

VALIDITY ANALYSIS OF THE DEVELOPMENT OF LKPD INTEGRATED WITH DAYAK LOCAL WISDOM THROUGH CROSSWORDLABS FOR STUDENTS OF SMA PGRI PULANG PISAU

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Abstrak: Science education in schools requires innovative media that not only focuses on concepts but also instills local cultural values in students. In this context, the development of Student Worksheets (LKPD) integrated with Dayak local wisdom through the Crosswordlabs platform is a strategic step toward achieving meaningful and contextual learning. This study aims to analyze the validity level of the developed LKPD. The research method applied is Research and Development (R&D) using the 4D development model, which includes the stages of Define, Design, Develop, and Disseminate, with a focus on product validation. Data were obtained through validation sheets filled out by two validators, namely subject matter experts and media experts. The validation results showed that the LKPD integrated with Dayak local wisdom obtained a feasibility percentage of 74.11% from subject matter experts and 82.85% from media experts. Based on the assessment criteria, both are classified as highly feasible. Thus, this Crosswordlabs-based LKPD is considered valid and feasible to be implemented as an innovative learning medium that not only strengthens the understanding of biological concepts but also fosters a sense of pride and appreciation for Dayak local wisdom among students.

Keywords: Validity Analysis, LKPD, Dayak Local Wisdom, CrosswordLabs

Introduction

Education plays a crucial role in advancing a nation, as a nation's progress depends on the intelligence of its citizens. According to Law Number 20 of 2003 concerning the National Education System, national education serves to develop students' potential, foster and shape character, and instill positive values to foster a dignified and competitive generation of Indonesians. The primary objective

of national education is to improve the quality of human resources. One strategic effort to achieve this is through improving the quality of education (Widiansyah, 2018).

Along with the advancement of technology, various innovations have been implemented to improve the quality of education (Sa'adah, 2018). One form of this innovation is the development of a curriculum adapted to the changing era and technological advancements (Rosmiati et al., 2023). Currently, the curriculum being implemented is the Independent Curriculum, which aims to foster creativity and student learning abilities according to their individual potential, interests, and talents. One relevant innovation in the world of education is the development of Worksheets. Digital-based Student Worksheets (LKPD) are designed with an engaging and meaningful approach. According to Choirudin et al. (2021), LKPD plays a crucial role in supporting a directed and systematic learning process. Through the activities they contain, LKPD can increase student engagement and motivation. Besides serving as an additional source of information related to the concepts being studied, LKPD also helps create a more enjoyable and in-depth learning environment.

Based on interviews and observations with Biology teachers in grade X of SMA PGRI Pulang Pisau, it was discovered that the learning resources used were still limited to textbooks. These books only contained brief assignments and practical activities, thus failing to fulfill the essential components that should be included in LKPD, such as identity, basic competencies, and supporting theoretical explanations. In addition, the teaching materials used were not equipped with a variety of materials, information, or interesting practice questions, so they were less able to motivate students to be active in the learning process. As a result, students tended to be passive and only received general explanations from the teacher without being involved in the process of discovering concepts independently. One solution to overcome this problem is to develop LKPD that is integrated with local wisdom values, so that learning becomes more contextual and meaningful for students (Latifah, ULN, et al . 2024).

To make local wisdom-based learning more engaging and meaningful, educators can utilize the *CrosswordLabs digital platform* as a tool for developing Student Worksheets (LKPD). *CrosswordLabs* is an online platform that allows teachers to easily create interactive crossword puzzles, thereby increasing student engagement and enthusiasm during the learning process. Through the use of this platform, students not only understand the content of the lesson but also practice critical thinking and deepen concepts in a fun way (Hidayati et al., 2024). By combining elements of local wisdom and digital technology like *CrosswordLabs*, learning can be more active, contextual, and meaningful, in line with the spirit of the Independent Curriculum, which emphasizes creativity and independence in learning.

The integration of Dayak local wisdom in the development of *CrosswordLabs -based Student Worksheets (LKPD)* plays an important role in fostering a sense of pride in one's own culture while providing contextual and applicable science learning. Through an interactive and fun crossword-based approach, students are encouraged to be more active, enthusiastic, and motivated in participating in the learning process. This activity not only strengthens student engagement but also has the potential to significantly improve their scientific literacy skills. Based on these reasons, the author conducted a study entitled "Development of Integrated Dayak Local Wisdom Student Worksheets Through *CrosswordLabs* for Students on Kingdom Plantae Material." The purpose of this study was to determine the level of validity of Integrated Dayak Local Wisdom Student Worksheets through *CrosswordLabs* so that they are suitable for use in the learning process.

Method

This research uses a 4D model (*four-D models*). The development of four-D models consists of 4 main stages, namely: 1) *define*, 2) *design*, 3) *develop*, and 4) *disseminate* (Trianto, 2010:93). In this study, only the development stage was carried out due to various limitations of the researcher. Validation of the research instrument and LKPD will be used for trials with media experts and material experts. The validity instrument in the form of a LKPD validation sheet is used to determine

the validity of the Integrated LKPD of Dayak local wisdom through *the CrosswordLabss* that was developed. This validation sheet uses a questionnaire in the form of a list of questions given to the validator to provide responses that are in accordance with user requests. This validation questionnaire is filled out by the validator with the criteria that have been provided.

The data analysis technique collected in this study was an analysis of the feasibility of LKPD integrating local wisdom from the results of expert assessments of the LKPD being developed.

1). LKPD Assessment Results Data

Validation data for the developed LKPD was analyzed using a quantitative descriptive method using a *rating scale* by the validator. The raw rating scale data consisted of numbers, which were then interpreted qualitatively with five categories adapted using a Likert scale, as shown in Table 1.

Table 2. E-LKPD Assessment Scoring Guidelines

Score	Criteria
5	Very good
4	Good
3	Pretty good
2	Not good
1	Very bad

Source:(Mardapi D 2008)

Next, the data obtained from the scores is converted into percentage form using the following formula.

$$P = \frac{\sum \text{Skor yang diperoleh}}{\text{Skor maksimal}} \times 100\%$$

Information:

P = Percentage (%) of Eligibility

$\sum$ Score obtained = Total Score obtained from the Assessment

Maximum Score = Highest Score X Number of Criteria Items

The percentage scale of eligibility is shown in Table 3.

Table 3. Percentage Scale of Eligibility

Eligibility Percentage	Criteria
81%-100%	Very Worthy
61%-80%	Worthy
41%-60%	Quite Decent
21%-40%	Less than worthy
0%-20%	Not feasible

(Arikunto , 2013) . The percentage results are said to be successful or valid if the results are in the range of 81%-100%, 61%-80%, or in the range of 41%-60%, namely in the criteria of "very feasible", "feasible", or "quite feasible".

Result and Discussion

The validity of the LKPD was obtained from a validity test conducted by two validator lecturers, material experts and media experts. The following are the validation results of the developed LKPD:

Table 2. Results of Material Expert Validation

No	Statement	Score	Information
1	The Plantae material presented in the LKPD is in accordance with the Basic Competencies in the applicable curriculum.	5	Very good (lesson material is presented according to knowledge, skills and attitude competencies)

2	The Plantae material contained in the LKPD is appropriate for the educational level of class X of high school.	5	Very good (the lesson material is presented in an integrated manner)
3	The Plantae material presented in the LKPD is clear so it is easy to understand.	4	Good (Because, LKPD contains theories, pictures, and examples related to the material)
4	The questions asked in the LKPD are relevant to the expected competencies.	4	Good (Because the questions are adjusted to basic competencies and learning indicators and are arranged systematically and clearly)
5	The material and questions asked in the LKPD support the achievement of learning objectives in LKPD activities.	3	Good (Because the material and questions presented have a clear purpose)
6	The material in LKPD can arouse students' interest in studying the material further.	4	Good (Because, LKPD contains elements that can instill curiosity)
7	The presentation of Plantae material in LKPD is in accordance with existing definitions.	4	Good (Because, LKPD cites clear definitions according to good references)
8	The presentation of the concept is presented in a coherent manner.	5	Very good (Because, LKPD contains material sequentially from beginning to end)
9	Presentation of actual material in accordance with scientific developments.	3	Pretty good (Because the material contained is in accordance with scientific developments)
10	The selection of learning resources is appropriate and accurate.	4	Good (Because, LKPD contains learning resources that are appropriate and accurate)
11	LKPD integrated with local wisdom through <i>CrosswordLabs</i> can help students to discover new knowledge based on the activities carried out.	4	Good (Because, LKPD instills a character of curiosity)
12	LKPD integrated with local wisdom through <i>CrosswordLabs</i> can help students to connect the knowledge they already have with the activities they will carry out.	4	Good (Because, LKPD contains conceptual truths in the presentation of material)
13	The selection of images is linked to the material and presentation of the material in the LKPD integrated with local	4	Good (Because, LKPD already contains images related to the material and is packaged attractively)

	wisdom through <i>CrosswordLabs</i> , packaged in an attractive manner.		
14	The accuracy of LKPD media integrated with local wisdom through <i>CrosswordLabs</i> to explain the material.	3	Pretty good (Because, Good (Because, LKPD contains content according to the material))
15	The presentation of LKPD media integrated with local wisdom through <i>CrosswordLabs</i> helps students' understanding.	4	Good (Because, LKPD not only contains theory but also exercises and practicals to train skills and determine the level of understanding of students)
16	The descriptions in the LKPD media integrated with local wisdom through <i>CrosswordLabs</i> which are presented encourage students' curiosity.	3	Pretty good (Because, LKPD instills curiosity)
17	LKPD integrated with local wisdom through <i>CrosswordLabs</i> can help students to apply their knowledge to everyday life.	4	Good (Because, LKPD contains contextual approach components))
Amount		63	

The average percentage of score obtained based on data analysis is 74.11% and based on the criteria table it falls into the appropriate criteria so it is suitable for use in the learning process.

Revision

Based on the validation results from the material aspect, it is known that the material has entered the criteria for being suitable for use, but still needs improvement in several components of the Integrated Dayak Local Wisdom Worksheet through *CrosswordLabss* based on suggestions given by material expert lecturers. The suggestions and improvements given by material experts are: In general, the appearance of the Worksheet is attractive. However, the material in the Worksheet is too little so that students easily find the answers. It is recommended to add material and example images from each Division so that the groups of each division are clearer.

Expert assessments indicate that the material in the Student Worksheet (LKPD) aligns with the Basic Competencies (KD) in the curriculum and is relevant to the cognitive development level of 10th-grade high school students. These results reinforce Trianto's (2016) view that learning tools must be designed based on curriculum analysis to optimally achieve learning objectives. Presenting material in a contextual and coherent manner has been shown to help students understand concepts more deeply.

In terms of presentation, the material in the Student Worksheet (LKPD) is presented in an attractive and easy-to-understand manner, complemented by images and examples relevant to everyday life. This approach aligns with Bruner's (1966) theory of *discovery learning*, which asserts that the learning process will be more meaningful if students actively construct their knowledge through direct experience and exploratory activities. Furthermore, Sudjana and Rivai (2013) emphasize that visualization in learning media can clarify messages and foster students' interest in learning.

CrosswordLabs media into the Student Worksheet (LKPD) also provides added value to the learning process. Through digital crossword puzzle activities, students not only memorize information but also connect it to real-world contexts. This aligns with the research findings of Hidayati et al. (2024), which states that interactive media such as *CrosswordLabs* can increase students' motivation, engagement, and critical thinking skills due to its challenging and enjoyable

nature. Although considered adequate, further revision and development are still needed, especially in deepening the material description and adding representative illustrations from each division of *Plantae* to enhance student understanding. This recommendation aligns with Arsyad's (2020) view that good learning materials need to have adequate content depth and be complemented by visual elements to strengthen conceptual understanding.

Overall, the research results show that the student worksheet (LKPD) that combines Dayak local wisdom and digital technology through CrosswordLabs is able to create an active, meaningful, and contextual learning experience. This integration reflects the principles of contextual teaching *and learning (CTL)* as explained by Johnson (2002), namely that the learning process will be more effective if students can connect knowledge to real-life situations. Therefore, this LKPD is considered potential for implementation in supporting creative Biology learning and in accordance with the spirit of the Independent Curriculum.

Media Expert Validation

The quality of the presentation of the student worksheets developed through *CrosswordLabss* can be determined based on the results of media validation. These media aspects include presentation techniques, presentation support, learning presentation, and completeness of presentation. The validation results conducted by media experts are shown in Table 3.

Table 3
Media Expert Validation Results

No	Statement	Score	Information
1	Systematics of compilation The integrated Dayak local wisdom LKPD through CrosswordLabss is correct.	5	Very good (Because the writing systematics is in accordance with the LKPD feasibility indicators and is structured sequentially starting from identity, objectives, instructions, activities, to evaluation.)
2	LKPD procedures are presented in a coherent and easy to understand manner.	5	Very good (Because each activity presented has a clear learning objective and the steps are easy for students to follow.)
3	Suitability of LKPD with the material.	4	Good (Because, the presentation of LKPD contains illustrations that are appropriate/suitable for the material)
4	The presentation of this LKPD is interesting.	4	Good (The design of the appearance, color, content, and center of view of the composition are very interesting)
5	The presentation of displays and images in this LKPD can support cell material.	5	Very good (Because, the presentation of LKPD contains images that are appropriate/correct to the material)
6	The size and type of letters used are correct.	4	Good (Because, the text in the LKPD uses easy-to-read fonts students can read clearly)

7	The color composition in the media is dominant and attractive.	4	Good (Because, the design of the appearance, color, center of view of the composition is very harmonious)
8	The text is easy to read well.	4	Good (Because, the text in the LKPD uses Easy typography Understanding, reading and engaging students)
9	The presentation of material in LKPD is interactive and participatory.	4	Good (Because LKPD contains activities such as practice questions and <i>CrosswordLabs games</i> which encourage active student involvement.)
10	The completeness of LKPD emphasizes supporting the achievement of learning objectives.	4	Good (Because the material presented is in accordance with Core Competencies and Basic Competencies)
11	The contents of the LKPD emphasize an independent learning process.	4	Good (Because, in the LKPD it is equipped with lots of exercises to be able to train students to learn independently)
12	This LKPD can help strengthen understanding of the concepts contained in the material in the textbook.	4	Good (Because LKPD presents biological concepts with a Dayak local wisdom approach which enriches the context of students' understanding.)
13	The contents of the LKPD are able to develop social communication between students.	4	Good (Because the activities in the LKPD, including group activities and discussions through <i>CrosswordLabs</i> , encourage social interaction and cooperation)
14	Library sources are listed at the end of the LKPD.	3	Pretty good (Because the references and sources of material have been listed, it is still necessary to add more diverse references to strengthen the scientific basis.)
Total		58	

The average percentage of score obtained based on data analysis is 82.85% and based on the criteria table it is included in the very feasible criteria, so it is very suitable for use in the learning process.

Revision

Based on the validation results from the media aspect, it is known that the media has entered the criteria of being very suitable for use, but still needs improvement in several components of the LKPD integrated with Dayak local wisdom through *CrosswordLabss*. Based on suggestions from media expert lecturers, the suggestions and improvements provided by the media experts include



improvements to work procedures to use short, clear sentences so that students can more easily understand the steps of the activity without causing confusion.

The assessment covers various aspects, such as presentation techniques, component completeness, and display quality. Structurally, the LKPD (Worksheet) has followed an ideal format that includes identity, learning objectives, usage instructions, learning activities, and evaluation. This aligns with Prastowo's (2015) opinion, which emphasizes that effective teaching materials must have a logical and complete presentation sequence so that students can understand the material more easily. In terms of visual appearance, the LKPD is considered highly attractive due to the use of balanced colors, proportional layout, and easy-to-read typography. These aesthetic elements play a crucial role in creating a comfortable and engaging learning experience. According to Arsyad (2020), text legibility and harmonious color composition can increase student attention and interest during the learning process, thus positively impacting the effectiveness of learning media.

In terms of interactivity, the use of *CrosswordLabs* as a digital learning tool offers distinct advantages. The crossword puzzle activities within the worksheets enable students to think critically, collaborate, and actively participate in understanding biological concepts. This finding aligns with Mayer's (2009) theory on *multimedia learning*, which emphasizes that learning is more meaningful when students interact directly with the material through a combination of text, images, and interactive activities. Worksheets are also considered capable of fostering self-directed learning through *clear* exercises and activity guides. This condition aligns with Knowles' (1984) view that independent learning encourages students to take responsibility for their own learning process and enhances independence, a key focus of the Independent Curriculum.

Although the LKPD was generally considered very feasible, media experts provided input to formulate work procedures using more concise and easily understood sentences, so that students would have no difficulty following the steps of the activity. This suggestion aligns with the instructional design theory proposed by Dick and Carey (2009), which emphasizes the importance of clear instructions at each stage of learning to avoid confusion among students. In general, the results of the media aspect validation indicate that the LKPD based on Dayak local wisdom with the support of *CrosswordLabs* has fulfilled the elements of aesthetics, interactivity, and instructional clarity. This combination of local cultural values and digital technology creates a contextual and meaningful learning experience, as explained by Johnson (2002) in the concept of *Contextual Teaching and Learning (CTL)*, that learning will be more effective when linked to real-life contexts and students' cultural values.

Conclusion

The research results show that the *CrosswordLabs* -based Student Worksheet (LKPD) integrating Dayak local wisdom is deemed suitable for use in Biology learning, particularly in the Kingdom Plantae topic. The integration of local culture and digital technology can create a more contextual, interactive, and meaningful learning process for students. Validation shows that the LKPD has a high level of alignment with core competencies, clear presentation of material, and an attractive appearance. The use of crossword puzzles in *CrosswordLabs* has also been shown to increase student motivation and active participation. Thus, this LKPD is not only suitable in terms of content and media, but also supports the implementation of the Independent Curriculum, which emphasizes creativity, independence, and scientific literacy. As a recommendation, the development of similar LKPD can be applied to other science materials or fields by adapting the context of local wisdom, and continued with research on its effectiveness on student learning outcomes.

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