Development Of Animal Structure Practicum E-Module On Canva Application

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ABSTRACT

The integration of technology into education has become increasingly important in enhancing the learning experience, particularly in practical and laboratory-based courses. This study explores innovation in learning through the integration of information technology, particularly e-modules for teaching animal structure laboratories using Canva. Using an R&D approach with the 4-D development model, the study involved 3 validators and 17 students at Universitas Lancang Kuning. Data were analyzed descriptively qualitatively and quantitatively, indicating high levels of validity for subject matter, language, and media experts. Student responses to the e-module were also very positive. The study findings indicate that the Animal Structure Laboratory E-Module created with Canva application is highly valid and suitable for use in learning, reinforcing the use of technology in an educational context. This study contributes to the advancement of digital education and highlights the Canva application's versatility in creating educational resources.

Introduction

Currently, educators are constantly facing demands from various stakeholders to be able to facilitate students with various learning innovations. One form of innovation in learning is the integration of technology and information in the form of interactive media or educational materials into learning, one of which is e-modules or electronic modules (Martikasari, 2018). Although creating e-modules are hardly new around the world, the studyers underline the serious issue that many existing biology teachers in Indonesia are still underutilizing technology in the classroom. E-module creation is chosen because it is the easiest way for technology illiterate teachers to adapt and answer to the market demands.

E-module is an electronic-based module that uses information and communication technology, especially electronic devices. In terms of indicators and structure, e-modules

have their own characteristics, the same as printed modules. The difference between e-modules and printed modules lies in the system and flexibility of the presentation components. The advantage of adopting e-modules is that they are more practical, for example the file size is relatively small and easy to carry. Students and students can study e-modules wherever and whenever they have electronic devices such as gadgets (Wahyuni *et al.*, 2018). E-modules also include teaching materials that are systematically packaged into learning units with specific objectives and presented in electronic form so that users are more interactive to facilitate learning because the appearance is attractive and users understand independently (Gunawan, 2010).

This paper showcases the development of an e-module using Canva. This application makes it easier for students to understand the material because this application can display text, video, animation, audio, images, graphics and so on according to the desired appearance so that it can make students interested in interesting material. This graphic design tool allows users to easily create various types of creative designs online, including creating e-modules with moving animation features so that the modules are more interesting by adding video links that can be applied. to the electronic module. Currently, Canva is available in several versions starting from web, iPhone and Android, this makes the electronic module accessible on any electronic device (Alison, 2020).

In its field, biology has very important material, namely the structure of animals. The Canva-based animal structure practicum module is a module which contains animal structure course material which is presented by referring to investigation techniques for phenomena or symptoms, gaining new knowledge or correcting it and combining it with previous knowledge. Understanding the structure of an animal's body requires a deep understanding of the organs involved in the animal's function and life. However, this material is often considered complex and difficult for students to understand. Therefore, Canva-based animal structure practicum modules are really needed to

support learning in lectures at this time and an updated learning approach is also needed to evaluate information and overcome various problems in life (Maspupah & Subandi, 2019).

While digital tools and e-modules have gained global attention as effective teaching aids, many biology educators in Indonesia still rely on traditional teaching methods. There is a noticeable gap in the integration of technology into the classroom, particularly in teaching complex subjects like animal structure (Wahyuni *et al.*, 2018). Many biology teachers also face difficulties in adopting new technologies due to a lack of digital literacy or training. E-module creation, although a relatively simple technology, is underutilized because teachers are unfamiliar with tools that make e-module design user-friendly and effective (Setiawan & Wiedarti, 2020).

These objectives provide a clear direction for the study, emphasizing the need for innovation in biology education through the development of accessible and effective digital learning tools. Specifically, this study aims to develop a canva-based e-module for animal structure practicum and address the lack of biology-specific e-modules for practicums.

Method

This study includes Research and Development (R&D) study. According to Amali *et al.*, (2019) Study and Development is a study method for developing and testing products that will later be developed in the world of education. The product developed is an Electronic Module (E-Module) Animal Structure Practicum Based on Canva Design. The development model used is the 4D model by Thiagarajan *et al.* (1974). This development model consists of four main stages, namely: define, design, develop and disseminate. This study was conducted at Universitas Lancang Kuning, Pekanbaru. Data collection for this study was carried out in December for Biology Education students in semester 5, class 5.1, Academic Year 2023/2024.

The technique used in sampling is a non-probability sampling technique. Studyers used a purposive sampling

technique. Purposive sampling is a technique for determining samples with certain considerations. This means that sampling is based on certain considerations or criteria that have been formulated in advance by studyers (Sugiyono, 2019).

In this study, the study parameters include the results of the validation of the development of the animal structure e-module for Biology students at Universitas Lancang Kuning using an expert assessment questionnaire and student responses for module validation.Instruments are used in the field to collect data according to the aspects being measured. The instruments used in this study were validation sheets and questionnaires.

a. Validation Sheet

The validation sheet in this study is the sheet used to validate the e-module product that will be developed. The purpose of filling out the validation sheet is to test the feasibility of the e-module to be developed.

Table 1. Instrument Grid for Material Experts, Language Experts, and Media Experts

Aspect	Indicator	No. Question
Material Expert Instrument Grid		
Appropriate content and presentation	Material conformity with RPS	1,2,3
	Material accuracy	4,5,6,7,8,9,10
	Up-to-date material	11,12
	Encourage curiosity	13,14
	Presentation technique	15
	Presentation support	16,17,18,19
	Presentation of learning	20
	Coherence and consistency of thought flow	21,22
Linguist Instrument Grid		
Language and communication	Straightforward	1,2,3
	Communicative	4
	Dialogic and interactive	5,6
	Suitability to the level of development of students	7,8
	Conformity to language rules	9,10
	Use of terms, symbols or icons	11,12
Media Expert Instrument Grid		
Graphic feasibility	E-module size	1,2
	E-module cover design	3,4,5,6,7,8
	Design e-module content	9,10,11,12,13,14

(Source: Study modification in Anggraini, 2022)

b. Response Questionnaire

A response questionnaire is a list of questions or statements that are answered by students. The responses are in the form of a closed student response that evaluated the e-module used to teach them about animal structure.

Table 2. Student Response Questionnaire Grid

Aspect	Indicator	No. Question
E-Module Display Aspects	The cover design, images and writing on the e-module attract readers' interest	1
	The appearance of each e-module page is interesting for studying animal structure practicum	2
	The overall appearance of the e-module is attractive and can increase motivation and enthusiasm for learning	3
Graphic Aspects of E-Module Presentation	The balance of images, colors and text is proportional so it is interesting and easy to learn	4
	The images presented in the e-module are interesting and can help understand animal structure practicums	5
	The images presented in the e-module are clear and accompanied by image descriptions that clarify the practicum	6
Aspects of Using E-Modules	Animal structure practical e-modules can help learning besides printed books	7
	Animal structure practical e-modules can help you learn independently	8
Aspects of Material Accuracy	The material presented in the e-module is easy to understand	9
	Practical material in the e-module can increase understanding of animal structure material	10
Aspects of Learning Support Materials	E-modules are equipped with summaries that can help present important points without ignoring relevant details	11
Linguistic Aspect	The material presented in the e-module uses simple language and is easy to understand	12
	The sentences used are clear and easy to understand	13
Learning Aspects	Student activities and practical observation sheets can train problem-solving abilities	14
	The unique information in the e-module is very interesting to read and learn	15

(Source: Study modification in Budiastuti, 2021)

The e-module feasibility questionnaire in this study is a closed questionnaire in the form of a checklist using a Likert scale which is presented in the following table.

1) Analysis of Validity Questionnaire Data

Table 3. Validity Questionnaire Assessment Score

Criteria	Score
Very worthy/very valid	4
Eligible/valid	3
Ineligible/invalid	2
Very inappropriate/very invalid	1

(Source: Riduwan, 2009)

The data obtained through the questionnaire was then analyzed descriptively using the following percentage formula.

$$P = \frac{\Sigma score\ per\ item}{maximum\ score} x100\%$$

(Source: Riduwan, 2009)

Next, the eligibility percentage obtained is then presented into eligibility categories based on the following table.

Table 4. Eligibility Criteria

Percentage Score	Interpretation
76-100%	Very worthy/Very valid
51-75%	Eligible/Valid
26-50%	Ineligible/Invalid
0-25%	Very inappropriate/ Very invalid

An e-module developed is classified as suitable for use as teaching material if the percentage obtained from the validation process is ≥ 51%, so the product can be used as teaching material.

2) Analysis of Student Questionnaire Data

Table 5. Student Questionnaire Assessment Scores

Criteria	Score
Strongly agree	4
Agree	3
Don't agree	2
Strongly disagree	1

(Source: Arikunto, 2010)

The data obtained through the questionnaire was then analyzed descriptively using the percentage formula. To determine the percentage of students' answers to each statement/question item in the questionnaire, the following formula is used.

$$\%all\ aspects = \frac{n}{N}\ X\ 100$$

Information
n = Total score
N = Sum of all maximum scores

The percentage obtained for each statement/question item is then interpreted based on the following table criteria. The criteria set to state that students have a positive response is that at least 50% of students give positive responses to the

number of question items or statements in each aspect (Majid, 2014).

Table 6. Eligibility Criteria

Percentage Score	Interpretation
76-100%	Very worthy/Very valid
51-75%	Eligible/Valid
26-50%	Ineligible/Invalid
0-25%	Very inappropriate/ Very invalid

The study procedure with the 4D development model has 4 stages, namely define, design, develop and disseminate. However, in this study, the studyers carried out four stages: **Definition Stage**, which is the stage for establishing and defining the conditions needed for learning development. Determination of requirements is carried out by paying attention to and adapting to student learning needs. The define stage includes 5 main stages including front end analysis, student analysis, task analysis, concept analysis, and formulation of learning objectives (Thiagarajan *et al.*, 1974).

Design Stage which consists of four sub-stages, including: Constructing criteria, referenced tests, media selection, format selection, and initial design. The activities are developing a framework or storyboard for the e-module, including content structure and flow, selecting appropriate tools, media, and interactive elements (e.g., videos, animations, quizzes) to be incorporated into the module and planning the user interface and design layout to ensure usability and engagement (Gagne *et al.*, 2005).

Development Stage which is carried out with the aim of making a predetermined product. The activities are create the first draft of the e-module using the Canva application, conduct expert reviews (e.g., from educators and subject-matter experts) to evaluate the content and usability, revise the product based on feedback to address any identified issues and conduct initial

testing with a small group of users (e.g., students and teachers) to evaluate the functionality and effectiveness (Branch, 2009; Trianto, 2009).

Disseminate Stage which distribute the final product and evaluate its broader impact and effectiveness. The activities are implementing the e-module in a larger audience or educational setting (e.g., in classrooms or as part of the curriculum), providing the training or support for educators to effectively use the e-module monitoring the implementation process and collect data on its impact on learning outcomes and engagement and disseminating the results and product through academic publications, workshops, or online platforms (Dick *et al.*, 2014).

Results and Discussion

The development model used to obtain e-modules that meet the desired criteria in this study is a 3D development model which consists of three stages, namely: (1) Define, (2) Design, and (3) Develop (Development). The steps that must be taken by studyers to finally produce a product are as follows:

a. Define Stage (Definition)
The define stage includes 5 main stages including front end analysis, student analysis, task analysis, concept analysis, and formulation of learning objectives (Trianto, 2009).

1) Front end analysis
Studyers have carried out an analysis of the problems faced in practicum learning, namely that the practicum guidebook that has been provided is still not interesting to read, this is because the content in the book lacks color in the pictures and there are no examples in the form of videos that make it easier for students to see how to do surgery, practicum material.
The structure of this animal requires colorful pictures so that students can see the differences in animal anatomy. In this problem, an alternative picture

was obtained that could help solve the basic problem and make it easier to determine the learning media to be developed. In this case, the studyers found that the animal structure practical material must have media that can explain in detail through photos, videos and animations.

2) Learner analysis
In this case, studyers have carried out analysis and observed students in learning animal structure practical material, studyers found that students still find it difficult to carry books everywhere and also students are not enthusiastic about reading books that are not interesting to look at, this is because the teaching materials are It is still used in printed form where students are required to carry the book every day. Therefore, the studyers concluded that the learning process for these students requires alternative teaching materials in accordance with current technological developments.

3) Task Analysis
Interviews were conducted with course lecturers related to learning and assignments given to students. From the results of this interview, the course lecturer said that the assignments given by students during the practicum were that students observe, dissect and describe the results they observed during the practicum, by filling in the practicum worksheet in the book. This allows studyers to know that the content of the practicum material and assignments given is in accordance with the content of the curriculum and books used.

4) Concept Analysis
In the animal structure practical material, studyers have analyzed the competency standards that will be used so that studyers can determine teaching materials more specifically. The competency standards obtained are that the teaching resources used

must be in accordance with the predetermined RPS. Therefore, the studyer used teaching resources in the form of the book Animal Structure Practical Guide compiled by Mariana, S.Pd and Al Khudri Sembiring, S.Pd and the e-book Animal Structure Practical Guide compiled by the Andalas University laboratory practicum team as a reference, because it can explains the practical material on animal structures in detail.

5) Formulation of Learning Objectives

Studyers have carried out an analysis of the syllabus and competencies that need to be achieved so that the objectives of the learning activities to be achieved in the e-module that will be developed can be determined. The formulation of this learning objective has been written in the e-module being developed.

b. Design Stage (Designing)

The Design Stage consists of four stages, including: Constructing criterion-referenced tests, media selection, format selection, and initial design.

1) Preparation of Criterion Tests (Constructing Criterion-Referenced Tests)

Constructing Criterion-Referenced Tests is the construction of tests that use test scores to produce statements about the behavior that can be expected from someone with that score. Studyers have conducted study from various sources to be able to create a validation instrument and test the readability of respondents that will be used.

2) Media Selection (Media Selection)

At this stage the studyer will create teaching materials in the form of e-modules using the Canva design application. This application is easy to access by anyone without downloading the application, students do not need to log in to the application to view the e-module because the e-module can be directly accessed and read, this application can also be used for free with every use. To be able to see the e-modules used, students just click on the following link: https://www.canva.com/design/DAF0JR7s8TA/VRCAIQHEaDbRNqSr3y6bXw/edit

3) Format Selection (Format Selection)

At this stage the studyer determines the format by designing learning materials consisting of: 1) Title. 2) Instructions for using the e-module. 3) Description of the material. 4) Learning objectives. 5) Learning activities. 6) Evaluation/assessment. 7) Summary. At this design stage, the e-module is prepared based on the material contained in the RPS. In the creation process, the studyer used an interactive theme and the colors used were soft which made the eyes fresh and the font used was a Georgian type font, this font can be read clearly and is included in one of the best fonts applied by Canva Design. Other supporting media are also used, such as photos and videos.

4) Initial Design (Initial Design)

The process carried out at this stage is designing, carried out by designing all learning tools and creating e-modules before testing is carried out. There are several forms of design in the animal structure practical e-module as follows:
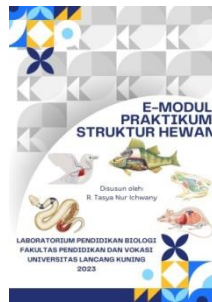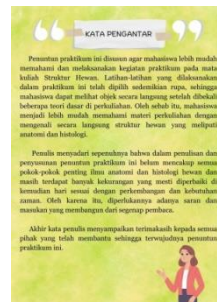
Figure 1. Cover

Figure 2. Foreword

Figure 3. Table of contents

Figure 4. Practical rules

Figure 5. Practical objectives and general description

Figure 6. Summary and video of surgery

Figure 7. Tools, materials and surgical methods
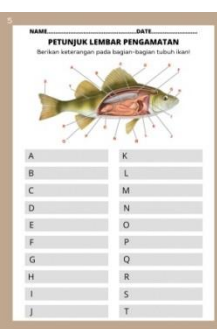
Figure 8. Observation sheet

c. Develop Phase (Development)

Thiagarajan *et al.* (1974) explained that at the development stage there are two processes, including: expert appraisal (expert assessment) and developmental testing (development testing) (Trianto, 2009).

1) Expert assessment (Expert Appraisal)
   a) Material Expert Validation

Validation of the appropriateness of teaching materials from the aspects of appropriateness of content and presentation can be seen in the following table:

Table 7. Validity of Material from the Aspects of Appropriate Content and Presentation

No	Information	Validator %	Validity Level	Eligibility Level
1.	Material conformity with RPS	100	Very Valid	Very Worth It
2.	Material accuracy	100	Very Valid	Very Worth It
3.	The up-to-dateness of the material	100	Very Valid	Very Worth It
4.	Encouraging curiosity	100	Very Valid	Very Worth It
5.	Presentation technique	100	Very Valid	Very Worth It
6.	Presentation support	87,5	Very Valid	Very Worth It
7.	Learning presentation	75	Valid	Worth It
8.	Coherence and logical flow of thought	100	Very Valid	Very Worth It
	Amount	762,5		
	Avarage	95,3	Very Valid	Very Worth It

The results of the validation of the eight indicators above from the aspect of appropriateness of content and presentation can be seen in the following explanation: (1) The indicator of material suitability with the RPS received a score of 100% in the very valid category. (2) The material accuracy indicator gets a score of 100% which is in the very valid category. (3) The material update indicator gets a score of 100% which is in the very valid category. (4) The indicator encouraging curiosity gets a score of 100% which is in the very valid category. (5) The presentation technique indicator gets a score of 100% which is in the very valid category. (6) The supporting indicators for presentation received a score of 87.5% which is in the very valid category. (7) The learning presentation indicator received a score of 75% which is in the valid category. (8) The indicator of coherence and coherent thought flow received a score of 100% which is in the very valid category. Based on the description above, it can be concluded that the e-module from the aspect of suitability of content and presentation by material experts is very valid and very suitable for use in the learning process with an average percentage of 95.3%.

For each activity in the Animal Structure Practical E-Module, an observation sheet is displayed so that students can do exercises to gain insight into the animal structure practical material, however, after being validated by material experts, the observation sheet is still not enough to provide feedback to students who are given practice questions.

b) Language Expert Validation

Validation of the suitability of teaching materials from the aspects of language and communication suitability can be seen in the following table:

Table 8. Language Validity from the Aspect of Language and Communication Appropriateness

No	Information	Validator %	Validity Level	Eligibility Level
1.	Straightforward	91,6	Very Valid	Very Worthy
2.	Communicative	100	Very Valid	Very Worthy
3.	Dialogic & interactive	100	Very Valid	Very Worthy
4	Suitability to student development	100	Very Valid	Very Worthy
5	Conformity to language rules	87,5	Very Valid	Very Worth It
6	Use of terms, symbols, or icons	100	Very Valid	Very Worth It
	Amount	256,8		
	Average	85,6	Very Valid	Very Worthy

The results of the validation of the six indicators above from the aspect of appropriateness of language and communication can be seen in the following explanation: (1) The straightforward indicator received a score of 91.6% in the very valid category. (2) The communicative indicator gets a score of 100% which is in the very valid category. (3) Dialogic and interactive indicators get a score of 100% which is in the very valid category. (4) The indicator of conformity with student development gets a score of 100% which is in the very valid category. (5) The indicator of conformity with language rules received a score of 87.5% which is in the very valid category. (6) The indicator for the use of terms, symbols or icons gets a score of 100% which is in the very valid category. Based on the description above, it can be concluded that the e-module from linguists has met validity standards and can be used in the learning process.

The language used in the Animal Structure Practical E-Module Based on Canva Design which has been developed by studyers is more extensive and detailed. Each material in the Animal Structure Practical E-Module provides a correct and precise explanation of writing, but after being validated by a linguist, the writing is still inaccurate and not neat.

c) Media Expert Validation

Validation of the suitability of teaching materials from the media aspect can be seen in the following table:

Table 9. Media Validity from Graphic Feasibility Aspects

No	Information	Validator %	Validity Level	Eligibility Level
1.	E-module size	75	Valid	Worthy
2.	e-module Cover Design (Cover)	96,8	Very Valid	Very Worthy
3.	e-module Content Design	85	Very Valid	Very Worthy
	Amount	256,8		
	Average	85,6	Very Valid	Very Worthy

The validation results of the three indicators above from the aspect of graphic feasibility can be seen in the following explanation: (1) The e-module size indicator received a score of 75% in the valid category. (2) The e-module cover design indicator received a score of 96.8% in the very valid category. (3) The e-module content design indicator received a score of 85% which is in the very valid category. From the description above, it can be concluded that the e-module that has been created can be used to make it easier for lecturers in the teaching and learning process.

The animal structure e-module design has been developed by studyers to a greater extent and in detail based on suggestions and input from validators. Each material, especially in the summary of the Animal Structure Practical E-Module, uses QR barcodes to provide a more detailed explanation regarding animal structure material, but after being validated by media experts, the barcodes are not suitable and cannot be used for a long period of time.

The Canva-based e-nodule that has been developed was obtained using a questionnaire distributed to experts. The assessed aspects of the product being developed consist of (a) Aspects of material feasibility, (b) Aspects of language

appropriateness. c). Aspects of media suitability.

During the validation process, the validators provided constructive comments on the strengths and weaknesses of this animal structure practicum e-module. Apart from comments, suggestions are also given by validators so that they can be used as a basis for consideration for revising the product. Then the e-module product is revised based on suggestions given by the validator and the e-module can be used as teaching material in the learning process.

2) Development Testing (Developmental Testing)
   a) Student Response

   The wide-scale field test in this study consisted of 17 students in class 5.1 Biology Education at Universitas Lancang Kuning who were taken based on certain

considerations or criteria from semester 5. The student sampling technique for product trials used a purpose sampling technique. This sampling technique has been considered by studyers to be carried out, as stated by Setyosari (2012) explaining Dick and Carey's expression regarding formative evaluation, there are three steps, including: 1) One to one trying out, this test is carried out on 1-3 people . 2) Small group tryout, this test is carried out on 8-10 people. 3) Field tryout, this testing is carried out on a wide scale consisting of 15-30 people. This study is included in the field tryout type with a total of 17 students as respondents. Data collection on product trials was carried out offline, then students filled out a response questionnaire to the e-module developed by studyers via Google Form. Field test results can be seen in table 9.

Table 9. Student Responses to E-Modules

No		Rated aspect	Σx	Σxi	%	Category
	1	E-module display	190	204	93,0	Very worthy
	2	E-module presentation graphic	185	204	90,6	Very worthy
	3	Use of e-modules	128	136	94,1	Very worthy
	4	Material accuracy	128	136	94,0	Very worthy
	5	Learning support materials	58	68	85,2	Very worthy
	6	Language	121	136	88,9	Very worthy
	7	Learning	126	136	92,6	Very worthy
		Total	936	1020	91,76	Very worthy

The results of student responses to the e-module in table 17 above can be described as follows: (1) The e-module display indicator received a score of 93.0% in the very feasible category. (2) The graphic indicator for e-module presentation received a score of 90.6% in the very feasible category. (3) The e-module usage indicator received a score of 94.1% which is in the very feasible category. (4) The material accuracy indicator gets a score of 94.0% which is in the

very decent category (5) The learning support material indicator gets a score of 85.2% which is in the very decent category (6) The language indicator gets a score of 88.9 % in the very appropriate category (7) The learning indicator scored 92.6% which is in the very appropriate category. Based on the description above, it is known that the e-module received a total score of 91.76%, which means that the e-module is very suitable for use.

Conclusion

Based on the results of the study and development that has been carried out, the Canva-based Animal Structure Practicum Electronic Module (e-module) product is implemented which uses a 3D development model. Where the results of the validity test on the e-module are in very valid criteria from 3 aspects of the assessment carried out by experts as validators. The assessment aspect consists of the validity of the material with an average score of 95.3% which is in the very valid category. Then, the results of the language validity assessment with an average value of 96.5% are in the very valid category, and the results of the media validity assessment with an average value of 85.6% are in the very valid category. From the results of the validity test analysis, it is known that the e-module that has been developed is in the "very valid" category. Then, in the results of the student response test that the studyers carried out, they obtained a total score of 91.76%, which means it was in the "very valid" category so it was suitable for use in animal structure practicum.

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