

DEVELOPMENT OF E-LKPD BASED ON LOCAL WISDOM IN CONVENTIONAL BIOTECHNOLOGY SUB-MATERIALS TO TRAIN STUDENT'S CREATIVE THINKING SKILLS

Pengembangan E-LKPD Berbasis Kearifan Lokal Pada Submateri Bioteknologi Konvensional Untuk Melatihkan Keterampilan Berpikir Kreatif Peserta Didik

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Abstract

Learning during the COVID-19 pandemic was less effective, especially for topics that required experimental activities such as conventional biotechnology; also, limited learning media was used due to the lack of technology. Conventional biotechnology is considered an abstract material, unsuitable if only explained without practice. Conventional biotechnology will be easier to understand if integrated with local wisdom topics. Both topics can be studied together to practice creative thinking skills because Indonesian students are still in the low-medium category. Therefore, the development of digital learning media is needed to overcome these problems. This research aimed to develop an E-LKPD in conventional biotechnology based on local wisdom, which is valid, practical, and effective in training students' creative thinking skills. This study used a 4D model through define, design, and develop stages without the disseminate stage. The researcher collected data through the validation method, observation sheet, the results of E-LKPD completeness, and response questionnaire sheets for 20 students of class XII MIPA 7 SMA Negeri 8 Surabaya. The data obtained were analyzed using descriptive-quantitative technique. The results show very valid E-LKPD with a 3.80 score, which is suitable for learning. Very practical E-LKPD based on the observation sheet with a 97.50% score. Very effective E-LKPD based on the completeness of learning outcomes 83.33%, indicator achievement of 86.88%, and positive responses for E-LKPD of 97.68%. E-LKPD is feasible regarding validity, practicality, and effectiveness in training creative thinking skills. Thus, this research is useful for practicing creative thinking skills and providing digital learning facilities for students.

Keywords: E-LKPD, conventional biotechnology, local wisdom, creative thinking skills.

Abstrak

Pembelajaran pada masa pandemi COVID-19 berjalan kurang efektif, terlebih untuk topik yang memerlukan kegiatan percobaan seperti bioteknologi konvensional. Media pembelajaran yang digunakan masih sangat terbatas karena kurangnya pemanfaatan teknologi. Bioteknologi konvensional dianggap sebagai materi yang abstrak sehingga kurang sesuai jika hanya dijelaskan tanpa dipraktikkan. Bioteknologi konvensional akan lebih mudah dipahami jika diintegrasikan dengan topik kearifan lokal. Kedua topik tersebut dapat dipelajari seiringan untuk melatih keterampilan berpikir kreatif. Sebab, keterampilan berpikir kreatif peserta didik Indonesia masih dalam kategori rendah-sedang. Oleh karena itu, pengembangan media pembelajaran dengan pemanfaatan teknologi sangat diperlukan untuk mengatasi masalah tersebut. Tujuan penelitian ini adalah untuk mengembangkan E-LKPD bioteknologi konvensional berbasis kearifan lokal yang valid, praktis dan efektif untuk melatih keterampilan berpikir kreatif pada peserta didik. Penelitian ini menggunakan model 4D melalui tahap define, design, develop, tanpa tahap disseminate. Pengumpulan data melalui metode validasi, lembar pengamatan keterlaksanaan aktivitas, hasil ketuntasan E-LKPD, dan lembar angket respons pada 20 peserta didik kelas XII MIPA 7 SMA Negeri 8 Surabaya. Data yang diperoleh dianalisis dengan teknik deskriptif-kuantitatif. Hasil menunjukkan bahwa E-LKPD sangat valid dengan skor 3.80 sehingga layak digunakan dalam pembelajaran; E-LKPD sangat praktis berdasarkan lembar pengamatan dengan skor 97.50%; E-LKPD dinyatakan sangat efektif

berdasarkan ketuntasan hasil belajar sebesar 83.33%, ketercapaian indikator sebesar 86.88%, dan respons positif untuk E-LKPD sebesar 97.68%. Secara keseluruhan, E-LKPD dinyatakan layak ditinjau dari validitas, kepraktisan dan keefektifan untuk melatih keterampilan berpikir kreatif. Dengan demikian, penelitian ini berguna untuk melatih keterampilan berpikir kreatif dan memberikan kemudahan belajar secara digital bagi peserta didik.

Kata Kunci: E-LKPD, bioteknologi konvensional, kearifan lokal, keterampilan berpikir kreatif.

INTRODUCTION

The COVID-19 pandemic impacts all aspects of life, especially education. All schools are closed to control the virus's spread and advise the public to stay at home. The solution provided by the Government is distance learning (online learning). Online learning causes education to be more challenging to achieve and difficult for educators, students, and parents. Electronic devices and used various digital platforms to facilitate learning activities. As a result, internet usage is increasing.

According to research, Siste et al. (2020) stated that internet and digital device usage increased by 52% among adults in Indonesia during the pandemic. The literature review by Ratulangi et al. (2021), also stated that during COVID-19, internet use by students increased. Therefore, educators must be creative and skilled in technology to make learning more interesting (Mansyur, 2020). Teaching materials are easier to develop using the free digital platforms available.

Based on interviews with educators and students of SMA Negeri 8 Surabaya, learning during the pandemic was less interactive due to the lack of technology. Educators only use limited teaching materials such as PDF and PowerPoint files through the Google Classroom platform. As a result, learning is less than optimal, especially for Biology material which requires practice and difficulty understanding concepts for students.

During the pandemic, limited teaching materials were used for Biology learning without discussion or explanation. Meanwhile, the material in Biology learning should be taught more effectively using practical methods so students can achieve learning aims and understand concepts well (Rani et al., 2020). The Project-Based Learning model can increase student participation in dealing with real situations to form independent learning through practice (Rukmana et al., 2020). The learning model requires suitable learning media so the learning process is more optimal and can improve students' skills.

Student Worksheet (LKPD) is one media that can be used, and it guides students in problem-solving activities (Melawati et al., 2022). To keep up with digital progress,

the LKPD can be converted into an Electronic LKPD (E-LKPD) which can be used for distance learning. The learning process using digital media can improve the experience of creative thinking, problem-solving and critical thinking in students (Jan, 2017).

E-LKPD is a digital form worksheet with additional features and contains audio, video, music, and animation that can attract students to learn (Haryanto et al., 2020). E-LKPD allows students to take part in generating original ideas and developing them in the product form through digital technology (Sari et al., 2021). The E-LKPD use is very influential on independent learning abilities that have the potential to change students' views on the consumption of information digitally and interactively (Febriansyah et al., 2021).

E-LKPD can make students dominate 21st-century skills, commonly called 4C skills, which consist of critical thinking, creative thinking, communication, and collaboration (Vacide, 2019). Creative thinking skills are needed to find new understandings, original ideas, and combinations of knowledge from solving scientific problems (Ahmadi & Besançon, 2017). However, according to research by Doa et al. (2018) and Zubaidah et al. (2017), students' creative thinking ability in Indonesia is still in the low-medium category. Even the global creativity index explains that Indonesia is at the bottom regarding creativity and innovation in human resources (Florida et al., 2015). Thus, suitable learning models and media must train creative thinking skills through topics.

According to Yildiz & Guler Yildiz (2021), students' creative thinking skills have four crucial indicators that need to be trained: fluency, flexibility, originality, and elaboration. Fluency indicator means fluency in thinking which involves a series of cognitive activities. Fluency can be assessed through cognitive tasks such as idea generation (Jia et al., 2019). The indicator of flexibility focuses on the capacity of students to create varied ideas. In contrast, the indicator of originality leads to the formation of new original ideas (Rosen et al., 2020). The elaboration indicator means detailing so students can develop the ideas obtained in detail (Yustina et al., 2020a).

Biotechnology is one of the topics that can be used to train creative thinking skills. Mainly the conventional biotechnology sub-topic, which in practice uses simple equipment. In addition, conventional biotechnology sub-topics are easy to apply and explore according to the situation in which students live (Rukmana et al., 2020).

Conventional biotechnology can be taught with local wisdom by utilizing the uniqueness and abundance of an area's potential (Ramdiah et al., 2020). Bekasam is one of the unique culinary in Palembang local wisdom made using biotechnology principles. Local wisdom is starting to fade in education, so students cannot understand local cultural values (Uge et al., 2019). Based on research conducted by Purwaningrum et al. (2021), used practical local wisdom to improve creative thinking skills. The topic of conventional biotechnology can be taught with local wisdom to train creative thinking skills because it can encourage imagination and creativity in science learning (Permata Sari et al., 2020).

Integrating conventional biotechnology with local wisdom topics is appropriate in Indonesia, which is famous for its diverse people, languages, and traditions (Abidinsyah et al., 2019). That way, learning will be more meaningful, and students can better understand the concept of the discussed topic; it is also more interesting because it relates to the surrounding environment.

Based on research conducted by Tohiroh (2020), conventional biotechnology LKPD based on ecopreneurship is considered adequate for training creative and innovative thinking. In addition, Suratno et al. (2020) also explained that integrating biotechnology learning with local wisdom has valid, effective, and practical results.

Based on the description above, there is a gap between learning during the pandemic and the limited learning media, causing less effective learning on conventional biotechnology topics, observations of the surrounding environment, and obstacles in practicing creative thinking skills. Therefore, researchers are interested in developing E-LKPD in conventional biotechnology topics based on local wisdom, which contains independent practice activities to train students' creative thinking skills. Learning media development utilizes digital media to be accessed for distance learning. This study aims to produce an E-LKPD in conventional biotechnology based on local wisdom, which is valid, practical, and effective in training students' creative thinking skills.

METHODS

This research was development research conducted at the Department of Biology, Faculty of Mathematics and Natural Sciences, State University of Surabaya, and SMA Negeri 8 Surabaya from December 2021 to March 2022. This research used a quantitative-descriptive technique that refers to the 4D (Four-D) model from Thiagarajan (1974) includes the stages of define, design, develop and disseminate. However, the disseminate stage was not carried out because the research was only tested on a limited basis.

Table 1. Validation Score Interpretation Criteria

Score	Criteria
$1.00 \leq P \leq 1.50$	Not valid
$1.51 \leq P \leq 2.50$	Less valid
$2.51 \leq P \leq 3.50$	Valid
$3.51 \leq P \leq 4.00$	Very valid

Adapted from Çelik & Laptalı (2016)

The practicality level is measured using an observation sheet on the implementation of student activities in the form of a table observed through the 'Yes' or 'No' questions. The results of the observations were then analyzed using the Guttman scale reference (Table 2).

Table 2. Guttman Scale Score

Answer	Score
Yes	1
No	0

Adapted from Zulfikri (2021)

The data obtained is then calculated using the formula:

$$\text{Responses (\%)} = \frac{\sum \text{students answered 'Yes'}}{\sum \text{number of students}} \times 100\%$$

The results of the interpreted observation sheets are a percentage according to the practicality score interpretation criteria. The E-LKPD is declared practical if it obtains an average percentage of 61% at each stage (Table 3).

Table 3. Practicality Score Interpretation Criteria

Score (%)	Criteria
0 - 20	Not practical
21 - 40	Less practical
41 - 60	Enough
61 - 80	Practical
81 - 100	Very practical

Adapted from Rohma & Puspitawati (2021)

The effectiveness level can be known through the answered questions in the E-LKPD to practice creative thinking skills and analysis of the results of students' positive responses to the E-LKPD. The data was obtained

using the questions in the E-LKPD during the lesson and the response questionnaire sheets given after the lesson ended. The questions in the E-LKPD then calculated the percentage value using the formula:

$$P (\%) = \frac{\sum \text{question answered correct}}{\sum \text{number of question}} \times 100\%$$

Students can be declared complete if the percentage result is $\geq 75\%$ (Tohroh, 2020). The response questionnaire sheets were then analyzed using the Guttman scale reference (Table 2). The response questionnaire data was then calculated as the percentage value using the formula:

$$\text{Responses } (\%) = \frac{\sum \text{students answered 'Yes'}}{\sum \text{number of students}} \times 100\%$$

The results of the percentage of the positive responses are then interpreted according to the interpreting responses criteria, which E-LKPD is declared effective if it obtains an average positive response percentage of $\geq 61\%$ (Table 4).

Table 4. Effectiveness Score Interpretation Criteria

Score (%)	Criteria
0 - 20	Not effective
21 - 40	Less effective
41 - 60	Enough
61 - 80	Effective
81 - 100	Very effective

Adaptasi dari Rafidah & Rachmadiarti (2022)

RESULT AND DISCUSSION

The research result is the E-LKPD biotechnology based on local wisdom, which was developed with a validity value of 3.80. The implementation of student activities is very practical, with a score of 97.50%. E-LKPD in conventional biotechnology based on local wisdom received 97.68% positive responses from students for the effectiveness level in training creative thinking skills.

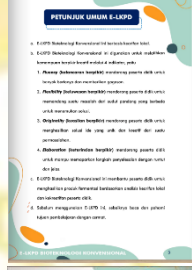
The developed E-LKPD contains several features that support topics delivered and concepts to train students' creative thinking skills. E-LKPD contains integration between conventional biotechnology with local wisdom topics. The E-LKPD result is in the form of a digital flipbook, written on A4 size paper, Times New Roman font 12 points, and consists of 23 pages, including the cover. The contents of the E-LKPD include text, images, and videos related to conventional biotechnology and local wisdom topics (Figure 1).

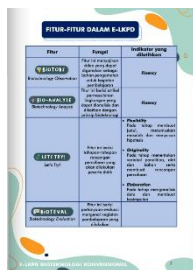


Figure 1. Text, Images, and Videos Feature

E-LKPD consists of 3 components: introduction, content, and closing. The introduction section contains a cover, introduction, table of contents, general instructions for E-LKPD, general instructions for using E-LKPD, features in E-LKPD, essential competencies, indicators, and learning aims. In the content section, there is a topics summary, the E-LKPD features, as well as project assignments. The closing section contains evaluation questions and a bibliography. The following displays developed E-LKPD in conventional biotechnology based on local wisdom (Table 5).

Table 5. Display of E-LKPD in Conventional Biotechnology Based on Local Wisdom

Appearance	Description
Introduction	
	The front cover of the E-LKPD in conventional biotechnology based on local wisdom.
	The general instructions section of the E-LKPD contains the uses or functions of the E-LKPD.
	The available instructions for using the E-LKPD section include how to operate the E-LKPD.



The features section in the E-LKPD contains descriptions, roles, and trained indicators of creative thinking skills by the features presented in the E-LKPD.

Content



The topics section includes a summary of local wisdom material and conventional biotechnology sub-materials with various features.



The "Let's Try" section is part of assigning project assignments through the scientific method steps.

Closing



The "Bioteval" section ends the chapter containing evaluation questions after carrying out learning activities.

The "Let's Try" section in the contents of the E-LKPD is the project assignment through the scientific method steps. The developed E-LKPD involves experimental activities that use several Project Based Learning syntaxes closely related to the scientific method (Banawi, 2019).

This E-LKPD in conventional biotechnology aims to train creative thinking skills so that it is equipped with features that support creative thinking indicators, namely Biotobs, Bio-Analyze, and Let's Try!. In addition, there is a supporting feature as an evaluation material, Bioteval (Table 6).

Table 6. Features of E-LKPD in Conventional Biotechnology Based on Local Wisdom

No.	Features	Description
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1.



Biotobs

This feature presents videos that can be used as observation material for learning activities. This feature trains the Fluency indicator on creative thinking skills.

Bio-Analyze

This feature presents articles on environmental problems that can be analyzed and linked to biotechnology principles. This feature trains the Fluency indicator on creative thinking skills.

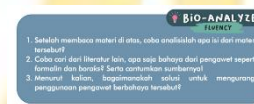
Let's Try

This feature contains the scientific method steps students will use to conduct experiments. This feature trains Flexibility, Originality, and Elaboration indicators on creative thinking skills.

Bioteval

This feature contains evaluation questions regarding carrying out the

2.



3.



4.



learning
activities.

Critical thinking skills can be trained through four indicators: Fluency, Flexibility, Originality, and Elaboration (Aldossari, 2021). Fluency indicators are trained through the Biotobs and Bio-Analyze features to encourage students to find many ideas.

The "Let's Try" feature trains three indicators of creative thinking skills at once: flexibility, originality, and elaboration. This feature has presented questions using the steps of the scientific method. Flexibility indicators are trained in making titles, formulating problems, and formulating hypotheses to encourage students to generate varied ideas from different perspectives (Figure 2) (Handayani et al., 2021).

The next step is to determine experimental variables, tools, and materials and make experimental designs to train originality indicators so students can generate unique ideas to solve problems (Figure 3). The elaboration indicator is trained in the last step, analyzing data and making conclusions so students can develop ideas in detail (Figure 4) (Handayani et al., 2021).



Figure 2. "Let's Try" feature to train flexibility



Figure 3. "Let's Try" feature to train originality



Figure 4. "Let's Try" feature to train elaboration

This E-LKPD in conventional biotechnology based on local wisdom can be accessed through the internet using a smartphone or laptop/PC. The text of the articles, images, and videos contained in this E-LKPD can be accessed through the 'Sumber' page listed. Thus, making it easier for online learning; this is in line with Demuyakor (2020) that there has been an increase in the use of technology in education.

Three validators have validated E-LKPD in conventional biotechnology based on local wisdom: material expert lecturers, education expert lecturers, and biology teachers who assess aspects of the feasibility of content, language, presentation, creative thinking skills, and effects on learning. The following is a table recapitulation of the results of validating conventional biotechnology E-LKPD based on local wisdom to practice creative thinking skills (Table 7).

Table 7. Recapitulation of Validation Result Score

No.	Assessed Aspect	Score			Average
		V1	V2	V3	
A. Content Feasibility					
1.	Concept quality	3.75	4	3.75	3.83
2.	Concept suitability	4	4	4	4
3.	Recency	3.17	4	4	3.73
Average / Criteria		3.85 / Very valid			
B. Linguistic					
4.	Indonesian language usage quality	3.80	4	4	3.93
5.	Use of biological terms	3.75	4	4	3.92
Average / Criteria		3.93 / Very valid			
C. Presentation					
6.	Presentation technique	3.50	4	4	3.83
7.	Material presentation suitability	3.50	4	4	3.83
8.	Presentation completeness	4	4	4	4
9.	Text quality	4	3.50	4	3.83
10.	Image quality	4	4	4	4
11.	Video quality	4	3.50	4	3.83
12.	Layout quality	4	4	4	4
Average / Criteria		3.90 / Very valid			
D. Creative Thinking Skills Characteristics					
13.	E-LKPD quality	3.20	4	4	3.73
14.	The features in the E-LKPD support students in:	3.50	4	4	3.83

- a. Fluency
- b. Flexibility
- c. Originality
- d. Elaboration

Average / Criteria		3.78 / Very valid			
E. Effects For Learning					
15.	Ease of using media Media capabilities in: a. Support independence	4	3	3	3.33
16.	b. Increase knowledge c. Practice creative thinking skills	3.33	4	4	3.77
Average / Criteria		3.55 / Very valid			
Average of all aspects / Criteria		3.80 / Very valid			

The validity results, as presented in **Table 6**, show that the total average validity score is 3.80, with a very valid category. These results involve all aspects that need to be considered in developing E-LKPD. The five significant aspects include the feasibility of content, language, presentation, characteristics of creative thinking skills, and effects on learning, with an average range score from 3.5 to 4, indicating that E-LKPD is feasible to use in learning.

The results of the feasibility aspect of the E-LKPD contents obtained an average score of 3.85, with a very valid category. These results indicate that the quality of the material concepts presented is reasonable and appropriate. The E-LKPD is by the Basic Competencies (KD) and analyzed learning objectives previously. The summary of the material to the learning activities presented in the E-LKPD is easy to understand and encourages students to learn independently. In addition, the scientific steps in the E-LKPD require students to understand and solve problems from different perspectives to train creative thinking skills (Wicaksono et al., 2020).

The linguistic aspect achieved the highest average score of 3.93, with a very valid category. These results indicate that using official, straightforward and communicative language makes E-LKPD easy to understand. The use of Indonesian is by the General Indonesian Spelling Guidelines (PUEBI); consistent

biological terms and informative sentences make reading easy to understand (Hendrawanto & Mulyani, 2017).

The presentation aspect of E-LKPD obtained an average score of 3.90, with a very valid category; this shows that the presentation of the E-LKPD is a systematic, complete, and appropriate material concept. The attractive design and neat layout make E-LKPD comfortable to learn. The quality of the text, image, and video fonts that are clear and easy to read make the E-LKPD easier to understand (Divayuda et al., 2021).

The distinctive aspects of creative thinking skills include the quality of the E-LKPD media and the features of the E-LKPD in supporting students to practice creative thinking. This aspect got an average score of 3.78, with a very valid category; this shows that the summary of integration material between conventional biotechnology with local wisdom and problems in E-LKPD can support students to think fluently, flexibly, original and in detail. In line with the material and questions, E-LKPD also provides opportunities for students to express their creative ideas through experimental activities. Trained students to solve problems creatively (Diwakar et al., 2019).

The last aspect has the lowest score, namely the effect on learning. This aspect scored 3.55 but still got a very valid category. **Table 7** shows results in the sub-aspect of used ease of media; accessed E-LKPD is considering not easy to use because it cannot without using the internet.

The researcher carried out the practicality test of E-LKPD in conventional biotechnology based on local wisdom using an observation sheet on the implementation of student activities. The test was limited to 20 students from SMA Negeri 8 Surabaya by five observers from UNESA students. The following is a recapitulation of the results of observing student activities (**Table 8**).

Table 8. Recapitulation of Student Activity Observations

No.	Assessed Aspect	Positive Response	Percentage (%)
1.	Able to operate E-LKPD	20	100
2.	Understanding learning aims	20	100
3.	Understanding E-LKPD instructions	20	100
4.	Doing each activity	20	100
5.	Work together and be actively involved	19	95
6.	Analyze and observe	19	95
7.	Designing experiments	20	100
8.	Formulating a solution	20	100

9.	Designing project activities	16	80
10.	Carry out project activities	20	100
11.	Collecting data/testing	20	100
12.	Summing up the experimental results	20	100
Average of all aspects		97.50	
Criteria		Very practical	

The data in **Table 8** focuses on the implementation of learning using E-LKPD, student activities during project assignments, and obstacles found during the learning process. The data is in line with the purpose of the practicality test to determine the level of convenience (condition) of the learning media developed. Hence, learning becomes more meaningful, engaging, valuable and can train students' creative thinking skills (Milala, Hendi Frata; Endryansyah; Joko; Agung, 2022).

The data results indicate that students can follow the lesson with the instructions, so the learning process goes well. They carried out learning activities in groups. The average positive responses is 97.50% regarding the activities carried out. Students can discuss in groups and generate ideas individually. At the stage of designing project activities, the results obtained are 80%; this happens because some students are not used to doing scientific activities with the scientific method (Junita & Yuliani, 2022).

The effectiveness of the E-LKPD in conventional biotechnology based on local wisdom is seen from the E-LKPD answers to train students' creative thinking skills and E-LKPD positive responses using a questionnaire sheet. The test was limited to 20 students from SMA Negeri 8 Surabaya. The following is a recapitulation of the answers on the E-LKPD.

Table 9. Recapitulation of Answer Results on E-LKPD

Groups	Average (%)	Criteria
1	77.78	Complete
2	88.89	Complete
3	88.89	Complete
4	77.78	Complete
5	83.34	Complete
Average of all groups		83.33 Complete

The recapitulation of the answers in **Table 9** shows that the average student score is 83.33% with the complete category, which means that they used E-LKPD effectively; this proves that students can hold the concept through topics summary in the E-LKPD. In addition to the completeness of learning outcomes, it also measured the effectiveness of the E-LKPD using the achievement of

four aspects of creative thinking skills. The following is a graph of the achievement of creative thinking indicators (**Figure 5**).

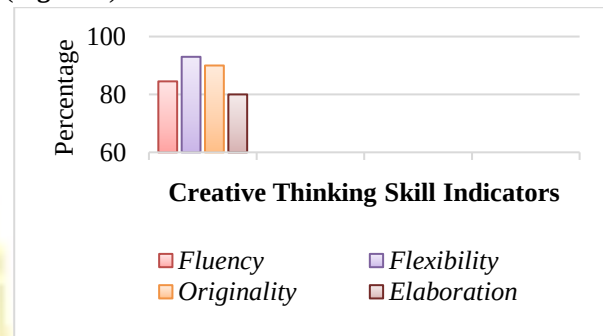


Figure 5. Graph of Achievement Results of Creative Thinking Skills Indicators

Based on **Figure 5**, reviewed effectiveness achievement through creative thinking skills gets excellent and complete results; namely, the fluency indicator gets 84.52% results, 93% flexibility, 90% originality, and 80% elaboration. The indicators of creative thinking skills overall average is 86.88% in the complete category; this shows that E-LKPD in conventional biotechnology based on local wisdom is effectively used to train creative thinking skills. The developed E-LKPD can make students find many varied ideas to solve a problem (Irwandani et al., 2020).

Table 10. Recapitulation of Student Response Results

No.	Assessed Aspect	Positive Response	Percentage (%)
A. Readability			
1.	Can follow the instructions in the E-LKPD	20	100
2.	The sentence structure is clear and easy to understand	20	100
3.	Using the term consistently	20	100
4.	Sufficient time to complete the task	19	95
5.	Instructions for using E-LKPD are clear and easy to understand	20	100
6.	E-LKPD leads to getting ideas	20	100
Average / Criteria		99.17 / Very effective	
B. Linguistic			
7.	Carry out data collection activities	20	100
8.	Associating observational data to answer questions	20	100

Average / Criteria		100 / Very effective	
C. Appearance			
9.	Attractive E-LKPD display	20	100
10.	E-LKPD attracts interest in learning local wisdom	16	80
11.	E-LKPD attracts interest in studying conventional biotechnology	16	80
12.	Pictures and videos according to the topic of discussion	20	100
Average / Criteria		90 / Very effective	
D. Local Wisdom Topic			
13.	Finding the concept of local wisdom	20	100
14.	E-LKPD makes it easy to learn local wisdom	20	100
Average / Criteria		100 / Very effective	
E. Conventional Biotechnology Topic			
15.	Discovering conventional biotechnology concepts	20	100
16.	E-LKPD makes it easier to learn conventional biotechnology	20	100
Average / Criteria		100 / Very effective	
F. PJBL Learning Models			
17.	E-LKPD helps find/determine problems that are around	20	100
18.	E-LKPD helps practice designing projects	20	100
19.	E-LKPD helps implement projects according to the plan	20	100
20.	E-LKPD helps practice compiling reports and presentations	19	95
Average / Criteria		98.75 / Very effective	
G. Creative Thinking Skills			
21.	E-LKPD helps generate lots of questions and ideas (fluency)	20	100

22.	Can communicate ideas in group discussions (fluency)	19	95
23.	E-LKPD helps to see the problem from a different point of view (flexibility)	20	100
24.	E-LKPD allows finding alternative solutions to solve the problems (flexibility)	20	100
25.	Can combine ideas from group members (originality)	16	80
26.	E-LKPD helps develop ideas so that they become more precise and more interesting (elaboration)	20	100

Average / Criteria	95.83 / Very effective
Average of all aspects / Criteria	97.68 / Very effective

The response questionnaire was obtained with 26 questions, and it is known that students who gave positive responses were in the average range of 97.68%, categorized as very effective to use. Students' responses were also reviewed from the responses given through the suggestions and criticism column. Almost all students answered that the E-LKPD developed was very good, but the pages were lacking. Students also revealed that text, images, and video variations make E-LKPD more fun and easier to reach (Lim et al., 2020).

Regarding readability, E-LKPD received a positive response percentage of 99.17%, with a very effective category. Readability aspects include E-LKPD instructions that can be followed, consistency of terms and sentences that are easy to understand, sufficient time allocation, and the ability of E-LKPD to train students to get varied ideas. The aspect of readability has an important effect on reading interest and the ability of E-LKPD to guide students in getting ideas. Connecting sentences and terms consistent with relevant learning activities can make learning more meaningful (Käsper et al., 2018). High response results indicate that students are interested and get varied ideas after learning to use the E-LKPD.

The linguistic aspect of E-LKPD obtained a positive response percentage of 100% with a very effective category; this means that students agree that the E-LKPD can guide them to collect data and then associate it with answering some of the questions asked. The language

used in the E-LKPD must be communicative, under PUEBI (General Instructions for Spelling of Indonesian), and in easy-to-understand terms so that the E-LKPD can achieve the desired learning objectives (Susantini et al., 2021).

The presentation aspect of E-LKPD obtained a positive response percentage of 90% with a very effective category. The presentation aspect of the presentation of E-LKPD displays the presentation of local wisdom material and conventional biotechnology that can attract students' interest, as well as appropriate pictures and videos. The presentation aspect is very important in learning because an attractive display can increase students' interest in learning (Anisah & Wisanti, 2022).

In the material aspect, namely local wisdom and conventional biotechnology, the percentage of positive responses is 100% in the very effective category. The summary of the material contained in the E-LKPD makes it easier for students to learn the integration between local wisdom and conventional biotechnology. The two materials are matched and connected to support student learning in practicing creative thinking skills (Desti et al., 2021).

Aspects of the PJBL learning model obtained a positive response percentage of 98.75%, with a very effective category. E-LKPD uses the PJBL learning model, integrated with the scientific method in its implementation. This learning model makes it easier for students to understand the activities. By applying the PJBL learning model, students find it easier to deal with contextual problems (Yustina et al., 2020b).

The last aspect, the creative thinking skills aspect, received a positive response percentage of 95.83% with a very effective category. This aspect includes indicators of creative thinking skills: fluency, flexibility, originality, and elaboration. The positive response results prove that the E-LKPD has successfully trained the four indicators for students. The questions in the E-LKPD can encourage students to seek and accumulate creative ideas, which are then designed to solve a problem (Sugiyanto et al., 2018).

The results above show that E-LKPD can be implemented in conventional biotechnology sub-material learning. To achieve learning objectives, teachers need the help of teaching materials to optimize the participation of students in achieving competence; this agrees with research (Teni Nurrita, 2018), those teachers must choose suitable learning media to achieve the stated teaching aims.

CLOSING

Conclusion

Based on the research description, it concluded that developed E-LKPD in conventional biotechnology based on local wisdom obtained very valid with a validity score of 3.80 and a very practical category in observing the implementation of student activities with a score of 97.50%. Students get the results of learning mastery by 83.33%, the achievement of indicators of creative thinking skills by 86.88%, and E-LKPD gets a positive response from students by 97.68%, with a very effective category used to train students' creative thinking skills.

Suggestion

Researchers suggest that further needed research regarding developing capable media to train digital skills to support 21st-century learning. Further research related to applying E-LKPD in conventional biotechnology based on local wisdom to determine the improvement of student learning outcomes and creative thinking skills.

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