The Effectiveness of Web-Based Teaching Materials in Mandarin Subject

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Abstract: This study aimed to determine the effectiveness of web-based teaching materials about "我的家人" (wǒ de jiā rén, my family） in Mandarin subject. This research employed a mixture of quantitative and qualitative research methods with the Alessi & Trollip development model of planning, design, and development. The subjects of this study were 37 students of management major at MDP University. The trial design in this study used a one-group pretest and posttest design. This research's data collection techniques are interviews, observations, tests, and questionnaires. The researchers utilized interviews, observations, tests, and questionnaires to analyze the data. The research analysis on the development of teaching materials can be described as: (1) its validity has been tested after being tested through 3 experts carried out in stages, with an assessment of 93.33%. (2) its practicality has been tested on three students by filling out a questionnaire. It is obtained an efficient evaluation (91.66%) for each assessor. This web-based teaching material can be used as online collaborative learning by getting an efficient assessment. (3) effectively increases learning outcomes between the pretest and posttest scores. In the pretest, the score was dominated in the very poor category, while in the posttest, the score was dominated in the good enough category. It was considered effective, reflected in the N-gain score of 56.49% in the medium category.

Keywords: effectiveness, teaching materials, Chinese language

The boundaries of my language represent the boundaries of my kingdom (Putnam, 2008) which has the beauty of each individual in language skills (Sanders, Berninger & Abbott, 2018) and not implied intelligence in thinking (Suriasumantri, 1995). Mandarin is part of the needs of every individual (Shoshana, 2019). Mandarin has become an international program (Chua & Azlan, 2019) in the knowledge and dissemination of Chinese culture (Liu, Chan, Zhao & Liu, 2019), where someone who has more than one language ability, the future will be brighter (Ardila, Rosselli, Ortega, Lang & Torres, 2019). In 2004, the National Office of the International Chinese Language Council or Hanban (Wang & Feng, 2019), based in Beijing, organized more than 300 Confucius Institutes called 孔子学院（Brazys & Dukalskis, 2019) in each country to promote teaching, learning, and testing Mandarin as a foreign language (FL) in the community (Duff & Eds, 2008).

Each student has a diverse background such as age, ethnicity, religion, culture, and gender. Unfortunately, they have something in common, they like social media, can operate computers or cellphones well for a particulartime, have an enthusiastic attitude in learning foreign languages to prepare themselves for the world of work in the future. Therefore, it is necessary to correctly apply web-based teaching materials to address students' weaknesses in learning foreign languages. Some students did not have satisfactory results in their academic goals, thus extending the time for graduation. The low learning outcomes may be caused by students who do not understand and do not know what to ask, lack of practice after learning, or tend to memorize rather than understand concepts. Therefore, a better learning design is needed to improve student learning outcomes.

Multi Data Palembang University (MDP) is one of the intellectual-based innovation campuses, where the learning capacity is mainly using computers. In this new era, computers have spread to all fields in technology and science, so the implementation of this computing technology plays an essential role in the teaching-learning activity (Diana, Rahmi, & Nyayu, 2018). The Mandarin language subject is a part of science that generally studies foreign language skills. In the 21st century,

the advancement of the world of technology and information is needed as one of the things in learning to develop teaching materials that appropriate the needs of the teaching and learning process (Riska, Siahaan, & Ismet, 2018).

Website is one distance learning media in the teaching process, which can be employed as educational technology in online courses (Lin & Hsieh, 2001). Almost all universities provide distance learning programs using web-based learning and teaching with a learning system that students can utilize on and off-campus (Samarawickrema & Stacey, 2007). There are results that 71.9% of students aspire to study online or independently with the assistance of web-based teaching materials that can be accessed in many places (Rajasingham, 2011). Web-based teaching materials are a means to help students achieve more optimal learning goals (Amichai-Hamburger, 2002), because web-based teaching materials can be accessed beyond the time and place (Setiawan, Sudomo & Hasanah, 2019). Furthermore, this learning tool is expected to motivate students to connect the knowledge gained with skills applied in social life (Duff & Eds, 2008). The researchers expected the teacher and students could take advantage of current science and technology in learning Mandarin by utilizing the website as a learning platform that is not limited by time and place of learning.

"My family" is one of the materials taken in learning Mandarin for the beginner level (Luo, Li & Li, 2019), this material is easier to understand and closer to student life (Keeney, Hohman & Bergman, 2019). The students can utilize the emphasis on reading, pronounce the use of vocabulary in everyday life (Moncloa, Erbstein, Subramaniam & Carrasco, 2019), and employ the effectiveness of Web-Based Teaching Materials in Chinese Language Courses.

METHOD

This research method utilized a mixture of qualitative and quantitative methods using the Alessi & Trollip development model, which consists of 3 stages: planning, design, and development (Stephen M. Alessi, 2001). The planning stage determines the scope of content, identifies student characteristics, collects material sources, and determines the display or shape. The design stage includes making the concept of learning materials, SPON MDP flowcharts, and storyboards. The development stage consisted of preparing Chinese text, Chinese voice and video, unifying product components, preparing supporting materials, doing alpha testing and revision, beta testing and modification, then product testing. Figure 1 is a picture of the Alessi & Trollip development model.

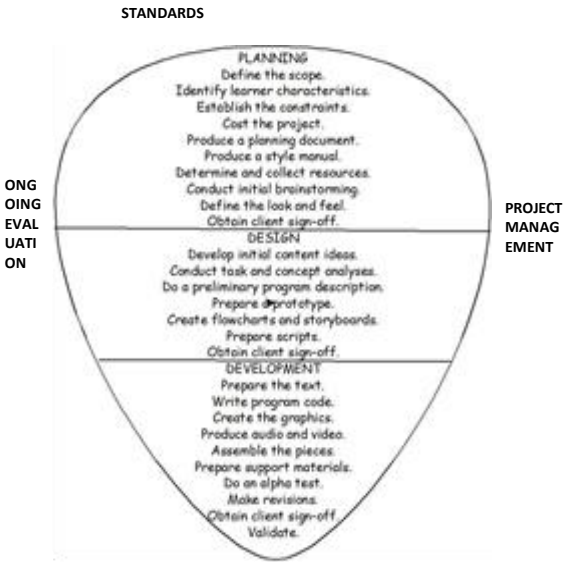

Figure 1. Alessi and Trollip Development Model, 2001

The research location was conducted at MDP university, with the research subjects consisting of 36 management students. The researchers have developed and designed web-based teaching materials. The average validator in percentage obtained a value of 93.33%, while the results of product trials based on the average n-gain were 56.49% (medium category). The test of learning outcomes at the product trial stage consists of pretest and posttest. Consequently, the pretest is carried out before learning, and the posttest is carried out after learning. The following formula calculates the results obtained.

$$\text{Result score} = \frac{Obtained\ Score}{Maximum\ Score}\ x\ 100\%$$

The procedure of determining student skills in Chinese courses employs practical, holistic assessment techniques where the assessment is based on an overall impression or a combination of all criteria (RISTEKDIKTI, 2016). The skill assessment table can be seen in table 1.

Table 1. Holistic Rubric

Indicators	Percentage	Score	Total Score
Material Mastery	30%		
Accuracy in pronunciation	30%		
Communication skills	20%		
Understand the meaning of the word that is pronounced/mentioned	10%		
Completeness of writing the word that is pronounced/mentioned	10%		
FINAL SCORE	100%		

Source: Adapted from (Ristekdikti), 2016

The researchers analyzed the average value of learning outcomes with 60% for the value of knowledge and 40% for the value of skills based on the value of knowledge and skills. The average value of learning outcomes is calculated by:

Average Score = (60% ×Theory) + (40% ×Practice

Description:
Theory = knowledge value
Practice = skill value

The categories of student learning outcomes are shown in table 2.

Table 2. Learning Outcome Category

Scoring Criteria	Final Score
N >= 80	A
68 =< N < 80	B
56 =< N < 68	C
45 =< N <56	D
N < 45	E

Sumber : MDP, 2014

The ability of learning outcomes of cognitive and student skills is used to determine the effectiveness of the product through the calculation of gain normalization (N-gain) with the formula:

$$\text{Ngain} = \frac{Spost - Spre}{Smaks - Spre}$$

Table 3. N-gain Score

Scoring Criteria	Category
N-gain ≥ 0,7	High
0,7 > N-gain ≥ 0,3	Medium
N-gain ≤ 0,3	Low

(Richard R Hake, 2013)

The ability of learning outcomes of cognitive and student skills in the effectiveness of web-based learning my family material in Chinese courses through the calculation of gain normalization (N-gain).

RESULT AND DISCUSSION

Result

The effectiveness of web-based teaching materials from research results on the percentage of expert validation, n-gain scores, pretest and posttest. In the alpha test, there are 30 statement items that consist of statement agreeing column, follow-up, and a review filled out by the validator. The first validator gave his response, namely the teaching materials were following the material presented and explained in easy-to-understand language and accordance with the correct Chinese grammar rules. Teaching materials have also raised interesting questions to test and strengthen students' memory of the material that has been delivered.

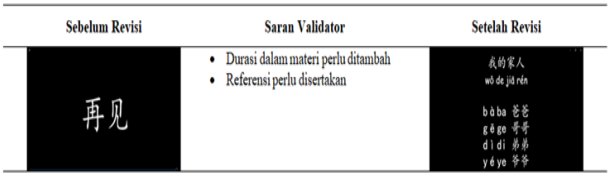

Figure 2. Second Expert Advice

The second validator suggested that the duration of the learning video should be extended, and references should also be displayed. The researcher fixed these problems by adding a summary in the form of running letters and pinyin characters at the end of the video as adetermination to increase student memory in the learning process so that the duration of the material also increased, and references in the form of names were added to the front screen. After making improvements, the researchers gave it back to the validator to check whether there was still something that needed improvement. Still, he said that the learning video was feasible to use.

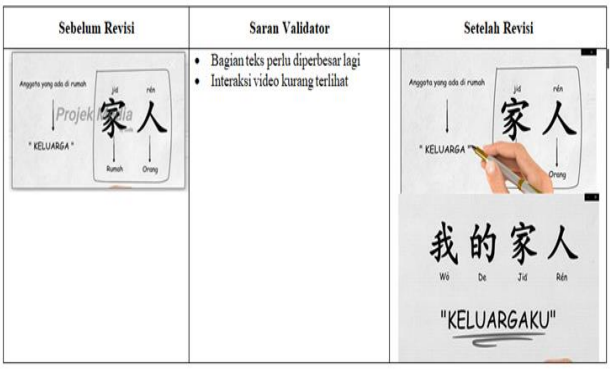

Figure 3. Third Expert Advice

The third validator suggested that the video made was clear enough by the material presented and the sound in the video. It just needed to slightly increase the size of the text in the video, add duration in the material, and include references in the video. The researchers fixed it by enlarging the

letters in the video, both characters and pinyin. This statement proves that this product can already be used. The recapitulation of the expert tests can be seen in the following table.

Table 4. Website-Based Teaching Material Expert Test

Validator	Maximum Score	Validity	Percentage
1	30	30	100%
2	30	28	93,33%
3	30	26	86,66%
Total	90	84	93,33%

The results of the validation test from the three experts show that the web-based teaching materials were tested validly (93.33%) with a revised edition of references to the material in the video, the text in the video needs to be enlarged a little, the video cannot be clicked, the lack of interaction in the video, and the duration in learning need to be extended. Furthermore, the researchers made improvements based on the suggestions. After making improvements, the researchers gave it back to the validator to check whether there was still something that needed improvement. Still, he said that the learning video was feasible to use. It shows that the teaching materials developed are tested for validity.

In the beta test, students are approved to access the website and click the practical instruments uploaded to assess web-based teaching materials in learning. The practice instrument includes 12 statement items, namely demonstrating; way of presentation, quality of text, images, audio, video, input, spacing, language, style, grammar, technical terms and jargon, glossary and introduction. Based on the practical test results of the three students, the web-based teaching materials were practically tested (91.66%) by fulfilling 33 statements out of a total of 36 messages. The findings of the beta test results were written in the form of comments by the three to enlarge the text and audio to be clarified again. Furthermore, the researchers improved the teaching materials based on the experts' statements.

Product testing is the process of evaluating whether this product meets its objectives in a student learning environment (Alessi & Trollip, 2001). This test produces data on pretest scores and posttest scores. The product trial phase was carried out online by involving 36 students majoring in Management at the MDP Rajawali campus with an allocated time of 90 minutes. The product trial documentation can be seen in the following image.

Figure 4. Product Trial Process

The researchers gave the pretest questions in a PDF file via WhatsApp, and the students responded to them directly. The posttest questions were given keywords through SPON after completing the first question. The pretest questions were presented to know the students' initial knowledge about my family material. Posttest questions are given to know the students' abilities after learning to use learning videos. The forms of the pretest and posttest questions were varied, namely multiple choice seven questions, short answers three questions, true and false three questions, matching two questions, and a total of 15 questions being tested. Based on the test results, the students cannot complete and solve the questions appropriately; therefore, a second alternative is offered by using an application on the website.

Table 5. Pretest andPosttest Score

Scoring Interval	Number of Students		Percentage (%)		Category	Information
	Pretest	*Posttest*	*Pretest*	*Posttest*		
81-100	3	28	8,3%	77,8%	A	Very Good
69-80	14	7	38,9%	19,4%	B	Good
57-68	5	1	13,9%	2,8%	C	Fair
46-56	8	0	22,2%	0	D	Low
45-0	6	0	16,7%	0	E	Very Low

After testing using a web-based learning process, students show a reasonably good improvement in using and completing all the challenges given, so it is concluded that the research shows success and can be used effectively in future learning activities among students. The improvement is illustrated in the following diagram.

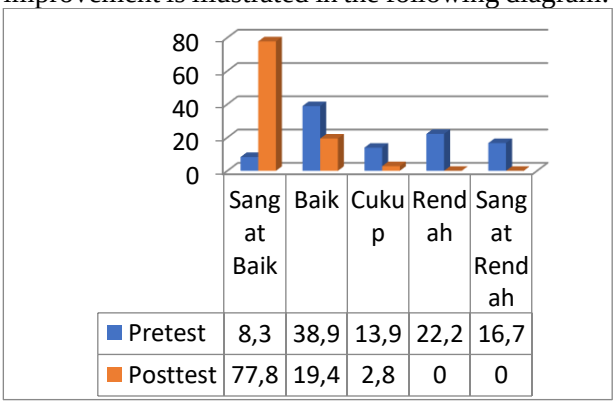

Figure 5. The Result of Pretest and Posttest

The effectiveness of student learning outcomes is obtained from the average pretest and posttest analysis, which is then calculated using the N-gain formula.

Table 6. The Average Score of Pretest and Posttest

Average Score Pretest	Average Score Posttest	Average ScoreN-gain
60,55	82,47	56,49%
Category		Medium

The average N-gain score obtained is 56.49%. These results show a score of 0.7 > g 0.3, meaning that the development of this product is in the medium category (Richard R Hake, 2013). Based on these results, it can be seen that my family's web-based teaching materials have a considerable influence on improving student learning outcomes both in terms of knowledge and in terms of skills.

DISCUSSION

Web-based teaching materials have been tested for validity and practicality in Mandarin language courses. The validation stage carried out by experts shows that this web-based teaching material is valid. The beta test results showed that students enjoyed and overcame the use of these web-based teaching materials; besides that, the amount of valuable teaching time could be optimized so that these web-based teaching materials were practical to use. This web-based approach to teaching materials can reduce students' difficulties in understanding concepts and make it easier for lecturers to carry out learning activities to increase student learning outcomes.

Web-based teaching materials in Mandarin courses are effective on student learning outcomes. The product's effectiveness can be seen from the resulting student learning outcomes (N-Gain). According to Hake, the average N-Gain obtained is 56.49%, which is in the medium category. It happens because there are two assessments that the researchers employed at the evaluation stage. There are still 14 students who get low scores because students do not know Mandarin at all, both at home and in the school environment. After using the media, the student got a good score, as seen from the posttest score. No students earn a score in the low and very low categories. This phenomenon shows that the learners are not familiar with the pronunciation of Mandarin because it is not the native language (Nel, 2021).

This research is relevant to the research that has been conducted by Dehghanpour & Hashemian (2015),which shows that the use of web-based media can improve students' ability to answer reading questions well. Web-based teaching materials are also practicable and effective as web-based teaching materials in message design courses at the Makassar State University Education Technology Study Program. They are effective in improving student learning outcomes (Parumbuan, 2009). It can be seen from the results of the second study, which showed an increase in student learning outcomes can improve after using web teaching materials.

There are some advantages of research on the development of web-based teaching materials. First, web-based teaching materials resemble social media to add learning tools for students to learn and understand Mandarin. Second, web-based teaching materials prioritize learning through video tutorials to make it easier for students to practice the material. Third, the analysis and complexity of the coverage of the material contained in this teaching material are quite good because the material contained in the teaching material includes images, writing in the form of characters, pinyin, and sound. Fourth, the students can learn anytime and anywhere because it uses the internet, and video tutorials can be downloaded. Next, the students can learn at their own pace and ability because teaching materials can be studied anytime and anywhere. Last, web-based teaching materials meet the aspects of high validity and practicality so that students can use them well.

On the other hand, there are some disadvantages of web-based teaching materials. First, web-based teaching materials can only be accessed via mobile phones/computers with an internet network, which is a drawback for students who are not connected to the internet. Second, it requires high motivation to study independently or via the internet. Third, web-based teaching materials can only be accessed by students who teach Mandarin courses. Fourth, some of the shortcomings in web-based teaching materials in Chinese language courses that this researcher has developed are expected to be used as a reference for further researchers to make similar products even better.

CONCLUSION

Based on the results of research and discussion regarding Web-Based Teaching.

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