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Development of E-LKPD Based on Scientific Literacy on Reproductive System Material to Improve High School Students Learning Outcomes and Collaboration Skills

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Abstract

Biology learning requires students to think critically, logically, factually and the reproductive system material is complicated, making it difficult for students to understand the lesson and lack collaboration skills. The aim of this research is to analyze the validity, practicality and effectiveness of scientific literacy-based E-LKPD on reproductive system material to improve high school students' learning outcomes and collaboration skills. The type of research used is Research and Development research with a pre-experimental one group pretest-posttest design. The population in the study were students of grade XI SMA Negeri 7 Semarang. The research sample selection used a purposive sampling technique with samples from class XI-5 and XI-6. The research stages include potential and problem analysis, product design, product validation, initial product revision, small-scale trials, final product revisions, large-scale trials, and final product. The research results show that the validity of the E-LKPD product based on scientific literacy on reproductive system material obtained very valid criteria with a percentage of 92,13%. The practicality of E-LKPD products based on scientific literacy on reproductive system material obtained very practical criteria with a percentage of 93,45% from teachers and 93,55% from students. E-LKPD based on scientific literacy on reproductive system material was declared effective in improving learning outcomes with an average N-gain of 0,62 and collaboration skills with a score of 90,62%. E-LKPD based on scientific literacy on reproductive system material was successfully developed in the category of very valid, very practical, and effective in improving learning outcomes and collaboration skills at SMA Negeri 7 Semarang.

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INTRODUCTION

Classroom learning must be designed effectively so that educational goals can be achieved in accordance with national education goals. Effective learning can supported with use of capable learning media help student for understand material and makes it easier student in study (Nurrita, 2018) . Learning in the 21st century requires the application of technology in learning. Utilization technology in learning in class can done with using learning media in form electronics that are used can accessed through computer or cellphone. Electronic media that can utilized in learning that is modules, booklets, catalogs, magazines, and student worksheet. Use of learning media in school push student for study independent and capable look for solution from problem (Nurfadhillah *et al*., 2021) .

When used in the learning process, appropriate learning media can direct students to improve their skills and learning outcomes. Learning media that can be used in learning is E-LKPD. E-LKPD is a learning media that contains instructions for implementing tasks that must be completed by students in learning activities with reference to the learning objectives to be achieved (Farkhati & Sumarti, 2019) . Using E-LKPD makes it easier for teachers to teach material to students. Apart from that, E-LKPD can also encourage students' activeness, independence, and responsible attitudes during the learning process (Lathifah *et al*., 2019) . This interactive E-LKPD is also in accordance with the use of technology and is efficient because students become accustomed to facing developments in the era of digitalization (Prastika & Masniladevi, 2021) . The E-LKPD that has been developed can be accessed by students via electronic devices with the help of an internet network which is expected to increase students' understanding of the material being studied (Lathifah *et al*., 2019) . E-LKPD which is developed interactively can attract students' attention, is clear, easy to understand, is not limited by space and time and can help students carry out practical work independently. This interactive E-LKPD is equipped with learning videos, articles, and automatic assessment features making it easier for students to learn. The use of interactive E-LKPD based on mobile learning in learning can be used as a solution to student boredom during learning (Wati *et al*., 2021) .

Based on on results interviews conducted at SMA Negeri 7 Semarang stated that use of learning media not yet varies cause lack of participation student so that fast bored. Use of conventional LKPD at SMA Negeri 7 Semarang still based paper so that can not integrated with source learn others. Use of conventional LKPD learning media not yet capable support fun learning so that participant educate easy bored and not participate active on learning material system reproduction. The LKPD used has not been integrated with the internet and is not equipped with interactive videos, pictures or illustrations that facilitate the student learning process. LKPD used in learning also limited on related tasks with material just and no serve problem real thing that exists in around. Besides that, with progress technology and potency students who have conventional LKPD cellphone not enough practical used in learning.

Learning science on system reproduction is carried out need ability literacy skilled science. Learning science need ability literacy skilled science from participant educate because in learning biology student sued for can think factual, critical, and logical. Based on PISA (Program for International Students Assessment) 2018 results, abilities literacy Indonesian science only reach score 396 and down to 383 on in 2022 (PISA, 2023) . Ability science obtained by Indonesia clear is at in below the average score set by the OECD and is at in lower other countries. Learning at SMA Negeri 7 Semarang yet integrated with scientific literacy so that student difficulty for develop ability think factual, critical, and logical.

The use of E-LKPD is possible steps done as innovation educator For create learning interactive. E-LKPD encourages student for participate active in learning so that student not only listen the material explained by teachers with method lecture however also can in a way active understand, identify, analyze, and look for solution from questions presented. Integrated E-LKPD development with aspect scientific literacy can interpreted as ability apply science in solve problem so that capable increase attitude And sensitivity to environment. Scientific literacy is something ability understanding science, communication science, and application knowledge science you have somebody in look for solution problem so that can increase attitude and sensitivity to environment around. Ability scientific literacy is required capabilities in

face development era as well as globalization so that need created for students capable implement sciences science on life daily (Rizkita *et al*., 2016) . Integration scientific literacy on E-LKPD very much related with enhancement skills collaboration as learning 21st century. The development of E-LKPD also increases student interest and interest so that students are serious about learning. The seriousness of student learning has an impact on improving student learning outcomes and student skills.

Learning outcomes can be interpreted as an evaluation carried out at the end after the learning process has been carried out repeatedly (Awalluddin, 2018) . Student learning outcomes are formed due to interaction with the environment. Student learning outcomes have a long shelf life or are not lost if the learning is successful. Learning outcomes have a role in shaping individual personalities because they encourage individuals to achieve better learning outcomes (Syardiansah, 2016) . This process will have an effect on changing an individual's way of thinking and behavior in a positive direction. Apart from that, one of the skills that students can develop is collaboration skills. Collaboration skills are students' ability to interact with other people, establish cooperative relationships, and have a responsible attitude towards learning, for example assignments given by the teacher. According to Le *et al*. (2018) collaboration skills are an individual's ability to contribute and participate with the aim of building relationships with other individuals, mutual respect for relationships with other people, mutual respect for relationships in a team work environment to achieve the same goals carried out in each activity.

Based on this background, it is necessary to carry out research on the development of E-LKPD based scientific literacy on material system reproduction For increase learning outcomes and skills collaboration high school student. This learning media can be used in class on reproductive system material.

RESEARCH METHOD

This research was conducted at SMA Negeri 7 Semarang in the 2023/2024 academic year. The population of this study were all class XI students of SMA Negeri 7 Semarang. The sampling technique uses purposive sampling. The samples used were 2 classes, namely classes XI-5 and XI-6, considering the number of students was 67 students. In this research, the data obtained is product validity data from material experts and media experts, teacher and student responses to the product, student learning outcomes, and student collaboration skills.

The aim of this research is to develop E-LKPD based on scientific literacy on reproductive system material to improve learning outcomes and collaboration skills for high school students. The validity of scientific literacy-based E-LKPD is measured through validation carried out by material and media experts. The practicality of E-LKPD based on scientific literacy is measured from the results of teacher and student responses. The effectiveness of E-LKPD based on scientific literacy is measured through *pretest* and *posttest results* as well as self-assessment questionnaires and peer assessment of collaboration skills. E-LKPD based on scientific literacy is declared effective with the following conditions: (1) results Study student achieved $0.3 \leq$ N-gain < 0.7 students on category currently and or high, (2) completeness Study classical ≥ 8 5% with criteria minimum completeness 75, (3) student collaboration skills ≥ 80 %.

RESULTS AND DISCUSSION

Development of E-LKPD based on scientific literacy on reproductive system material based on students' needs regarding learning. The E-LKPD developed is integrated with the internet so that it can be easily accessed. E-LKPD is equipped with interactive videos, pictures and illustrations that can attract students' attention and interest in learning. The E-LKPD that was developed also presents articles related to real problems that exist around students. The assignments and questions presented on the E-LKPD are adjusted to the material and students' cognitive level so as to encourage students to identify, analyze, prove and find solutions to each problem presented in the E-LKPD. Product development is integrated with live worksheets which make it easier for students to work on E-LKPD. The developed of E-LKPD based on scientific literacy consists of four activity units. Activity unit 1 discusses reproductive organs and their

functions. Activity unit 2 discusses gametogenesis. Activity unit 3 discusses fertilization, the menstrual cycle, and the hormones that play a role in this process. Activity unit 4 discusses disorders and diseases in the reproductive system.

Validity of E-LKPD Based on Scientific Literacy on Reproductive System Material

The validity of E-LKPD products based on scientific literacy aims to determine the feasibility or validity of products that have been developed for use in learning. Apart from that, media experts and material experts also provide suggestions, criticism and input so that improvements can be made to the E-LKPD based on scientific literacy on reproductive system material. The validity by media experts of E-LKPD based on scientific literacy on reproductive system material is divided into three aspects, namely graphic, presentation and language aspects. The results of the validity of media experts on E-LKPD are presented in Table 1.

Table 1 Validity of Media Experts on E-LKPD Based on Scientific Literacy on Reproductive System Material

No	Aspects	Score	Maximum Score	Percentage (%)	Criteria
1.	Chart	47	48	97,91	Very valid
2.	Presentation	7	8	87,50	Very valid
3.	Language	21	24	87,50	Very valid
	Total score (%)			**90,97**	**Very valid**

Based on data from Table 1, the validity of the scientific literacy-based E-LKPD media on reproductive system material obtained a total score of 90,97%. The validity test of E-LKPD based on scientific literacy consists of three aspects. The three aspects tested in the E-LKPD validity test have very valid criteria with a percentage of ≥ 85%. The graphic aspect of E-LKPD achieved a total score of 97,91%, the presentation aspect was 87,50%, and the language aspect was 87,50%. Media validity scores for graphic aspects, presentation aspects and language aspects reached very valid criteria.

E-LKPD based on scientific literacy on reproductive system material that has been successfully developed has the advantage of considering several aspects. Aspects considered include the image and video illustrations presented, text and illustration layout, typography, and letter composition used in the E-LKPD. The layout of text and images in the contents of the E-LKPD is balanced and consistent. The contents of the E-LKPD based on scientific literacy on reproductive system material are equipped with activity titles, subtitles and page numbers to make it easier for students to do assignments and solve problems. The colors used have a balanced composition and are not too flashy so they do not disturb students when working on E-LKPD on cellphones. The size and type of font used in preparing the contents of the E-LKPD does not use too many types and variations of letters, the spacing is normal, and the font chosen makes it easier for students to read. E-LKPD is equipped with picture and video illustrations to help students understand the material. According to Yasmin & Amini (2023) E-LKPD which is integrated with videos and images improves product quality so that it can attract students' attention. The layout of the videos and images as illustrations in the E-LKPD is considered so that they do not interfere with the delivery of the assignments and questions presented in the text. The language chosen has also been adapted to the level and intellectual development of students. According to Yuzan & Jahro (2022) , students will find it easier to understand the material and learning activities presented in E-LKPD if the language used is appropriate to intellectual and emotional development. The scientific literacy-based E-LKPD that was developed is structured coherently and completely according to the sub-material contained in the reproductive system material. Presenting E-LKPD in a coherent and complete manner can make it easier for students to learn (Wahyuni *et al.*, 2021) .

The validity score of E-LKPD based on scientific literacy in the presentation and language aspects did not get the maximum score because there were several shortcomings. The presentation aspect of the E-LKPD is not yet equipped with an answer box, number in the answer box, and information on the sub-

material discussed in each activity, making it less easy for students when working on the E-LKPD. The shortcomings in the presentation aspect are then followed up and corrected according to the validator's suggestions. Improvements to the presentation aspect include adding answer boxes, numbers in the answer boxes, and descriptions of sub-materials for each activity. The language aspect of the E-LKPD is considered not yet communicative so that students are unable to understand the sentences in the questions presented. The language aspect deficiencies were then followed up and corrected by changing the sentences to be shorter and clearer so that students could more easily understand the meaning of the questions. Apart from that, the use of words in sentences is also shortened. Another component of the validity of E-LKPD is material expert validation which consists of aspects of material suitability and material accuracy. The results of the validity of material experts are presented in Table 2.

Table 2 Validity of Material Experts on E-LKPD Based on Scientific Literacy on Reproductive System Material

No	Aspect	Score	Maximum Score	Percentage (%)	Criteria
1.	Material suitability	38	40	95,00	Very valid
2.	Material accuracy	22	24	91,60	Very valid
	Total percentage (%)			**93,30**	**Very valid**

Based on Table 2, the validity of the literacy-based E-LKPD on reproductive system material according to material experts obtained a total score of 93,30%. Validity in the aspects of material suitability and material accuracy obtained > 90%. The validity score for the material suitability aspect is 95% and the material accuracy score is 91,60%. The score for aspects of material suitability and material accuracy reached very valid criteria.

The material presented in E-LKPD is up to date or current, presents examples that are often encountered in everyday life, and is interconnected with each other. The material presented in the E-LKPD based on scientific literacy on reproductive system material is also in accordance with the learning outcomes and learning objectives in the Kurikulum Merdeka, namely that students can analyze the relationship between the structure of organs in the organ system and their function in the process of mechanisms as well as abnormalities and disturbances that arise in the organs reproductive system. The learning activities presented in the product contain complete material, starting with an initial introduction to the material, questions, tasks related to daily life, discussion activities that allow students to analyze, design and interpret data. E-LKPD can be said to be good if it has consistency and suitability between the learning activities given to students and the learning materials (Umaroh *et al*., 2022) .

The data, illustrations, questions, and problems presented in the scientific literacy-based E-LKPD on reproductive system material are cases that occur in everyday life. The questions and problems in the learning activities contained in the E-LKPD encourage students to be able to understand problems, analyze problems, and find solutions to problems which is done by creating problem-solving plans to concluding solutions to problems from the data obtained. E-LKPD also encourages students to carry out further investigations with the analysis activities presented. Yahya *et al*. (2023) stated that E-LKPD based on scientific literacy is able to increase students' curiosity in conducting studies and investigations so that students' higher thinking abilities also increase.

The validity score of the E-LKPD in the aspect of material accuracy did not get the maximum score because the material presented in the E-LKPD could still be added to. Additional material that needs to be done is material on contraceptive use and additional questions in the conclusion. Deficiencies in the accuracy aspect of the material were then followed up and corrected by adding material on the use of contraception which was presented in a form to provide students with a better understanding regarding the technology material used in preventing pregnancy in women, tables and questions in the conclusion section to direct students in constructing conclusions from the reproductive system material presented. presented on E-LKPD.

Practicality of E-LKPD Based on Scientific Literacy on Reproductive System Material

The practicality of E-LKPD based on scientific literacy on reproductive system material was obtained through teacher and student responses. The E-LKD practicality test aims to determine the practicality, efficiency and readability of the E-LKPD when used in learning. The aspects considered in the practicality test are learning, language and technical aspects. The results of the practicality of E-LKPD based on scientific literacy on reproductive system material according to teachers and students are presented in Table 3.

Table 3 Practicality of E-LKPD Based on Scientific Literacy on Reproductive System Material by Biology Teacher and Students

Respondent Aspect	Score	Maximum Score	Percentage (%)	Criteria
Teacher				
Learning	52	56	92,85	Very practical
Language	7	8	87,50	Very practical
Technical	16	16	100	Very practical
Average			93,45	
Class XI Students				
Learning	54,85	56	97,94	Very practical
Language	15,11	16	94,49	Very practical
Technical	7,58	8	94,71	Very practical
Average			95,71	
Class XII Students				
Learning	51	56	91,07	Very practical
Language	14,9	16	93,12	Very practical
Technical	7,2	8	90,00	Very practical
Average			91,39	
Average (XI&XII)			93,55	
Practicality Score (%)			**93,52**	**Very practical**

Based on Table 3, the results of the analysis of the practicality of E-LKPD according to teachers and students obtained a total score of 93,52% with very valid criteria. The results of the practicality test according to the teacher obtained a score of 93,45%, class XI students scored 93,55%, and class XII students scored 93,55%. The aspects tested in the practicality test consist of learning aspects, technical aspects and language aspects. The scores for the three aspects tested were ≥ 85%. The practicality score obtained in each aspect and the total score show very practical criteria.

The questions and problems presented are also in accordance with the facts and problems that exist in the surrounding environment. E-LKPD based on scientific literacy is able to encourage students to find solutions to problems, improve student collaboration and participation skills, and make it easier for students to understand learning material. Discussion learning activities encourage students to work together and understand problems so they can find solutions to these problems. Contextual problems presented in learning media are easier to reach and are able to produce positive responses for students (Cahyani & Suniasih, 2022) .

E-LKPD based on students' scientific literacy was developed by considering color composition, layout, illustrations and videos, and the appearance presented. The color composition, illustrations, videos presented in E-LKPD are able to attract and motivate students to learn. E-LKPD based on scientific literacy on reproductive system material is very practical to use in learning because it is integrated with Live Worksheets . E-LKPD which has been integrated with Live Worksheets can be accessed easily and does not use paper. Students can immediately answer questions in the E-LKPD in the answer box and student grades can be seen immediately when the answers have been collected. The use of E-LKPD in learning makes it

easier for teachers to convey material and makes it easier for students to learn because it is easily accessed (Utami *et al.*, 2022) .

Effectiveness of E-LKPD Based on Scientific Literacy on Reproductive System Material

The effectiveness of E-LKPD based on scientific literacy on reproductive system material is divided into two, namely learning outcomes and student collaboration skills. The effectiveness of E-LKPD in improving learning outcomes can be seen from classical completeness and the average N-gain score. Effectiveness data was obtained through self-assessment questionnaires and peer assessments of collaboration skills and student pretest and posttest results. The results of classical completion of student learning outcomes are presented in Table 4.

Table 4 Classical completeness of student learning outcomes after using E-LKPD based on scientific literacy on reproductive system material

Data Description	Pretest	Posttest
The highest score	62	100
Lowest value	8	17
Average value	27	89
Total number of students	67	67
Number of students completed (>75)	0	59
Classical completeness (%)	**0%**	**88%**

Based on Table 4, the percentage of students' classical completion after using E-LKPD in learning reached 88%. The classical completeness score obtained was > 85%, which shows that literacy-based E-LKPD is effective in improving the classical completeness of student learning outcomes. The results of student scores were analyzed using the N-gain method to determine the increase in student learning outcomes after learning using E-LKPD based on scientific literacy on reproductive system material that had been developed. The results of the N-gain analysis are presented in Table 5.

Table 5 N-gain Score on Student Learning Outcomes after Using E-LKPD Based on Scientific Literacy on Reproductive System Material

Respondent	Pretest Value	Posttest Value	Maximum Value	N- gain	Criteria
XI-5 students	20,33	92,94	100	0,72	High
XI-6 students	35,32	86,41	100	0,52	Currently
Average N-gain				**0,62**	**Currently**

Table 5 shows the average N-gain student learning score of 0,62 with medium criteria after using E-LKPD based on scientific literacy on reproductive system material. The N-gain score in class XI-5 reached 0,72 with high criteria and XI-6 was 0,52 medium. Overall, the average results of the total N-gain and each class achieved a g score ≥ 0.3, which states that the results of the pretest posttest increase obtained were significant.

E-LKPD based on scientific literacy on reproductive system material is effective in improving learning outcomes. The classical completeness obtained based on data analysis exceeds the established standards and is in accordance with research by Triana *et al*. (2022) . E-LKPD is effective in improving learning outcomes in accordance with research by Lailiah *et al*. (2021) which states that E-LKPD can have an influence on students' cognitive domains, making it possible to improve learning outcomes. E-LKPD development is carried out by adding images, videos, and articles that help increase students' knowledge and understanding. The video link explains the meaning of the reproductive system, the organs of the reproductive system and their functions, and various types of reproductive system disorders. The practice questions in E-LKPD are packaged in an interesting way, so that students do not get bored and are more enthusiastic about learning. Using E-LKPD makes students feel happy when studying in class because it

looks attractive, the activities in E-LKPD are also equipped with pictures which can make it easier for students to understand the material.

The use of E-LKPD based on scientific literacy can encourage science process skills in students. The use of E-LKPD allows students to actively participate in learning the material being carried out. Active student participation makes the student's learning experience not limited to knowledge (Ilmy *et al*., 2022) . The learning that is expected of students is not only limited to the ability to remember, but students must be able to understand, analyze and interpret the knowledge they have through problem solving which is carried out by finding ideas and concepts (Nada *et al*., 2022) . The use of E-LKPD based on scientific literacy on reproductive system material has an effect on improving students' cognitive abilities and increasing students' interest in learning. Increasing student interest causes student motivation to also increase, thereby directly improving student learning outcomes. The use of E-LKPD which increases students' interest in learning will be in line with improving student learning outcomes. Student interest in learning will cause students to consistently and seriously understand the material. Student learning outcomes are also closely related to interest in learning as an influencing factor. Mardlah *et al*. (2022) stated that the learning process will run smoothly if it is accompanied by interest because students who are interested in a subject will study the material or lesson seriously.

The effectiveness of E-LKPD based on scientific literacy on reproductive system material is also measured against indicators of collaboration skills. Collaboration skills are obtained based on a questionnaire filled out by students with 15 statement items. The results of student collaboration skills are presented in Table 6.

Table 6 Scores of Self Assessment and Peer Assesment Colaboration Skills of Students after Using E-LKPD Based on Scientific Literacy on Reproductive System Material

Respondent	*Peer Assessment* (%)	*Self Assessment* (%)	Average (%)	Criteria
XI-5 students	89,80	91,00	90,90	Very collaborative
XI-6 students	90,88	90,80	90,35	Very collaborative
		Total Percentage	**90,62**	**Very collaborative**

Based on the data in Table 6, the total score of students' collaboration skills is 90,62% with very collaborative criteria. The collaboration skills score in class XI-5 reached 90,90% and class XI-6 reached 90.35% with the respective criteria being very collaborative. Students' collaboration skills are measured based on five indicators, namely contributing actively, working productively, flexibility, responsible attitude, and respectful attitude. The results of the analysis of student collaboration skills per indicator are presented in Table 7.

Table 7 Scores for Each Indicator of Student Collaboration Skills after Using E-LKPD Based on Scientific Literacy on Reproductive System Material

Indicator	*Peer Assessment* (%)	*Self Assessment* (%)	Average (%)	Criteria
Contribute actively	89,67	93,28	91,47	Very collaborative
Work productively	90,29	93,47	91,88	Very collaborative
Flexibility	96,08	93,60	94,84	Very collaborative
Responsible Attitude	93,78	92,91	93,34	Very collaborative
Appreciative Attitude	95,14	96,01	95,57	Very collaborative

Based on the data presented in Table 7, the highest collaboration skills are respectively shown by indicators showing an attitude of respect with a score of 95,57%, flexibility of 94,84%, an attitude of responsibility of 93,34%, working productively of 91, 88%, and contribute actively. Amounting to 91,47%. In general, students' collaboration skills get very collaborative criteria.

Indicators of collaboration skills in the form of students' responsible attitude can be seen based on the timeliness of completing the tasks given, being responsible in the assignments given, and complying with the instructions given, showing highly collaborative criteria. The last indicator of collaboration skills is

showing an attitude of respect in the form of the attitude of students who are able to appreciate and respect the opinions of friends in discussions, and do not impose opinions and accept joint decisions in solving problems, showing criteria that are very collaborative. Student responsibility in learning is very necessary because it will affect student learning outcomes. The fourth indicator is showing flexibility and compromise which can be seen from the students' ability to accept criticism and suggestions as well as discuss differences of opinion and accept assignments given, showing very collaborative criteria and is an indicator of collaboration skills which has the highest percentage. Increasing collaboration skills in students is in accordance with research by Fauziah *et al*. (2023) which states that students who are given the task of solving problems jointly and collaboratively tend to increase their activeness, attitude of responsibility, respect and flexibility.

The use of E-LKPD based on scientific literacy on reproductive system material can facilitate students' collaboration skills through discussions carried out in finding solutions to problems and answers to questions. Learning using E-LKPD gives students the freedom to mobilize their skills and knowledge in finding solutions to problems together (Nurjanah *et al*., 2020) . E-LKPD based on scientific literacy on reproductive system material is able to facilitate students' collaboration skills because it presents problems and questions that must be solved in groups. The problem presented in the E-LKPD is that students have to carry out a simple experiment that requires cooperation and contribution from group members, thereby practicing collaboration skills.

There are three activities in E-LKPD that invite students to discuss analyzing phenomena, designing experiments and interpreting data. The activity of analyzing phenomena in E-LKPD can train students to analyze problems which are then discussed further to find solutions to these problems together. Members of each group are trained to work productively and have an active contribution in solving problems and answering questions presented on the E-LKPD. Learning with group discussions allows students to exchange ideas, ideas, opinions, and information in an effort to solve problems (Sugianto *et al*., 2022) . Learning using E-LKPD based on scientific literacy on reproductive system material directs students to improve collaboration skills through discussions carried out in solving problems. Collaboration skills were measured at the last meeting to determine the level of students' collaboration skills after carrying out learning using scientific literacy-based E-LKPD on reproductive system material that had been developed.

The level of collaboration skills obtained very collaborative criteria in accordance with the research of Novendra *et al*. (2023) . These good student collaboration skills will help students connect theoretical knowledge and practical knowledge (Dhitasarifa *et al*., 2023) . The practical abilities in question can be in the form of practicum activities, field activities, or activities that require communication skills between students.

CONCLUSION

Based on the results and discussion that have been explained, it can be concluded that E-LKPD based on scientific literacy on reproductive system material has been successfully developed with very valid, very practical, and effective criteria for improving students' learning outcomes and collaboration skills. The e-LKPD that has been developed can be used in the classroom learning process.

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