# Needs Analysis of Student Worksheets to Develop Collaborative Skills in Learning Science

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**Abstract.** Learning in schools must develop students collaborative skills, student worksheet as a learning tool is considered capable of encouraging students to develop these skills. The purpose of this study was to describe the needs of student worksheets that develop collaboration skills in learning science in elementary schools. This research was conducted using a qualitative descriptive method involving teachers. Data collection was carried out using instruments in the form of questionnaires and student worksheet assessments from the questionnaire fillers. Research data is processed by determining the percentage value of the results of questionnaires and analysis of student worksheet based on structure, preparation standards, based on certain models and the emergence of collected collaboration skills. The results showed that most of the existing student worksheet did not meet standards, were not based on a particular learning model, and had not trained students' collaboration skills. This research shows the need to develop worksheets that are able to train students' collaboration skills.

**Keywords:** Collaborative skills, student worksheet, elementary schools.

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## INTRODUCTION

In the 21st century, many changes have occurred in human life due to the development of science, technology and information, which has removed the limitations of space and time. These developments bring people into a new era of global competition and challenges in all parts of the world, including Indonesia. Therefore, human resources that can compete are needed to overcome global competition and challenges.

Students need 21st-century skills as provisions for competing in the competitive era of technology and information. Based on this, learning is needed that can prepare students for the realities of the 21st century. 21st-century learning content is then known as the 4C term (*communication*, *collaboration, critical thinking, and creativity).* In line with this, Binkley (in Winaryati, 2018) suggests that 21st-century skills are globally described in the following four categories: (a) Ways of thinking: Creativity and innovation, critical thinking, solving problems, making decisions, and learning to learn; (b) Ways to work: Communicate and cooperate; (c) Tools for work: General knowledge and skills of information and communication technology; (d) Way to live: career, personal and social responsibility including cultural awareness and competence.

One of the four competencies that must be owned by the 21st-century generation is the ability to collaborate (*collaboration*). Collaboration skills are the ability to participate in every activity to build relationships with other people, respect relationships, and teamwork to achieve the same goals (Rahmawati, 2019). Collaboration skills are essential for everyone to have, which acts as transferable skills that will be useful in all contexts of life, one of which is as a link between theoretical knowledge and practical knowledge (Kundarti et al., 2019). In addition, several problems also become reasons for the importance of collaboration skills as one of the 21st-century skills as follows, 1) empathy in adolescents is decreasing, 2) with the ease of technology, the millennial generation tends to be individualistic and apathetic towards the environment, 3) in the world of work, teamwork is needed to complete work assignments, 4) collaboration is a human need because naturally humans as social beings are always in contact with other humans, working together, and helping each other (Kinanti, 2019; Kurniaputri, 2021; Saleh, 2020).

*Student collaboration skills will be seen when he interacts in a group. In group discussion activities, students are trained to collaborate in a group by making an active contribution to their group; people in the group are involved in working together to generate ideas and, at the same time, get feedback on these ideas (Abidin et al., 2021)*

Learning Science in elementary schools as part of education plays an essential role in developing collaboration skills in students to prepare them to compete and face the challenges of the 21st century. Based on research and literature, it can be concluded that collaboration skills must be developed in the world of education in order to prepare students to be successful and contribute positively to the life of 21st-century society (Apriono, 2013; Dewi & Simanjuntak, 2019; Zubaidah, 2017).

Education is a strategic tool for developing students' collaborative skills as the next generation. Elementary school, as an educational institution, is a place for students to develop and hone the skills, knowledge, and attitudes needed in society, including collaboration skills. One way to develop collaboration skills in schools is to create learning in which some activities encourage students to discuss and work together to solve problems (Pratiwi, 2017).

Learning support devices such as learning materials are needed to encourage learning activities that develop collaborative skills. Teaching that is designed as well as possible. One component of teaching materials often used in science learning is the Student Worksheet or LKPD.

LKPD acts as a guide for students in learning activities that help students to play an active role in learning. LKPD is a tool to help and facilitate teaching and learning activities so that effective interactions are formed between students and educators, students learn more independently and learn to understand and carry out written assignments so that they can increase student activity and learning achievement (Effendi et al., 2021).

## METHOD

The method used in this study is a qualitative method with a qualitative descriptive design. Descriptive research seeks to describe phenomena that occur realistically, actually, really, and at this time because it makes descriptions, pictures or paintings systematically, factually, and accurately regarding the facts, characteristics, and relationships between the phenomena being investigated (Rukajat, 2018). Descriptive analysis in this study is the percentage of results from the aspects contained in the indicators of mastery of the concept. Meanwhile, the qualitative approach is an approach to building knowledge statements based on a constructive perspective (Creswell in Rukajat, 2018)

This research was conducted involving elementary school teachers. Concept mastery data collection techniques were collected with a non-test instrument in the form of a questionnaire. The data obtained and reduced are then presented in the form of tables and descriptions. This was done to make it easier to read the research results that were made. The final stage of data analysis is drawing conclusions that can answer the problems that have been formulated at the beginning of the study. The mapping of respondents is presented in Table 1, adopted from Maulana & Sopandi (2022) below.

**Table 1**. Mapping of Respondents

| Indicator | Variable | Total | Percentage |
|---|---|---|---|
| Gender | Male | 3 | 9.4% |
| | Female | 29 | 90.6% |
| Employment Status | ASN | 17 | 53.1% |
| | Non-ASN | 15 | 46.9% |
| Working Period | < 5 years | 22 | 68.8% |

| Indicator | Variable | Total | Percentage |
|---|---|---|---|
| | 6- 10 years | 1 | 3.1% |
| | >10 years | 9 | 28.1% |
| Teaches in Class | 1 | 6 | 18.75% |
| | 2 | 2 | 6.25% |
| | 3 | 5 | 15.63% |
| | 4 | 8 | 25% |
| | 5 | 7 | 21.87% |
| | 6 | 4 | 12.5% |
| School Status | State | 28 | 87% |
| | Private | 4 | 12.5% |

While the questions asked in the questionnaire were adopted from Maulana & Sopandi (2022) which were adjusted for the elementary school context, presented in Table 2 below.

**Table 2.** Indicators of questionnaire questions

| Indicators | Sub-Indicators |
|---|---|
| LKPD | Use Use of LKPD in the Science learning process |
| Preparation of LKPD | LKPD prepared/made by the teacher himself |
| | The LKPD used is based on a particular learning model (following the syntax stages of the model used) |
| | If the LKPD is based on a learning model, what model is the basis of its preparation |
| Support the development of collaborative skills | Train develop students' collaboration skills |

**RESULTS**

In terms of the intensity of use of the LKPD the answers from the questionnaire were categorized into the following criteria: "Always" means used in every learning activity; "Frequently" means that the LKPD is used almost continuously, but occasionally it is not used for some time; "Sometimes" means that the LKPD is only used occasionally under certain conditions (more than eight lessons); "Ever" means that the LKPD is used several times (less than eight lessons); "Never" means in every learning activity does not use LKPD. Based on the results of completing the questionnaire, the intensity of using LKPD in learning science in elementary schools is presented in table 3.

**Table 3.** The intensity of using LKPD

| Questions | Alternative | Percentage |
|---|---|---|
| Is the science learning process using LKPD? | Always | 18.8% |
| | Often | 25% |
| | Sometimes | 50% |
| | Never | 3.1% |
| | Never | 3.1% |

Based on the results of the questionnaire presented in Table 3, as many as 50% "sometimes" use worksheets in science learning, 25% of teachers often use LKPD in science learning, 18.8% always use LKPD in science learning, and teachers who "have" and "never" used LKPD in science learning are 3.1% teachers respectively. Based on these data, the majority of teachers "sometimes" use LKPD in science learning, adapted to certain conditions, content, and situations.

In terms of the compiler, it is categorized as self-made by the teacher concerned, not made by the teacher himself, and made with a team, as well as the LKPD in the theme book. The results of filling out the questionnaire are presented in table 4 below.

**Table 4.** Compiler of LKPD

| Questions | Alternative Answers | Percentage |
|---|---|---|
| Was LKPD prepared/made by the teacher himself? | Yes | 62.5% |
| | No | 0% |
| | With a team | 2% |
| | In the theme book | 31.3% |

Based on the results of filling out the questionnaire presented in Table 4, 62.5% of teachers make their own LKPD, 2% make it with a team because in some schools, the same level classes can consist of several classes, 31.3% make the LKPD in the theme book, and 0% do not make LKPD at all. This shows that the majority of teachers made their own LKPD, and most were based on what was in the 2013 curriculum theme book. Based on the uploaded LKPD some respondents indicated that the LKPD prepared was not in accordance with the standards for preparing LKPD.

In general, the preparation of LKPD is based on a learning model to maximize and focus. The learning model is a logical sequence for teaching students and is a guide for what the teacher does in teaching (Widodo, 2021). In table 5, the results of the responses are presented, which aim to find out whether the preparation of the LKPD is based on a particular learning model or not.

**Table 5.** Preparation of LKPD based on a learning model

| Question | Answer | Percentage |
|---|---|---|
| Is the LKPD used based on a particular learning model (following the syntax stages of the model used)? | Yes | 87.5% |
| | No | 12.5% |

| Question | Answer | Percentage |
|---|---|---|
| If LKPD is based on a learning model, what model is the basis for its preparation? (allowed to choose more than one answer) | PBL (Problem Based Learning) | 40.6% |
| | PJBL (Project Based Learning) | 28.1% |
| | Inquiry | 31.3% |
| | CTL (Contextual Teaching and Learning) | 34.4% |
| | Others | 6.2% |

A total of 87.5% stated that the preparation of LKPD was based on a learning model, while 12.5% stated that it was not based on a particular learning model. As many as 40.6% of respondents used the Problem Based Learning learning model, 34.4% used the Contextual Teaching and Learning model, 31.3% used the Inquiry learning model, 28.1% used the Project Based Learning learning model, and 6.2% used another learning model. However, after analysis, the uploaded LKPD is not fully based on a particular learning model. The learning steps in the LKPD do not appear to be in accordance with the syntax of a particular learning model, and the LKPD only contains instructions that students must do. Meanwhile, worksheets based on specific learning models have structured steps according to the syntax of a particular learning model.

In terms of collaborative skills for assessment, student worksheets capable of developing student collaboration skills require more specific assessments with separate instruments in order to provide an accurate assessment. So that this assessment is a subjective assessment of the respondent on the LKPD he has compiled. To verify the answers from the respondents, the researcher then analyzed the uploaded LKPD. Respondents' assessment of the LKPD they compiled trained students' collaboration skills or not is presented in table 6.

**Table 6.** Respondents' assessment of the development of collaboration skills on LKPD

| Questions | Alternative | Percentage |
|---|---|---|
| Is the LKPD used to train student collaboration skills? | Yes | 75% |
| | Maybe | 21.9% |
| | No | 3.1% |

Based on Table 6, 75% of respondents thought that the LKPD they compiled had trained collaboration skills, 21.9% said it was possible, and 3.1% thought that the LKPD they had compiled had not trained skills student collaboration.

**LKPD**

Analysis LKPD analysis uploaded by respondents aims to verify the answers given. In addition to analyzing the LKPD uploaded by respondents, the researcher also analyzed the existing LKPD uploaded by teachers on the SIMPKB "guruberbagi" and "ayoguruberbagi" Kemendikbud pages.The collected LKPD are analyzed based on structure, requirements for preparing LKPD, and indicators of collaboration skills are considered based on indicators adapted from Trilling and Fadel (in HR Pratiwi et al., 2020), namely encouraging group collaboration, individual contribution in groups, responsibility, and compromise in making decisions. The results of the analysis are presented in Table 7 below.

**Table 7**. Analysis of LKPD

| sample LKPD LKPD | Title | PB | Purpose | TL | P | Based | Diactive | Condition Model Construction | Requirements Technical requirements | MKK |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| 4 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 5 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 6 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 7 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 |
| 8 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 |
| 9 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 10 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 11 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 1 | 1 | 0 |
| 12 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 |
| Total | 11 | 7 | 11 | 12 | 3 | 0 | 8 | 9 | 7 | 4 |
| % | 91.67 % | 58.33 % | 91.67% | 100 % | 25 % | 0% | 66.67% | 75% | 58.33% | 33.33 % |

Description: 0 = not fulfilling, 1 = fulfilling, PB = Learning instructions, TL = tasks and work steps, P = Assessment of MKK = practicing collaboration skills

Based on the percentage of LKPD analysis results, most of them have met the LKPD standards based on the structure, and it's just that the evaluation part there is only 25% of LKPD. This shows that the majority of LKPD do not contain assessments. In addition, there are only 58.33% of study guides in LKPD, still, less than 60% which shows that most of the LKPD does not contain study instructions. It can be seen from Table 7 that there is no LKPD that completely complies with the LKPD structure. This shows that it is necessary to increase teachers' understanding of the LKPD structure.

From the LKPD analysis, there was not a single LKPD based on the learning model. Based on the results of the analysis, the learning activity steps in the LKPD do not follow the syntax of a particular learning model. Steps of learning activities are only in the form of learning tasks that are less focused. LKPD based on the learning model makes the learning process more focused and concise because it has been adapted to specific syntax and learning models. Based on this, LKPD is needed, which is compiled based on a particular learning model that describes the syntax of the learning model.

In the preparation of LKPD must meet the didactic requirements, construction, and technical requirements. However, most LKPD do not meet these requirements. Only 66.67% fulfilled the inactive requirements, 75% met the construction requirements, 58.33% met the technical requirements, and only 3 out of 12 LKPDs fully fulfilled these three requirements, even though these three conditions were essential for guaranteeing the quality of the compiled LKPD. Furthermore, in terms of training students' collaboration skills, only 4 of the 12 LKPDs were assessed as being able to meet these indicators. Most worksheets need to clearly indicate whether learning is done in groups or individually, while one thing that really supports collaboration skills is group learning.

**DISCUSSION**

Based on the data that has been collected, the majority of teachers "sometimes" use worksheets in science learning adapted to certain conditions, content, and situations. Even though LKPD is one of the learning tools that is very important in learning. LKPD is able to invite students to gain knowledge, experience, skills, and attitudes actively it is beneficial in learning activities and students' understanding (Diasanti & Rosdiana, 2019; Umbaryati, 2016).

The LKPD structure generally consists of titles, study instructions, competencies to be achieved or learning objectives, assignments and work steps, and assessments (Nana, 2022). In addition, in its preparation, LKPD must fulfill three aspects, namely didactic requirements, construction requirements, and technical requirements (Umbaryati, 2016). The title will inform the topics that will be the focus of activities, study instructions, assignments, and work steps to guide students in carrying out learning activities (Hadi Soekamto, 2020).

In addition to the structure and requirements for preparing LKPD that must be met, collaboration skills must be considered in preparing LKPS. Collaboration skills are essential to develop because they are one of the skills needed in the 21st century. Collaboration skills are fundamental for everyone to have, which will be helpful in all life contexts (Kundarti et al., 2019) However, based on the data obtained, there are no LKPDs made by teachers, in general, they do not contain the complete LKPD structure, do not fulfill the requirements for preparing LKPDs optimally, and do not yet contain elements that encourage the development of collaboration skills, this shows that it is necessary to increase teachers' understanding of the LKPD structure. as well as LKPDs that are following the structure, requirements for preparing LKPDs and encouraging student collaboration skills. Teachers have important roles and tasks in learning, so teachers must be able to improve their quality, one of which is that teachers must have adequate competence in preparing teaching materials to facilitate and provide convenience and support for the implementation of learning activities for students (Subarjo, 2022). Student worksheets (LKPD) are one of the teaching materials that are very important in learning activities because they are a means to assist and facilitate teaching and learning activities so that effective interactions are formed between students and educators, can increase student learning activities and achievements (Umbaryati, 2016).

## CONCLUSION

Existing LKPDs in the field does not meet the LKPD standards, are not based on a particular learning model, and need to train students' collaboration skills. Based on this, it is necessary to prepare LKPD, which consists of a complete LKPD structure, meets standards (didactic, construction, and technical requirements), is prepared based on a particular learning model, and can train students' collaboration skills.

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