

# Student worksheet based on Surakarta's local wisdom in primary school: A preliminary research

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**Abstract.** Student worksheets as one of the learning tools that should be developed by the teacher because textbooks from the government have minimal material. Student worksheets that are integrated with local wisdom can make learning more meaningful. This study aims to describe the results of the preliminary analysis consist of the 2013 curriculum learning process that is implemented in primary school at Banjarsari Surakarta, especially in terms of the needs of student worksheet in the learning process, the steps for making student worksheet based on Surakarta's local wisdom, and analyzing local wisdom material that will be integrated into making student worksheet. This research used a qualitative descriptive approach. The research subjects were teachers and 5th-grade students, amounting to 2 teachers and 10 students. The sampling technique used was purposive sampling. Data collection techniques using interviews, observation, and documentation. Data validity uses source and method triangulation. Data analysis techniques include reduction, presentation, and conclusion. The results obtained are the teachers generally use simple student worksheets and haven't been linked to local wisdom. The student worksheet format created only consists of work steps and assessments. The steps of making a student worksheet are curriculum analysis and local wisdom to be used, compiling, determining title, and writing. Local wisdom materials that can be integrated include Laweyan batik, Pasar Gede, medicinal plants, and the Javanese community farming system. The implication of this research is to provide meaningful learning resources for students and instill a sense of love for local culture.

**Keywords:** Local Wisdom, Student Worksheet, Primary School

## 1. Introduction

The current educational process needs to answer the challenges that occur in the 21<sup>st</sup> century. Education must be able to prepare and develop human resources of quality and character to educate the nation's life. Therefore, the government always strives to improve the quality of Indonesian education, one of which is by making innovations in the curriculum. This innovation is to evaluate and improve the Education Unit Level Curriculum or called Kurikulum Tingkat Satuan Pendidikan (KTSP) into the 2013 Curriculum. All learners should be prepared to be lifelong learners, creative, connected, and collaborative problem solvers, who contribute to the common good in today's globally interdependent world [1].

However, there are still some obstacles in the implementation of learning in the 2013 Curriculum. These constraints include 1) assessment in the 2013 curriculum which is complex, 2) student books that are too textual, and 3) difficulties for teachers in combining content and teaching in the form of themes here are obstacles in the implementation of the 2013 curriculum that comes from the government, institutions, teachers, students, and parents. These obstacles include the distribution of books, time management, assessment, teacher administration, learning activities in student books, integration of content, mastery of ICT, and student adaptation to thematic learning [2].

The 2013 curriculum strongly recommends the use of an authentic assessment approach where students can develop their higher order of thinking process and provide more than one correct answer. Various techniques were available for authentic assessment such as portfolio, assignment, papers, group discussion, and so on [3]. Productive instructional strategies are needed to support motivation, competence, and self-directed learning. These curricula, teaching, and assessment strategies feature well-scaffolded instruction and ongoing formative assessments that support conceptual understanding, take students' prior knowledge and experiences into account, and provide the right amount of challenge and support on relevant and engaging learning tasks[4].

The student worksheet according is a collection of student activity sheets that allow real activities with the objects and problems being studied [5][6]. A student worksheet is a learning tool as a complement or means of supporting the implementation of the learning plan. It should be designed by the teacher himself under the subject matter and learning objectives [7]. Student worksheet or also known as Lembar Kerja Peserta Didik (LKPD). LKPD is one of the means to assist and facilitate the teaching and learning activities and become effective interaction between students and educators, to improve the activity of students in improving learning achievements [8].

The results of initial observations, especially in some primary schools in the Banjarsari district found that the implementation of the 2013 curriculum was quite evenly distributed, although there were still some primary schools that used the KTSP curriculum. However, the use of student worksheet in primary school is still not optimal, it is still rare for teachers to make student worksheet independently because teachers are more dominant in using student books. Teachers are already equipped with teacher books and student books but teachers also need to innovate in developing student worksheets. The implementation of the learning carried out is quite good. Teachers often invite students to learn from nature or the surrounding environment, but teachers have not linked learning with local culture in Surakarta. Therefore, it is hoped that teachers will use book companion learning tools that can support learning optimally and take advantage of local wisdom in Surakarta [9] [10] [11].

The students still used the worksheet (LKPD) bought at the market. It may be very influential because now no longer all content material in the scholars' worksheet (LKPD) in keeping with the character of students. This suggests the mastering of learning in grade has now no longer been maximized. Teachers generally tend to increase mastering tools no matter pupil mastering style, this makes mastering much less than optimal. The use of students' worksheets (LKPD) has to be tailor-made to the characteristic of the students to

boom the knowledge of students withinside the system of studying the principles and concepts as properly as enhancing mastering knowledge of students [8]. On the other hand, integrating local wisdom into learning tools is an alternative in providing teaching materials that are appropriate to the characteristics of students. A curriculum design with local wisdom and technology can build new knowledge. Besides, teaching materials developed by integrating local potential can help develop students' skills [5]. One way to integrate the inculcation of local culture is through the integration of local wisdom in learning. Science education in schools should combine culture in the environment around [12] [13].

It is still rare to find previous research that focuses on elementary school level students worksheet (LKPD) based on local wisdom, especially those related to Surakarta's local wisdom, including Laweyan Batik, Pasar Gedhe, medicinal plants, and Javanese farming systems. The potential and local wisdom in Surakarta are diverse and unique, so it needs to be introduced to children from an early age for the preservation of local wisdom.

Developing a culture-based student worksheet requires an early stage of research based on a need analysis through field studies and literature studies. The preliminary research aimed to describe the learning process of the 2013 curriculum which is applied in elementary schools in the Banjarsari sub-district of Surakarta, both in terms of the needs of LKPD in the learning process, themes, and materials, as well as the use of learning methods and approaches in delivering material in the 2013 curriculum. Also, needs analysis is used to describe steps making LKPD based on the local wisdom of Surakarta and analyzing local wisdom material which will be integrated into making LKPD that are adjusted to basic competencies.

LKPD is also expected to provide convenience for students in learning Natural Sciences. Also, the results of this study can be an alternative reference for educators in introducing the cultural values of the local community to develop the character of collaboration, curiosity, responsibility, and care for the environment of students [14].

## **2. Material and Methods**

This study is a qualitative descriptive which is the initial stage in the development of student worksheet based on Surakarta's local wisdom. To develop student worksheets, researchers need to carry out preliminary studies. The data is obtained based on a needs analysis through field studies and literature studies. The research subjects were teachers and students of class V, amounting to 2 teachers and 10 students conducted at SDN Prawit 1 and SDN Sambirejo. The sampling technique used in this study was purposive sampling. Data collection techniques using interviews, observation, and documentation. Data validity uses source and method triangulation. The research variable is students worksheet based on local wisdom which is printed teaching material in the form of sheets of paper containing material, summaries, and instructions for carrying out tasks that must be done by students that refer to basic competencies and are linked to local wisdom. Data analysis techniques include data reduction, data presentation, and conclusion.

## **3. Results and Discussion**

The results and discussion of this research consisted of a thematic learning process, steps to develop student worksheets, and mapping materials that would be linked to local wisdom. The initial research was conducted observations of primary school learning commonly used by teachers to know how the 2013 curriculum learning process that is implemented at Banjarsari Surakarta, especially in terms of the needs of student worksheets in the learning process.

### ***3.1. Thematic Learning in Primary School***

The implementation of the 2013 curriculum in elementary schools was quite good. However, there were some obstacles faced by students and teachers regarding integrated thematic learning in the 2013 curriculum. One of them is that the material in textbooks (student books and teacher books) is not in-depth, demanding teacher creativity to develop material through various sources. However, teachers have limited time in finding material and developing student worksheets. The results of observations, it appears that the thematic learning process has been going well. However, in the implementation in the field, some things are not following the lesson plan. This happens because the material content is quite complex, to get around this, the teacher usually gives assignments to students to learn and work on at home with parents.

Based on the analysis of the learning tools in grade V, the researcher found several problems related to the completeness of the learning tools and LKPD. One of the factors that cause this problem is that the teacher has difficulty planning integrative thematic learning. Besides, teachers experience limited time in making student worksheets and developing materials. The most difficult to the easiest steps in thematic planning for elementary school teacher candidates are mapping competence standard and indicators into themes, determining indicators, determining themes and effective weeks, compiling webs of themes for one semester, compiling theme nets per week, compiling syllabus, compiling theme nets by theme, compiling assessments, compiling lesson plans, compiling themes networks per day, and compiling teaching materials [15].

The results of interviews with two teachers obtained information that the learning process in class V using integrative thematic learning has lasted 2.5 years. Learning activities consist of a preliminary, core, and closing activities. The teacher has linked learning with the cultivation of character education and HOTS. Usually in learning use teacher book guidelines and student books, which are received from the government (government assistance). It was found that the local wisdom of the people who lived on peatlands had not been utilized by educators in learning. Educators have not yet developed LKPD themselves. LKPD used was LKPD which is available from the publisher or download from the internet [16].

The constraints at the beginning of using thematic, especially in the preparation of student worksheets, teaching materials, and assessment. For the learning process, the teacher must develop the material by himself, because the depth of the material for the teacher's and student's books is still lacking, therefore a companion book is needed. Methods in teaching are usually lectures and questions and answers, group formation, discussion, for a scientific approach. The most effective learning is done through group

discussions. The lesson plans made by the teacher are equipped with student worksheets but only contain student activities, which are simple, sometimes used in groups not individually. The student worksheet only consists of indicators, activity steps, and assessments. Teachers quite often associate local wisdom in learning such as folk songs, regional dances, batik, traditional food, and historical buildings but have never integrated it in LKPD. The teacher hopes that there will be a colored student worksheet, equipped with material as development and made attractive with pictures and can be linked to local wisdom.

Meanwhile, interviews with students obtained information that some students had difficulty learning thematically. Thematic learning resources are limited to student books only while the material in student books is not in-depth. Students expect a student worksheet that is associated with local wisdom, an interesting student worksheet according to self-students is a student worksheet that is equipped with material, pictures, and colors.

Following previous research which explained that the learning process was carried out by presenting local wisdom as learning, namely the local potential which consists of the process of making batik involving students can learn how to learn it with environmental pollution materials. Science learning emphasizes the process and hands-on experience to develop the ability of students to be able to help and enhance local potential or indigenous knowledge in a scientific manner. The introduction of local potential can increase student respect for local potential, recognize the values of local wisdom, and improve the internalization of values that can lead students to become personal characters [13].

### 3.2. *The Steps for Making Student Worksheet*

The steps for making a student worksheet are analyzing the curriculum and local wisdom that will be used, compiling a map of the needs of the student worksheet, determining the title, and writing [14] [17] [18]. The correct steps must be taken to produce a student worksheet that is by the following learning materials are presented in table 1.

**Table 1.** The Steps for Making Student Worksheet

<b>Steps</b>	<b>Description</b>
<b>Curriculum Analysis</b>	- The curriculum is intended to determine which materials require student worksheet teaching materials.
<b>Prepare a map of student worksheet needs</b>	- The student worksheet needs map is indispensable to find out the number of it to be written and the order of the LKPD can be seen. - The title of the student worksheet is determined based on basic competencies, main materials, or learning experiences contained in the curriculum.
<b>Determine the title of the student worksheet</b>	- Writing student worksheet can be done with the following steps:
<b>Writing student worksheet</b>	1. Formulating basic competencies that must be mastered; 2. Determine assessment tools assessment is carried out on the work process and work results of students; 3. Arrange the material, student worksheet material depends on the basic competency to be achieved;

Steps	Description
<b>Student worksheet structure</b>	4. The material can be in the form of supporting information, namely a general description or scope of the substance to be studied. The material can be taken from various sources, such as books, magazines, the internet, and research journals. - The student worksheet structure, in general, is the title, learning instructions (student guides), competencies to be achieved, supporting information, assignments, and work steps, and assessments.

Table 1 shows by fulfilling the elements and steps of making the LKPD, the LKPD that is made will be following the learning objectives to be achieved. The advantages of LKPD are students can learn and advance according to their respective thinking speed and repeat. They can answer questions and exercises. LKPD is useful for teachers to direct students' activities and thought processes. While the benefits of LKPD for students include providing concrete experiences for students, helping to various learning sources, encouraging student interest and motivation, increasing retention in the learning process, using time effectively and efficiently [19].

By integrating local wisdom in learning, students not only develop their character but are also able to find knowledge related to competency aspects, the application of knowledge in solving problems around them. Learning will be more meaningful and knowledge will be embedded as long-term memory so that it will have an impact on increasing knowledge. The research results show that the integration of local wisdom in LKPD has increased scientific literacy in all aspects, including the product of knowledge. This shows that local wisdom-based learning tools are effectively used in science learning and can develop students' scientific literacy [13].

Based on the literature study, it was found that the local wisdom-based student worksheet design was presented in the following table 2.

**Table 2.** Literatur Studies Result

Local Wisdom	Students Worksheet Component	Description
1. Observation Results of Local Wisdom-Based Community Activities in Sungai Kakap District [14]	- LKPD title that refers to KD and its equipment - Writing KD - LKPD objectives - LKPD contents are following local wisdom and learning resources that support LKPD	The development of LKPD is based on the results of the IPA concept and character values found in the local wisdom of the people who live in the Kubu Raya peatland which has been carried on for generations. The local wisdom of the people studied is related to the substance and its characteristics, namely: community activities in finding medicine to remove heat, boil water, process palm water into brown sugar, process copra, process the remaining leaves/vegetables into compost, process rice into various food, making "tapai", and purifying peat water in the dry season. Besides, character values that stand out from everyday community activities can also be found that can be developed in science learning. In
2. Coffe [20]	- Cover of worksheets	

Local Wisdom	Students Worksheet Component	Description
	<ul style="list-style-type: none"> <li>- Foreword</li> <li>- Table of contents</li> <li>- User manuals,</li> <li>- Standard contents</li> <li>- Concept maps,</li> <li>- Introduction</li> <li>- Contents of worksheets</li> <li>- Notes</li> <li>- Bibliography.</li> </ul>	Jember is known as an agricultural city that produces a lot of coffee commodities. So that it is appropriate for local coffee knowledge to be internalized into learning in schools, so that students get to know the local wisdom of coffee in their area
3. Tahu Takwa [21]	<ul style="list-style-type: none"> <li>- Cover</li> <li>- Foreword</li> <li>- Table of contents</li> <li>- Learning activities</li> </ul>	Ethnomathematics-based Student Activity Sheet (LKS) on the process of making "Tahu Takwa". This aims to introduce the self-culture to students that the process of making "Tahu Takwa" can be calculated using mathematics.

Based on the LKPD's component in previous research, the LKPD to be developed in this study consists of the following components: cover, table of contents, concept maps and basic competencies, material, insight into local wisdom, worksheets, evaluation, answer keys, bibliography.

### 3.3. The Mapping of Mathematic and Science Material

Based on this literature study types of local and systematic activity are obtained which will be referred for the making of the student worksheet. The mapping of Mathematics and Science Content in primary schools presented in table 3.

**Table 3.** Mapping of Mathematics and Science Material

	Local Wisdom	Mathematic Materials	Science Materials
1.	Batik Laweyan	Speed and Discharge	Environmental pollution affects water quality and how to treat the waste of batik making.
2.	Pasar Gede	Count Fraction Operation	Food and health
3.	Medicinal plants as ingredients for making herbal medicine	Geometry	Propagation of plants
4.	Java community farming system	Data Collection and Presentation	Ecosystem

Table 3 shows that the choice of local wisdom in mathematics and science subjects as the main theme is because these themes are closely related to everyday life and can instill character values in students. Culture-based learning is a learning approach model that prioritizes student activities with various cultural backgrounds [22] [23]. Local wisdom is the ways and practices developed by a group of people, which comes from their deep understanding of the local environment, which is formed from living in the place for generations [24].

The selection of local wisdom is based on the suitability of local wisdom with learning materials in 5<sup>th</sup>-grade students. Previous researchers have mapped basic competencies and indicators of Mathematics and Science subject matter and selected appropriate local wisdom to be integrated into the lesson content. Besides, the location and form of local wisdom chosen were not far from the research location and were closely related to students' daily lives. This is expected to make it easier for students to understand the concepts to be studied. Local wisdom has not been widely used as material for LKPD in previous studies, so researchers are interested in integrating it into the development of current LKPD.

This is following previous research which explains that the identification of local wisdom in Yogyakarta which is used in science learning and following the topic of environmental pollution was utilizing batik waste as a result of the process of making batik in Yogyakarta. Integrating local wisdom in science learning that was develop scientific literacy in the very good category. It indicates that learning tools based on local wisdom were effective to use in science learning to develop scientific literacy [13].

#### 4. Conclusion

The teachers generally use simple student worksheets, but not in every lesson, and have not been linked to local wisdom. The student worksheet format only consists of work steps and assessments. The steps for making a student worksheet are analyzing the curriculum and local wisdom that will be used, compiling a map of the needs, determining the title, and writing it. Materials of local wisdom that can be integrated include Laweyan batik, Pasar Gede, medicinal plants as raw material for herbal medicine, and the Javanese farming system. While the suggestion that can be given is that the research results can be considered by the researcher to develop and utilize teaching materials based on Surakarta's local wisdom. Teachers are expected to use a variety of teaching methods or media and materials in teaching the material and relating it to local culture. Students are expected to more easily understand the material as well as learn and preserve culture by integrating local wisdom in learning. Therefore, the development of LKPD based on Surakarta's local wisdom is highly recommended to be applied in mathematics and science learning, considering that its application can increase the positive character of students and their love for local wisdom.

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