

Development of Experiential Learning *Discovery Learning* Tools through E-learning on Protist Material

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ABSTRACT

Using the discovery learning concept, this study intends to generate learning resources such as lesson plans, LKPD, and learning outcomes tests. Research and development (R&D) methodologies are used in this work. The design research and development R&D procedure is referred to as the implementation procedure. The R&D model has ten stages: 1) potential and problems, 2) Product Design, 3) Data Collection, 4) Design Validation, 5) Design Revision, 6) Product Trial, 7) Product Revision, 8) Trial Use, 9) Product Revision, and 10) Mass Production. Due to a complete lack of time and research funds, this study only made it to the design revision stage. A material validation questionnaire was utilized for validator 1 and a learning device validation questionnaire was used for validator 2. Based on the findings of the research and discussion, it can be concluded that an experience-based Discovery Learning learning tool has been produced through E-learning as a learning tool that has been assessed by several validators, with an average value of 97.3 for lesson plans with a very feasible category for validators 1 and 78.6 with eligible categories for validator 2. The average LKPD score is 94.3 for validator 1, with a very good category, and 81.4 for validator 2, with a very feasible category. The average value for the learning outcomes test is 95 for validator 1, with a very good category, and 87.5 for validator 2, with a very feasible category.

Keywords: *Discovery Learning; Learning Tools; E-learning; Protists.*

INTRODUCTION

According to Sanjaya (2006), students' capacities in researching their own knowledge, understanding of the surrounding environment, and the ability of students to improve their learning experiences are still low. The learning model is one of the supports for the quality of the learning process. However, we are currently dealing with the COVID-19 Pandemic, which has had a significant impact across all disciplines, particularly in education. As a result, all teaching and learning activities are required to be completed at home. As a result, all schools use an online or online learning system, also known as e-learning (Khotimah & Satiti, 2019; Sya'diyah, 2019).

Protista material in class XI is a material that is pretty difficult to comprehend. Because students are directly participating in the discovery process, they will be more interested in Protista material. Learning with a constructivism method has a more profound effect on students' knowledge development. Discovery Learning (DL) or discovery learning is a learning style that encourages students to participate actively in the learning process (Shofiyani & Rahmawati, 2019; Rustaman, 2005).

Based on the results of an interview with a Biology instructor conducted as part of a questionnaire submitted to MA Al-Baruny Sambongdukuh Jombang on March 6, 2021 about the school's experience-based online learning system. Even though there were a few challenges, such as children still having difficulty distinguishing living things and complaining about the internet network, the teacher claimed that experience-based online learning, particularly on Protista content, had been implemented. Furthermore, the teacher provides students with online work requirements for assignment, and they are unable to practice practicum during online learning. As a result, it is crucial to study an experiential-based

discovery learning learning tool for class XI protists at MA Al-Bairuny Sambongdukuh Jombang using e-learning.

METHOD

Research and development (Research and Development) is the type of research used. Research and development in the field of techniques Models come in a variety of shapes and sizes. The model that was used was the establishment of a research and development model. The R&D model has ten stages: potential and problems, 2) Data Collection, 3) Product Design, 4) Design Validation 5) Revision of the design 6) Product Revision, 7) Trial Usage, 8) Product Revision, 9) Product Revision, 10) Mass Production. This method and model was chosen because it try to create a learning tool which contains a Learning Device Design (RPP), a Student Worksheet (LKPD), and a learning outcome test. Caused by a lack of time and research grants, this project only completed it to the design revision stage.

This experience-basedis to explain all opinions, ideas, and validator responses acquired from the comment sheet using technical analysis of data in the usage of discovery learning learning tool. Data was collected through a questionnaire and an open assessment as during trial stage to provide criticism, opinions, input, and improvements. The questionnaire's data is qualitative data which is collected using a five-level Likert scale and then processed by calculating average percentage of item scores in each answer to each question in the questionnaire.

The below are the assessment methods used to determine learning devices:

Table 1: Assessment Guidelines for the Likert Scale :

Information	Score
Very Good	5
Good	4
Less Good	3
Not Good	2
Not Very Good	1

(Source : Sugiyono,2018)

To process the data per item, can do following :

$$P = \frac{X}{Xi} \times 100$$

Information :

P : validation value

X : score obtained

Xi : max score

While the following is the formula for processing the overall data items :

$$P = \frac{\text{the total value of the validator}}{\text{total of all aspects of the questionnaire}}$$

The following are the eligibility requirements:

Table 2 Feasibility Scale

Score	Category
0-20%	Not Worthy
21-40%	Less Worthy
41-60%	Quite Worthy
61-80%	Worthy
81-100%	Very Worthy

(Source: Ernawati & Sukardiyono, 2017)

RESULT AND DISCUSSION

The results of the development research conducted have produced a learning device using an experience-based discovery learning model. Which aims to foster the spirit of learning in students in the midst of the COVID-19 pandemic.

The purpose of this study is to develop discovery learning learning tools which include lesson plans, LKPD and test questions through *E-learning* that meet the appropriate criteria, so that these learning tools can increase students' enthusiasm for learning. The following are the results of validation from experts :

Result

Table 3 Material Experts' and Learning Device Experts' Validation Results

No	Rated aspect	Validator 1 (Material Expert)	Validator 2 (Learning Device Expert)
1	Conformity between Core Competencies (KI) and Basic Competencies (KD)	100	80
2	Conformity of the formulation of achievement indicators with basic competencies (KD)	100	60
3	The suitability of learning materials with indicators of competency achievement that have been formulated	100	80
4	Clarity of the formulation of learning objectives for <i>E-Learning</i> learning	100	60
5	Conformity between indicators and learning objectives of E-Learning	100	60
6	The suitability of learning strategies (methods and approaches) for E-Learning learning	100	60
7	Suitability determines learning resources in <i>E-Learning</i> learning	100	100
8	Suitability determines the <i>Discovery Learning</i> Model for E-Learning	100	100
9	The accuracy of compiling learning steps according to the <i>Discovery Learning</i> stage	100	100
10	Clarity of learning scenarios (steps of learning activities) in E-Learning learning	80	80
11	Learning scenarios (steps of learning activities) describe active learning and reflect scientific learning	100	80
12	Consistent in closing activities in learning	100	80
13	The suitability of the assessment technique with the indicators/competencies to be achieved	80	80
14	Completeness of assessment learning tools (questions and process skills instruments)	100	80
15	Integration and synchronization between components in RPP	100	80
	Average	97.3	78.6
	Category	Very worth it	Worth it

Table 4 LKPD Validation Results “Worksheet for E-Learnig Protista Students

No	Rated aspect	Validator 1 (Material Expert)	Validator 2 (Learning Device Expert)
1	LKPD title according to the content	100	100
2	The Learning Objectives contained in the LKPD are in accordance with the contents	100	80
3	LKPD steps are student center	100	80
4	LKPD steps to train students to do independent practicum	100	80
5	LKPD contents can train students' process skills	100	60
6	The activities listed on the LKPD encourage students to interact more with the surrounding environment	100	100
7	LKPD content supports <i>Discovery Learning</i>	100	80
8	LKPD contents support E-learning	100	80
9	The content that is trained on the LKPD is able to provide reinforcement for students that they really have mastered it	100	80
10	LKPD raises the curiosity of students	100	80

No	Rated aspect	Validator 1 (Material Expert)	Validator 2 (Learning Device Expert)
11	The training materials and training methods in the LKPD are challenging and interesting for students so that they feel comfortable completing the exercises without feeling bored	80	80
12	The exercises and training methods give students the opportunity to do the exercises independently	80	80
13	LKPD provides answers and explanations about getting answers from each exercise that can be easily understood	80	80
14	LKPD provides clear and easy-to-understand instructions on what will be done in completing the Exercise	80	80
	Average	94.3	81.4
	Category	Very Worth it	Very Worth it

Table 5 Learning Outcome Test Validation Results

No	Rated aspect	Validator 1 (Material Expert)	Validator 2 (Learning Device Expert)
1	Conformity of the content of the questions with the basic competencies set	100	100
2	The suitability of the content of the questions with the learning objectives	80	80
3	The formulation of each item uses simple, communicative, and easy to understand language	100	80
4	The formulation of each item uses good and correct Indonesian rules	100	80
5	The formulation of each item does not use words/sentences that give rise to multiple interpretations	100	80
6	Clarity of instructions in answering questions	100	80
7	Questions to support E-Learning learning using google forms	80	100
8	Ease of students in accessing questions through the question link	100	100
	Average	95	87.5
	Category	Very Worth it	Very Worth it

Discussion

Based on the results of the validation of the learning design in table 3, shows that the average value of the RPP is 97.3 with a very feasible category for validator 1 and 78.6 with a feasible category for validator 2. There is a significant difference between the two validators, namely in aspects number 2, 4, 5, and 6. Aspect number 2,4, 5 and 6 validator 1 gives a value of 100 while validator 2 gives a value of 60. From the results of table 4.1 the RPP developed is feasible to be used in E-Learning learning activities although there are still revisions to the lack of conformity to the formulation of achievement indicators with basic competencies (KD), lack of clear learning objectives, and the lack of inclusion of learning methods and approaches.

While for table number 4 shows that that the average value of the LKPD is 97.3 with a very decent category for validator 1 and 81.4 with a decent category for validator 2. There is a significant difference between the two validators, namely in aspect number 5. Aspect number 5 validator 1 gives a value of 100 while validator 2 gives a value 60. From the results of table 4.2 the LKPD developed is very feasible to be used in E-Learning learning activities although there are still minor revisions to the process skills that have not been seen from the way the LKPD is worked and the sentences on the LKPD questions can be further organized.

For the table number 5 shows that the average value of the learning outcomes test is 95 with a very feasible category for validator 1 and 87.5 with a very feasible category for validator 2. From the results of the validation, no significant difference was found between the two. From the results of table 4.2 the learning outcomes test developed is very feasible to be used in E-Learning learning activities.

After validating the product by the material expert validator and learning device expert, the researcher received advice from the learning device expert validator one of them are there is no method with a learning approach, there is no visible process skill from how to work on LKPD, questions can be revised or rewritten and adjust the formulation in the achievement indicators with basic competencies because there is no link with roles in life.

According to (Hamzah et al., 2020) RPP is a preparation that must be done by educators before teaching. Preparation here can be interpreted as written preparation or mental preparation, emotional situations to be built, a productive learning environment including convincing learners to want to be seen fully. According to (Widodo, 2017) the Student Activity Sheet is a student activity in learning to apply or practice the knowledge that has been obtained. According to (Mardapi, Kunaidi, & Kartowagiran, 2011) The test is a number of questions that have a right or wrong answer. The test is also defined as a number of questions that require answers or responses by measuring a person's level of ability

CONCLUSION

Based on the results of the research and discussion, it can be concluded that the experience-based Discovery Learning learning tool through E-Learning, as one of the learning tools that have been assessed by several validators with an average value for the lesson plan is 97.3 with the Very Eligible category for validator 1 and 78.6 with the category Eligible for validator 2. The average value for 94.3 in the Very Eligible category for validator 1 and 81.4 in the Very Eligible for validator category 2. The average value for the Learning Outcomes Test is 95 with the Very Eligible category for validator 1 and 87.5 with the Very category Eligible for validator 2.

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