Needs Analysis for Development of Environmental-oriented Students' Worksheet on Natural and Social Science of Fourth Grade Students of UPT SDN 9 Makale

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Abstract. Student Worksheet as part of the learning tool is needed by teachers and learners to facilitate the learning process, the right worksheet will greatly assist learners in understanding the lessons with direct experience so that the subject matter will be constructed in the minds of learners. Environmental-oriented worksheet on science subjects can increase the activeness of students in the learning process and allow students to work together collaboratively, think critically and creatively. Description analysis of worksheet development needs in learning science Class IV UPT SDN 9 Makale be the focus of this study. This study uses qualitative methods with the type of case study research. The subjects consisted of two teachers of class IV UPT SDN 9 Makale. The subjects were determined by purposive sampling based on the teacher with the highest number of students in the class. Data collection techniques carried out by interviews, questionnaires, and documentation. Data analysis techniques used in this study are Miles and Huberman analysis techniques. Test the validity of the data using triangulation techniques. The results of this study indicate that science learning activitiesare still using conventional methods with lectures and assignments, there is noenvironment-oriented student worksheet which can facilitate students to conduct practical activities by involving students in the surrounding environment. Based on theneeds analysis in the field, it is necessary to develop student worksheet on natural and social science with environmental orientated for students in class IV UPT SDN 9 Makale.

Keywords: Development needs, student worksheet, environment oriented

1 Introduction

Education is a crucial element in the development of a country, and an understanding of an effective education system is the main foundation. Law No. 20 of 2003 on the National Education System in Indonesia stipulates that learning is a process of interaction between learners, educators, and learning resources in a learning environment. However, in recent times, the learning paradigm has shifted significantly.

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The implementation of The Merdeka curriculum in the 2022/2023 school year has been initiated by several schools, although the implementation is still in the early stages with a focus on Grade 1 and Grade 4. This Program is part of an initiative launched by the Minister of Education, Culture, Research and Technology, Nadiem Makarim. Curriculum Merdeka aims to provide a fun learning experience for students, with the hope of improving the standard of education in Indonesia. Measures for the implementation of The Merdeka curriculum include freeing students from the burden of tasks that are too heavy, especially in Grade 1 and Grade 4. This approach is designed to give students flexibility, allowing them to learn without excessive pressure. This is consistent with the idea that a Merdeka curriculum, tailored to the character and needs of students, can create a more conducive learning environment.

The implementation of The Merdeka curriculum is also expected to support more in-depth, fun, and independent learning. In Dewa Ayu's (2022) View,[1] a curriculum that gives students the freedom to learn according to their interests and needs has the potential to increase student motivation and engagement. The concept of curriculum as a key element in the education system is emphasized by Suryaman (2020)[2]. The curriculum is considered not only about achieving goals, but also provides an in-depth picture of the learning process. Thus, the implementation of The Merdeka curriculum in Grade 1 and Grade 4 in the 2022/2023 academic year illustrates a commitment to creating a more dynamic, responsive, and appropriate learning environment for students in an era of growing education.

The phases in the Merdeka curriculum for the elementary school level are Phase A for Grades 1 and 2, Phase B for Grades 3 and 4, and Phase C for Grades 5 and 6. Each phase uses learning tools according to subjects. Among others, Indonesian books, Science, Mathematics, English, PJOK, Pancasila Education, Islamic Religious Education, and ethics as intracurricular subjects. Unlike the 2013 curriculum that uses themes. The books can be accessed from the Merdeka Mengajar Platform application. Which in the application are several features available for use by educators to assist in the implementation of The Merdeka curriculum implementation. One of the books used in the implementation of The Merdeka curriculum is the Natural and Social Science book. The book combines social studies or social studies and scientific topics or science. According to Sujana, teaching science in elementary schools in particular should focus on providing direct knowledge to children to help them build the skills they need to explore and understand the environment scientifically. This is because science is very important to answer many human demands in everyday life (Anggrayni et al., 2023).[3]

Students' worksheets are one part of the learning tool, in the learning process required student worksheets as an important component developed by teachers for learners. Student worksheet which contains materials for learners to be more active and can take meaning from the learning process. Student worksheet is a sheet of paper containing material, summary, and instructions for the implementation of learning tasks that must be done by students who refer to the basic competencies to be achieved (Kristyowati, 2018.)

In the situation of education in UPT SDN 9 Makale, there are significant challenges related to teaching materials that have emerged so far. Based on the results of observations and interviews with teachers in local elementary schools, it was revealed that the teaching materials used were mainly limited to student worksheets purchased

from publishers, and package books that were only available for borrowing at school. In fact, the student worksheets used are limited to those in teacher textbooks in the Merdeka curriculum. This study highlights that the natural and social science worksheet consists of 8 (eight) chapters, while the worksheet in student textbooks is more in the form of statements and less has elements of images in tools and materials. The use of less attractive colors, as well as the absence of instructions for use for learners, makes each step of the work not accompanied by a picture. Some questions are not productive statements. No scientific process is carried out, even though science is synonymous with science experiments to be able to find concepts. In line with the opinion of Fitriana (2019)[4] that the skills of the science process and the scientific attitude of students can develop through science practicum activities. Experimental activities can stimulate students ' creativity and train students to find science concepts, not just limited to knowledge.

These facts are in line with the findings of Gusti & Ratnawulan (20200)[5] which states that the learner worksheets obtained from publishers have not fully met the learning needs of the 21st century. This becomes increasingly relevant considering that the Merdeka curriculum emphasizes the need for learning that is able to form attitudes, knowledge, and skills for learners. In this context, natural and Social Sciences are key subjects that are expected to make a significant contribution to the formation of student character. The use of student worksheets is expected to build an effective interaction between teachers and students, encourage students ' interest in the concept of Natural Science (IPA) is being studied. Although it is expected to be a tool that supports the learning process and increases students ' interest in learning, the fact is that most student worksheets available in schools do not include experimental, demonstration, or discussion activities.

This finding is in line with the Ayyul 2022 Study,[6] which states that many learners feel bored and lack enthusiasm in learning due to student worksheet limitations that do not support learning, which ultimately affects their learning outcomes. This also highlights that many teachers still rely on conventional student worksheets obtained instantly from publishers, without preparation, planning, or making. This kind of practice is likely to make the student worksheet used less interesting, less contextual, boring, monotonous, and not in accordance with the needs of learners.

In response to these problems, this study aims to identify the need for teaching materials in the form of printed student worksheet science that is oriented to the environment. With a deep understanding of these needs, it is hoped that the development of student worksheet can be more attractive and support active and creative learning of students, in accordance with the demands of learning in the 21st century era and the purpose of the Merdeka curriculum itself. The nature of learn science in elementary school, namely science as a scientific attitude, scientific product, and scientific process (Syar, 2020)[7]. Science and social learning teach understanding yourself and the surrounding environment so that it can be applied in everyday life. Students are required to have an active, creative, critical, and communicative attitude in learning sciences.

Utilization of Environmental media, as described by Widyastanti, 20142014[8], can be described in more detail in accordance with the views of experts, namely:

1. Cost efficiency: by using objects that are already available around, the use of Environmental media not only provides a real experience for learners, but also has

the potential to reduce costs that are usually associated with purchasing learning materials.

2. More immersive learning experience: the utilization of Environmental media helps to create a more immersive learning experience for learners. This is because they not only receive information verbally, but also visually and practically through interaction with the surrounding environment.
3. Suitability to individual needs: objects taken from the learner's environment can be better adapted to the individual needs and interests of each. This allows personalizing learning and increasing the appeal of the material.
4. Applicability in everyday life: materials learned through Environmental media are more likely to be applied directly in the daily lives of learners. This is because they can identify and Realize learning concepts with their own practical experience.
5. Increased engagement and motivation: the use of Environmental media, which involves direct interaction with real objects, can increase learners ' involvement in the learning process and motivate them to be more actively involved.
6. More contextual learning: media environments allow for more contextual learning, where learners can associate learning concepts with concrete situations or objects around them.
7. Improved communication skills: direct involvement with objects and events in the learner's environment can improve their communication skills since the material is easier to understand and digest.

Thus, the use of environmentally oriented learner worksheets can be designed to take advantage of the diversity and availability of the environment around learners, creating learning that is more thorough and related to their lives.

2 Methods

The method used in this study is a qualitative method by applying a case study approach. Qualitative approaches are used to explore and understand the meaning of individual or group views on social problems. The purpose of this study was to understand the development needs of environmentally oriented-student worksheet from the perspective of teachers and learners. Fourth grade teachers UPT SD 9 Makale be the subject of research, selected through purposive sampling method, namely the selection of subjects based on certain considerations that are considered capable of providing relevant data (Sugiyono,32013)[9]. In data collection, interview, questionnaire, and documentation methods are used. Interviews are conducted to gain an in-depth understanding of the problems in the field. Interview guidelines and instruments are based on three main research focuses: problems, context, and needs (Burhan,2020)[10]. Questionnaires were used to identify problems, and documentation was used to support the results of interviews and questionnaires and as analytical material. Data analysis was performed using Milles and Hubberman analysis techniques, which included data reduction, data presentation, and inference and verification (Miles & Huberman, 1994). Data from interviews and observations are elaborated in detail, focusing on aspects relevant to the research objectives and ignoring unimportant information. Triangulation techniques are applied to improve data validity

by obtaining information from the same source through different techniques. The results of the study focused on three main aspects, namely curriculum analysis, context analysis, and analysis of problem-solving solutions.

3 Results and Discussion

3.1 Curriculum Analysis Results

Identification of problems found in the field using interview techniques conducted on fourth grade teachers UPT SDN 9 Makale. Here are the interview results:

No	indicators	of Interview results
1	implementation of Merdeka curriculum in schools	has been implemented in schools in accordance with the provisions of Minister Nadiem Makarim
2	constraints in teaching Merdeka curriculum	difficulty in making learning devices in the form of teaching modules
3	content of science material which is considered	to have extensive material content of science material is considered to have a learning is achieved
4	practicum activities using student worksheet instructions in the school environment	lack of practical activities in the school environment because the tools and materials are inadequate and take a long time
5	learning devices that are often used in learning	science teacher's guidebook and science student's guidebook that has been provided by the school
6	availability of science student worksheet the neighborhood	does not have a separate special student worksheet. student worksheet is still integrated with teacher textbooks and student textbooks.
7	opinions of the father / mother if the development of environmentally oriented science student worksheet	very agree, because with the existence of science student worksheet it will make it easier for teachers and students to conduct practical activities so that learning objectives can be achieved
8	opinions of the father/mother in the development of science student worksheet related contents.	should be designed later will contain conducting experiments according to the characteristics of elementary school students, tools and materials are described and accompanied by pictures, rare-step experiments are equipped with pictures of how it works and the questions in the student worksheet are productive questions

The results of the curriculum analysis conducted show that in UPT SDN 9 Makale, the implementation of the Merdeka curriculum has begun since 2022. However, its implementation still does not fully comply with the principle of a Merdeka curriculum that emphasizes learner-centered learning. This is in line with the findings of Sumarsi,2022[11] which states that the Merdeka curriculum is directed to teach children how to manage the natural and social environment holistically. Nonetheless, interviews with fourth grade teachers showed that most teachers (75%) still often use conventional methods such as lectures and assignments, resulting in a lack of active participation of learners and the dominance of the teacher's role in the learning process Susanti, 2018.[12]

From the results of the questionnaire, it is known that 50% of teachers use student worksheet from publishers, while the rest use package books from the government. Although student worksheet is considered a teaching material that supports the 2013 curriculum and can increase the creativity of (hervyanti, 2022) learners[13], the fact is that the student worksheet used is not the result of a teacher's design. Student worksheet is more often purchased from publishers without accompanying work instructions, tools and materials, as well as the results of discussions. Student worksheet in circulation generally only contains a summary of the material and practice questions, without providing comprehensive guidance. The design of the content of student worksheet in natural and social science in schools generally only includes a list of questions and a summary of the material, with a less attractive appearance and minimal images. This weakness can generate boredom in learners and encourage them to memorize the material without understanding it in depth. This finding is consistent with the Elfina & Sylvia (2020) Study, which emphasizes that a less meaningful summary of the material can cause learners to simply memorize concepts without sufficient understanding. Therefore, there is an urgent need to develop a better and appropriate student worksheet in the learning process. The results of context analysis showed that environmental-focused natural and Social Science learning involves an approach in which learners engage in experiments using the surrounding environment as context. The purpose of this experiment is to help learners develop problem-solving skills by providing hands-on experience of objects, work procedures, and concepts.

3.2 Context Analysis Results

Environment-centered experiments aim to train scientific thinking and hone science process skills, including observation activities, investigation design, data analysis, and inference. Involving learners in experiments is expected to make them able to explain natural phenomena scientifically, conduct scientific evidence, and make decisions based on science knowledge (Arrohman, et al., 2022)[14]. Experiments are also considered as a means for learners to find the truth of the theory they learn, in line with the essence of science learning that emphasizes the discovery process (Hasmiati, et al., 2017).

However, the results of the questionnaire showed that 72.5% of teachers never did practicum, 25% did it rarely, and only 12.5% carried out practicum activities frequently. This indicates that the ability of learners in problem solving is still relatively low.

Science lessons are considered to have a wide and complex scope of material, including biology, physics, chemistry, and social aspects. To support this learning, adequate

media and teaching materials are crucial. In the implementation of science experiments, there is a need for student worksheets that can guide them through these activities. Science experiments require an active role of learners in proving theories or even discovering new theories, with teachers acting more as facilitators (Astuti, et al., 2021[15]). However, the currently available student worksheet is not optimal in facilitating science experiments, observations, and discussions.

3.3 Solution Analysis Results

The results of interviews with teachers at UPT SDN 9 Makale showed that the use of worksheets learners natural and Social Sciences in schools is still limited to the teacher and student manuals provided by the government and distributed to each school. However, the student worksheet for student activities has not been specifically provided and is still incorporated into the teacher and student handbook, in accordance with the previous 2013 curriculum.

Learners ' understanding of the subject matter will be well formed if assisted with teaching materials that are designed innovatively and creatively (Sari & Sutihat, 2022)[16]. Teaching materials in the form of student worksheet circulating in schools have not facilitated the implementation of environmentally oriented science experiments.

Table 2. Standard student worksheet Environmental-oriented on natural and social science standards in accordance with the development systematics.

No	Aspect	Suitable	not suitable
1	title and material of student worksheet appropriate to subject matter	√	
2	the learner identity is provided		√
3	The learning objective provided		√
4	suitability of learning objectives with the contents of student worksheet	√	
5	Using language that is easy to understand	√	
6	there are instructions for use student worksheet		√
7	there is a summary		√
8	Tools and Materials are written clearly and in detail	√	
9	Practical work procedures are available	√	
10	contained productive questions		√
11	conclusion column is provided		√
12	contents of the student worksheet provide direct student experience		√
13	The hands-on student activities		√
14	There are images of each tool and material		√
15	there are examples of images for each procedure		√

According to Windyariani 2016[8]), a good student worksheet has a structure consisting of several elements. First, there is a clear title to identify learning activities. Second, student worksheet lists learning achievement as a goal to be achieved in the activity. Furthermore, the time of completion of the activity is also mentioned to provide time guidance to the learners. The necessary equipment and materials for learning activities should be described with interesting pictures in accordance with the characteristics of primary school students. In addition, the student worksheet must provide a summary of the material as a guide to understand the concepts to be studied. Work steps accompanied by how to use tools and materials also need to be included so that learners can follow the learning process well. The question posed in the student worksheet should be of a productive nature, in which the answer cannot be found without conducting an experiment or experiment. However, in the previous student worksheet, there was no experimental work step. In fact, in learning natural and social sciences with experimental or experimental activities, students could experience, conduct themselves, follow the process, observe, analyze, prove, and draw conclusions.

Science and social learning often involve experimental activities or direct observation of objects, so the appropriate student worksheet is needed to guide learners. Student worksheet helps learners build knowledge in their minds and makes it easier to understand the subject matter. The use of student worksheet provides a meaningful experience in learning, where learners are actively involved in finding new concepts associated with the theory or the surrounding environment (Asmirani, et al., 2013[17]). However, in practice, there are various shortcomings in the previous student worksheet, so that further development is needed student worksheet. This aims to make science learning more in line with the Merdeka curriculum, where educators and learners need a trial-based science student worksheet. Elementary school teachers face obstacles in the development of student worksheet, such as low ability to use information technology, low motivation due to approaching retirement, and network limitations that make it difficult to explore information from the internet. One solution to overcome these problems is to maximize training related to technological capabilities. Competency improvement activities by educators can increase the motivation and spirit of understanding of elementary school teachers in preparing teaching materials student worksheet (Sari, et al., 2021)[16]. Kendala another obstacle faced by teachers is the difficulty in developing teaching tools and applying scientific activities to ask and reason in the context of the 2013 curriculum (Vonny, 2023)[18]. Related to the use of student worksheet science, there are major obstacles that arise due to the limited student worksheet available. Many teachers use student worksheets purchased from publishers, which tend to contain only summaries, questions, and problems without providing guidance on the problem-solving process (prabandari,2020)[19]

4 Conclusion

Based on the results of the needs analysis that has been done, there is a need to produce learning materials that can support the learning process of students, both at school and independently. In this case, there is a need to design worksheets for students focusing on natural and Social Sciences related to the environment. This teaching material is expected to serve as a guide for teachers and students during national and social science

learning. Student worksheet on natural and social science that are oriented to the environment are considered essential because they reflect practical activities or direct observation, in accordance with the essence of Science Learning. Thus, students will be trained to develop problem-solving skills and the ability to find their own concepts from the knowledge that has been learned. Therefore, the independent development of student worksheet is considered a necessary step to maximize the learning of science in the context of an Merdeka curriculum

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