

# An Experimental Approach in Implementation of Virtual Reality for Improving Psychomotor Skill in Listening Course

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## ABSTRACT

Learning language needs the theory and practice. However, during the COVID 19, going to the laboratory to practice language has been unavailable. Meanwhile, students need to practice their skills in the real world to improve psychomotor-based curriculum goals in schools. The research aims to implement Virtual Reality using the experimental methods as media of practice in the Listening course. Testing involved 15 students filling out questionnaires about the implementation of VIRTUAL REALITY IN THE LISTENING course. The questionnaire has discussed the result of improving psychomotor in the Listening course as the target of RPS (the plan of learning course). The result of this research shows that the student needed VR to improve their psychomotor, reaching 82% of the total student.

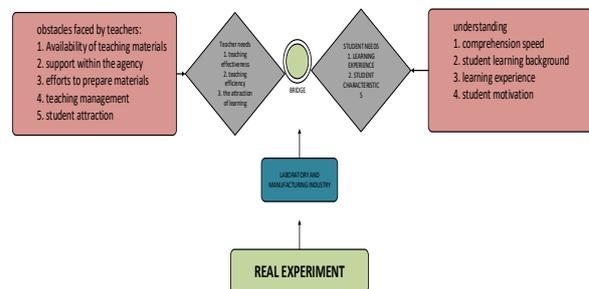
**Keywords:** *Virtual Reality; Psychomotor Skill, Listening Course*

## 1. INTRODUCTION

In classroom learning, the most widely used teaching method is lecturing (lecturing the pulpit). This learning method is the best (ranked #1) [1]. In lecturing, the learning media used can be people, objects, text, audio, visual, video, computer multimedia, and internet-based media [2]. Virtual Reality (VR) technology is an extension of multimedia computer technology [3]. VR has advantages over previous learning media [4], [5]. "Low-Cost VR" and Desktop VR are mature technologies that have the potential to be used in learning [3], [6].

To achieve the desired competence in learning in higher education, several media and learning methods can be used. The use of learning media is necessary (see Figure 1). Utilization of learning media can be done by following the learning pattern of instructor/lecturer presentations to groups of students, individual learning, or interactions between instructors/lecturers and students. For individual learning patterns, one of the learning methods is self-study. In independent learning, students' success is strongly influenced by their style

(type) of learning. According to Kolb [7], there are four types of learners, namely converge, diverged, accommodator and assimilator. From style diverse student learning, the most successful media to accommodate this type of student learning is learning with VR media, because it integrates various dimensions in the learning process [8].



**Figure 1** Types of learning media and methods

The development and the use of visual learning media (images), audio, and video (multimedia) to the use of Virtual Reality (VR) and Augmented Reality (AR) in learning continue to be researched and

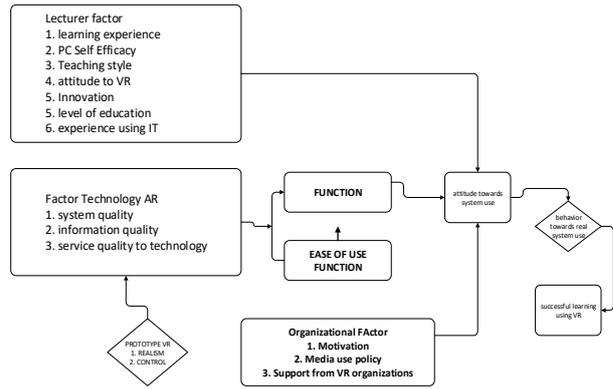
developed. It aims at the effectiveness, efficiency, and motivation in student learning [9]. VR is a part of a multimedia computer that will become a teaching trend in the future and is a new learning strategy in the field of engineering to learn a system [6].

Multimedia computers have been widely used and applied in universities as learning media and various other fields [10]. The development of multimedia computer technology is growing rapidly in several aspects of its components. This allows encouraging the use of Virtual Reality (VR) as a medium for practicing and learning. VR has several types, one of which is non-immersive VR (Desktop Virtual Reality /DVR). Desktop Virtual Reality (DVR) is a three-dimensional (3D) interactive program built with a computer in a multimedia environment that is implemented on a personal computer (PC) or laptop. Several scientists have developed and researched the use of VR as a learning medium (DVR), VR media has a positive influence on improving learning outcomes [11] as well as in several other aspects [12].

The investigation of the effectiveness of VR as a learning medium for improving student learning outcomes carried out [12] has shown that VR had a positive effect on improving student learning outcomes. However, there has been still an issue of how to achieve effective learning with VR media. To this issue, it [12] is still recommended to be conducting further research on the issue. From this background, this research was done to get to know how the perception of the effectiveness of VR teaching in private universities (PTS) is. Variables from previous researchers that are relevant to the effectiveness of teaching using VR media were identified to achieve the specified competence.

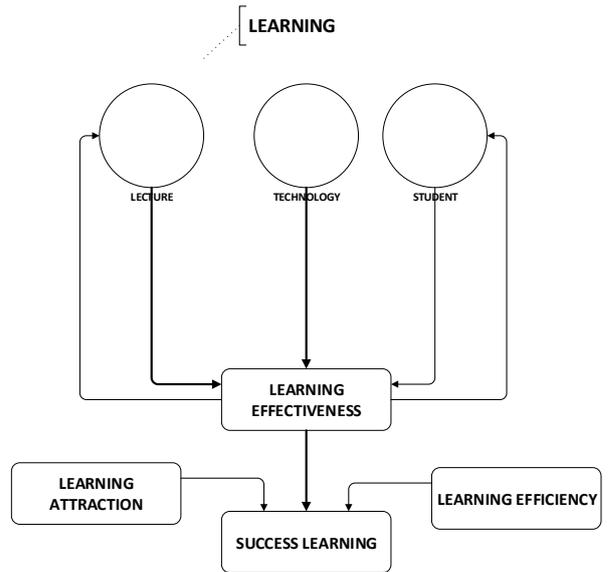
**2. METHOD**

To determine the perceived effectiveness of teaching VR media for listening lessons, a research instrument (questionnaire) was developed from the Technology Acceptance Model (TAM) model and combined with several research models related to VR technology in existing education, see Figures 2, 3, and 4. From the predecessor researchers of the effectiveness of function learning using VR media from the point of view of the Lecturer or Lecturer and the intention of using the media, the relationship of the influencing factors is shown in Figure 2.

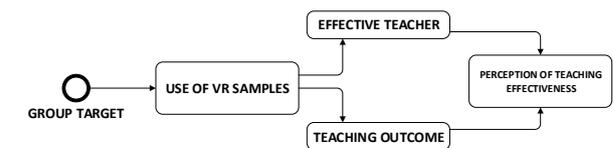


**Figure 2** Perception of Listening Learning mediated by VR.

From Figure 3, the use of VR technology that is seen from the perspective of the instructor or lecturer is one of the supporters in achieving learning effectiveness and as a part of achieving successful learning. By the background and purpose of this study, namely to describe the perception of the teacher (lecturer) on Virtual Reality (VR) media and its use in teaching, figure 3 becomes an initial model in this study. From the conceptual model above, the research framework that was built can be seen in Figure 4 below



**Figure 3** Perception of Listening Learning mediated by VR.



**Figure 4** Research Framework.

Questionnaires and interviews were distributed and conducted to determine the effectiveness of teaching

perception of media VR. Effective teaching can be indicated by indicators such as professional knowledge from teachers to create the best designs, media, and methods to achieve teaching materials according to the objectives (effective teaching). The paper [13] suggested that effective teachers have a positive correlation with teaching effectiveness. The research [14], suggests that teaching effectiveness will have a positive effect on learning effectiveness. His research also revealed that the Student Evaluation of Teaching (SET) was not adequate to measure teaching effectiveness.

After obtaining the initial conceptual model from several researchers, then several conceptual models were developed to form new variables with different objectives. The variables formed are the successful teacher (effective teacher) and the level of achievement of teaching (teaching outcome). Questions related to the variable of a successful teacher (effective teacher) and the level of achievement of teaching (teaching outcome) in the questionnaire and interview model become an assessment of the perception of teaching effectiveness of a teacher (Lecturer).

The core questions for the two variables are:

a. "What do you think about the effectiveness of VR teaching?"

Question related to the variable level of achievement of teaching (teaching outcome) is:

b. "What is the level of achievement of teaching (teaching outcomes) by using VR media?"

The questions in the questionnaire besides getting input from experts on how to build it were also based on previous research instruments. The variables of learning effectiveness and VR media performance were measured using a rating scale. The range of values used is from (1) to (10). In this study, several question items were modified based on questions from previous researchers.

### 3. FINDINGS AND DISCUSSION

The consideration of choosing the lecturer respondents (lecturers) at universities is based on (accreditation):

- (1) Quality of teaching staff
- (2) The facilities owned
- (3) The number of students.
- (4) Organizing Manufacturing Process Courses.

The study used development research and case study approach in groups. The data were collected by interview technique and the sample selection method

was using non-probability sampling technique, namely purposive sampling.

Respondents were interviewed according to the scenario in purposive sampling. They were lecturers in the Department of Industrial Engineering who teach Manufacturing Process Courses (minimum teaching experience of 1 year or have taught Manufacturing Process Courses), maximum age of respondents 45 years or low level of computer resistance, experience teaches (minimum 1 year) or has authority/competence in decision making related to the implementation of manufacturing process lectures.

Characteristics of Respondents (Lecturers) are as follows: the gender of the respondents, it can be seen that the number of male respondents is 12 people (92%) and female are 1 person (7.7%). Regarding the teaching style of respondents, seen many styles of teaching with the behavior of behavior, there are 3 people (23, 1 %) and the number of teaching styles with the behavior of transformation, there are 10 people (76.9%).

Good performance of VR media will support the use of the media by teachers. From the results of interviews with respondents on the intention to use VR media in learning, it will increase positively (+) if the use-value (usability) of the media is comprehensive, in line with this for support from agencies (organizational factors) is positive, and the characteristics of users, in this case, the level of the adoption of VR technology, the teaching style is also positive (supportive) and the intrinsic motivation aspect (attraction to VR technology) exists, the intention to use VR media in learning will increase (+) high. The answer at most to the intention of using VR technology is 38, 5 % (high craving), and the least was 7.7% (moderate desires). The desire of respondents (lecturers) tends to be very high, (92.3%) towards the use of VR technology in future learning, especially in the Manufacturing Process course if there is support from the agency.

Regarding the efficiency of learning, if it is related to the value of the cost of developing and using it, the results of the assessment of the respondents are as follows: Overall (within a certain time interval) the perception of the efficiency of learning by using VR media (which has been comprehensive), learning will be better (efficient) if followed by massive use of the media. However, when viewed partially on the perception of the position of using VR technology as a medium in learning, there are differences. For lecturers with the availability of teaching materials and learning media for VR technology, their position as learning media is a supplement so that the characteristics of their use are necessary but not essential so that expectations for the use-value of VR media are low because the competency goals targeted have a high level (in Bloom's taxonomy). This is due to the availability and completeness of facilities in teaching so that it is not

necessary to use VR media. However, VR media will become essential if VR media can integrate existing laboratory facilities or for practicum using expensive machines. The good performance of the media will provide its attraction in teaching. Positive support from the agency for teaching materials/materials will minimize the effort that will be expended by the teacher in organizing teaching. From these positive things, teaching effectiveness will also be positively achieved.

The way of teaching and the level of technology adoption (in this case VR technology) in the article illustrates how far the level of technology adoption has been carried out by lecturers. Of the total respondent's styles of teaching, the majority of respondents (76, 9 %) used the transformation of teaching styles and learning styles with the rest of the paradigm of behavior. This teaching style affects the intention to use VR media because VR media supports learning with a constructivist learning paradigm. There are two poles of the learning paradigm, namely behavior, and constructivism, in teaching a lecturer can (dominant) at one pole be a facilitator (student-centered learning) or as a teacher-centered instruction.

Regarding the level of technology, adoption can be grouped into several levels or Hooper calls it a phase namely:

- (1) Familiarization phase,
- (2) Utilization phase (Real use, in Davis)
- (3) Integration phase,
- (4) Reorientation phase and
- (5) Evolution phase.

The familiar phase is indicated by the instructor or lecturer starting to learn to understand and to use the technology. The utilization phase occurs when the instructor or lecturer begins to try to use the technology in the classroom, either for learning with simulation methods or role-playing. This phase is a phase that has been carried out by an instructor or lecturer. The integration phase occurs when the instructor or Lecturer begins to use the technology by integrating it into the curriculum or SAP. In this case, the instructor or lecturer designs several scenarios for the achievement of learning competencies and is responsible for the use of technology in the teaching and learning process in the classroom. In many ways, this is the last phase that is usually done by an instructor or lecturer.

The next phase is the reorientation phase, in this case, the instructor or lecturer considers and re-conceptualizes the purpose and function of learning in the classroom, in this phase there will be a paradigm shift or learning or teaching style from an instructor or lecturer. Lecturers can be knowledge centers or want to be facilitators. Lecturers who have reached this phase

usually do not show that they teach well in delivering learning materials (example: "act" of explaining, organizing classes, or motivating the class that the portions are not many) but rather on building a conducive learning environment that supports and facilitates students to explore and build their knowledge. In this phase, the student becomes the subject of the learner rather than the object of education or being educated. The last phase is the evolutionary phase, which is a phase that requires the learning system (institution/education provider) to engage and adopt technology so that the learning system remains effective.

If it is related to these phrases, the majority of the respondents are still in the phase of getting to know VR technology, although some have gone to the utilization phase (using). And if we look at the level of acceptance (level of resistance) to this VR technology, it can be said that respondents accept this technology well, namely 84.6% saying it is good if it is used in learning, meaning that VR technology has the potential to be used in learning. This is in line with the function of the use of media in learning.

#### **4. CONCLUSIONS**

Based on the results of all data processing and analysis that has been carried out in this study, the following conclusions can be drawn: (1) Learning is an activity that aims to help students have cognitive, affective, and psychomotor competencies as desired. To achieve successful learning with VR media, proper planning and methods are needed. Constructivism learning using VR media can be said to be effective ("successful learning") if it meets several indicators, namely effective, efficient (feasible and does not require much effort), good media performance (has attractiveness). The effectiveness of teaching can be achieved by a good learning program (media design and methods) conducted by the teacher. With VR media teaching strategies can create interactive-active classes, teaching efficiency can be achieved and the level of material achievement is measurable. (2) The use of VR media in teaching is very supportive for material that requires visualization, practice, and limited resources. The desire of the respondents tended to be very high (82,5%) towards the use of VR technology in learning.

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