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# Development of Virtual Reality Technology in Entrepreneurial Learning Containing Ethnpreneurship

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*Abstract:* - Although many studies on entrepreneurship learning have been conducted, no ethnpreneurship-loaded entrepreneurial learning module uses virtual reality media. This research aims to develop an entrepreneurship learning module with Virtual Reality-assisted Ethnpreneurship. This study adopted the research development of the Borg and Gall model using four stages (data collection, planning, product draft development, and field trials). The data was collected through instruments that included a literature review, an expert validity test, and a questionnaire followed by descriptive analysis. The results showed that developing entrepreneurship learning modules containing Ethnpreneurship assisted by Virtual Reality was effectively used in learning to increase entrepreneurial intentions. Research implications and recommendations are also discussed for future research.

*Key-Words:* - learning modules, entrepreneurship, ethnpreneurship, virtual reality.

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## 1 Introduction

Based on 2019 statistical data, the open unemployment rate in Indonesia reached 6.25% of the total workforce. Judging from the level of education, the highest unemployment is high school graduates at 6.78%, vocational graduates at 8.63%, diploma graduates reaching 6.89%, and graduates from higher education at least 6.24%, [1]. BPS data shows the highest percentage of unemployed Vocational High School (SMK) graduates. Several factors cause the number of SMK graduates to be unemployed. The first factor is cultural barriers related to the culture that develops in society, such as parents' pride when their children are accepted as employees, [2], [3]. The second factor is formal education which is considered unable to produce graduates ready to work. In contrast, the third factor is related to the inability of graduates to meet the quality desired by the market, [4], [5].

Entrepreneurial intentions can be built through education and fostered through the learning process, [6], [7], because the better the learning about

entrepreneurship education received by students, the better the entrepreneurial intentions of students will be, [8], [9]. If education can provide adequate knowledge and inspiration, the intention to become an entrepreneur as a career choice will increase. Educational institutions must encourage the development of creative entrepreneurial ideas, provide the necessary knowledge about entrepreneurship and provide entrepreneurial skills. However, entrepreneurship learning applied in vocational schools is limited to theoretical and has yet to reach the practical stage, even though the implementation of entrepreneurship must be done in practice, [10], [11], [12].

In addition, entrepreneurship development based on identity and culture still needs to be improved and taught through formal education, especially in vocational schools, even though local entrepreneurship must be applied to the community to enrich entrepreneurship nationally. The challenge for Vocational Schools in the future must be to produce high-quality outputs that can synergize with the

business world and the industrial world, [13], [14]. Thus, these outcomes can create new jobs for themselves and others to contribute to employment and reduce unemployment problems, [15], [16], [17]. In the use of entrepreneurship learning modules, teachers still utilize existing ones but have yet to find any learning modules that contain entrepreneurship from the local culture. In addition, virtual reality applications have never been used as a medium for entrepreneurship learning in vocational schools.

## 2 Literature Review

Behavioristic learning theory and constructivism, the basis of this research, are associated with these two learning theories in compiling ethnopreneurship learning modules that are charged with virtual reality. Recent educational programs to overcome employment problems and build the local economy are massive, starting from the primary, secondary, and higher education levels. Entrepreneurship education is delivered in various forms and sizes and carried out by many private and public entities, [18], [19]. Many approaches are used in these programs: face-to-face, classroom, online, business simulation, and more.

Within a given industry, approaches to startup training vary, [20], [21]. For example, some microfinance organizations offer classroom training, [22], and others offer it as part of regular group meetings, [23], [24], some mandatory and some elective, [25]. The need for and demand for entrepreneurship education and training continues to grow, although the results of behavior evaluations across these programs are often not tracked. Entrepreneurship Education in Vocational Schools through Creative Products and Entrepreneurship Subjects (PKK) is based on the 2013 curriculum structure, which groups PKK subjects for SMK/MAK students into compulsory group subjects. This subject aims to support one of the government's programs to increase the skilled workforce and have an entrepreneurial spirit.

"Ethnopreneurship" was first proposed by [26], by involving a specific triangulation of culture, identity, and market, [26]. The concept of Ethnopreneurship is presented in Figure 1.



Fig. 1: The concept of Ethnopreneurship

Activities that combine identity, culture, and market are the elaboration of the concept of ethnopreneurship. An area, of course, has its peculiarities, both domestically and abroad. On the other hand, according to [27], ethnopreneurship is the ability to create something new in solving problems to provide benefits and added value and create ethnographic-based jobs (local wisdom and ethnicity). At the same time, an ethnopreneur makes something new in solving problems. To provide help, add value, and create ethnographic-based jobs (local wisdom and ethnicity). So in this section, ethnopreneurship and ethnopreneur in the Indonesian context are focused on innovation and creativity to open a business by offering products and services based on local wisdom and local culture.

The module as a learning resource is a tool that cannot use alone, so learning resources can make it easier for students to collect information in learning activities, [28], [29]. Meanwhile, [30], suggests that learning resources are created to make it easier for students to gain knowledge in teaching and learning activities in the classroom. Based on this understanding, learning resources are tools designed to promote learning activities in the school. Educators created learning resources to help educators provide learning to students. Of course, the learning materials made by the teacher must adapt to the conditions of the class or the learning material being studied in the classroom.

Virtual Reality (VR) is a technology in telecommunications, information, and communication that allows users to interact with an environment that is simulated by a computer so that the user seems to be physically involved, [31], [32]. The use of VR technology has several advantages, including saving costs, saving time, and saving energy. To create an atmosphere close to or resembles the real world, VR

uses special hardware such as VR glasses as displays and joysticks to move and interact.

The workings of a virtual reality system are that the user sees a pseudo world on VR glasses which is a dynamic image. A computer generates a 3D environment where the user can participate in real-time and experience the sensation of being there. The two most important things to consider when creating or using VR are real-time 3D virtual environments and human interface devices that connect users. The user can hear realistic sounds through the headset or speakers, move around the virtual world, and interact using a joystick.

Entrepreneurship material is one of the compulsory subjects in Vocational High Schools. The lack of learning materials used as references for learning entrepreneurship causes students to find it challenging to learn this material. In addition, the less-than-optimal use of digital media, such as smartphones in classroom learning and Virtual Reality technology, makes learning activities less innovative and optimal. Developing an entrepreneurial learning module containing ethnopreneurship assisted by virtual reality will provide alternative solutions in improving students' entrepreneurship attitudes, entrepreneurial intentions, and startup abilities.

### 3 Research Method

This study's research type uses research and development methods or Research and Development (R & D). R & D is a research method used to produce specific products and test the effectiveness of these products, [33]. The development model Borg and Gall consist of ten implementation steps shown in the following chart (Figure 2):

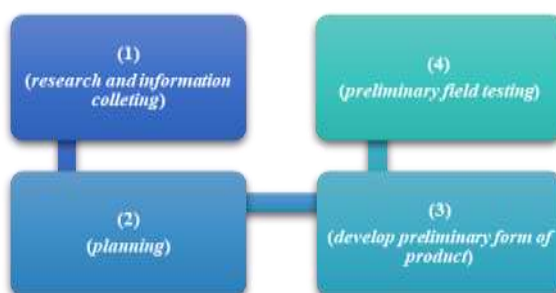


Fig. 2: Research Model

The initial step in this development is collecting data covering several things, namely needs measurement, literature study, research on a small scale, and considerations in terms of value. The first is material selection. The material to be developed in this R & D is Entrepreneurial Attitude and Behavior and Business Opportunities. The second school selection, the school chosen was SMK Negeri 8 Bandar Lampung.

Based on the data collection that has been done, a product plan/design is made, including a). The purpose of using learning modules for Creative Products and Entrepreneurship Subjects is to provide teaching materials in the form of learning modules as companions and references in the learning process and also as an effort to improve student learning outcomes. b). Users of the Entrepreneurship Subject learning module containing ethnopreneurship assisted by Virtual Reality are class XI Vocational High School (SMK) students. c). The product component does learning modules for Creative Products and Entrepreneurship Subjects with Virtual Reality-assisted ethnopreneurship for class XI Vocational High School (SMK) students. So that there will be 2 (two) products, namely learning modules and Virtual Reality Applications. If the preparatory steps are completed, the next step is to carry out the development stage of learning modules and Virtual Reality applications. Furthermore, expert validation and field tests were conducted on students to determine whether the product and its completeness were valid or invalid.

### 4 Results and Discussion

Entrepreneurial intentions can be built through education and fostered through the learning process, [6], [7], because the better the learning about entrepreneurship education received by students, the better the entrepreneurial intentions for students, [8], [9]. If education can provide adequate knowledge and inspiration, the intention to become an entrepreneur as a career choice will increase. Educational institutions must encourage the development of creative entrepreneurial ideas, provide the necessary knowledge about entrepreneurship and provide entrepreneurial skills.

Based on preliminary research by providing questionnaires to vocational entrepreneurship teachers

regarding learning problems that occur in vocational schools, it was obtained data that applied learning took place by utilizing various kinds of learning media such as using PowerPoint media, videos, and the use of the surrounding environment. In addition, learning uses learning models and methods such as discussion, picture and picture, problem-based learning, and project-based learning. In the use of entrepreneurship learning modules, teachers still use existing modules such as from textbooks. No entrepreneurship learning module has been found that contains examples of entrepreneurship from local Lampung or Lampung culture. In addition, virtual reality applications have never been used as a medium for entrepreneurship learning in vocational schools.

Entrepreneurship learning in Vocational High Schools is still glued to existing textbooks, even though teachers are given the authority to develop teaching materials adapted to environmental conditions and situations. Teaching materials must be related to the environment and conditions around students in daily life practices, [34], [35], [36] such as business ideas, creative products., entrepreneurial character, and success stories from the local Lampung area. Things like that are called ethnopreneurship, a person's ability to create something new in solving problems to provide benefits and added value and create ethnography-based jobs (local wisdom and ethnicity), [27].

Learning activities with entrepreneurship integration, in addition to making students master the targeted competencies (materials), are also designed and carried out to make students recognize, realize, and internalize entrepreneurial values and make their actual behaviors. Learning materials related to norms or values in each subject need to be developed, made explicitly, and linked to the context of everyday life. Thus, entrepreneurial-minded learning is not only found at the cognitive level but also touches on internalization and authentic experiences in students' daily lives. Through this effort, it is expected to be able to foster entrepreneurial interest in students. This entrepreneurial interest encourages the creation of entrepreneurs who can create jobs for themselves and others.

One way to overcome problems that teachers in SMK can is to develop a module that contains ethnopreneurship using virtual reality. Through modules containing ethnopreneurship using virtual reality and its implementation in learning, teachers

build students' positive perceptions about entrepreneurship, generate entrepreneurial intentions and provide entrepreneurial skills by ensuring products stimulate students to pursue entrepreneurship and live independently.

In the context of the society in Lampung Province, inculcating entrepreneurial values through ethnopreneurship learning becomes very important, considering that Lampung Province consists of various ethnic groups and has multiple local and cultural characteristics. However, this needs to be adequately explored, which results in limited ideas in bringing up local culture and wisdom as an alternative for entrepreneurship development using virtual reality from an early age by vocational students in Lampung Province. The following is an application that can be used as a learning module for vocational school teachers in learning entrepreneurship can use. The concept of Ethnopreneurship is presented in Figure 3.

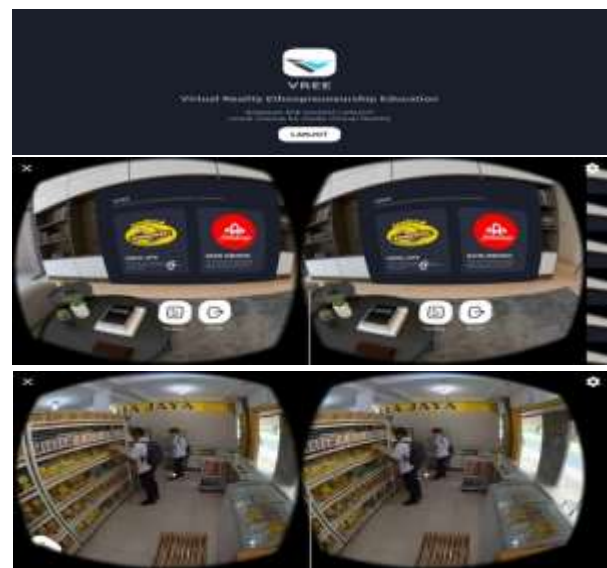


Fig. 3: Ethnopreneurship-laden Virtual Reality Applications

The Entrepreneurship Module developed and used as a reference for research is the following materials presented in Table 1:

Table 1. Basic Competencies and Indicators

Basic Competency	Indicators
Understanding entrepreneurial attitudes and behavior	Understanding entrepreneurs and entrepreneurship
	Identify entrepreneurial attitudes and behaviors
	Understanding the characteristics of entrepreneurs
	Identify entrepreneurial successes and failures
Presenting entrepreneurial attitudes and behavior	Identify entrepreneurial behavior
	Presenting entrepreneurial attitudes and behavior
Analyze business opportunities for goods/services	Explain business opportunities and risks
Determine business opportunities for goods/services	Explain the factors of business success and failure
Presenting entrepreneurial attitudes and behavior	Developing business ideas and opportunities
	Analyze business opportunities

After the material is determined, the next stage is designing the module, and testing is done by expert validation consisting of media experts, material experts, linguists, and expert practitioners. The next step is to test the validity of the attitude instrument, entrepreneurial intention, and startup capacity.

#### 4.1 Media Expert Validation

Media experts validated the functions and benefits of the media, media appearance, and media effectiveness. 2 (two) expert validators carried out the media expert validation. The assessment was carried out using a questionnaire in the form of a questionnaire. Media experts study the content of the media and its suitability with the media for entrepreneurship learning modules containing Etnopreneurship assisted by Virtual Reality Vocational High Schools (vocational high schools). The results of the assessment by media experts can be seen in Table 2.

Table 2. The results of the media expert's assessment

No	Aspects assessed	Validat or Score		Average	Feasibility Score
		1	2		
1	Media reveals the character of objects with everyday life	4	4	4	Good
2	The arrangement of paragraphs in the media is correct	4	4	4	Good
3	The suitability of the media to the needs of students	4	4	4	Good
4	The media describes the contents/teaching materials through illustrations of everyday life	3	4	3,5	Pretty good
5	Appropriateness of the size of the font/writing	4	4	4	Good
6	Attractive media cover display	4	3	3,5	Pretty good
7	The attractiveness of the placement of pictures and illustrations	3	4	3,5	Pretty good
8	The media title color contrasts with the background color	4	4	4	Good
9	Don't use too many fonts	5	5	5	Very good
10	The use of variations of letters (bold, italic, all capital, small capital) is not excessive.	4	4	4	Good
11	Spacing between text arrangements is normal, and spacing between letters is normal.	4	5	4,5	Good
12	Shape, color, size, and proportion of objects/images according to reality	4	4	4	Good
<b>Overall Score</b>		<b>47</b>	<b>49</b>	<b>96</b>	<b>Good</b>
<b>Average</b>		<b>4,8</b>			
<b>Percentage value (%)</b>		<b>96,0%</b>			
					<b>Very Valid</b>

Based on the material expert recapitulation table for entrepreneurship learning module media filled with Etnopreneurship assisted by Virtual Reality Vocational High Schools (vocational high schools), an average of 4.8 is obtained with the criteria of "Good" and a percentage value of 96% with a validation level of 96.0% which can be declared "Very Valid."

## 4.2 Material Expert Validation

Material expert validation was carried out by 2 (two) validators. The validation covers several aspects related to the material displayed in the entrepreneurship learning module containing Ethnpreneurship assisted by Virtual Reality Vocational Schools (Vocational High Schools), namely as follows:

Table 3. Expert practitioner test results

No	Rated aspect	Skor	Kelayakan
1	KI & KD compatibility	4	Good
2	Material accuracy	4	Good
3	Supporting learning materials	5	Very good
4	Material updates	4	Good
5	Presentation technique	5	Very good
6	Material presentation support	4	Good
7	Presentation of Learning	4	Good
8	straightforward	5	Very good
9	Communicative	4	Good
10	Interactive	5	Very good
<b>Overall Score</b>		<b>44</b>	<b>Good</b>
<b>Average</b>		<b>4.4</b>	
<b>Percentage value (%)</b>		<b>88,0%</b>	<b>Very Valid</b>

The expert practitioner test results are presented in Table 3. Specifically, expert practitioners give a score with an average of 4.4, which can be said to be "Good" with a validation level of "Very Valid" so that the entrepreneurship learning module containing Ethnpreneurship assisted by Virtual Reality can be used.

## 4.3 Module Improvement Suggestions

After material, media, linguists, and practicing experts have validated the product design, the researcher revises the developed product design. As for the recapitulation of suggestions from experts, namely:

### 4.3.1 Media Expert Advice

In addition to providing an assessment of media experts, they also provide advice related to the entrepreneurship learning module containing Ethnpreneurship assisted by Virtual Reality, namely as follows in Table 4:

Table 4. Suggestions for improvement of media experts

No	Improvement suggestions	Repair Results
1.	The appearance of the cover is improved to avoid plagiarism	Already repaired
2.	Writing letters and font sizes to be equated	Already repaired
3.	Color selection, please be adjusted	Already repaired
4.	Please pay attention to spacing	Already repaired
5.	Several images have not been written as a description of the image	Already repaired

### 4.3.2 Material Expert Advice

In addition to conducting assessments, material experts also provide suggestions and comments. These suggestions are used as the basis for improving the entrepreneurship learning module containing Ethnpreneurship assisted by Virtual Reality, while the suggestions given by material experts are as follows in Table 5:

Table 5. Material expert suggestions for improvement

No	Improvement suggestions	Repair Results
1.	Pay attention to material selection	Already repaired
2.	Pay attention in giving assignments	Already repaired
3.	At the beginning of the chapter should be given an outline of the content	Already repaired

### 4.3.3 Linguist

The suggestions given by linguists related to the entrepreneurship learning module containing Ethnpreneurship assisted by Virtual Reality, while the suggestions given by linguists are as follows in Table 6:

Table 6. Suggestions for improvement of linguists

No	Improvement suggestions	Repair Results
1.	Please correct the writing using standard words	Already repaired
2.	Adapt to the development of students	Already repaired
3.	Pay attention to fragments of words that are not standard	Already repaired
4.	Pay attention to the lack of lettering and spelling	Already repaired



#### 4.3.4 Expert Practitioner

In addition to conducting assessments, expert practitioners also provide suggestions and comments. These suggestions are used as the basis for improving the entrepreneurship learning module containing Ethnopreneurship assisted by Virtual Reality, while the suggestions given by expert practitioners are as follows in Table 7:

Table 7. Suggestions for improvement of material experts

No	Improvement suggestions	Repair Results
1.	There aren't any	There aren't any

#### 4.3.5 Expert Validation Test Recapitulation

Based on the results of the validation test of media experts, material experts, linguists, and practitioners, the average percentage can be summarized in Table 8.

Table 8. Recapitulation of the validation test results of media experts, material experts, linguists, and expert practitioners

No	Expert Validation	Average	Criteria	%	Validation Level
1.	Media Expert Validation	4,8	Good	96,0%	Very Valid
2.	Material Expert Validation	4,4	Good	87,0%	Very Valid
3.	Linguist Validation	4,4	Good	87,0%	Very Valid
4.	Practical Expert Validation	4,4	Good	88,0%	Very Valid
	<b>Overall Average</b>	<b>4,5</b>	<b>Good</b>	<b>89,5%</b>	<b>Sangat Valid</b>

Based on the results of Table 8, it can state that the entrepreneurship learning module product containing Ethnopreneurship assisted by Virtual Reality can be said to be "Good," with an average result of 4.5 with a validation level of 89.5%, which is declared "Very Valid."

#### 4.4 Improved Learning Outcomes

This Virtual Reality-based learning module is said to be effective because it can increase learning outcomes by an average of 50%. This follows the opinion expressed by [37], that the learning module is a device that contains learning materials designed to

help students master competencies. In addition, another opinion was also expressed, [38], that a learning module is an object or object. Tools or devices teachers in the learning process can use to help teachers clarify the material being taught and make it easier for students to understand the learning material. The module developed is said to be effective and feasible, so this module can be able to facilitate students in the learning process in class.

The effectiveness of the Virtual Reality-based module in improving the learning outcomes of Class XI students at SMK N 8 Bandar Lampung After the research, there was an increase in the score of each student on the post-test compared to the results of the pre-test scores. The increase in the value of each student can be seen in Table 9:

Table 9. Increase in Student Learning Outcomes

No	Student's name (Initials)	Pre-Test	Post-Test
1	ALNA	50	70
2	RAMP	60	70
3	NGAKS	60	70
4	KSJA	50	70
5	CYAP	70	90
6	RRA	50	70
7	FPRA	60	70
8	BAA	50	70
9	AYA	60	90
10	RARM	80	90
11	EABM	70	90
12	AGSA	60	70
13	JAS	60	80
14	RAWP	50	80
15	CEAE	60	80
16	JRAK	70	90
17	SDAW	60	90
18	ZDA	50	70

In general, the development of Virtual Reality-based modules has a positive impact on increasing student scores. If viewed carefully, most students, and even all students, experienced a significant increase in grades, and an average of 50% got the same score as the minimum completeness criteria. This shows that this learning module has a good impact on the development of student learning outcomes in class XI at SMK N 8 Bandar Lampung. In addition, research,



[39], also shows that the developed virtual reality-based learning media has proven effective in improving student learning outcomes. So it can be concluded that the Virtual Reality-based learning module effectively improves student learning outcomes.

## 5 Conclusion

Based on the results of research that has been carried out regarding the effectiveness of the results of developing entrepreneurship learning modules containing Virtual Reality assisted Ethnpreneurship, as well as testing and analyzing the effect of entrepreneurship learning modules containing Ethnpreneurship assisted Virtual Reality on entrepreneurial intentions related to entrepreneurship learning modules containing Ethnpreneurship assisted Virtual Reality in vocational high schools there some validation results obtained. First, the results of the recapitulation of material experts received an average of 4.8 with the criteria of "Good" and a percentage value of 96% with a validation level of 96.0%, which can be declared "Very Valid." Second, the results of material experts assessed based on the aspect of conformity with students' level of development. The readability aspect had an average score of 4.5, "Good," so the entrepreneurial learning module containing Ethnpreneurship assisted by Virtual Reality could be "Very Valid" with a percentage value of 88 0%. Third, the results of linguists have an average score of 43.5 in the "Good" category, so the entrepreneurship learning module containing Ethnpreneurship assisted by Virtual Reality can be said to be "Very Valid," with a score of 87.0%. Fourth, the expert practitioner scored an average of 4.4, which is "Good," with a validation level of "Very Valid." Based on the four validation test results, it can be stated that the entrepreneurship learning module product containing Ethnpreneurship assisted by Virtual Reality can be said to be "Good," with an average result of 4.5 with a validation level of 89.5%, which is declared "Very Valid" so that the entrepreneurship learning module contains Ethnpreneurship. Assisted Virtual Reality can be used. This learning module can also effectively improve learning outcomes in vocational high school students with 82% achievement.

Suggestions are given to educators, and they should

be more creative and innovative in using technology as a learning medium. This is so as not to make students feel bored and tend to make students more interested in learning in class, especially entrepreneurship subjects. By doing this entrepreneurship learning module, it is expected to make teaching and learning activities more fun. Suggestions for future researchers to be able to conduct research similar to this study but with different subjects and locations because this research is still limited to learning in vocational high schools.

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