

# Independent Learning Method Based on Virtual Reality to Improve Foreign Language Skills

Herri Akhmad Bukhori<sup>1,\*</sup>, Sunarti<sup>2</sup>, Tiksno Widyatmoko<sup>3</sup>

<sup>1, 2, 3</sup> Universitas Negeri Malang

\*Corresponding author. Email: herri.akhmad.fs@um.ac.id

## ABSTRACT

Understanding the meaning of a word needs imagination from students, especially the meaning of the word in the right situation and right place. This research creates media from Virtual Reality (VR) to give enough imagination of the meaning of a word or sentence in a foreign language. The purpose of this study is to improve the skills of foreign language that students can learn with a model: self-regulated learning with 3 factors (goal setting and planning, rehearsing and memorizing, and self-evaluating). A test case of media was used involving 10 undergraduate students at the Department of Mandarin Language at the Universitas Negeri Malang. The result of the test indicated a significant growth in the skill of foreign language, reaching 81.5%.

**Keywords:** *Virtual Reality, Self-Regulated, Foreign Language.*

## 1. INTRODUCTION

The strategies for developing self-regulated learning are: self-evaluating, organizing and transforming, goal-setting and planning, seeking information, keeping records and monitoring, environment structuring, self-consequence, rehearsing and memorizing, seeking social assistance, reviewing records, others [1]. Seeking information is a student's self-initiative activity in finding helpful information from non-social sources of information while doing assignments, for example, students looking for information in the library and the internet. The search for information related to these learning resources can be supported by the existence of information technology in the world of higher education, namely e-learning. [2]

The implementation of distance education in higher education is regulated by the Ministry of Education and Culture in Permendikbud No. 109 of 2013 regarding policies related to electronic learning (e-learning). The purpose of e-learning is to provide higher education services to community groups who cannot attend face-to-face education and to expand access and facilitate higher education services in education and learning. Universitas Negeri Malang has e-learning facilities in the form of an Integrated Online Learning application with Virtual Reality as a form of e-learning development in the learning process.

VIRTUAL REALITY is an e-learning application created and developed by the ICT directorate which is specifically designed for the learning process according to the needs of the community. The main purpose of the Virtual Reality application is to support the learning process, which includes some contents that support the learning process such as lecture materials, lecture assignments, lecture notes, evaluations, attendance, and discussion forums. Virtual Reality is directly integrated into Academic Information System (SIAK), so this application can only be accessed and used by students who have enrolled courses at SIAK. The use of the Virtual Reality application has been running for approximately 5 years and has been widely implemented in every department/study program in the academic community, including the Agroindustry Technology Education Study Program.

The use of e-learning in Virtual Reality is still supported for face-to-face learning, but it can be a new type of learning that is more independent and allows students to conduct self-regulated learning. However, it is still unknown whether using Virtual Reality, self-regulated learning for students can be developed and which self-regulated learning factors can develop students' self-regulated learning abilities after using the Virtual Reality application. This study aims to determine the dominant self-regulated learning factors by students at the Mandarin Language Education after

using Virtual Reality and to determine students' self-regulated learning abilities after using Virtual Reality.

## 2. METHOD

### 2.1. Research design

This research design type is a quantitative descriptive research using *Likert* scale questionnaires in collecting data which is distributed to the Mandarin Learning Education students who actively use the Virtual Reality application. The results of data collection were analyzed by the descriptive percentage analysis method. Descriptive percentage analysis is used to find out how many factors can lead to self-regulated learning abilities in Mandarin Learning Education students after using the Virtual Reality application, which can then be seen which self-regulated learning abilities are dominant in students.

### 2.2. Place and time of research

This research was conducted at the Mandarin Language Education Study Program, Faculty of Letters, Universitas Negeri Malang.

### 2.3. Research Sample

To determine the sample in this study, a purposive sampling technique was used, where the sample was taken according to the research objectives, namely students who actively use and utilize the Virtual Reality application. The data in this study were obtained from the 2014 and 2015 Mandarin Language Education Student respondents who have used the Virtual Reality application in the 2016/2017 odd semester learning.

### 2.4. Data Collection Technique

The data collection technique used in this study was through the distribution of a questionnaire consisting of 2 questionnaires, namely a questionnaire about the use of the Virtual Reality application and a questionnaire about the self-regulated learning abilities of Mandarin Language Education students. And as for the Virtual Reality user, data were taken from the ICT (Information Communication Technology) directorate as supporting data in this research. The validation of the questionnaire was carried out by a judgment expert.

### 2.5. Research Instruments

#### 2.5.1. Questionnaire

This questionnaire consisted of 2 questionnaires that were used to obtain data about users of the Virtual Reality application and self-regulated learning for Mandarin Learning Education students. The first

questionnaire was a questionnaire on the use of the Virtual Reality application which contained 25 questions. This questionnaire was used to determine the extent of knowledge and the use of the Virtual Reality application by students of Mandarin Learning Education. The second questionnaire was a questionnaire about self-regulated learning which was related to the use of the Virtual Reality application. This questionnaire contained 35 questions with a *Likert* scale of 1 – 4 (never, sometimes, often, and always). This questionnaire was used to determine students' self-regulated learning abilities that could appear after students used the Virtual Reality application, which would later be processed and analyzed. The questionnaire grid is presented in table 1.

**Table 1.** Virtual Reality Application Questionnaire Grid

No	Dimension	Indicator
1	Readiness	1. Tool Use Facility 2. Time Spent
2	Cognition	1. Application Concept Knowledge 2. App Content Knowledge
3	Application	1. Describe App Content 2. Accuracy Of Application Usage
4	Satisfaction	App Usage Effect

**Table 2.** Self-Regulated Learning Questionnaire

No	Dimension	Indicator
1	Cognitive	1. Goal setting and planning 2. Rehearsing and memorizing 3. Organizing and Transforming 4. Self-Evaluation
2	Motivation	1. Self-Consequence 2. Environmental Structuring
3	Attitude	1. Keep Records And Monitoring 2. Reviewing Record 3. Other

#### 2.5.2. Virtual Reality User Data

VIRTUAL REALITY user data was obtained from the Directorate of ICT which handles Virtual Reality where the number or percentage of students and lecturers of Mandarin Education is active in accessing the Virtual Reality application. Furthermore, the data could be a support in describing or analyzing research results.

### 2.6. Data Analysis

Descriptive data analysis through descriptive percentages was undergone to find out how much the

application of Virtual Reality application was used in the development of self-regulated learning for agro-industry technology education students. The steps taken in using this analytical technique according to Ghazali [3] are as follows:

- a. Collecting questionnaires that have been filled out by respondents by checking for completeness.
- b. Change the qualitative score into a quantitative score based on the *Likert* scale used.
- c. Make a score- tabulation.
- d. Entering in the descriptive formula the percentage that is

$$P = \frac{\sum x}{\sum xi} \times 100\% \tag{1}$$

In equation 1, the value of P is the value, where P is the score where x is the amount of feedback in a question, while the value of xi is the ideal total value.

### 3. FINDINGS AND DISCUSSION

Based on the results of an interview with the person in charge of the Virtual Reality application program from SIPEJAR UM, it is known that Integrated Online Learning (Virtual Reality) Universitas Negeri Malang is an e-learning application in the context of a learning management system designed to facilitate learning in a learning mode, remote, independent, and flexible. Integrated Online Learning serves as a supporting tool for direct learning media used in face-to-face lectures. Thus, students need to fulfil several aspects to carry out in learning using the Virtual Reality application, namely readiness, cognition, implementation, and satisfaction. The percentage of aspects of the use of Virtual Reality for Mandarin Language Education Study Program students is presented in Table 3.

**Table 3.** The Percentage of Aspects of the Use of Virtual Reality for Mandarin Language Education Study Program Students

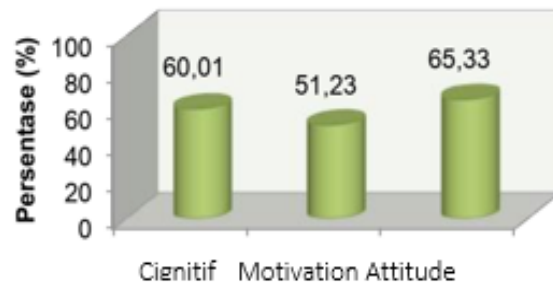
Aspects Of Use	Percentage (%)	Criteria
Readiness	83.09	very high
Cognitive	92.48	very high
Implementation	61.48	good enough

Seeing the high results obtained from each of these aspects, the application of Virtual Reality is expected to help develop the self-regulated learning abilities of Mandarin Learning Education students. Based on the readiness aspect, it shows that almost all students have the tools and facilities to be able to use the Virtual Reality application. Students have also managed the time of using this application well. Then from the cognitive aspect, it can also be seen that Mandarin Language Education students have known and understood the concepts and contents of the Virtual

Reality application. In the implementation aspect, it can also be seen that students can describe the function of the Virtual Reality application. The results of the questionnaire show that students use Virtual Reality to obtain lecture materials while the task upload feature is rarely used because this is related to assignments from the lecturer.

### 3.1. Self-Regulated Learning Factors and Ability

The factors analyzed in this study are cognition, motivation, and behavior as developed by Wolters et al. [4]. The indicators included in the cognitive factors are goal setting and planning, rehearsing and memorizing, organizing and transforming, and self-evaluating. Then the indicators included in the motivational factors are the self-consequence, seeking social assistance, and environmental structuring. Meanwhile, indicators that include behavioral factors are keeping records and monitoring, seeking information, reviewing records, and other/help-seeking. The percentages of the three factors of self-regulated learning ability are presented in Figure 1.



**Figure 1** Percentage of Ability Factors

Based on these three factors, in this study, there are 11 indicators to measure the self-regulated learning ability of the Mandarin Language Education students taken from [4] strategy as presented in Table 4.

**Table 4.** Percentage and Category of Self-Regulated Learning Ability of Mandarin Language Education Students After Using the Virtual Reality Application

No	Indicator	Percentage (%)	Category
A	Goal setting and planning	69.83	High
B	Rehearsing and memorizing	56.86	enough
C	Organizing and Transforming	70.59	High
D	Self-Evaluation	68.38	High
E	Self-Consequence	57.54	Enough
F	Seeking Social Assistance	42.30	Low

No	Indicator	Percentage (%)	Category
G	Environmental Structuring	60.91	Enough
H	Keep Records And Monitoring	59.56	Enough
I	Seeking information	70.59	High
J	Reviewing Record	66.09	High
K	Other	64.71	Enough

Table 4 shows that there are 2 indicators of student SRL ability with the highest percentage and category, namely the ability to organize and transform (organizing and transforming) (70.59%) and Seeking Information (looking for information) of (70.59%), while the indicator of ability Students' self-regulated learning with the lowest percentage is seeking social assistance (42.30%).

### 3.1.1. Goal Setting and Planning

Goal setting and planning is an attempt to set goals and plans to rank priorities and manage time to complete tasks [5] Goal setting and planning is also a self-initiative from students in determining learning goals and planning time and activity for goal completion [6]. Based on Table 4, Mandarin Education students who have used the Virtual Reality application have high goal setting and planning abilities with a percentage of 69.90%. Setting goals in learning is the first step in the process of creating self-regulated learning [5]. The ability to set goals and study plans is a very important initial ability possessed by a self-regulated learner. The most dominant aspect in the indicator is timing in completing assignments, for example, when a lecturer assigns students to send assignments through the Virtual Reality application, the maximum limit is set and students cannot upload assignments after the specified time limit. This shows the role of other people, namely lecturers and college friends, as well as the environment in the form of Virtual Reality. This is an external influence that affects self-regulated learning in students because self-regulated learning is not only determined by personal processes but is also influenced by the environment and behavior reciprocally [7]. This aspect can foster student discipline, where self-discipline or volition is another important factor that can affect self-regulated learning state that many researchers agree that the most fundamental aspect of self-regulated learning is goal-focusing [8]. Self-regulated learning is an active and independent effort of students by monitoring, regulating, and controlling cognition, motivation, and behavior that is oriented or directed at learning goals [9]. Thus, students must first have a fixed goal so that they can make efforts to develop the self-regulated learning abilities that exist in students.

### 3.1.2. Rehearsing and Memorizing

Rehearsing and memorizing are a student's self-initiative in trying to remember the material by practicing or studying the material repeatedly until he can remember or memorize it with friends or study alone [10]. Table 2 shows that Mandarin Learning Education students who have used the Virtual Reality application have the ability to rehearse and memorize at a percentage of 56.86%. The most dominant aspect of rehearsing and memorizing abilities in this indicator is remembering material by self-study (58.82%) because the Virtual Reality application is used to obtain lecture material.

Self-regulated learning abilities in the form of rehearsing and memorizing Mandarin Language Education students after using the Virtual Reality application get low results because although there are discussion features, they are rarely used this application but these features are also rarely used. Students and lecturers prefer to use other applications found on mobile phones for reasons of practicality and convenience.

### 3.1.3. Organizing and Transforming

Organizing and transforming are effort to rearrange material that has been received and rewritten so that it is easy to understand [11]. Table 2 shows that Mandarin Education students who have used the Virtual Reality application have organized and transformed abilities with a percentage of 70.59%. This indicator is one of the most dominant indicators that appear in Mandarin Education students after using the Virtual Reality application with the dominant aspect of rearranging the material that has been obtained from Virtual Reality (81.86%).

Students who have self-regulated learning can be observed from the form of actions or actions that lead to the achievement of learning goals [12]. Characteristics of students who have high self-regulated learning include students who will be accustomed to repetition, elaboration, and organization in following the learning process (Montalvo & Tores, 2004). In addition to rearranging the materials that have been obtained from the Virtual Reality application regularly, there is also another aspect in this indicator of organizing and transforming abilities, namely rewriting the material

### 3.1.4. Self-Evaluating

Self-evaluating is an attempt to evaluate the quality of the task or the progress of the tasks and learning that have been implemented (Zimmerman, 1990). Self-evaluating is also a student's self-initiative in evaluating progress or reviewing the efforts and results of efforts made in doing an academic activity [10]. This ability to

evaluate is important for students to have in growing self-regulated learning because it can train self-initiative to be more careful when carrying out the learning process so that students can regulate their cognition well. In the learning process, someone who has self-regulated learning can build learning goals, he tries to monitor, regulate and control his cognition, motivation, and behavior to control the goals that have been made [11].

Table 4 shows Mandarin Education students who have been using SIPEJAR have high self-evaluation ability with a percentage of 68.38. The most dominant aspect is evaluating the quality or progress of lecture assignments (77.45%). Self-regulated learning is an individual learning process that is carried out independently and planned in compiling a series of learning activities following predetermined goals, which then after the goals are achieved, is followed by evaluating the results to be improved to achieve optimal results. Students who use the self-regulated learning method have an awareness of the results of their performance. The most basic aspect of self-regulated learning is goal-focused, so evaluating is the best way to achieve its goals [12].

### *3. 1.5. Self-Consequence*

Self-consequence is the ability of students to arrange and predict rewards or punishments for success or failure experienced in learning activities [11]. Self-consequence is important because it aims to make students survive and be more enthusiastic in learning and complete learning targets. After all, some rewards or pleasures will be given by themselves. Table 4 shows Agro-industrial Technology Education students who have used SIPEJAR can self-consequence with a percentage of 57.54% with the most dominant aspect is compiling and predicting the benefits that will be obtained if using SIPEJAR (78.43%). Students in their development are categorized into late teens that are in the range of 18-21 years. At this stage, individual development is marked by the search for self-identity, the influence of the environment, and starting to be able to make decisions for him/herself.

Another aspect that is dominant in the cell consequence indicator is the expectation of getting additional grades from the lecturer with a percentage of 40.20. This aspect shows a consequence in the form of gifts that students think of, namely that if students often open and use SIPEJAR, they will get additional value from their lecturers. However, this aspect gets a low percentage because it turns out that this self-consequence ability is the provision of consequences by imagining the rewards or pleasures that will be given by oneself and not others. In this aspect, the benefits or rewards that students will get come from other parties, namely lecturers, meaning that these benefits or rewards

do not come from the students themselves. In contrast to the aspects previously discussed where the benefits that students get come from themselves to create motivation in students to be able to organize or manage themselves in achieving their learning goals.

Motivation is the core of self-management in learning (self-regulated learning), where through motivation students are willing to take action and take a responsibility for the learning activities they do. As defined, that self-regulated learning is defined as a form of individual learning that depends on learning motivation

### *3. 1.6. Seeking Social Assistance*

Seeking social assistance is an attempt to seek or ask for help from peers, lecturers, and others when they encounter learning difficulties. Ability to seek social assistance is a student's self-initiative in getting help from friends, lecturers, or other people when experiencing learning difficulties that can affect the activities of the learning process. Table 2 shows Mandarin Language Education students who have used SIPEJAR can seek social assistance with a percentage of 42.30% with the most dominant aspect of ability being discussing mathematics and lectures obtained from SIPEJAR with classmates (55.88%).

Another aspect of the seeking social assistance indicator that is not dominant and is included in the low category is discussing material with lecturers in the "discussion forum" at SIPEJAR (34.56%). The Mandarin Language Education students did not take full advantage of the content of the "discussion forum" in SIPEJAR optimally. This may be because the direct discussion process is more effective and efficient than discussing through the content of the "discussion forum" on SIPEJAR. However, Mandarin Language Education students have implemented social interactions such as discussing both with classmates and with teachers in the learning process. Social interaction with classmates/college students can affect learning strategies in the development of student self-regulated learning [13]. Peers and groups have the potential to encourage more motivation in learning. With frequent discussions between groups consisting of classmates, it can increase the self-regulated learning ability factor in students.

### *3. 1.7. Environmental Structuring*

Environmental structuring is an attempt to regulate the learning environment to make learning easier and more comfortable. Table 4 shows Mandarin Education students, who have used SIPEJAR, have sufficient environmental structuring ability with a percentage of 60.91% with the most dominant aspect being to organize and choose a comfortable environment or place to use SIPEJAR (67.16%). Mandarin Education students

use the SPOT UPI application more often when they are at home. If students can find and choose a good environment (e.g. environmental structuring), it means that students can avoid distractions during the learning process, and arrange a comfortable environment for learning, then the effort to learn will run optimally. By maintaining the learning process, the learning objectives will be achieved. Therefore, the ability to find and choose the environment (e.g. environmental structuring) is important for a self-regulated learner because according to cognitive social theory, self-regulated learning is not only determined by personal processes, but is also influenced by the environment and behavior reciprocally.

### *3. 1.8. Keeping Records and Monitoring*

Keeping records and monitoring or making and checking records are an effort made to record and monitor events or learning outcomes received during the learning process [11]. Keeping records and monitoring are a student's self-initiative in trying to record or have notes on a learning outcome. Table 2 shows that Mandarin Language Education students who have used SIPEJAR have sufficient ability to keep records and monitoring with a percentage of 59.56% with the most dominant aspect being monitoring the existence of new lecture materials distributed by lecturers at SIPEJAR (66.67%).

### *3. 1.9. Seeking Information*

Seeking information or looking for information is an attempt to obtain information following the tasks performed from other reference sources [11]. Seeking information is also a student's self-initiative in seeking helpful or useful information from non-social sources of information while working on assignments. Table 2 shows that Mandarin Language Education students who have used SIPEJAR can seek information of 70.59% and become the most dominant indicator or ability. This is because students use the SPOT application to find learning resources.

Regarding the individual's ability to recognize the resources contained in the environment, Zimmerman [11] uses the term 'resourcefulness' which refers to the ability to control the physical environment around him in terms of limiting distractions that interfere with learning activities, and successfully seek and use references and skills needed to master what is learned.

### *3. 1.10. Reviewing Records*

Reviewing records or checking notes and textbooks is an attempt to reread notes to study material that has been obtained for study or exam preparation. Reviewing records is a student's self-initiative in trying to reread exam questions, notes, or textbooks to prepare for the

exams that will be faced. Table 2 shows that Mandarin Language Education students who have used the SIPEJAR application have high record-keeping abilities with a percentage of 66.09% with the most important aspect being studying material from SPOT UPI lectures for exam preparation (75.98%). In the learning process, exams are activities or stages in learning that aim to see, assess and evaluate the abilities and results of the learning process that has been carried out by students. So, to get maximum results, students will certainly make strategies or efforts to get these maximum results. By reviewing these records, students will be more prepared and confident in facing exams. Thus, creating the idea that the opportunity to get optimal results is very large and the learning objectives in a self-regulated learner can be achieved.

### *3. 1.11. Other (Help-Seeking)*

Other (help-seeking) is behavior that is initiated by other people such as friends, teachers, parents, or other people. For example, students do assignments on the instructions of lecturers, or other examples of self-initiative to imitate the way of learning applied by other people. Although this strategy is not an initiative from oneself, the actual decision to follow or not follow the direction of others lies with the students themselves. Table 4 shows that Mandarin Language Education students who have used SIPEJAR have other abilities (help-seeking) of 64.71% with the most dominant aspect being learning behavior initiated by other people (70.59%), namely Mandarin Language Education students using SIPEJAR if any instructions from the lecturer. Meanwhile, for other aspects of other abilities (help-seeking), students try to imitate the learning method of friends who are diligent and achievers, getting a percentage of 58.82%.

The development of one's learning abilities can come from the actions of others, namely in the form of instructions and guidance or directions from teachers or lecturers. These instructions and guidance can encourage learners to be able to better master a lesson. [13]. Learners acquire self-regulated learning skills and strategies quickly from social sources such as observing or imitating the learning process of others, verbal descriptions, and reciprocal social guidance [14]. The results on this aspect indicate that students of Mandarin Language Education after using SIPEJAR have sufficient self-regulated learner behavior as stated in the theory above. With this behavior, it is hoped that it can generate motivation in students so that they are moved to continue to improve the quality of their learning so that students' self-regulated learning abilities can develop.

#### 4. CONCLUSIONS

Behavioral factors are the most dominant self-regulated learning factors in Mandarin Education students after using VR in learning with a percentage of 65.33%. There are two dominant self-regulated learning abilities in Mandarin Language Education students after using VR media in learning, namely organization and transforming (organizing and transforming) and seeking information (looking for information) of 70.59%.

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