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### NEEDS ANALYSIS OF MIXED REALITY BASED LEARNING MODEL SAVAR

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**Abstract**. The purpose of this study is to analyze the needs for educational media that can enhance students' learning through mixed reality education using industrial control techniques. There are thirty research subjects at Politeknik Bosowa Makassar. This research is an R&D study using the SAVAR (*Substitution, Augmentation, Virtual Learning, Apply and Re-evaluation*) model. Mixed reality is a technology of unity Augmented reality and virtual reality. The results of this research are an analysis of the execution of the project and a study of the student's characteristics.

Keywords : SAVAR, Mixed Reality, Educational

### A. INTRODUCTION

Entrepreneurship education has now been widely introduced in various educational institutions in almost all disciplines and even throughout the world (Jaime De Pablo, Jose Luis Ruiz Real, 2019) and (Lackeus, 2015). Based on related research and government policies that have been described previously that special attention is needed to the learning process of entrepreneurship courses, especially in providing independent practice, namely business activities to students outside the campus with a learning model that is in accordance with student conditions with the hope that they will be more creative, collaborative, motivative and productive and have a sense of empathy in responding to social life in the community, However, among these studies related to the learning model of entrepreneurship courses in general, they do not have a learning management information system that can



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support the process of entrepreneurial learning activities of students outside the campus so that their activities are more controlled. Development of digital-based learning models using 4D in increasing student compotency 4C (Communication, Collaborative, Critical Thinking and Creativity) (Erdisna et al., 2022). Universities that have the concept of building community progress are expected to implement it in the curriculum. Entrepreneurship education is very important in cultivating an entrepreneurial spirit in students in higher education (Vodă & Florea, 2019).

The phenomenon of digitalization and the 4.0 Industrial Revolution, as has been explained, presents a global issue that generates various challenges, including in the realm of vocational education. Unemployment and labor absorption problems continue to threaten vocational education providers. This undoubtedly significantly impacts the Human Resources (HR) of vocational education graduates who need to fill these job opportunities. Vocational education graduates are expected to meet job competencies in line with the demands of the working world as preparation for their entry into the workforce. This forms the crucial basis for policymakers and stakeholders in vocational education to thoroughly prepare their graduates to compete in the Industry 4.0 era with a new framework. The conditions outlined above suggest the importance of mastering digital technology. The development of digital technology cannot be halted and continually evolves. The framework of digital technology can have both positive and negative effects depending on its purpose and management approach.

In the context of digitization, the 4.0 Industrial Revolution, and the postpandemic transition, adjustments can be made to the design of learning experiences. The instructional design within such contexts can be incorporated into a learning model. This is because a learning model directs towards a specific approach and distinctive learning methods, enabling the integration of digital-based learning approaches, as discussed earlier, along with post-pandemic life into the learning model. Learning models play a crucial role in achieving instructional learning objectives. Moreover, they assist and guide educators in selecting the components of the learning process, including techniques, strategies, and methods, to ensure the attainment of learning goals.

Mixed reality refers to an environment that combines elements from the real world and the virtual world, where virtual objects can interact with real objects within the same environment. This creates an experience that blends the physical and digital worlds simultaneously, allowing users to interact with digital content within the context of their real-world surroundings. Mixed reality technology encompasses a broad spectrum, ranging from augmented reality, where virtual objects are added to existing physical environments, to mixed reality, where virtual and real objects can interact with each other within an integrated environment.

Based on the aforementioned, this study develops a learning model with a digital-based learning approach by integrating learning materials into a digital



technology system. The expected outcomes of this research include a Mixed Reality-based Learning Model and suitable learning tools. The subsequent objective of this research is to contribute to the enhancement of the learning process in educational institutions, especially in vocational education relevant to the researcher's field of study, and to build digital competencies and human resources, which are characteristic of a global society.

### **B. METHOD**



This research is a *Research & Development* research that aims to design a *SAVAR* Learning Model based *on Mixed Reality* to improve digital literacy skills and learning quality. The final product produced is a *SAVAR* Learning Model based *on Mixed Reality* and learning tools that meet the criteria of valid, practical, and effective to use.



Mixed Reality is a blend of Augmented Reality and Virtual Reality technologies. Mixed Reality technology presents digital objects that can be seen in the real world with the assistance of physical devices. While Augmented Reality interacts with the real world in its application, Virtual Reality operates where a portion of the environment is already in the digital world. Mixed Reality bridges the gap between the two, namely the real world and the digital world.



### **C.RESULTS AND DISCUSSION**

The initial step in this research involves needs analysis. During this stage, needs analysis is conducted through preliminary observation and documentation methods. The scope of the preliminary observation includes analyzing the implementation of lectures, examining student characteristics, and assessing the required learning models.

Table 1	. Description	of Needs	Analysis
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No.	Indicator	Coverage	
1.	Implementation of Lectures	<ol> <li>Learning Planning</li> <li>Learning Process</li> <li>Teaching materials used</li> </ol>	
2.	Student Characteristics	<ol> <li>Generation Z or I Generation</li> <li>Have not used Smartphones as learning support.</li> </ol>	
3.	Analysis of Learning Model Development Needed	<ol> <li>Covering the relevance needed in the Industrial Age 4.0</li> <li>Integrating digital-based learning.</li> <li>Creating an active, innovative, and modern learning process.</li> <li>Integration between learning tools that are able to facilitate the demands of the world of work.</li> </ol>	



Figure 2. Mixed Reality Media in Learning



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### **Model Test**

Table 2. Test validity-reliability Learning outcome test instruments

Test Questions	Coefficient of Validity	R Table	Information
1	0,362	0,304	Valid
2	0,341	0,304	Valid
3	0,313	0,304	Valid
4	0,324	0,304	Valid
5	0,345	0,304	Valid
6	0,312	0,304	Valid
7	0,347	0,304	Valid
8	0,376	0,304	Valid
9	0,339	0,304	Valid
10	0,339	0,304	Valid
11	0,325	0,304	Valid
12	0,331	0,304	Valid
13	0,147	0,304	Invalid
14	0,497	0,304	Valid
15	0,476	0,304	Valid
16	0,371	0,304	Valid
17	0,341	0,304	Valid
18	0,053	0,304	Invalid
19	0,341	0,304	Valid
20	0,121	0,304	Invalid
21	0,353	0,304	Valid
22	0,333	0,304	Valid
23	0,029	0,304	Invalid
24	0,381	0,304	Valid
25	0,382	0,304	Valid
26	0,363	0,304	Valid
27	0,374	0,304	Valid
28	0,337	0,304	Valid
29	0,494	0,304	Valid
30	0,152	0,304	Valid
31	0,229	0,304	Invalid
32	0,384	0,304	Invalid
33	0,556	0,304	Valid
34	0,445	0,304	Valid
35	0,391	0,304	Valid

The results of the instrument validation of the question items contained 6 questions that were declared invalid, namely Test Question 13, Test Question 18, Test Question 20, Test Question 23, Test Question 31, and Test Question 32. Instrument items that are declared invalid are then no longer used as Industrial Control Engineering Knowledge Test instruments. The rest of the questions can be used as measuring tools in this study.





Figure 3 Learning Outcomes of mixed reality media

### **D.CONCLUSION**

Based on the results of research and development, as well as discussions related to the developed Mixed Reality-Based Learning Model, several conclusions can be drawn, namely:The needs analysis for the Mixed Reality-Based Learning Model requires several analyses, including: (a) analysis of course implementation; (b) analysis of student characteristics; (c) analysis of student characteristics; and (d) analysis of the required learning model description.

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