

# **Design And Test of Learning Effectiveness Using The “LeDu” Comic Media Application Prototype in Improving Chinese Learners’ Grammatical Competence**

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## **Abstract**

In this era of globalization, technology is very much needed, especially in the world of education. To improve the quality of learning, many tools can be used to support the quality of learning, one of which is using media as a teaching aid. This study aims to analyse the effect of comic media mobile application on Chinese grammatical competence among Chinese learners. This study uses a quantitative descriptive approach, and purposive sampling determined the sample. The research instrument used was the test (pre-test and post-test) and the questionnaire. The data analysis method used to test the hypothesis is the pre-test-post-test using the t-test (paired sample test) and the normality test. After the pre-test, the research subjects were asked to try the comic media application “LeDu” for two weeks. Through the post-test results, the average value of the research subjects increased from 74 to 87.23. The t-test on the correlation between the pre-test and post-test scores shows a correlation between the two variables, and the t-test data shows the value of Sig. (2-tailed) is  $0.000 < 0.005$ , indicating that the “LeDu” comic media application prototype significantly affects learning Chinese grammatical competence. The questionnaire data also shows that the respondents responded positively to 3 aspects, user interest, content quality, and application usability.

## **Keywords**

Chinese, Comic Media, LeDu, Grammatical Competence

## **1. Introduction**

Mandarin is the national language of the People’s Republic of China and the language with the most prominent native speakers in the world. This phenomenon is increasingly attracting the attention of Indonesians to learn and master the language. Learning Mandarin in every educational institution in Indonesia is carried out as foreign language learning, making Mandarin the second largest foreign language after English (Jureynolds and Ying 2020). Many schools and universities have started using media as a teaching aid to improve language learning. The learning process aims to provide concrete experiences and motivation to learn and enhance the absorption and retention of learning.

Comics are one of the most interesting visual learning media. Readers not only get information or learning materials but can also be entertained through the stories’ content. Comics are a form of cartoon with supporting characters to act out a story (Sudjana and Rivai 2013). Comics that have funny and interesting pictures, as well as fun storylines, are not only popular among children but also have their charm for children, teenagers, and adults. In addition, Wilujeng and Lan (2015) also said that comic words are easy to remember, increase creativity and motivate students to learn.

Daryanto (2010) stated that learning to use comics has a positive impact because it can encourage students to learn, even though the material is complex.

They are seeing the importance of mastering foreign languages other than English in Indonesia, which aims to increase the competitiveness of Indonesian people in global competition. Comics have a vital role in motivating students to know the context of the conversation first essential before mastering vocabulary and grammar. A revolution in conventional learning media in the form of textbooks needs to be carried out, and comics that will be used as the new Chinese language learning media should be accessible digitally on Chinese learners' smartphones. Thus, we can conclude that learning media not only makes students understand the material's content better but also makes learning more effective and enthusiastic. Therefore, several questions arise regarding comics as a new learning medium that can be presented digitally: Can comic strips used as English learning media be used in learning Mandarin as a foreign language? How can industrial revolution 4.0 be applied to Chinese learning materials in the form of comic strips? How to design an application prototype that helps significantly help learners improve their understanding of Chinese grammar?

### **1.1 Research Objectives**

This study aims to determine the design of comic media applications in the form of mobile apps, which help understand Mandarin grammar effectively. The plan that will be made also needs to be tested to test the hypothesis: there is a significant influence on the use of digital comic learning media applications in learning Chinese.

With the background that has been explained, the researchers are interested in making a comic media application prototype named LeDu. The application changes comic strips commonly used conventionally into an application that can be accessed via smartphones. To test the prototype design, this study will conduct user and hypothesis testing to see the effect of comic media in mobile apps on the successful results in learning Mandarin.

## **2. Literature Review**

Industrial revolution 4.0 led to digital transformation in education, which affected learning materials (Berthelsen and Tannert) 2020). Digital learning materials help achieve learning outcomes and constructive knowledge (Noroozi et al. 2012) and can also increase the learning value of students (Zwart et al. 2017). Students can accept digital learning material if integrated with their learning mode (Sarsar et al. 2021). The use of digital learning materials is essential to attract learners' attention (Chiu and Churchill 2015), con; conventionalizing materials and digital textbooks should pay attention to factors that attract the attention and interest of learners.

Comics as an entertaining read have been widely studied as a new learning medium. Comics can develop language skills and artistic and creative activities in individual students. Comics can help students remember the contents of learning materials and serve as entertainment for these students (Sudjana and Rivai 2002). Teachers can use comics effectively to arouse, expand, and develop students' reading interests (Sudjana and Rivai 2013). Comics are entertaining and more effective in education (Lanti 2017). Comics can be used to practice all language competencies. Comics can also support the learning process because their use can increase reading interest and improve vocabulary learning skills (Jureynolds et al. 2021). The content must make comics a medium for learning images and material content as enjoyable as possible so that students are interested in reading and easily understand the material's content (Kustandi and Darmawan 2020). There were differences in motivation in Generation Z before and after being given learning media. In addition, Generation Z students' interest or learning motivation is stated to be greater if they use various learning media (Nawawi 2020). Comics can be an alternative learning media that can motivate and solve problems for their readers (Themelis and Sime 2020).

Making comics as a learning medium is usually done using classroom action research. The research variables used vary, but the hypothesis testing has something in common: testing the effectiveness of using comics in learning, activeness in class, and students' learning motivation. Nasrulloh et al. (2020) stated that their research aimed to determine the feasibility of PBL (Problem-Based Learning)-based E-Comic learning media. Irawan et al. (2020) using experimental research methods, found that the activeness of students with comic media in the learning process in the experimental class was 74.19%, and in the control, class was 77.41%. Both percentages show that both classes are pretty active. Rulviana (2020) using the classroom action research method, found that comics as one of the learning media can improve student narrative writing learning outcomes.

### **3. Methods**

This study uses a quantitative descriptive approach. This study used a purposive sampling technique from students of the Chinese Department of a well-known campus in Jakarta. The selected respondents have intermediate Mandarin language skills and have used comics as a learning medium. From 100 respondents, 30 met these criteria—test data collection techniques (pre-test-post-test) and questionnaires. The research design that the researcher uses is a one-group pre-test-post-test design.

#### **3.1 Test Design and Implementation**

The tests carried out included pre-test and post-test. The test was conducted to obtain data by comparing research subjects before and after using the application. Researchers will use Google Forms as a medium to carry out both tests. At first, the researcher will give the research subject a pre-test. After doing the pre-test, the researcher will ask the research subjects to learn to use the comic media application “LeDu” for two weeks, then the research subjects will answer the post-test questions.

To make the research results more accurate, the pre-test and post-test questions have the same difficulty and number of questions. The questions are divided into four types of questions. The following is a test item design consisting of four sections: The first section is personal data that research respondents must do; this aims to re-assure whether the respondents meet the criteria of the research subjects; The second section is a test question regarding completing the sentence or conversation according to the given context; The third section is changing the sentences with the given the word or sentence pattern; The fourth section is according to the contextual, make a sentence with the given the word or sentence pattern. The test will be done by the respondents for 10 minutes and monitored through a zoom meeting. After working on the questions, the researcher will analyze the results of the pre-test and post-test tests.

#### **3.2 Questionnaire Design and Implementation**

Questionnaires were used in this study to determine the user experience of the research subjects when using the LeDu application, as well as a measure of the effectiveness of using digital comic media applications as a learning medium from the perspective of the research subject.

This questionnaire will be distributed after the research subjects do the pre-test and post-test. The questions in the questionnaire are divided into five sections; The first section is the personal data of the respondents, and the second section is a continuation of the third and fourth sections. If the respondent has studied the vocabulary or grammar points given by the LeDu application, he will proceed to the 3rd section, and if the respondent has never studied the material, he will go directly to the 4th section; The third section is a question for respondents who have learned about the content of the LeDu application; The fourth section is a question for respondents who have never known about the content of the LeDu application; The fifth section is a suggestion from respondents for the development of the LeDu application.

### **4. Data Collection**

After the test data (pre-test and post-test) and questionnaires have been collected, the researcher will conduct data analysis. For the pre-test and post-test, the hypothesis will be tested first using the normality test technique with the help of SPSS 25 for windows. Then, the data will be analysed using descriptive statistical analysis techniques.

The following steps the researcher will take in analysing the data: Preparing pre-test-post-test questions and questionnaires (questionnaires). Researchers will make pre-test and post-test questions and questionnaires to be filled out by research subjects; Researchers will give pre-test questions to research subjects after the research subjects finish filling out the questions. Research subjects will use the application to learn vocabulary and grammar points presented in comic form on the Leduc application. After using the application for two weeks, research subjects will work on post-test questions; After working on the pre-test-post-test questions, the researcher will give an online questionnaire and collect it. Pre-test and post-test data will be processed with numbers; The pre-test and post-test data results will be tested for hypotheses using data analysis. Normality test with SPSS 25 for windows; In the last stage, the researcher will analyse the data that has been collected. This data analysis was used to know the differences in respondents’

abilities before and after using the LeDu application. In addition, the questionnaire results will be processed to become the basis for developing the LeDu application.

## 5. Results and Discussion

### 5.1 Pre-test and Post-test Result

Testing the prerequisites for this analysis was carried out before the researcher conducted the data analysis. The condition used in this study is the normality test. The results of the analysis prerequisite test are presented as follows: (Tables 1 & 2)

Table 1. The result of Tests of Normality by SPSS  
Tests of Normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
PRE-TEST	.132	30	.192	.942	30	.105
POST-TEST	.100	30	.200*	.974	30	.643

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The normality test results show that the normality results of the pre-test and post-test using SPSS 25 for windows proved normal, with a value of Sig. >0.05. This indicates that the data from 30 respondents selected through purposive sampling have met the criteria, and the data can be used to test the hypothesis.

Table 2. Hasil Pre-test dan Post-Test

No.	Respondent	Pre-test Score	Post-Test Score
1	CDY	88	98
2	KT	75	90
3	INK	73	89
4	CM	88	92
5	RM	70	86
6	KK	68	86
7	VC	85	95
8	JFC	63	88
9	TC	88	78
10	NB	58	88
11	EP	85	95
12	H	60	83
13	AL	73	80
14	AL	85	93
15	FEB	78	85
16	SW	80	92
17	A	70	83
18	DCS	65	90
19	DSS	70	85
20	FP	82	93
21	FB	68	83
22	FA	70	88
23	VRS	58	83
24	WC	68	90

25	JC	80	85
26	ME	70	78
27	TB	78	85
28	D	88	93
29	N	73	88
30	FY	63	80
<b>Average</b>		<b>74</b>	<b>87,23</b>

From the Table 2 above, the pre-test score of the respondents has an average of 74, and 13 respondents have a score of 75. The post-test score of the respondents has an average of 87.23, and 30 respondents scored 75. The average value of the pre-test and post-test indicates that after the respondents used the LeDu comic media application, the respondents experienced an increase in learning outcomes.

## 5.2 Questionnaire Result

In addition to the data from the pre-test and post-test results, a questionnaire regarding user experience is handy for developing LeDu comic media applications. The questionnaire data was containerized after the respondents used the LeDu comic media application for two weeks and had done the pre-test and post-test. The data of the user experience questionnaire is processed into three main aspects, namely user interest, content quality, and application usability: (Figure 1)

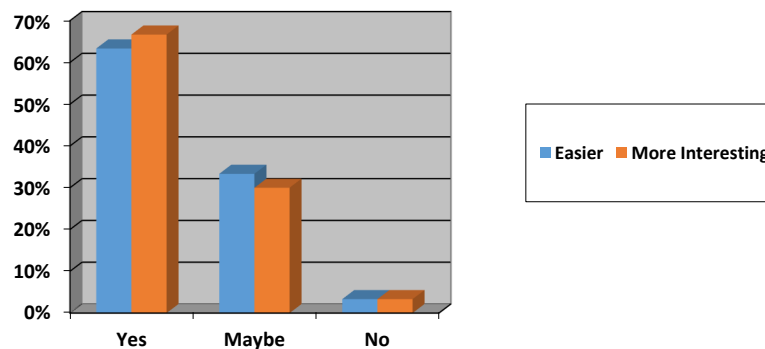


Figure 1. User interest aspect

In terms of user interest, the application of LeDu comic media is compared to conventional textbooks in learning Chinese. 19 out of 30 respondents stated that if the material in the book is made into content in the LeDu application, it will make it easier for them to learn Chinese. 20 out of 30 respondents stated that the LeDu comic application is more interesting to read than conventional textbooks. (Figure 2)

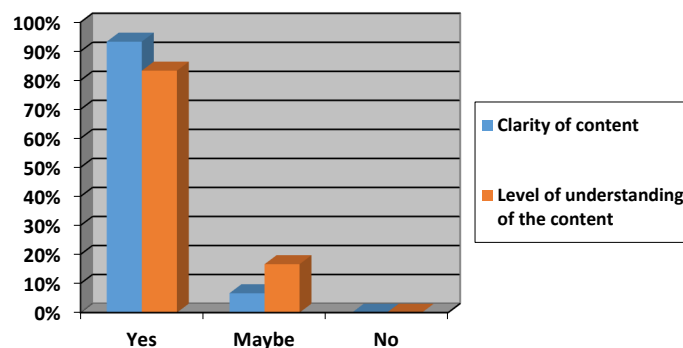


Figure 2. Content quality aspect

The LeDu comic media application conveys learning content through vocabulary/sentence patterns through humorous contextual stories. Through the content quality aspect, it can be seen that 28 of 30 respondents stated that the delivery of content in the form of vocabulary/sentence patterns in the LeDu application could be clearly understood, and 25 of 30 respondents said that through the LeDu application learning content made respondents understand the use of vocabulary/sentence patterns. (Figure 3)

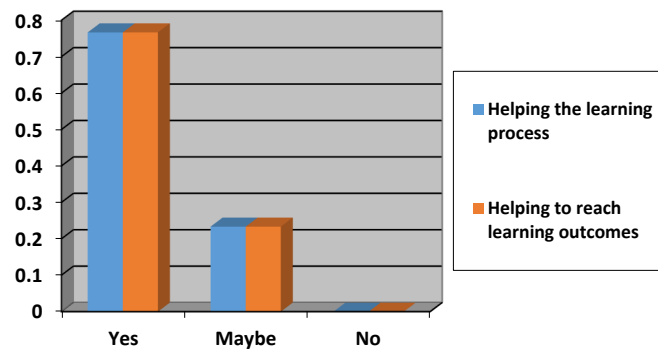


Figure 3. Application usability aspect

Through numerical data processing regarding the results of the pre-test and post-test, after using the LeDu comic media application, respondents experienced an increase in learning outcomes. This is indicated by the rise in the average score increase in the average score points, and all respondents scored >75 in the post-test. Through the application usability aspect, this is in line with the opinion of 23 out of 30 respondents who stated that applications could help the learning process, as well as help achieve learning outcomes.

### 5.3 Data Validation and Discussion

Through analysis of test data and questionnaires, it can be stated that the application of LeDu comic media can improve the results of learning Mandarin. It also received a positive response to user interest, content quality, and application usability from respondents who used the application. Therefore, as a follow-up to the analysis of this research, it is necessary to test the hypothesis. This aims to prove whether the application of LeDu comic media in improving the understanding of Chinese grammar has proven to be Chinese grammar has proven effective.

The data from the pre-test and post-test will be calculated by calculating the t-test using the paired sample t-test method with SPSS 25 for windows, with a significance level of 0.05, and testing the hypothesis. The following are the results of the paired samples t-test output analysis:

Table 3. The result of Paired Samples Statistic by SPSS

		Paired Samples Statistics			
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	74.0000	30	9.35507	1.70799
	Posttest	87.2333	30	5.17743	.94526

Based on the Table 3 above, it can be seen that the 30 research samples had an average pre-test value that was smaller than the post-test average value, which was  $74 < 87.23$ . This proves an average difference after using the LeDu comic media application. To verify whether there is a significant difference, the researcher will also attach the output of paired samples test 2 as follows:

Table 4. The result of Paired Samples Correlations by SPSS

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pre-test & Posttest	30	.528	.003

According to the results of the paired samples test output with the help of SPSS 25 for windows, the correlation coefficient value is 0.528 with a sig value of 0.003. Because the deal of sig  $0.003 < 0.005$ , it can be concluded that there is a relationship between the pre-test and post-test variables. (Table 4)

Table 5. The result of Paired Samples Test by SP

Paired Samples Test									
		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-test – Posttest	-	7.95107	1.45166	-	-	-	29	.000
		13.23			16.2023	10.2643	9.116		
		333			1	5			

According to the results of the paired samples test in the picture above, the value of Sig. (2-tailed) is  $0.000 < 0.005$ , indicating the hypothesis is proven. So it can be concluded that there is a significant influence in using comics learning media applications to increase understanding of Mandarin grammar. (Table 5)

## 6. Conclusion

Based on the results of the previous research and discussion, the researchers concluded that there was a significant influence in the use of comic learning media applications on the study of Chinese language learning. This is also evidenced s of the calculation of the paired samples test, that the value of Sig. (2-tailed) is  $0.000 < 0.005$ , which proves a significant influence on using the LeDu comic learning media application. In addition, it can also be seen that the average value of the pre-test is smaller than the average value of the post-test, namely  $74 < 87.23$ , which means that there is a significant increase in the value of the research subject.

Based on the results of research data processing, the LeDu comic media application can be used as an alternative to improve Mandarin grammar skills for learning Chinese. The LeDu funny media application can also be an alternative for Chinese language learners in previewing material. This mobile app will help make it easier for the teacher to explain the material's content. Still, it can also help students better understand the material's content before getting an explanation from the teacher so that if there are difficulties in the material, they can be asked to the class lecturer when teaching and learning activities are carried out. The LeDu comic media application can also be an alternative for students to review lessons.

Suggestions for developing the LeDu application and future research are to be able to conduct research on comic learning media with different designs. Presumably, it can improve learning outcomes for elementary-level Chinese learners or those who do not have Chinese language skills.

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