts. A recapitulation of the validity test results of the LKPS that has been developed can be seen in Table 8.

Table 8. Results of Validity Assessment of Student Worksheets Oriented to 21st-Century Skills

No.	Subject	V Score	Predicate
1	Learning Materials Expert	0.92	Very good
2	Learning Media Expert	0.90	Very good

Implementation Stage. At this stage, it is carried out by learning assisted by Student Worksheet media oriented to 21st-century learning. At this stage, students learn by using Student Worksheet media. Then, students work on the Student Worksheet and make a craft related to the problems on the Student Worksheet at the end of the lesson to find out how far students have progressed before and after participating in learning activities using this Student Worksheet. In this research, the results of the assessments or responses of teachers and students are used to determine the practicality of the developed product. The recapitulation of the results of teacher responses and student responses to the Student Worksheets that have been developed can be seen in Table 9.

Table 9. Results of Teacher Responses and Student Responses to the Student Worksheet Oriented to 21st-Century Skills

No.	Subject	Assessment Percentage	Predicate
1	Teacher/Practitioner	98%	Very good
2	Student	94%	Very good

Evaluation Stage. This stage is the final phase of the ADDIE model, where at this stage, an effectiveness test is carried out to find out whether the Student Worksheet media oriented towards 21st-century learning is effective in supporting students' psychomotor knowledge after participating in learning using this Participant Worksheet media when compared to before students studied using this Participant Worksheet media. The effectiveness test was conducted to determine the differences before and after using the 21st-century skills-oriented Participant Worksheet learning tool. The effectiveness test in research on the development of the Participant Worksheet was carried out using a one-shot case study pattern, namely treatment once with a posttest. The Mid-Semester Assessment (PTS) results are used as a comparison. The PTS-posttest results will be compared using the Paired Sample t-test because it only uses a sample in the fifth grade of elementary school of 16 people. However, before that, a normality test is carried out as a prerequisite before an effectiveness test. The test results can be seen in Table 10.

Table 10. Effectiveness Test Results

No	Description	Score	Category
1	Normality Test Results	0,077	Normal
2	Wilcoxon Test Results	0,000	Significant

Discussion

Student worksheet media oriented towards 21st-century skills in science content for fifth-grade students has very good validity. It refers to the acquisition of the material validity index, namely 0.92. The development of Student Worksheet media oriented towards 21st-century skills in science content for fifth-grade students at SD Negeri 1 Bunutin explains the theory of events in life with various concrete examples and interesting activities in the Student Worksheet. The material expert validity test results show that 21st-century skills-oriented Student Worksheet media development has complete material coverage. This Student Worksheet media provides knowledge and experience for students to know what heat means and how the theory of events in life is felt in everyday life so that it can be easier to carry out daily activities related to heat. It can also provide students with experience and knowledge to create creative ideas in making heat-related skills useful for their daily lives (S. Rahayu et al., 2021; Sabrini et al., 2022). Understanding the concept of events in life is very important for student development; not only students but also the wider community must also be able to know how theory and practice, especially material related to Natural Sciences, occur in everyday life (Alfurqan et al., 2020; Jayananda, 2020). It is supported by previous research which obtained results that the application of Student Worksheets in the learning process, especially heat transfer material, really needs to be applied to students and provide an exciting learning experience (Latifah, 2016; N. P. S. Pratiwi & Margunayasa, 2022). The development of Student Worksheet media helps the learning process, especially by making it easier for students to understand Natural Science material, especially in discussing heat transfer that occurs in everyday life (Khoirunnisa et al., 2020; Rahman et al., 2020).

Student worksheet media oriented towards 21st-century skills in science content for fifth-grade students has very good validity. It refers to obtaining a media validity index of 0.90. These validity results show that the Student Worksheet media is appropriate or good when applied in the learning process. It is because the 21st-century skills-oriented Student Worksheet media can provide students with experience and knowledge to create creative ideas in making skills related to heat, which are useful for students' daily lives. It is supported by Suryaningsih's opinion that developing Student Worksheets as learning materials, practicums, and technological developments is necessary for students to meet the demands of 21st-century learning activities (Suryaningsih & Nurlita, 2021). It supports the study's results (Astuti, 2019; Septikasari & Frasandy, 2020) that with Student Worksheets, students can learn independently or collaboratively on tasks specifically designed to meet students' needs and level of understanding. It supports the instructional differentiation essential in 21st-century learning, where students can develop skills and understanding according to their pace and learning style.

The results of the teacher response test were 98%, so it was categorized as very good. According to the teacher's perspective, the Student Worksheet media is by the learning needs of students in the field. The creation of this media has also been designed according to the results of the analysis phase that occurred in the field. This development aims to support the teaching and learning process in educational institutions. Learning media is very important for the process, so in the learning process, it is necessary to maximize the learning media used (Prayoga et al., 2022; Suwastini et al., 2022). It aligns with studies from (N. P. S. Pratiwi & Margunayasa, 2022; Rasmono, 2020). Many things underlie the need for learning to be carried out with the help of learning media, one of which is because science content, especially heat transfer material, can involve abstract concepts and is difficult to understand directly. Using Student Worksheets, these concepts

can be explained in more detail, and illustrations, pictures, or diagrams can be utilized to help students visualize the processes of natural phenomena that occur in everyday life.

Student worksheets allow students to learn independently and at a pace appropriate to the student's abilities (C. Azizah et al., 2022; Fristyayuniar et al., 2023). Today's students are a generation that has been exposed to technology since childhood; therefore, if teachers teach only book-oriented, students will quickly get bored, so students' interest in learning will decrease. So, a teacher needs to be able to design learning as interestingly as possible and use media as creatively as possible so that learning outcomes can be achieved according to targets (Effendi et al., 2021; Iswatiningsih et al., 2021)

The student response assessment results were 94%, so the results of this test could be categorized as very good. The development of Student Worksheet media oriented towards 21st-century skills in science content for fifth-grade students at SD Negeri 1 Bunutin is an interesting Student Worksheet. It is designed to improve student learning outcomes in the psychomotor domain, especially in heat transfer material. There are several interesting things about this Student Worksheet media. It is proven by the many supporting animations and the help of original images that can support the presentation of the material. The presentation of the objectives of this Student Worksheet is very clear, and the suitability of the material and learning outcomes of this Student Worksheet is also very good and, of course, oriented towards students' 21st-century skills; this is by the testing carried out by each expert and testing practicality by practicing teachers as well as students. It supports the study from (Magdalena et al., 2021; Pamungkas & Koeswanti, 2022), which explains that basically, the use of learning media that is relevant, creative, and meets students' needs can make learning activities not boring So, students will be interested. It can be a new experience for them.

The implementation of this effectiveness test is adjusted to the final step or stage of the ADDIE development model, namely the evaluation stage (Cahyadi, 2019; Hidayat & Nizar, 2021). The results of the prerequisite test, namely the normality test, indicate that the data used in this study has a normal distribution. Then, the Wilcoxon test obtained significant results, meaning that there was a significant difference in learning outcomes in the psychomotor domain of students before and after using the 21st-century skills-oriented Student Worksheet product for the science content of fifth-grade students at SD Negeri 1 Bunutin. Based on the results of this research, it can be concluded that the development of Student Worksheet media oriented towards 21st-century skills in science content for fifth-grade students at SD Negeri 1 Bunutin can improve learning outcomes in the realm of student psychomotor, student interest, and motivation to learn and help develop skills. Students' critical, creative thinking and 21st-century skills. It aligns with the study's results (Prayoga et al., 2022; Tegeh et al., 2019). Therefore, using Student Worksheet media oriented toward 21st-century skills in science content can be recommended as an alternative to learning at the elementary school level (Septikasari & Frasandy, 2020; Suryaningsih & Nurlita, 2021).

Using this media can also help teachers increase students' interest in learning, especially in science subjects, and serve as a reference for teachers to innovate in learning media. The impact of this research is to raise students' interest in learning and improve learning outcomes in the psychomotor domain of students through the media of 21st-century skills-oriented student worksheets, which present material, directions, and learning objectives concisely and clearly. Because there are limited things in this study, namely the scope of material, class level, learning content that is developed, and the number of subjects used in product effectiveness testing, it is recommended that other researchers carry out further studies on 21st-century skills-oriented student worksheets. in science content, apart from that, it can develop products that are similar to lesson content, material, and in different classes.

3. CONCLUSION

The development of Student Worksheets oriented towards 21st-century skills on science content for fifth-grade students using ADDIE modeling has created a Student Worksheet product that is valid, practical, and effectively implemented in learning activities to overcome the lack of science learning outcomes for fifth-grade elementary school students. Using this media can also help teachers increase students' interest in learning, especially in science subjects, and serve as a reference for teachers to innovate in learning media. The impact of this research is to raise students' interest in learning and improve learning outcomes in the psychomotor domain of students through the media of 21st-century skills-oriented student worksheets, which present material, directions, and learning objectives concisely and clearly.

4. REFERENCES

Alfurqan, Trinova, Z., Tamrin, M., & Khairat, A. (2020). Membangun Sebuah Pengajaran Filosofi Personal: Konsep dari Pengembangan dan Pendidikan Dasar. *Tarbiyah Al-Awlad*, *Vol. 10*(2), 213–222.

https://doi.org/10.15548/alawlad.v10i2.2579.
Astuti, T. P. (2019). Model Problem Based Learning dengan Mind Mapping dalam Pembelajaran IPA Abad 21. *Proceeding of Biology Education*, *3*(1), 64–73. https://doi.org/10.21009/pbe.3-1.9
Azizah, A. N., & Nugraheni, A. S. (2020). Analisis Teknik Menyimak Puisi Melalui Video Animasi Pada Siswa Kelas 2 SD Negeri Triharjo. *Jurnal Holistika*, *4*(2), 114. https://doi.org/10.24853/holistika.4.2.114-120.
Azizah, C., Arwin, S., & Pargito. (2022). The Development of Problem-Based Learning LKPD to Improve Students' Critical Thinking Ability in The Fifth Grade of Primary School. *International Journal of Theory and Application in Elementary and Secondary School Education*, *4*(1), 65–74. https://doi.org/10.31098/ijtaese.v4i1.798.
Azizah, N., Zmaroni, M., & Ginanjar, R. R. (2022). Analisis Kesulitan Belajar dalam Pemahaman Konsep Pembelajaran IPA Kelas IV di MI Hidayaturrohman Kecamatan Teluknaga Kabupaten Tangerang. *Jurnal Pendidikan Dan Konseling*, *4*(5), 1707–1715. https://doi.org/10.31004/jpdk.v4i5.6968.
Cahyadi, R. A. H. (2019). Pengembangan Bahan Ajar Berbasis ADDIE Model. *Halaqa: Islamic Education Journal*, *3*(1), 35–42. https://doi.org/10.21070/halaqa.v3i1.2124.
Dahlia, D. (2022). Penerapan Model Pembelajaran Problem Based Learning untuk Meningkatkan Hasil Berlajar Matematika Topik Bilangan Cacah. *Pedagogia: Jurnal Ilmiah Pendidikan*, *14*(2), 59–64. https://doi.org/10.55215/pedagogia.v14i2.6611.
Effendi, R., Herpratiwi, H., & Sutiarso, S. (2021). Pengembangan LKPD Matematika Berbasis Problem Based Learning di Sekolah Dasar. *Jurnal Basicedu*, *5*(2), 920–929. https://doi.org/10.31004/basicedu.v5i2.846.
Endah, N. (2017). Peningkatan Hasil Belajar IPA Siswa Kelas 5 SD Menggunakan Model Pembelajaran Kooperatif Tipe TGT Berbantuan Media Gambar. *Jurnal Pendidikan Sekolah Dasar*, *3*(2), 96. https://doi.org/10.30870/jpsd.v3i2.2131.
Fristyayuniar, A. A., Wardani, S., Haryani, S., & Mokhtar, E. (2023). Application of Inquiry Learning-Based LKPD to Improve Students' Interpersonal Intelligence. *International Journal of Active Learning*, *8*(1), 31–38. https://journal.unnes.ac.id/nju/index.php/ijal/article/view/44131/14392.
Hidayat, F., & Nizar, M. (2021). Model Addie (Analysis, Design, Development, Implementation and Evaluation) Dalam Pembelajaran Pendidikan Agama Islam. *Jurnal Inovasi Pendidikan Agama Islam (JIPAI)*, *1*(1), 28–38. https://doi.org/10.15575/jipai.v1i1.11042.
Hikmawati. (2012). Penggunaan Pendekatan Keterampilan Proses dalam Meningkatkan Hasil Belajar Pesawat Sederhana Siswa di Kelas V SDN 51 Lambari. *Jurnal Publikasi*, *2*(1), 44–53. https://doi.org/10.26858/publikan.v2i1.1584.
Iswatiningsih, D., Fauzan, F., Dluhayati, D., & Karunia Lestari, Y. (2021). Efektivitas Pembelajaran Bahasa Indonesia Daring di Masa Pandemi Covid-19 dalam Meningkatkan Kemampuan Berbahasa Siswa SMP. *Diglosia: Jurnal Pendidikan, Kebahasaan, Dan Kesusastraan Indonesia*, *5*(1), 141–156. https://jurnal.unma.ac.id/index.php/dl/article/view/2853/2161.
Jannah, D. R. N., & Atmojo, I. R. W. (2022). Media Digital dalam Memberdayakan Kemampuan Berpikir Kritis Abad 21 pada Pembelajaran IPA di Sekolah Dasar. *Jurnal Basicedu*, *6*(1), 1064–1074. https://doi.org/10.31004/basicedu.v6i1.2124.
Jayananda, D. (2020). Pengembangan Lembar Kerja Siswa Berbasis Multimodal Melalui Analisis Muatan Pengetahuan dan Keterampilan IPA Pada Tema Peristiwa Dalam Kehidupan Kelas V Sekolah Dasar. *Jurnal Penelitian Dan Evaluasi Pendidikan Indonesia*, *10*(2), 61–69. https://doi.org/10.23887/jpepi.v10i2.3512.
Khoirun Naimah. (2022). Inovasi Pembelajaran IPA SD dengan Pemanfaatan Media KIT Alat Sederhana yang Berasal dari Lingkungan Sekitar Untuk Meningkatkan Kompetensi dan Kreativitas Siswa. *Formosa Journal of Science and Technology*, *1*(2), 97–110. https://doi.org/10.55927/fjst.v1i2.693.
Khoirunnisa, A., Nulhakim, L., & Syachruroji, A. (2020). Pengembangan Modul Berbasis Problem Based Learning Materi Perpindahan Kalor Mata Pelajaran IPA. *Profesi Pendidikan Dasar*, *1*(1), 25–36. https://doi.org/10.23917/ppd.v1i1.10559.
Latifah, S. (2016). Pengembangan Lembar Kerja Peserta Didik (LKPD) Berorientasi Nilai-Nilai Agama Islam melalui Pendekatan Inkuiri Terbimbing pada Materi Suhu dan Kalor. *Jurnal Ilmiah Pendidikan Fisika Al-Biruni*, *5*(1), 43–51. https://doi.org/10.24042/jpifalbiruni.v5i1.104.
Magdalena, I., Fatakhatus Shodikoh, A., Pebrianti, A. R., Jannah, A. W., Susilawati, I., & Tangerang, U. M. (2021). Pentingnya Media Pembelajaran Untuk Meningkatkan Minat Belajar Siswa SDN Meruya Selatan 06 Pagi. *EDISI : Jurnal Edukasi Dan Sains*, *3*(2), 312–325. https://ejournal.stitpn.ac.id/index.php/edisi.
Monika, T. S., Julia, J., & Nugraha, D. (2022). Peran dan Problematika Guru Mengembangkan Keterampilan 4C Abad 21 Masa Pandemi di Sekolah Dasar. *Jurnal Cakrawala Pendas*, *8*(3), 884–897.

https://doi.org/10.31949/jcp.v8i2.2672.

Muna, K. N., & Wardhana, S. (2021). Pengembangan Media Pembelajaran Video Animasi dengan Model ADDIE pada Pembelajaran Bahasa Indonesia Materi Perkenalan Diri dan Keluarga untuk Kelas 1 SD. *EduStream: Jurnal Pendidikan Dasar*, *5*(November), 175–183. https://doi.org/10.26740/eds.v5n2.p175-183.

Muttaqin, M. F., & Rizkiyah, H. (2022). Efektifitas Budaya Literasi dalam Meningkatkan Keterampilan 4C Siswa Sekolah Dasar. *Dawuh Guru: Jurnal Pendidikan MI/SD*, *2*(1), 43–54. https://doi.org/10.35878/guru.v2i1.342.

Pamungkas, W. A. D., & Koeswanti, H. D. (2022). Penggunaan Media Pembelajaran Video Terhadap Hasil Belajar Siswa Sekolah Dasar. *Jurnal Ilmiah Pendidikan Profesi Guru*, *4*(3), 346–354. https://doi.org/10.23887/jippg.v4i3.41223.

Pratiwi, N. P. S., & Margunayasa, G. (2022). E-LKPD Berbasis Inkuiri Terbimbing Pada Muatan IPA Materi Perpindahan Kalor Kelas V. *Jurnal Pedagogi Dan Pembelajaran*, *5*(1), 100–108. https://doi.org/10.23887/jp2.v5i1.46542.

Pratiwi, S. N., Cari, C., & Aminah, N. S. (2019). Pembelajaran IPA Abad 21 dengan Literasi Sains Siswa. *Jurnal Materi Dan Pembelajaran Fisika*, *9*, 34–42. https://doi.org/10.20961/jmpf.v9i1.31612.

Prayoga, T., Agustika, G. N. S., & Suniasih, N. W. (2022). E-LKPD Interaktif Materi Pengenalan Bangun Datar Berbasis Etnomatematika Peserta Didik Kelas I SD. *Mimbar Ilmu*, *27*(1), 99–108. https://doi.org/10.23887/mi.v27i1.44777.

Rahayu, A. H., & Anggraeni, P. (2017). Analisis Profil Keterampilan Proses Sains Siswa Sekolah Dasar Di Kabupaten Sumedang. *Pesona Dasar (Jurnal Pendidikan Dasar Dan Humaniora)*, *5*(2), 22–33. https://doi.org/10.24815/pear.v7i2.14753.

Rahayu, S., Ladamay, I., Wiyono, B. B., Susanti, R. H., & Purwito, N. R. (2021). Electronics Student Worksheet Based on Higher Order Thinking Skills for Grade IV Elementary School. *International Journal of Elementary Education*, *5*(2), 453. https://doi.org/10.23887/ijee.v5i3.36518.

Rahman, I. N., Hidayat, S., & Nulhakim, L. (2020). Pengembangan LKPD Berbasis Pembelajaran Kontekstual untuk Meningkatkan Hasil Belajar. *Jurnal Teknologi Pendidikan Dan Pembelajaran*, *7*(2), 99–110. https://jurnal.untirta.ac.id/index.php/JTPPm/article/view/10678.

Rasmono. (2020). Upaya Meningkatkan Hasil Belajar IPA Kompetensi Dasar Menerapkan Konsep Perpindahan Kalor Dalam Kehidupan Sehari-Hari Melalui Metode Demonstrasi Pada Siswa Kelas V Semester Ii Tahun Pelajaran 2018/2019 Sd Negeri Bulakpacing 01 Kecamatan Dukuhwaru Kabupate. *Jurnal Dialektika Jurusan PGSD*, *10*(1), 312–321. https://doi.org/10.58436/jdpgsd.v10i1.511.

Retnawati, H. (2016). *Analisis Kuantitatif Instrumen Penelitian*. Parama Publishing.

Sabrini, A. T., Yulianti, D., Maulina, D., & Widodo, S. (2022). The International Journal of Social Sciences World Development of LKPD Based on PQ4R Strategy to Improve Students' Creative Thinking. *The International Journal of Social Science World*, *4*(2), 353–357. https://doi.org/10.5281/zenodo.7504928.

Santi, I., Hutapea, N. M., & Murni, A. (2022). Pengembangan Perangkat Pembelajaran Matematika Menggunakan Model Problem Based Learning (PBL) untuk Memfasilitasi Kemampuan Pemecahan Masalah Matematis Peserta Didik Kelas X Jurusan Otomotif SMK pada Materi Matriks. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *6*(2), 1584–1602. https://doi.org/10.31004/cendekia.v6i2.1178.

Santoso, E. (2017). Penggunaan Model Pembelajaran Kontekstual Untuk Meningkatkan Kemampuan Pemahaman Matematika Siswa Sekolah Dasar. *Jurnal Cakrawala Pendas*, *3*(1). https://doi.org/10.31949/jcp.v3i1.407.

Septikasari, R., & Frasandy, R. N. (2020). Keterampilan 4C Abad 21 Dalam Pembelajaran Pendidikan Dasar. *Journal of the American College of Cardiology*, *75*(20), 2635–2638. https://doi.org/10.15548/alawlad.v8i2.1597.

Setiadi, G., & Nurma Yuwita. (2020). Pengembangan Modul Mata Kuliah Bahasa Indonesia Menggunakan Model Addie Bagi Mahasiswa Iai Sunan Kalijogo Malang. *Akademika : Jurnal Manajemen Pendidikan Islam*, *2*(2), 200–217. https://doi.org/10.51339/akademika.v2i2.207.

Setyoningrum, N. ., & Supriyanti, T. (2019). Pelaksanaan Asesmen Pembelajaran IPA dalam KTSP. *Indonesian Journal of Conservation*, *3*(1), 99–110. https://doi.org/10.15294/ijc.v8i2.22691.

Sobri, A. Y., & Ningrum, E. S. (2015). Implementasi Kurikulum 2013 di Sekolah Dasar. *Manajemen Pendidikan*, *24*(5), 416–423. http://ap.fip.um.ac.id/wp-content/uploads/2015/05/volume-24-no.-564-71.pdf.

Soleh, A. R., & Arifin, Z. (2021). Integrasi Keterampilan Abad 21 dalam Pengembangan Perangkat Pembelajaran Pada Konsep Community of Inquiry. *QALAMUNA: Jurnal Pendidikan, Sosial, Dan*

Agama, *13*(2), 473–490. https://doi.org/10.37680/qalamuna.v13i2.995.

Subali, B., & Mariyam, S. (2013). Pengembangan Kreativitas Keterampilan Proses Sains Dalam Aspek Kehidupan Organisme Pada Mata Pelajaran IIPA SD. *Jurnal Cakrawala Pendidikan*, *3*(3), 365–381. https://doi.org/10.21831/cp.v3i3.1625.

Suryaningsih, S., & Nurlita, R. (2021). Pentingnya Lembar Kerja Peserta Didik Elektronik (E-LKPD) Inovatif Dalam Proses Pembelajaran Abad 21. *Jurnal Pendidikan Indonesia (Japendi)*, *2*(7), 1256–1268. https://doi.org/10.59141/japendi.v2i07.233.

Suwastini, N. M. S., Agung, A. A. G., & Sujana, I. W. (2022). LKPD sebagai Media Pembelajaran Interaktif Berbasis Pendekatan Saintifik dalam Muatan IPA Sekolah Dasar. *Jurnal Penelitian Dan Pengembangan Pendidikan*, *6*(2), 311–320. https://doi.org/10.23887/jppp.v6i2.48304.

Syafi'ah, R., & Laili, A. M. (2020). Pengembangan LKS IPA SMP Kelas VII Berbasis Pendekatan Saintifik Untuk Melatihkan Keterampilan Proses IPA Siswa. *LENSA (Lentera Sains): Jurnal Pendidikan IPA*, *10*(2), 104–113. https://doi.org/10.24929/lensa.v10i2.115.

Tegeh, I. M., Simamora, A. H., & Dwipayana, K. (2019). Pengembangan Media Video Pembelajaran Dengan Model Pengembangan 4D Pada Mata Pelajaran Agama Hindu. *Mimbar Ilmu*, *24*(2), 158. https://doi.org/10.23887/mi.v24i2.21262.

Wirdaningsih, S., Arnawa, I. M., & Anhar, A. (2017). Pengembangan Perangkat Pembelajaran Matematika dengan Pendekatan Contextual Teaching and Learning untuk Meningkatkan Kemampuan Pemecahan Masalah Peserta Didik Kelas XI. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *1*(2), 275. https://doi.org/10.33603/jnpm.v1i2.535.

Yestiani, D. K., & Zahwa, N. (2020). Peran Guru Dalam Pembelajaran Pada Siswa Sekolah Dasar. *Fondatia : Jurnal Pendidikan Dasar*, *Vol 4 No 1*, 41–47. https://doi.org/10.36088/fondatia.v4i1.515.

Yulianti, Y. A., & Wulandari, D. (2021). Flipped Classroom : Model Pembelajaran untuk Mencapai Kecakapan Abad 21 Sesuai Kurikulum 2013. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *7*(2), 372. https://doi.org/10.33394/jk.v7i2.3209.