

## **VALIDITY OF E-LKPD BASED ON LIVEWORKSHEETS TO TRAIN SCIENCE PROCESS SKILLS ON PLANT CELL STRUCTURE MATERIAL**

### ***Validitas E-LKPD Berbasis Liveworksheets untuk Melatihkan Keterampilan Proses Sains pada Materi Struktur Sel Tumbuhan***

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#### **Abstract**

This research aims to develop e-LKPD on plant cell structure material with the aim of training science process skills that are suitable for use in learning based on validity and practicality. This research uses a 4-D development model (four-D Models), including defining, designing, developing, and deploying, but the dissemination needs to be carried out in this development research. The research was conducted at the Department of Biology, UNESA, and tested on 33 F1 SMAN 3 Sidoarjo students. The research instruments used were e-LKPD validation sheets, implementation observation sheets, teacher response questionnaires, student response questionnaires, pretest and posttest assessment sheets, and indicator achievement sheets. Data analysis was conducted in a quantitative descriptive manner. The validity result obtained a very valid category with an average of 3.75. The results of the practicality test are very practical in terms of the implementation score of 92.8%, teacher response score of 95.65%, and student response score of 97.73%. Based on these results, the e-LKPD is valid for students at the SMA phase F level.

**Keywords:** development model, liveworksheets, four D, plant cell structure, science process skills,

#### **Abstrak**

Penelitian ini merupakan penelitian pengembangan yang bertujuan untuk mengembangkan e-LKPD pada materi struktur sel tumbuhan dengan tujuan melatih keterampilan proses sains yang layak digunakan dalam pembelajaran berdasarkan validitas dan kepraktisan. Metode penelitian menggunakan model pengembangan 4-D di antaranya pendefinisian, perancangan, pengembangan dan penyebaran, namun dalam penelitian pengembangan ini tahap penyebaran tidak dilakukan. Penelitian dilakukan di Jurusan Biologi, UNESA, dan diujicobakan pada 33 peserta didik kelas F1 SMAN 3 Sidoarjo. Instrumen penelitian yang digunakan adalah lembar validasi e-LKPD, lembar observasi keterlaksanaan, lembar angket respon guru, lembar angket respon peserta didik, lembar penilaian pretest dan posttest, serta lembar ketercapaian indikator. Analisis data dilakukan secara deskriptif kuantitatif. Hasil validitas memperoleh kategori sangat valid dengan rata-rata 3,75. Hasil uji kepraktisan dikatakan sangat praktis ditinjau dari skor keterlaksanaan 92,8%, skor respon guru 95,65%, dan skor respon peserta didik 97,73%. Berdasarkan hasil tersebut maka e-LKPD valid digunakan untuk peserta didik jenjang SMA fase F.

**Kata Kunci:** 4 D, keterampilan proses sains, liveworksheets, model pengembangan, struktur sel tumbuhan

#### **INTRODUCTION**

Learning is a form of activity by students and teachers as facilitators in the learning process (Rohani, 2019). Learning is of high quality if there is reciprocity between teachers as educators and students, which is characterized by increasing students' abilities. Internal and external factors can affect learning (Faizah, 2017). Internal factors come from students consisting of physical and psychological factors, while external factors come from outside students, one of which is school factors. School

factors that can affect the learning process are the curriculum applied.

The change of the 2013 curriculum to an independent curriculum is a new revolution in the world of education. Based on the national education system law article 26 No.20 of 2003, curriculum changes are based on national education standards to realize national education goals. This change aims to improve the previous curriculum to align with the times (Rahmadhani et al., 2022). The changes in the independent curriculum are related to the components that will be used in teaching materials and

learning media. Namely, its preparation must be adjusted to the learning outcomes determined in each phase. Evaluation of the independent curriculum can be observed through the learning outcomes of students who meet the criteria. Learning outcome data is very useful for knowing progress as an indicator of achieving educational goals and understanding appropriate education policies (Johnson & Parrado, 2021). In addition to learning outcomes, the evaluation of the independent curriculum can also be seen from the science process skills as a form of introduction to students' skills in investigating problems in the surrounding environment (Mabsutsah et al., 2019).

*Science process skills* are skills that direct learners in thinking to create knowledge, solve problems, and formulate problems. There are several elements of science process skills, including observing, classifying, measuring data, making conclusions, communicating, controlling variables, and experimenting (Aliyah & Erman, 2021). Science process skills are considered necessary for students because they are related to the process of investigating the surrounding environment so that they can produce new concept knowledge for students (Rusyady, 2022), but based on Wahyuni's research (2020) shows that the results of science process skills tend to be low due to the lack of effective learning media used. Teachers only rely on Student Worksheets available in national textbooks that are the handles of teachers and students (Wahyuni et al., 2020). Based on the problems described, it is necessary to develop learning media to facilitate the learning process to be more meaningful.

Student Worksheets are a reference for learning continuity used by teachers. Based on the results of Saputra's research (2019), the LKPD used by students is still considered monotonous because the LKPD only contains practice questions and summaries of learning materials. There are still many LKPDs in the form of sheets of paper or commonly referred to as pages (Febriyanti, 2017). Based on these problems, there is a need for more interactive teaching materials, such as Electronic Student Worksheets (e-LKPD). In line with research by Sahid et al. (2021), which states that after conducting trials on e-LKPD, it can be seen that the average value of the science process skill indicator obtained is 0.79 in the high category. The development of interactive e-LKPD can utilize sites or websites like Liveworksheets.

Liveworksheets is a website or site that can apply e-LKPD using video, images, audio, and various evaluation questions (Hariyati, 2022). The advantages of Liveworksheets include the first is that there are exciting

features that can be used; the e-LKPD work process can be carried out / filled directly on the website; In the process of correcting answers, teachers can cross out / circle and then type the correct answers so that students can see the wrong and correct answers. Attractive display supported by features in Liveworksheets, such as learning video links; features of multiple-choice questions and essays, can increase students' learning motivation in working on the e-LKPD (Burhannudin, 2022). Based on research by Farman et al. (2021) regarding the effect of developing e-LKPD using Liveworksheets in Mathematics online learning during the Covid-19 pandemic, it shows a validation score of 4.04 in the perfect category and practical results get a score of 80.3 in the practical category.

Plant cell structure is one of the biological materials that can be facilitated with e-LKPD based on Liveworksheets. This material is complex and abstract, so e-LKPD can help students make cell structures accurate. Realizing student-oriented learning requires teaching materials that support so that students can easily understand the material and make independent observations. Using technology by applying image and video visualization can increase student learning motivation. Based on these problems, efforts to develop e-LKPD become exciting and innovative in Plant Cell Structure material. Efforts to develop teaching materials that will be carried out are the development of Liveworksheets-based e-LKPD, which aims to improve students' science process skills in science-based learning so that students can play an active role in following learning and student learning outcomes can increase. Liveworksheets media can improve student learning outcomes (Maysaroh, 2021). In addition, this development makes it easier for students to solve problems in e-LKPD, which is in line with today's technological advances.

This research aims to develop e-LKPD on plant cell structure material with the aim of training science process skills that are suitable for use in learning based on validity, practicality, and effectiveness. The development of e-LKPD using Microsoft Word and Canva was then converted using Website Liveworksheets. The development of e-LKPD plant cell structure is considered to be able to improve the elements of science process skills through features in this Liveworksheets-based e-LKPD, including observing; grouping/classifying; making inquiries; designing experiments; using tools and materials; conducting experiments; interpreting; and communicate.

## METHOD

Research on developing electronic student worksheets for plant cell structure material based on Liveworksheets uses a device development model, namely the 4-D model (four-D Models) developed by S. Thiagaradjan (1974). The 4-D Model consists of four stages, including define, design, develop and disseminate, but the dissemination stage needs to be carried out in this development research.

The first stage namely defines, begins with an analysis of the curriculum applied to determine Learning Outcomes (CP) according to phase levels and formulate indicators of the material chosen to be applied in learning so that the learning objectives to be achieved can be known. The curriculum used at SMAN 3 Sidoarjo is the Merdeka Curriculum. Analysis of students to find out the background of students so that they can compile E-LKPD as needed with subjects in the trial process, namely 33 people from Phase F of SMA Negeri 3 Sidoarjo who have heterogeneous abilities and with an age range of 16-17 years. This concept analysis is carried out by the learning objectives to be achieved, then continued with the preparation of e-LKPD in a systematic and structured manner and determining relevant concepts. Indicator analysis helps determine the experience in the learning process for students and determines learning objectives that students must meet after the learning process.

The second design stage is the stage of making the initial design of the developed teaching materials and then producing an initial design that is prepared according to the requirements for making a good LKPD. The preparation stage was carried out at the Department of Biology, FMIPA, Unesa, in December 2022-January 2023. The design of e-LKPD includes content design and display design. The content design of e-LKPD consists of a material framework arranged according to learning outcomes, learning objectives, and Liveworksheets-based learning flows. The display design of the e-LKPD product will be developed using software, namely Microsoft office word and Website Liveworksheets.

The third stage of development, namely e-LKPD, was validated by lecturers, material experts, and education experts and tested on 33 students of Phase F of SMA Negeri 3 Sidoarjo in heterogeneous conditions. This validity process uses a tool in the form of a validation sheet which contains several aspects, including aspects of presentation, content, language, suitability of the content, and achievement of indicators. The validation sheet assessment uses a scale of 1-4, followed by calculating the average score using the following formula.

$$P \text{ validity score} = \frac{\sum \text{score earned}}{\sum \text{maximum score}} \dots \dots \dots (1)$$

The results of the validity percentage are further interpreted in the eligibility criteria of Riduwan & Sunarto (2013).

Table 1. Eligibility Criteria

Average Score	Description
1,00 – 1,75	Less Valid
1,76 – 2,50	Quite Valid
2,51 – 3,25	Valid
3,26 – 4,00	Very Valid

(Source: Riduwan & Sunarto, 2013)

This research is also supported by the results of practicality tests. The practicality test was carried out using an observation sheet on the implementation of e-LKPD conducted by the observer by observing the activities of students during learning using the developed e-LKPD. The second technique is to use teacher response questionnaire sheets to determine teacher responses regarding using e-LKPD developed in learning. The third technique uses student response questionnaire sheets to find student responses in learning using e-LKPD. Analysis of the implementation of e-LKPD was carried out using the Guttman scale, which has the provision that the answer "Yes" gets a value of 1 and the answer "No" gets a value of 0 (Riduwan & Sunarto, 2013). The results obtained through observation can be calculated using the formula:

$$\% \text{Implementability} = \frac{\sum \text{answer score Yes}}{\sum \text{maximum score}} \times 100\% \dots \dots \dots (2)$$

The results of the percentage of the practicality of e-LKPD that were developed were then calculated on average and then interpreted in the eligibility criteria according to Riduwan (2016).

Table 2. Practicality Criteria

Average Score (%)	Category
0 – 20	Impractical
21 – 40	Less practical
41 – 60	Quite practical
61 – 80	Practical
81 – 100	Very practical

(Source: Riduwan, 2016)

## RESULT AND DISCUSSION

This development research produces teaching materials in the form of Electronic Student Worksheets (e-LKPD) based on Liveworksheets on plant cell structure material, which are classified as very valid, practical, and effective. The data obtained in this study include the value of validation, implementation observation, teacher response questionnaire results, student response questionnaire results, and student learning outcomes reviewed from the pretest and posttest.

### Electronic Student Worksheet Feature Specification





Electronic Student Worksheets (e-LKPD) based on Liveworksheets plant cell structure material were developed using Microsoft Word and Canva in A4 form. Then the design that has been created is saved in PDF format and then converted using Website Liveworksheets. The website makes student worksheets more effective with an attractive display supported by features in Liveworksheets such as learning video links; features of multiple-choice questions and essays can increase students' learning motivation in working on the e-LKPD (Burhannudin, 2022).



Electronic Student Worksheets (e-LKPD) based on Liveworksheets plant cell structure material developed contains two topics. The first topic is the structure of plant cells. Topic 1 invites students to carry out a series of identification processes regarding the shape of plant cells using scientific methods to practice science process skills. Students are invited to observe the formation and arrangement of epidermal cells on *Rhoe discolor* leaves.

The second topic is the structure of plant tissues. Topic 2 invites students to observe plant organs and directs them to determine the type of plant organs followed. In addition, on this topic, students are also referred to carry out a series of identification processes regarding comparing plant tissues using scientific methods to train science process skills. Students are invited to conduct video observation activities regarding tissue comparison in monocotyledon and dicotyledon plant roots.

Electronic Student Worksheets (e-LKPD) based on Liveworksheets plant cell structure material is equipped with interactive features to support improving science process skills in students. The description of these features can be seen in Table 3.

Table 3. Features of e-LKPD

No.	Features	Description
1.	 <b>Mari Mengobservasi</b>	This feature invites students to digest the information that has been presented and answer the questions provided.
2.	 <b>Mari Mengidentifikasi</b>	This feature invites students to identify the problems provided and formulate questions.
3.	 <b>Mari Mencari Tahu</b>	This feature invites students to make observations about the formulation of questions that have been created.
4.	 <b>Mari Mengolah Hasil</b>	This feature invites students to process

No.	Features	Description
5.	 <b>Mari Membuktikan</b>	This feature invites students to connect the results of observations with the formulation of questions that have been made before.
6.	 <b>Mari Menyimpulkan</b>	This feature invites students to conclude the material that has been learned.

### Validity of Electronic Student Worksheets

Validation of e-LKPD based on Liveworksheets plant cell structure material is carried out by two validators: material expert lecturers and educational expert lecturers. The validity of e-LKPD is seen from three aspect criteria: didactic, technical, and construction requirements. The results of Liveworksheets-Based e-LKPD validation are shown in Figure 1.

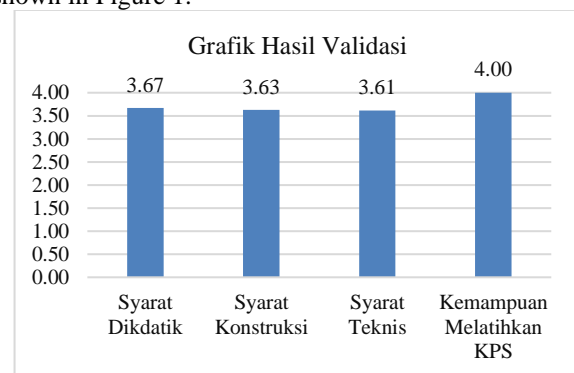


Figure 1. Liveworksheets-Based E-LKPD Validation Results in Data

Determination of the validity of e-LKPD based on Liveworksheets There are three conditions containing 14 aspects with 44 criteria assessed, namely didactic, construction, and technical requirements. The characteristics of a good e-LKPD are determined by three conditions, including didactic requirements, construction requirements, and technical requirements (Koderi et al., 2020). Based on the attachment data, it is known that the validity of the Liveworksheets-based e-LKPD developed obtained an overall average value of 3.75 with a very valid interpretation category. This proves that e-LKPD based on Liveworksheets developed theoretically is feasible for learning plant cell structure material to train students' science process skills.

The results of the validity of e-LKPD based on Liveworksheets on the aspects contained in the didactic requirements obtained a very valid category with an overall average of 3.67. The requirements for didactic



contain two aspects, including aspects that emphasize the process of finding the concept of obtaining a very valid category. However, there are still things that could be improved in this aspect. Namely, the images presented are considered less facilitating students in obtaining concepts. This is because other educators commonly use the images used in e-LKPD. The selection of image media affects the increase in student learning motivation (Saputro, 2019). Accommodating differences in students' academic abilities obtains very valid categories. Student responses also support this aspect, which state that Liveworksheets-based e-LKPD provides an opportunity to understand lessons according to students' learning speed; the statement received many positive responses.

The identity, language, and content components on Liveworksheets-based e-LKPD obtain very valid categories. This can be seen from the overall average results on the aspects contained in the construction requirements obtained a score of 3.63 with a very valid category interpretation. The identity component contains five aspects, including the title of obtaining a valid category. However, there are still areas for improvement in this aspect, namely the lack of precise color selection in the title text that does not contrast with the background color used. Appropriate color variations in teaching materials can make it easier for students to understand information and form new cognitive structures (Hasniati et al., 2022). Time allocation is very valid because it is considered very appropriate with the time needed to fulfill activities in achieving predetermined learning objectives. Learning objectives are very valid, but there is still a drawback, namely the lack of precise operational verbs in formulating learning objectives. The use of appropriate operational verbs can make it easier for teachers to assess the activities carried out by students (Budiastuti et al., 2021). The aspect of the student guide is very valid, but there is still a drawback, namely not including the steps in opening the liveworksheets website. The bibliography aspect is valid, but citations are considered less recent and not in line with the topics raised in teaching materials.

The linguistic component contains two aspects, including the average aspect of the language used according to the maturity level of students is very valid. This aspect still needs to be improved. Namely, some words use foreign languages that can cause students difficulty understanding them, such as 'cover glass,' 'object glass,' and 'cutter.' The simple aspect of sentences used obtains very valid categories. This is also supported by student responses stating that the language used in e-LKPD based on Liveworksheets is simple and easy to understand; the statement received a positive response.

The content component contains one aspect: Liveworksheets-based e-LKPD questions that obtain valid categories. This aspect is also supported by the positive response of students who stated that e-LKPD based on Liveworksheets contains illustrations that make it easier to understand the material according to students' abilities.

The ability of e-LKPD based on Liveworksheets is to train students' science process skills and obtain valid categories. This can be seen from the overall average results on the aspects contained in the technical requirements obtained a score of 3.75. Four aspects of the technical requirements, including the cover aspect of e-LKPD based on Liveworksheets, are very valid. Choosing a cover design for teaching materials increases students' interest in learning (Agustina, 2015). The image aspect in Liveworksheets-based e-LKPD obtained a very valid category, but there is still a drawback, namely that other educators commonly use the image. The writing aspect in Liveworksheets-based e-LKPD is very valid, but this aspect does not get the maximum score because some writings need to follow the EYD, such as 'thorough.' Appropriate and communicative language is essential to facilitate understanding of the material for students (Lubna, 2017). The aspect of practicing science process skills obtained a maximum average score of 4 with very valid interpretations. Based on the theoretical aspect, e-LKPD based on Liveworksheets developed can train students' science process skills because it directs students to make independent observations following scientific methods, including observing, grouping/classifying, formulating questions, designing experiments, using tools/materials, carrying out experiments and formulating conclusions. This is in accordance with the purpose of science process skills to increase students' motivation and learning outcomes by searching and discovering concepts independently (Nurhasanah, 2016). The aspect of practicing science process skills obtained a maximum average score of 4 with very valid interpretations. Based on the theoretical aspect, e-LKPD based on Liveworksheets developed can train students' science process skills because it directs students to make independent observations following scientific methods, including observing, grouping/classifying, formulating questions, designing experiments, using tools/materials, carrying out experiments and formulating conclusions.

This is in accordance with the purpose of science process skills to increase students' motivation and learning outcomes by searching and discovering concepts independently (Nurhasanah, 2016).

### The Practicality of Electronic Student Worksheets

The practicality of e-LKPD is seen from the implementation of e-LKPD, which is seen from the activities of students in learning using e-LKPD, teacher responses, and student responses in assessing e-LKPD based on Liveworksheets obtained teaching materials that are practical and feasible to be used in the development process. The implementation of e-LKPD was observed by three observers using the e-LKPD implementation sheet, the teacher's response was carried out by the biology teacher using the teacher's response sheet based on the learning process that the teacher had observed, and the response of students carried out by students following the learning experience using e-LKPD that had been carried out. The acquisition of data on the results of the implementation of e-LKPD based on observations of student activities in learning using e-LKPD based on Liveworksheets developed has been described in Table 4. Ten aspects observed by observers include aspects Students can operate e-LKPD properly without problems means obtaining an overall average of 100%, aspects of students with groups able to answer a question as a form of initial stimulus obtaining an overall average of 100%, aspects of students with groups formulating question formulations from the problems presented to obtain an overall average of 100%, aspects of students with groups understanding the tools and materials used in observations obtain an overall average of 100%, aspects of students observing the flow of simple observation designs obtain an overall average of 100%, aspects of students with groups making simple observations about the structure of Rhoe discolor leaf cells obtain an overall average of 100%, The aspect of students with groups making video observations about the differences in monocotyledonous and eudicotyledonous root tissue structures obtained an overall average of 100%, aspects of students with groups entering simple observations into the table that had been presented obtained an overall average of 66.7%, aspects of students with groups proved the formulation of questions with the results of observations obtaining an overall average of 66.7%, aspects of students with groups made Conclusions about the learning that has been done obtained an overall average of 100%.

Table 4. Results of Observation of the Implementation of E-LKPD Based on Liveworksheets

No.	Activities in e-LKPD	Average	Percentage (%)	Category
1.	Students can operate e-LKPD properly without significant obstacles	1	100	Very practical
2.	Students with groups can answer a question as a form of the initial stimulus	1	100	Very practical
3.	Students with groups make formulations of questions from the problems presented	1	100	Very practical
4.	Students with the group understand the tools and materials used in observation	1	100	Very practical
5.	Students observe the flow of a simple observation design	1	100	Very practical
6.	Students with the group made simple observations about the cell structure of <i>Rhoe discolor</i> leaves	1	100	Very practical
7.	Students with groups make video observations about the differences in monocotyledonous and dicotyledonous root tissue structures	1	100	Very practical
8.	Students with groups enter simple observations into the table that has been presented	0,67	66,7	Practical
9.	Students with groups prove the formulation of questions with observations	0,67	66,7	Practical
10.	Students with groups make conclusions from the learning that has been done	1,0	100	Very practical

No.	Activities in e-LKPD	Average	Percentage (%)	Category
Overall average		0,9	93,3	Very practical

Ten aspects observed by observers include aspects Students can operate e-LKPD properly without problems means obtaining an overall average of 100%, aspects of students with groups able to answer a question as a form of initial stimulus obtaining an overall average of 100%, aspects of students with groups formulating question formulations from the problems presented to obtain an overall average of 100%, aspects of students with groups understanding the tools and materials used in observations obtain an overall average of 100%, aspects of students observing the flow of simple observation designs obtain an overall average of 100%, aspects of students with groups making simple observations about the structure of Rhoe discolor leaf cells obtain an overall average of 100%, The aspect of students with groups making video observations about the differences in monocotyledonous and eudicotyledonous root tissue structures obtained an overall average of 100%, aspects of students with groups entering simple observations into the table that had been presented obtained an overall average of 66.7%, aspects of students with groups proved the formulation of questions with the results of observations obtaining an overall average of 66.7%, aspects of students with groups made Conclusions about the learning that has been done obtained an overall average of 100%.

Among the ten aspects, two aspects obtain minor average results, namely the aspect of students with groups entering simple observations into the table presented and aspects of students with groups proving the formulation of questions with observations that obtain an overall average of 66.7%. This is because when the teacher explains the feature, it proves that some students do not listen, so some students need help understanding and asking the teacher again. However, overall the results of the Liveworksheets-based e-LKPD implementation test are classified as very practical, with an overall average of 93.3%. Thus, the Liveworksheets-based e-LKPD developed is practical for use in learning.

The results of the recapitulation of teacher responses based on the results of teacher response questionnaires based on learning observations using Liveworksheets-based e-LKPD are presented in Table 5.

Table 5. Results of the Teacher Response Questionnaire

No.	Description	Score	Percentage (%)
<b>A. Readability Criteria</b>			
1.	The letters on e-LKPD are clear and easy to read	1	100
2.	The image presented is visible	1	100
3.	The sentences used are easy to understand	1	100
4.	Captions on images can make it easier to make observations	1	100
<b>B. Serving Criteria</b>			
5.	Attractive e-LKPD display	1	100
6.	The images presented are appropriate for the material studied	1	100
7.	The order of the material presented is easy to learn	1	100
8.	e-LKPD can increase student motivation	1	100
<b>C. Content Criteria</b>			
9.	Contains practical instructions for using or working on e LKPD	1	100
10.	Sentences are clear and easy to understand	1	100
11.	Instructions following the activities to be carried out	1	100
<b>D. Language Criteria</b>			
12.	Use of language following the EYD	0	0
13.	Use of language that is easy for learners to understand	1	100
14.	Sentences do not give rise to double interpretations	1	100
<b>E. Science Process Skills Indicator Criteria</b>			
15.	There is a feature to train students in observing/observing	1	100
16.	There is a feature to train students to formulate questions	1	100
17.	There is a feature to train students to make simple observations	1	100
18.	There is a feature to train students in processing data	1	100
19.	There is a feature to train students in concluding learning	1	100
Overall average		0,95	95,65

The practicality of Liveworksheets-based e-LKPD is also assessed through student responses in the form of student reviews of Liveworksheets-based e-LKPD learning given after the learning process ends. Using Liveworksheets-based e-LKPD to train science process skills received a perfect response from students, with an overall average of 97.73%, categorized as very practical (Riduwan, 2013). Twelve aspects of questions for student responses were given, but one aspect of the question obtained a small percentage of 90.91% in the aspect of video illustration used in e-LKPD. Three students did not agree that the illustrations in the Liveworksheets-based e-LKPD can make it easier for students to understand the

material according to their abilities; they said that using English videos made it easier for them to understand the material contained in the video. However, overall, student response to Liveworksheets-based e-LKPD is still in the excellent category. Thus, the Liveworksheets-based e-LKPD developed can be suitable for learning.

The recapitulation of the results of the student response questionnaire in using Liveworksheets-based e-LKPD is presented in Table 6.

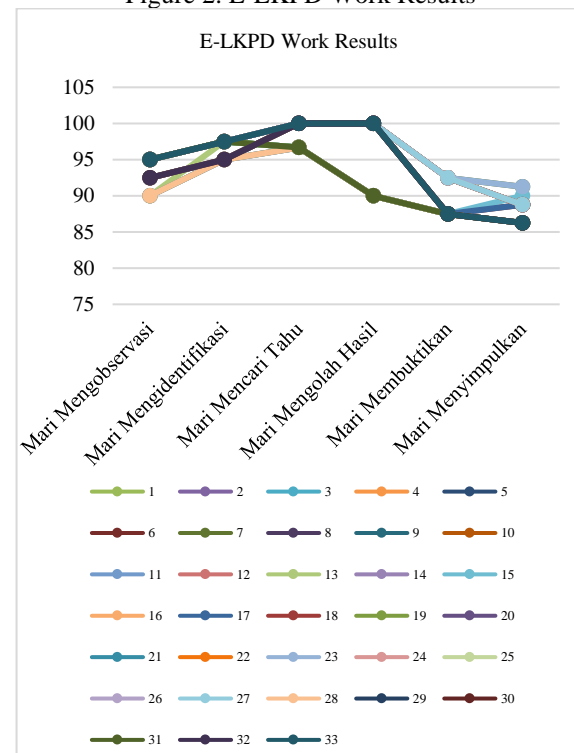
Tabel 6. Student Response Results

No.	Description	Grading		Percentage%
		Yes	No	
1.	The display of e-LKPD based on Liveworksheets is attractive.	33	0	100
2.	e-LKPD-based Liveworksheets are easy to run.	31	2	93,94
3.	e-LKPD based on Liveworksheets increases enthusiasm for learning the material.	33	0	100
4.	Using e-LKPD-based Liveworksheets, learning plant cell structure material becomes more meaningful.	33	0	100
5.	e-LKPD-based Liveworksheets support me in mastering the material.	31	2	93,94
6.	Liveworksheets-based e-LKPD provides an opportunity to understand lessons at my own pace.	32	1	96,97
7.	The material delivered in e-LKPD based on Liveworksheets is related to everyday life.	33	0	100
8.	The material presented in e-LKPD based on Liveworksheets is easy to understand.	31	2	93,94
9.	Liveworksheets-based e-LKPD contains illustrations that make it easier for me to understand the material according to my ability.	30	3	90,91
10.	Sentences and paragraphs e-LKPD based on Liveworksheets contain illustrations that make it easier for me to understand the material.	33	0	100
11.	The language used in e-LKPD based on Liveworksheets is simple and easy to understand.	33	0	100
12.	The letters used are simple and clear to read.	33	0	100
Overall average				97,47 (Very practical)

The practicality of Liveworksheets-based e-LKPD is also assessed through student responses in the form of student reviews of Liveworksheets-based e-LKPD learning given after the learning process ends. The use of Liveworksheets-based e-LKPD to train science process skills received an outstanding response from students, with an overall average of 97.73% which was categorized as very practical (Riduwan, 2013). Twelve aspects of questions for student responses were given, but one part of the question obtained a small percentage of 90.91% in the element of video illustration used in e-LKPD. Three students did not agree that the pictures in the Liveworksheets-based e-LKPD can make it easier for students to understand the material according to their abilities. They said that the use of English videos made it difficult for them to understand the material contained in the video. However, overall, student response to Liveworksheets-based e-LKPD is still in the excellent category. Thus, the Liveworksheets-based e-LKPD developed is suitable for use in learning.

The results of the e-LKPD work are presented in Figure 2.

Figure 2. E-LKPD Work Results



The results of e-LKPD work that students have carried out show the results of students' science process skills that have been obtained. Liveworksheets-based E-LKPD has six features that train eight indicators of science process skills. The Let's Observe feature teaches the process skill indicators of science observation. Based on the data of annex 10, page 89, the average overall results obtained by students in the let's observe feature amounted



to 93.8; this shows that e-LKPD can train indicators of science process skills keeping with very good categories. The second feature, then let's identify a part, showed an overall average result of 96.7, showing that e-LKPD could train indicators of science process skills and classify and formulate questions with very good categories.

The Let's find out feature trains three indicators of process science skills, including designing experiments, using tools/materials, and conducting experiments. The overall average result obtained by students on the find out feature of 98.9 shows that the Let's find out part is able to train the three indicators of science process skills in the very good category. The fourth feature is let's process the results with an overall average mark of 96.7; this shows that this feature can train indicators of science process skills interpreting with very good categories.

The fifth feature is, let's prove, with an overall average result of 89.2; it shows that this feature can train indicators of science process skills interpreting with very good categories. The last feature is the concluding feature, with an overall average result of 87.5, indicating that this feature is able to train indicators of science process skills interpreting and communicating with very good categories. However, this feature obtained the lowest results among other features due to the need for maximum indicators of communication science process skills possessed by students, and only a few students can present the results of their observations straightforwardly. Presentation techniques will be a good means of communication between speakers and listeners (Sutriadi, 2014).

## CLOSING

### Conclusion

Based on the development research, e-LKPD Based on Liveworksheets was produced to Train Science Process Skills on Plant Cell Structure Material. The validity result obtained an overall average of 3.75 with a valid interpretation. The results of the practicality test are perfect and very practical in terms of the implementation score of 92.8%, the teacher response score of 95.65%, and the student response score of 97.73%. Based on these results, the e-LKPD is valid for students at the SMA phase F level.

### Suggestion

Liveworksheets-Based e-LKPD development research is limited only to plant cell structure material. Similar research is needed in other biology learning so that the science process skills possessed by students are increasingly trained.

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