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Mandarin Language Material using Artificial Intelligence for Z-Generation student

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Abstract

This aims of research to develop an artificial intelligence-based Mandarin learning media for the millennial generation that is interesting and can be learned anywhere. The content of the latest material determined in this study is a descriptive text of the coronavirus in Indonesia. This study uses the Research and Development ADDIE design. The research data was obtained from the results of questionnaires, and validation of material and media experts. In the initial observation, it was found that 96.1% of students aged 15 – 20 years in Malang City are familiar with the use of technology in everyday life, therefore it is necessary to develop a technology-based interactive learning media that can support teachers in teaching students who are also Generation Z. After testing the material, it was found that this learning media has very good quality that score is 84. This research is also considered capable of making prototypes that have very good quality in terms of media that the total final score is 85.

Keywords: Artificial intelegence; Mandarin language, Z-generation

Introduction

Generation-Z or also known as the digital native generation is the generation born between 1996 and 2020 or precisely when technology is available in our lives (Seemille, 2017). Generation z is also called the digital native generation because of its ability and readiness to use technological devices. Several studies have shown that digital natives can use technology as naturally as breathing. They do many things through technology, such as finding learning resources for school assignments, social media, playing games, to just looking for information on the internet. This is also supported by the results of pre-observation conducted by researchers who found that 96.1% of 203 students of Mandarin language education in semester 1 of State University of Malang stated their readiness and closeness to the use of technology in their daily lives. Following the understanding of 21st-century learning abilities, technology has a very important role in the teaching and learning process (Dede, 2008). This is a challenge for teachers today. Teachers must be able to answer these challenges by being able to understand and provide technology-based learning media that are following the needs and interests of generation-z students.

One technology that is believed to have excellent potential in the future in education is artificial intelligence technology (Vaishya, 2020). Artificial intelligence is a system developed to be able to perform tasks like humans, such as visual perception, speech recognition, decision making, and translation between languages. Several studies have been conducted on artificial intelligence in education (Sapci, 2020). Several types of artificial intelligence are applied in the world of education, one of which is a double grade teacher. A dual teacher class is a

situation where there are two teachers in the class, namely the general class teacher and the artificial intelligence-based teacher (Wong, 2020). Artificial intelligence-based teachers are tasked with assisting the teaching and learning process. In contrast to conventional teachers, artificial intelligence-based teachers are believed to be able to assist students in learning efficiently (Debeer, 2021). The existence of this intelligent system is expected to be able to assist teachers in answering student questions by staying focused on basic things such as thinking about teaching methods that will be used in the next class.

The use of artificial intelligence systems in the learning process is also believed to increase students' ability to carry out independent learning processes. Several studies have stated that using an intelligence system in education can make students do active and independent learning activities. This is following the concept of 21st-century education which focuses on the role of students in learning. Because of the benefits that can be obtained, the researchers decided to use artificial intelligence in this study.

In this study, researchers focused on designing prototypes of artificial intelligence-based learning media that could facilitate students in learning Mandarin. Themes or topics are chosen based on suggestions from senior Chinese lecturers. The theme chosen is descriptive text with the topic of endemic animals in Indonesia. Endemic animals are animals that live in an area that cannot be found in other areas. This topic was chosen based on considerations between lecturers and researchers to develop regional potential in Indonesia. This artificial intelligence-based learning media prototype is expected to be able to provide a different experience of learning Mandarin independently.

Material and Method

This study uses the Research and Development ADDIE method. ADDIE stands for Analysis (analysis), Design (design), Development (development), Implementation (implementation), and Evaluation (evaluation). In practice, this research was carried out until the development stage due to time constraints. Interview guides, questionnaires, and expert validation sheets were used in this study. Two experts validate this prototype, namely learning materials experts and media experts. This study focuses on the development of artificial intelligence-based learning media with the topic of Indonesian endemic animals. To find out the needs and readiness of the first-semester Chinese education students, the researchers conducted initial observations by giving questionnaires to Mandarin language education students. Expert validation was analyzed using qualitative and quantitative methods. The expert validation questionnaire was carried out using a questionnaire filled out by experts using a Likert scale. In addition, experts also provide input on products developed so that they can produce better results in terms of material and terms of media. In the validation process by experts, the data is calculated using an assessment rubric. In the end, the data can show whether the product is categorized as bad, bad, moderate, good, or very good.

Artificial intelligence

Artificial intelligence or artificial intelligence in terms of its implementation in the world of education is a system designed in such a way that it can help the teaching and learning process (Chen, 2020). By doing this research, it is expected that the results of research and development products can hone students' abilities in carrying out the learning process (Widyatmoko, 2021). In the artificial intelligence system, there is a function where this system can be used as a place for students to study subject matter (Hwang, 2020). Students can access learning wherever and whenever they need it. In this product, there are also clear instructions about the material and how to use it so that students can learn independently.

Several studies have found that the use of artificial intelligence systems can create a more effective teaching and learning process. With the artificial intelligence system, teacher performance can be well supported because there is a system that can help students in the teaching process. Teachers can focus more on other basic things such as designing learning and teaching approaches or methods that will be applied when teaching. Students in this case do not need to wait for the time to meet directly with the teacher to get definite answers to the questions they have. This is said to increase the amount of student satisfaction in learning because students get a quick response to the questions they have (Reinius, 2021).

In addition, research (Yu, 2020) also states that the role of artificial intelligence technology in the learning process will make learning more

active. This is because the center of learning is entirely on the students. Students carry out learning activities on their intentions and needs. Besides being active, learning will also be more interesting with the presence of an artificial intelligence system (Williamson, 2020). This is due to differences in the experiences that students feel when using the products they are currently studying in the learning process. If previously the teaching process was carried out by teachers in the traditional way, now the learning process will be carried out in a new way using artificial teachers. Based on the literature study, it is deemed necessary to conduct research that develops artificial intelligence-based learning media.

Based on this explanation, the researchers decided to name this artificial intelligence-based learning media AIClopedia. AIClopedia comes from the words AI or Artificial Intelligence (Artificial Intelligence) and Encyclopedia (Encyclopedia). AIClopedia is designed to be an English learning medium for students who can display information about Indonesia's endemic animals both in writing and orally. It is hoped that students can use this learning media not only to improve their knowledge of descriptive texts but also their reading and listening skills.

Results and Discussion

In its implementation, this research uses the ADDIE research and development method, which is carried out until the development stage. At the initial stage, the observation process of 203 Mandarin language education students in semester 1 was carried out to determine the level of student technology use. The data shows that 96.1% of students stated their readiness to use technology in their daily life. But unfortunately, the use of technology in student life is still not optimal. This is shown from the data obtained that the activities most often carried out by students with internet technology are social media. Therefore, we designed a prototype that students can use as a medium for learning Chinese. This study chose the name AI Cyclopedia for this product, which comes from the words AI (Artificial Intelligence) and Encyclopedia (Encyclopedia) for the manufacture of Chinese language learning media.

The validation of this product is based on the assessment rubric in Table 1. The first expert validation carried out is the validation of the material expert which is then followed by the validation of the media expert. Material expert validation was carried out to determine the quality of the developed product in terms of learning materials. Meanwhile, media expert validation was carried out to determine the quality of the appearance and functionality of the product system architecture being developed. Based on the data obtained in the first expert validation, the product is categorized as a very good product in terms of material (77) and also media (78). However, the qualitative data shows that some things need to be improved. In terms of material, there is some grammar in the sentence that must be improved. On the other hand, from the media side, improvements are needed, such as an increase in the function of detecting images that do not match the description. Therefore, a revision process was carried out which was followed by a second validation test process. The validation results are shown in Table 2.

The material and media expert validation test was carried out again after the revision process was carried out based on the input provided by the expert. As written in Table 2, there are significant changes to the values obtained in the validation test, namely 84 in the material validation test and 85 in the media validation test. So that the products made can be judged as products that have very good quality in terms of materials and media.

After carrying out the material design process, the material expert validation process is car-

Table 1. Scoring of Rubric Score Category

Score	Category
75.7 – 90	Excellent
61.3 - 75.6	Very Good
46.9 - 61.2	Good
32.5 - 46.8	Enough
18 - 32.4	Less

Table 2. The Result before and after revision

Validation Expert	Before Revision	After Revision
Material Expert	77	84
Media Expert	78	85

ried out. This is done to ensure the quality of the material in the form of writing and sound contained in the AIClopedia learning media. In the results of the quantitative value of media experts, it was found that the quality of the material was categorized as having very good quality with a score of 77. In addition to assessing quantitatively with the Likert scale, material experts also qualitatively provided input and comments on products. Qualitatively, it can be concluded that there are still errors in the content of the material in terms of grammar, word selection, and pronunciation in the material in the form of sound. Therefore, even though the product has been declared to have excellent material content, it is necessary to make revisions to improve the final result.

After carrying out the revision process, the researcher returned to the evaluation process of material expert validation. This is done to find out whether there has been an improvement that occurred after the revision. From the data obtained, there was a quantitative increase with the acquisition of a value of 84. From this figure, it can be categorized that the material has very good quality. Furthermore, qualitatively, there are no comments and suggestions from experts both in terms of material in the form of writing and sound.

The second expert validation carried out was the validation of ICT media experts. This is done to know the quality of the product in terms of media. Similar to material expert validation, media expert validation is carried out in 2 types, namely quantitative and qualitative. Quantitative data were obtained from questionnaires that were assessed using a Likert scale. While quantitatively, some suggestions and comments become input and improvement for researchers. Based on the results of expert validation, it was found that the quality of the designed ICT media can be categorized as media that has very good quality with a score of 78. Unfortunately, qualitatively there are still things that need to be improved by researchers, for example, the need to add product names and enter email/social media data students on the login page. So it is necessary to revise the product that has been designed.

After the revision process was carried out, the evaluation of the validation of the ICT media experts was carried out again. It aims to determine the increase in the quantitative and qualitative value of the product. Quantitatively, the validation data shows the number 85 where

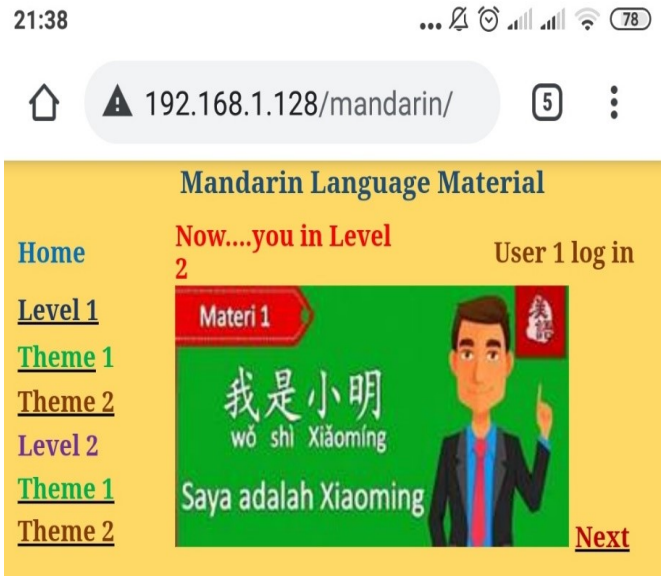

Figure 1. Mandarin learning materials with mobile applications

the product can be categorized as having very good quality in terms of media. From a qualitative perspective, no input or comments from experts were found. The product yield is shown in Figure 1.

Conclusion

This research uses the ADDIE method which aims to develop a prototype product of artificial intelligence-based English learning media for first semester Mandarin students, State University of Malang. The product that was made was named AIClopedia. This product is expected to be used as an artificial intelligence-based learning media which in its implementation can provide descriptive information about endemic animals of Indonesia by displaying bilingualism, namely Indonesian and Mandarin both in spoken and oral form. At the end of the research, and expert validation assessment process was carried out. Expert validation carried out is in terms of learning material experts and ICT media experts. The purpose of the two expert validations is to determine the quality of the products developed. The final data obtained states that the designed product can be categorized as a product with very good quality. The final score is 84 learning material experts, and 85 ICT media experts.

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