

Developing Folktale-Based Student Worksheets to Improve Junior High School Students' Collaboration Skills

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Abstract

Collaboration skills are an important part of 21st century learning that needs to be developed in teaching and learning activities. However, the results of observations and interviews with teachers at one of junior high school student in Malang, Indonesia showed that science learning has not fully facilitated optimal student collaboration. One alternative solution that can be done is through the development of student worksheets based on local folklore that is contextual and encourages group cooperation. This study aims to develop student worksheets based on the folklore "Sumber Wendit", which is feasible and practical to use in science learning on food chain materials. The study used the Research and Development (R&D) method of the Borg & Gall model, which was modified and implemented until the product revision stage. The validation test was carried out by one expert validator, while the readability and practicality tests each involved 25 students and one science teacher. The results showed that the student worksheets were in the very feasible category in terms of content, language, presentation, and appearance. This student worksheets were also considered easy to understand by students and helped them work together in understanding the concept of the ecosystem meaningfully. Thus, this student worksheets is declared valid, practical, and has the potential to support strengthening collaboration in science learning.

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1. Introduction

Science education at the junior high school level emphasizes not only mastery of scientific concepts, but also the development of 21st-century skills, including critical thinking, creativity, communication, and collaboration (Fitria et al., 2025). Among these four competencies, collaboration skills are of particular importance in preparing learners to face the challenges of the global era. These skills help learners work together, convey ideas, and make decisions effectively (Tang et al., 2020; Mu'arifah et al., 2023; Alfaeni et al., 2022). The Independent Curriculum is predicated on the enhancement of these competencies through an emphasis on participatory, collaborative, and contextual learning (Octaviana et al., 2022; Supiyono et al., 2025).

However, in practice, the pedagogy of science in schools remains predominantly characterized by conventional approaches that are individualistic and teacher-centered. This phenomenon has been observed to result in diminished engagement among students in collaborative group activities (Bhardwaj et al., 2025). The observations made by Mu'arifah et al. (2023) and Khajar et al. (2025) indicate that in group discussions, a significant number of students adopt a passive or reluctant stance towards engaging in the collaborative process. Indeed, empirical evidence has demonstrated the efficacy of group work activities in enhancing students' social interaction, conceptual understanding, and critical thinking skills (Robbins & Hoggan, 2019; Sunbanu et al., 2019).

To answer these challenges, contextual learning media that brings students closer to their socio-cultural environment is very necessary. One of the media that has proven effective is the student worksheet. When designed collaboratively, student worksheets is able to facilitate structured discussion, problem-solving, and group work activities (Alhusein., 2025). Especially if this student worksheets is compiled by containing local wisdom such as folklore, learning will become more meaningful, relevant, and close to the lives of students (Karmadi & Suhartini, 2024; Rizah et al., 2022). Folklore has cultural, educational, and social values that can strengthen students' critical thinking and collaboration skills (Masturiadi et al., 2023; Arianty et al., 2021). The integration between folklore and science learning is also considered effective in building students' collaborative skills and scientific reasoning (Daloos & Paderna., 2022; Yanto et al., 2025; Saputri et al., 2022).

The preliminary observations conducted at one of junior high school at Kediri, Indonesia indicate that the collaborative skills of seventh-grade students remain deficient. A negligible proportion of learners actively participate in group discussions, while the majority of learners demonstrate a tendency to rely on the contributions of a single group member. A review of interviews with science teachers indicates that students tend to be reluctant to engage in discussions and prefer to complete assignments independently. This finding indicates that traditional classroom learning environments may not adequately provide the necessary space or structure to facilitate effective collaborative learning (Mu'arifah et al., 2023; Octaviana et al., 2022; Ode et al., 2017).

The integration of topics in ecosystem materials, such as food chains, food webs, food pyramids, and energy flows, with local folklore-based media is a perfect fit. These concepts are interconnected, necessitating the active engagement of students in the process of discussion and analysis to comprehend the relationship between living things (Herdiawan et al., 2023; Karmadi et al., 2023). The folklore "Sumber Wendit" from the Malang area is a narrative that incorporates elements of the local ecosystem, including spring springs, Timor deer, long-tailed monkeys, and Javan eagles (Arianty et al., 2021). This narrative possesses considerable potential as a contextual medium to facilitate students' comprehension of energy flows and the relationships between living beings. Furthermore, the integration of folklore serves to facilitate a meaningful connection between scientific principles and the cultural values with which students are already familiar (Karmadi & Suhartini, 2024; Rizah et al., 2022; Sotero et al., 2020).

A substantial body of research has demonstrated that the implementation of folklore-based student worksheets can enhance conceptual understanding, critical thinking skills, and student engagement in the learning process (Karmadi & Suhartini, 2024; Dal et al., 2024). Student worksheets based on local wisdom provides a more contextual learning experience and increases learning motivation (Rizah et al., 2022). A body of research has emerged on the subject of the impact of local culture-based learning on the understanding of the environment and cultural identity among learners. The findings, as reported by Destina et al (2022) and Lin et al (2024), suggest that such learning can have a significant positive effect on this understanding. Concurrently, research conducted by Octaviana et al. (2022) and Saputri et al. (2022) has demonstrated that student worksheets designed with a collaborative approach are effective in enhancing students' collaborative skills.

Based on this background, this study aims to develop a contextual and collaborative "Sumber Wendit" folklore-based student worksheets to help students understand food chain material in grade 7 of junior high school. It is hoped that the products developed can be a learning medium that is not only fun and relevant, but also able to improve collaboration skills and strengthen the Pancasila Student Profile, especially in the dimension of mutual cooperation and global diversity.

2. Method

This research is research and development using the Borg & Gall model which has been modified by Sugiyono (2016). This model was chosen because it is in accordance with the need to develop and test the feasibility of products in the form of student worksheets. This research was carried out on a limited basis until the product revision stage based on expert validation, readability tests, and practicality tests.

The research was carried out for two months, from March to April 2025 at one of juniro high school at Malang, Indonesia. The research subjects included three categories, namely one science teacher in grade VII as a validator, 25 students in grade 7.3 as the subject of the readability test, and one science teacher in grade VII as the subject of the student worksheets practicality test. The selection of subjects is based on the criteria that they have received ecosystem material, including food chains to energy flows, as well as have experience learning using student worksheets in the classroom.

The first step is to identify potentials and problems through observation of science learning and informal interviews with teachers. The results of the observation show that students still have difficulty in understanding the relationship between living things and are less facilitated in collaborating during the learning process. In addition, there is no student worksheets that is contextual and based on local wisdom. Based on these results, the researcher designed a student worksheets based on the folklore "Sumber Wendit" that is relevant to the local ecosystem and contains collaborative activities.

The second step is the product design stage. At this stage, the researcher compiled an student worksheets framework that included learning objectives, local folklore that had been rearranged with elements of Malang's typical fauna, as well as a collaboration-based activity sheet. Research instruments were also prepared, including a validation questionnaire for teachers, a readability questionnaire for students, and a practicality questionnaire for teachers. All instruments use the Guttman scale, 1 and 0, accompanied by an open comment space.

The third stage is design validation, where the student worksheets product is given to one validator (an experienced science teacher) to be assessed in terms of content, language, presentation, and graphics. The results of this assessment were analyzed quantitatively using the following formula 1.

$$\text{Validation score} = \frac{\text{Total empirical score}}{\text{Maximum expected score}} \times 100\% \quad (1)$$

Furthermore, the average score of each aspect is converted into a validity category based on the classification from Riduwan (2010) shown in Table 1 below.

Table 1. Student Worksheets Assessment Criteria

Score Range	Criteria
81 - 100 %	Very good
61 - 80 %	Good
41 - 60 %	Fairly good
21 - 40 %	Not very good
0 - 20 %	Not good

The fourth step is the revision of the design based on the validation results. Suggestions and comments from validators are used to improve the activity instruction sections, illustration selection, and collaborative command sentences in the student worksheets. After the revision was carried out, the researcher proceeded to the product trial stage.

The fifth stage is the readability test by students. The revised student worksheets was tested on 25 7th grade students to find out the didactic, construction, and technical aspects. Students were asked to fill out a readability questionnaire consisting of 14 statements. The results were analyzed using the value conversion formula from Riduwan (2010) as in the previous stage.

The sixth stage is a practicality test by science teachers. Teachers are asked to fill out a questionnaire after using student worksheets in learning, to assess aspects of usability, relevance to learning, collaboration, material contextualization, and assessment. Teacher assessments are also analyzed using the percentage score conversion formula.

The seventh stage is the revision of the final product based on the findings of the readability and practicality tests. The results of this revision resulted in a final version of the student worksheets based on the folklore "Sumber Wendit" which is suitable for use in science learning for food chain materials to energy flow and supports students' collaboration skills.

3. Results and Discussion

The preliminary observations conducted indicate that students' collaborative skills in the scientific disciplines remain deficient. Teachers generally employ learning approaches such as observation of the surrounding environment or simple practicums. However, these approaches have not fully facilitated student collaboration optimally. It has been observed that students continue to demonstrate a certain degree of discomfort when it comes to collaborating in groups and exhibit a reluctance to assume responsibility for tasks that are conducted jointly. This finding aligns with the observations reported by Mu'arifah et al. (2023), who noted that collaborative group activities are often characterized by a predominant active student, while the other student assumes a more passive role. A series of informal interviews with science teachers has led to the hypothesis that the incorporation of contextual learning media will foster cooperation among students in the domain of science education, particularly in the context of ecosystem materials.

Supporting data were collected through a literature study on collaborative learning and the integration of folklore in science learning. The folklore "Sumber Wendit" was selected due to its incorporation of elements pertaining to the local ecosystem of Malang, including distinctive flora and fauna that can be linked to the concept of food chains and energy flow. This perspective aligns with the findings of Sumarwati et al. (2021), who contend that folklore serves as a repository of local values that can be utilized to enhance students' comprehension of their immediate environment. According to the findings of the aforementioned analysis, an initial draft of the student worksheets was formulated, encompassing collaborative activities, folklore narratives, and problem-solving tasks.

Validation is carried out by a science teacher as an expert in materials, media, and language. The validation results showed that the student worksheets developed obtained a score of 94% which was included in the very

feasible category with a positive assessment on the aspects of content, language, presentation, and graphics. More complete validation results are shown in Table 2 below.

Table 2. Student Worksheet Validation Results by Validators

Aspects Assessed	Score	Category
Content Feasibility		
Accuracy of learning material substance	80	Feasible
Usefulness in enhancing knowledge	100	Highly Feasible
Language		
Compliance with proper Indonesian language rules	66.7	Feasible
Effective and efficient use of language	100	Highly Feasible
Presentation		
Sequential and systematic presentation of learning activities	100	Highly Feasible
Presentation of discussion questions	100	Highly Feasible
Graphics		
Display design	100	Highly Feasible
Consistency of writing	100	Highly Feasible
Appropriateness of illustrations, images, and photos	100	Highly Feasible
Total Score	93.8	Highly Feasible

The validator suggested that some of the activity instructions be written more explicitly so that students better understand their role in the group work. This is important because clarity of instructions can increase the effectiveness of collaborative activities (Astuti, 2021; Saab et al., 2007).

The revised student worksheets was tested for readability for 25 students. Students assessed several aspects which included didactic, construction, and technical aspects. They assessed the ease of understanding the content, the attractiveness of the appearance, and the significance of folklore in explaining the concept of science. The results of the readability test are shown in Table 3 below.

Table 3. Results of Readability Test by Students

Aspects Assessed	Score	Category
Didactic		
Demonstrates collaborative characteristics	76.7	Good
Facilitates critical thinking	94	Very Good
Construct		
Use of communicative and interactive language	76	Good
Technical		
Font type and size	76	Good
Image size and quality	86	Very Good
Layout of the student worksheet	76	Good
Total Score	80.3	Very Good

Students said that folklore makes the activity more enjoyable and helps visualize the flow of energy and food webs. This finding strengthens the opinion of Saad and Zolkifli (2024) that folklore is able to increase the attractiveness and imagination of students in understanding the content of the lesson.

Science teachers who try to use student worksheets provide an assessment of the practicality of the media. Teachers are asked to fill out a questionnaire after using student worksheets in learning, to assess aspects of usability, relevance to learning, collaboration, material contextualization, and assessment. The teacher stated that the student worksheets is easy to use, has a systematic structure, and encourages interaction between students. However, the collaboration aspect is not yet fully visible in some activities, so it is recommended to clarify the discussion order or the specific column of the group discussion. The results of the practical test are shown in Table 4 below.

Table 4. Results of Practical Test by Teachers

Aspects Assessed	Score	Category
Usefulness	100	Very Good
Relevance to learning	100	Very Good
Collaboration	33.3	Poor
Contextualization of material	100	Very Good
Assessment	100	Very Good
Total Score	88.2	Very Good

The teacher suggested strengthening the collaborative aspect by adding an element of explicit discussion. This suggestion is in line with the opinion of Setyowati et al (2024) that the success of student worksheets in increasing collaboration lies in the clarity of instruction and the division of roles in the group.

Overall, the student worksheets product based on folklore "Sumber Wendit" is declared valid and practical to be used in science learning. These findings are supported by previous research by Yanto et al., (2025) and Saputri et al., (2022) which shows that the integration of folklore can strengthen collaboration and student engagement. The main strength of this student worksheets is in the aspects of contextualization and readability. The weakness lies in the lack of explicit collaborative instruction that needs to be refined in subsequent revisions. With further revision and effectiveness tests, this student worksheets has great potential to be widely applied in science learning based on local wisdom.

4. Conclusion

Based on the results of expert validation, readability tests by students, and practicality tests by teachers, the product in the form of student worksheets based on folklore "Sumber Wendit" was declared to be very feasible and practical to be used in learning science of food chain materials in grade 7 junior high school. This student worksheets is able to integrate local wisdom values and collaborative activities designed to improve understanding of concepts and cooperative skills between students. A high validation value indicates that this student worksheets has met the overall content, language, display, and presentation aspects. The readability test confirmed that learners found it helpful to understand concepts such as food chains, food webs, food pyramids, and energy flows through contextual narratives and group activities. Meanwhile, a practical test by teachers showed that this student worksheets is easy to use and relevant to classroom learning, although improvements are still needed in emphasizing collaborative instruction. Overall, these findings indicate that the development of student worksheets based on local folklore can be an effective learning innovation and support the strengthening of the Pancasila Student Profile, especially in the dimension of mutual cooperation and global diversity.

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All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

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