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## Development of Prezi-Based Electronic Mind Map Learning Media on High School Animalia Biology Material

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### ABSTRACT

The development of education continues to progress in the field of Information and Communication Technology (ICT) driving many changes, one of which is creating the concept of e-learning. The e-learning media in this study are electronic mind maps or prezi-based electronic mind maps. This research is research development (Research and Development), using the ADDIE development model (Analysis, Design, Develop, Implementation, and Evaluation). This research reached the learning media development stage or the development stage. The testing phase for the development of the e-mind map is analyzed in the form of validity (media validation, material validation, construct validation), practicality, and student responses. The results of the validation analysis are in the very valid category, practicality is in the very practical category used in learning, and student responses are in the very good category and are well received by students in learning.

## 1. Introduction

The development of education has progressed in the field of Information and Communication Technology (ICT) which has led to many changes, one of which is creating the concept of e-learning. E-learning learning allows students to be active and creative in managing education so that they can get many benefits, one of which is by developing electronic learning media that makes it easier for students to access online (Widiyasari, 2017). Learning media, in general, is conveying material that may not be conveyed by the teacher only verbally, with learning media can increase students' understanding of the material conveyed by the teacher (Alawiyah, et al., 2016).

Interviews, discussion, and analysis of the problem of how the use of learning media by teachers in schools with 4 biology teachers found that the learning media used

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by the average Power Point teacher had not developed other media in the learning process, especially in e-learning learning media. Analysis of the problems faced by teachers and students at school on biology learning material for class X on average in animalia material. This is due to the wide coverage of the material. Students also find it difficult to study this material by describing characteristics, classifying, giving examples of the roles of each phylum, and using Latin which is difficult to understand.

Referring to the analysis of the problems that have been described, one of the media that can help is e-learning learning media in the form of electronic mind maps or electronic mind maps. According to Buzan (2006), the advantages of the Mind Map include saving learning time, helping students become more creative, improving memory, easily seeing the overall picture of learning material, making it easy to add new information to the mind map, using colors, pictures, and symbols which are interesting. Electronic Mind Map learning media or abbreviated as the e-mind map can be accessed online via laptops and Android with the help of supporting software or applications so that it can be accessed more widely and can be explored in the learning process. In accordance with the opinion of Istiawan, et al. (2016) the Prezi application is easier to use and can be accessed via a smartphone with the help of the Prezi Viewer. So that it can facilitate students in learning.

The development of e-mind map learning media using a presentation application, namely, Prezi can help present the appearance of the e-mind map. Prezi is a digital presentation tool that is capable of presenting text, images, and videos online equipped with audio, and animation that can use laptops and cellphones that are accessed by the internet. So that the learning material presented through Prezi is memorable and makes an impression on the minds and memories of students, compared to other digital presentation tools such as PowerPoint and Macromedia Flash (Nasution and Siregar. 2019).

Based on this background, it is necessary to develop learning media entitled "Development of Prezi-Based Electronic Mind Map Learning Media on High School Animalia Biology Materials". The research aimed to develop a Prezi-based e-mind map so that it could become a learning medium for high school biology animalia material.

## **2. Methodology**

This research is research and development (Research and Development), in which the development of an e-mind map based on Prezi is carried out on high school biology animalia material. Data collection was carried out by observing and distributing questionnaires. The development of the e-mind map was carried out in KD 3.8, namely Animalia material. The stages of developing the Prezi-based e-mind map developed in this study used the ADDIE development model (Analysis, Design, Develop, Implementation, Evaluation) by Dick, et al., (2005). This research reached the learning media development stage or the development stage. The stages of developing e-mind map learning media are:

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This analysis is an early stage in the development of an e-mind map. At this stage, the researcher conducted field observations and analyses to identify problems and possible solutions to solve these problems. Design is the stage of how the Prezi-based e-mind map learning media will be designed as a whole in accordance with the objectives that have been set. The design phase for making a Prezi-based e-mind map is Syllabus design, lesson plans, assessment instruments, and Prezi-based e-mind map design.

The development stage is the stage of realizing the design into a product and at the development stage, a quality test of the prezi-based e-mind map is carried out in terms of the validity test, practicality test, and student response test. The validation test is carried out using a validation sheet. The validation sheet consists of 3 assessments, namely media validity in the form of media validation sheets, material validation sheets, and construct validity. Analysis of the validation results was carried out by finding the average of the validator's assessment results and compared with the validity criteria (Table 1).

Table 1. Validity Criteria

No	Score Average Interval	Category
1	$3,25 \leq x < 4$	Very Valid
2	$2,5 \leq x < 3,25$	Valid
3	$1,75 \leq x < 2,5$	Less Valid
4	$1 \leq x < 1,75$	Not Valid

(Source : Sugiyono, 2015)

The Practicality Test was carried out to see how far the practicality and applicability of the developed e-mind map were. Data collection was carried out using a Practicality questionnaire on the e-mind map that was developed and practicality categories would be analyzed (Table 2).

Table 2. Practicality Criteria

No	Score (%)	Criteria
1.	$80 < x \leq 100$	Very Practical
2.	$60 < x \leq 80$	Practical
3.	$40 < x \leq 60$	Practical Enough
4.	$20 < x \leq 40$	Less Practical
5.	$0 < x \leq 20$	Not Practical

(Source : Riduwan dan Akdon, 2007)

The student response test was carried out using a student response questionnaire. Categories in making decisions based on the value of each item obtained (Table 3).

Table 3. Categories of Student Responses

No	Value Intervals	Response Category
1	85,00-100	Very Good
2	75,00-84,00	Good
3	65,00-74,00	Good Enough
4	<65,00	Less

(Source : Riduwan dan Akdon, 2007)

### **3. Results and Discussion**

Research and development produce products in the field of education, namely prezi-based e-mind map learning media on animalia material. The stages of model development refer to the ADDIE model, in this study it reached the Analysis, Design, and Development stages. The testing phase for the development of the e-mind map is analyzed in the form of validity (media validation, material validation, construct validation), practicality, and student responses.

This analysis phase consists of an analysis of learning materials, an analysis of student needs, and analysis of learning media. The results of the analysis can be described as follows: Analysis of learning materials is an important thing to do to find out relevant materials and those that students find difficult. Based on interviews and discussions with 4 biology teachers, all of them stated that the material that was difficult for students in class X was animalia. Based on the results of the analysis stages that have been carried out, it can be said that an interesting and innovative development is needed for animalia material.

Student analysis aims to determine the characteristics of students who are targeted, namely students at the high school level. Based on the interviews and discussions on the low interest of students in learning animalia material and the low learning outcomes of students in animalia material at school. This learning media analysis covers media that has been developed in schools. Based on interviews and discussions, teachers still use media in the form of PowerPoint, pictures, and direct media in the learning process, but no one uses e-learning media or other electronic learning media.

The design stage is the development stage of a more innovative prezi-based e-mind map by utilizing Zooming User Interface (ZUI) technology. The design of the Prezi-based e-mind map on animalia material can be described as follows: The selection of content on animalia material in the form of Prezi-based e-mind map content is made in accordance with Basic Competency 3.8 contained in the 2013 Curriculum and the material developed is animalia. Designing learning tools, and display designs (storyboards) are used to facilitate researchers in developing product development and designing prezi-based e-mind maps on animalia material.

The design of a prezi-based e-mind map on animalia material is a continuation of the results of the previous analysis to develop step-by-step learning media in designing a prezi-based e-mind map on animalia material, namely: Making a Mind Map with the Simplemind Pro Application which consists of 4 mind maps ( Figure 1 - Figure 4). The appearance of mind maps is very large and complex so it is not clear when viewed directly and when printed on HVS A4 or HVS A3 paper this is due to a large amount of material. The results of this mind map will be included in the Prezi for the ZUI process.

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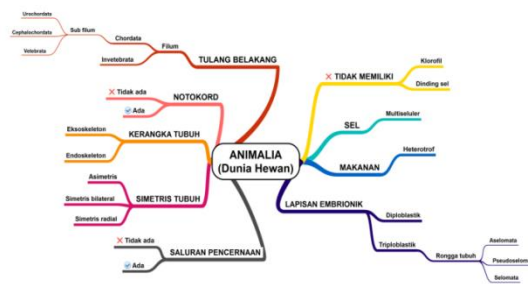


Figure 1. Mind Map 1 General Characteristic of Animalia  
 Access Links : <https://prezi.com/view/FZ9gT9Lfom3rDyZ1cigp/>

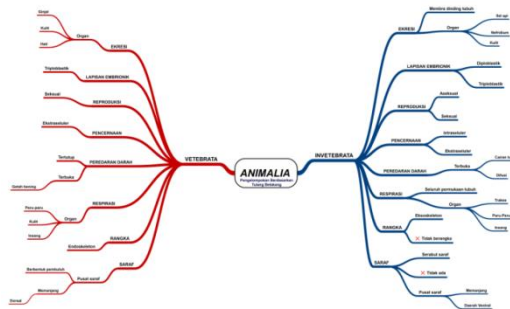


Figure 2. Mind Map 2 on system material on invertebrates and vertebrates  
 Access Links : <https://prezi.com/view/p9DaHVRnyUx7QZftEFm5/>

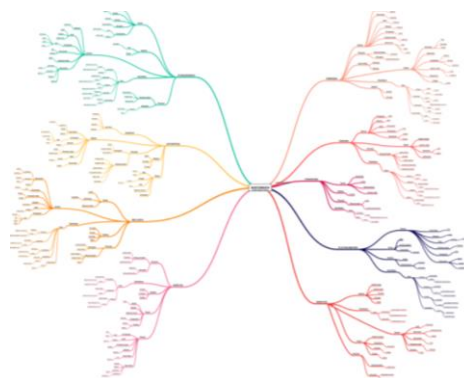


Figure 3. Mind Map 3 on invertebrate material  
 Access Links : <https://prezi.com/view/WDlqTRrlhgOrvzaTWS6o/>

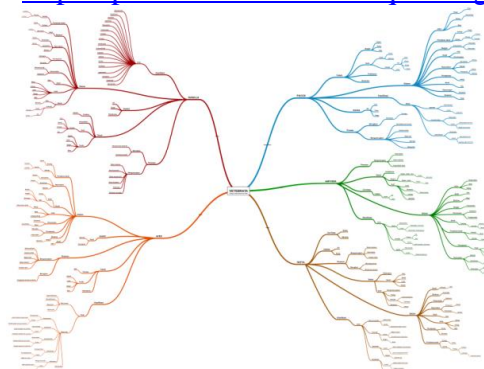


Figure 4. Mind Map 4 on Vertebrate material  
 Access Links : <https://prezi.com/view/4VUs0pbpgQSaVR3vW6tP/>

Making an Electronic Mind Map with the Prezi Application A mind map that has been made in the form of an image is entered into the Prezi Software to add Zooming User Interface (ZUI) settings. ZUI allows Prezi users to make presentations look dynamic by zooming in, zooming out, and highlighting these objects. The stages include supporting sections, mind map information, and Zooming User Interface (ZUI) settings on the Prezi to become an e-mind map (Figure 5 - Figure 7).

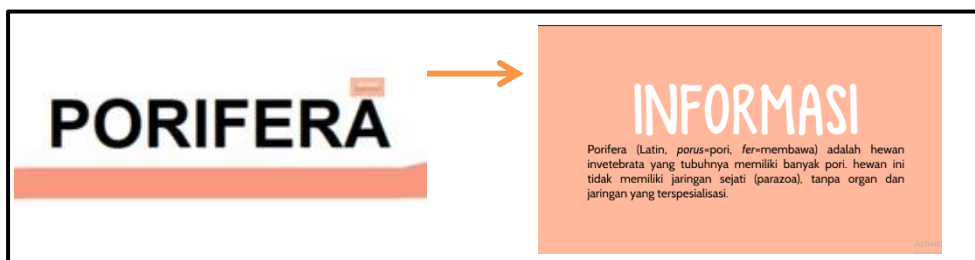


Figure 5. Explanation of the mind map in the Prezi application



Figure 6. The image on the mind map is Prezi applied

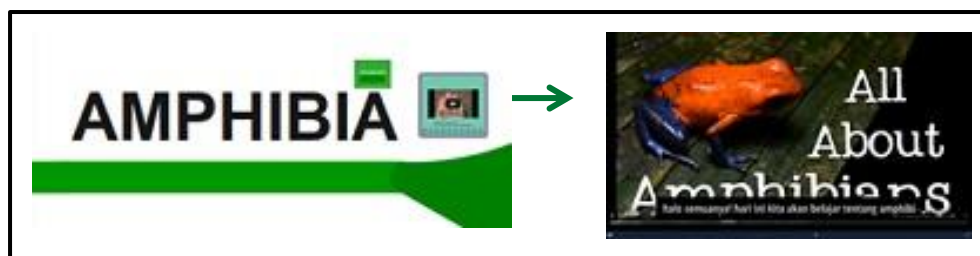


Figure 7. The video on the mind map is Prezi applied

The Development Stage in the form of the results of the development of a prezi-based e-mind map on animalia material is analyzed by conducting validation tests, practice tests, and Student Response tests. Using a validation sheet consisting of 3 assessments, namely: media validation, material validation and construct validation. Analysis of the validation data obtained from the validator, the results of the analysis can be summarized (Table 4) as follows:

The results of the overall score of media validation, material validation, and construct validation of the development of prezi-based e-mind map learning media on animalia material in Table 4 with a mean score of 3.69 are very valid and can be used in the learning process. The results of the validation for the development of e-mind map-based learning media based on prezi animalia KD 3.8 material obtained

media validation getting an average score of 3.67 with a very valid category. Prezi-based e-mind map media uses tools and navigation buttons on an easy-to-use e-mind map display, just by clicking on the part being studied the display will zoom in and zoom out. The layout is consistent with the order of the material. Supported by Wati's statement (2016), namely the placement of the right layout elements can make it easier for the reader to accept the information presented. Informative content with pictures, colors, and an attractive appearance. In accordance with the opinion of Ami (2012) that the brain tends to like pictures, illustrations, and colors compared to just writing.

Table 4. Recapitulation of the Average Validation Score

No	Validation	Average Validation Score	Validation Category
1	Media	3,67	Very Valid
2	Material	3,73	Very Valid
3	Construck	3,67	Very Valid
	<b>Average</b>	<b>3,69</b>	<b>Very Valid</b>

Material validation got an average score of 3.73 with a very valid category. The material on the Prezi-based e-mind map is in accordance with the suitability of the material with core competencies (KI) and basic competencies (KD) correctness of the concept, presentation of material, and adjustments to examples of pictures, videos, and questions related to animalia material. Construct validation got an average score of 3.67 with a very valid category. Based on all validation results, the development of e-mind map learning media based on prezi animalia material is very valid.

The construct consists of material quality, lesson plans, worksheets, questions, functions, and benefits that are appropriate to the use of learning media. The feasibility of learning media as a whole in research is based on obtaining validation data from material, media, and evaluation experts (Devangga, et al, 2022). Innovative learning media is a tool for conveying learning information and messages by utilizing advances in technology and information so that students can understand the material delivered by educators more easily (Khairani, et al, 2019). The Practicality Test was carried out to determine the practicality and applicability of the developed e-mind map. Based on the analysis of practical data obtained from the teacher, the results of the analysis can be summarized (Table 5).

Table 5. Practicality Test Results

No	Assessment Aspects	Score average	Category
1	Clarity Instructions for Use	98	Very Practical
2	Use of Prezi-Based E-Mind Map	93	Very Practical
3	Learning process	95	Very Practical
	<b>Average</b>	<b>95,3</b>	<b>Very Practical</b>

Practical results on the use of prezi-based e-mind map learning media on animalia material with an assessment of 3 aspects in the form of clarity of instructions for use, aspects of using prezi-based e-mind maps, and aspects of the learning process scored 95.3 in the very practical category and can be used in learning. The Prezi-

based E-Mind Map has KD, learning objectives, clear steps to use, language that is appropriate to EYD then easy to understand, questions according to learning objectives, and easy to use. The opinion of Pratama, et al, (2022) is that practicality in research serves to measure how far learning media is more practical than other available media when used in the learning process in class. Student response tests were conducted to find out how students responded to the prezi-based e-mind map on animalia material that had been developed. The results of the student response test to the prezi-based e-mind map on animalia material (Table 6).

Table 6. Student Response Test Results

No	Aspect	Response Score	Category
1	Instructional Media	86,5	Very Good
2	Use of E-Mind Maps	83,4	Good
	<b>Average Response Score</b>	<b>85,0</b>	<b>Very Good</b>

The results of students' responses to the use of prezi-based e-mind map learning media on animalia material with an assessment of 2 aspects in the form of aspects of learning media and the use of e-mind maps got a score of 85 in the very good category and were well received by students in learning. Students can easily understand how to use a prezi-based e-mind map.

Prezi-based text, easy-to-read text, images, and video e-mind maps are in accordance with the material. Students are enthusiastic about exploring and spelling out the questions given on the prezi-based e-mind map. Presentations with Prezi also don't need to move from one slide to another. One large canvas or virtual canvas is enough where images, videos, data, etc. can be inserted (Sulistiyorini and Argarini, 2019). So as to increase curiosity and interest in learning material.

#### 4. Conclusion

Based on the results of the research that has been done, it can be concluded that: The development of Prezi-based electronic mind map learning media on animalia Biology material for SMA obtains the results of the validation analysis category very valid, practicality with the category very practical to use in learning and student responses in the very good and acceptable category both by students in learning.

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