

# Interactive Learning Model in Vocational Education with Smart Board Technology at Universitas Negeri Padang

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**Abstract:- Increasing the competence of graduates to work according to the demands of the development of the Industrial Revolution 4.0 is determined by the role of educators. The role of educators in terms of choosing to apply technological innovations into their learning with appropriate models / strategies, is considered to be a solution to increasing competence. The long-term goal of this research is to develop an innovative and flexible learning model based on Smart Classroom through the study of the development of an interactive learning model on technology education and vocational-based Smart Board Technology at Padang State University. This type of research is Research and Development, with development procedures using the 4D Development Model consisting of: Define, Design, Develop and Disseminate. The model design was validated by 3 media experts with very high validity values; 87,35, through practicality testing on 36 students in the Department of Electronics Engineering, the Faculty of Engineering shows that learning through the use of IWB is more fun and interesting, and they claiming that it makes learning more fun and helps them understand difficult subjects. The developed model can be a solution to increase the competency of vocational education graduates through the application of technology innovation strategies into the offered learning.**

**Keywords:-** Component; Industrial Revolution 4.0; TVET; Interactive Learning Model; Smart Board Technology; Smart Classroom.

## I. INTRODUCTION

Efforts to harmonize the performance of vocational and vocational education in preparing graduates to work are increasingly in line with the demands of the development of the Industrial Revolution 4.0 or the fourth world industrial revolution [1]. The role of educators in applying technology into their learning with appropriate models / strategies, is considered to be a solution to increasing competence. The discovery of new models, methods, strategies in learning by integrating Information and Communication Technology

(ICT) into learning has become a serious study lately. Various efforts have been made, but there is no effective model / strategy in integrating the use of ICT equipment / literacy, specifically the integration of the IWB Smartboard in teaching and learning. Teaching and learning support by integrating ICT equipment and the internet is growing and is proven to be able to improve the competencies of students [2], then the integration of the use of Smartboard IWB in learning with certain models / strategies needs to be examined.

Greater ICT literacy in the form of synchronous and asynchronous learning using IWB Technology enables increased collaboration and collaboration, cost effectiveness and pedagogical improvements [3]. Vast ICT literacy in an intelligent learning environment is usually known as a smart classroom, and this environment is seen as a smart solution. The integration of the IWB Smartboard and e-learning software as an information system has become part of the intelligent learning environment. Smart Classroom as a modern method of education in education scenarios that provide quality education to students by helping them in the formation of better concepts, concept elaboration, increased reading skills and academic achievement. E-learning software as an information system has been widely used by higher education institutions, including Padang State University as a platform that supports both Synchronous and Asynchronous learning types.

The teaching strategies covered in e-learning include the use of application software, projectors and whiteboards, and this has evolved into an IWB Smartboard which combines whiteboard, computer, projector operations and has applications to manage learning content. Synchronous learning requires lecturers and students to interact at the same time can be spread geographically. On the other hand, asynchronous learning allows lecturers and lecturer-students to interact and participate in the educational process at different times different [3], [4]. Pedagogic changes and improving student achievement as an effect of the use of the IWB Smartboard are stated by [15]. The use of the IWB Smartboard includes the possibilities offered by

ordinary whiteboards, along with other ways that enable interactive teaching and learning [9], as well as connecting to students' computers from home [16], [15].

The "Smart Project" study that integrates IWB in teaching and learning examines six schools with the aim of exploring the effects of incorporating technology in pedagogy on teachers and students. Research findings show that IWB contributes significantly to parents and students, and therefore it is necessary to add Smart Classroom throughout the school system [9]. [17] claim that the benefits of IWB are that teachers can save comments and explanations at IWB, and thus record lessons for future use by students who skip class because of absenteeism or illness. The application of digital technology in the classroom is one way to facilitate the learning process (Ifenthaler, &Schweinbenz, 2013). Smart Board offers versatile technology with several applications (Holland, 2014). Ifenthaler and Schweinbenz (2013) state that students can use several modalities to build knowledge. Leaders need to consider all forms of technology as a method to help students in the classroom (Sorensen et al., 2013). Holland (2014) suggests that the power of learning must shift from teacher to student. The benefits of the Smart Board range from the availability of many tools for adding multi-media to lessons (Ifenthaler, &Schweinbenz, 2013). Smart Board also offers interactivity in lessons and can provide instant feedback. From the benefits noted above, it can be summarized that Adopting Smart Board technology into classroom lessons provides a multi-task process for teachers and students for all students.

The Faculty of Engineering of Padang State University (FT UNP) as a Technology and Vocational Education Institute, in order to become a competitive institution in responding to the Industrial Revolution 4.0 by making the lecture classes at FT UNP integrated ICT programmed and structured so that it is implemented into a Smart Classroom. Some classes / laboratories at FT UNP already have facilities to support the integration of technology to support the creation of Smart Classroom. In order to obtain optimal results in developing cognitive and learning skills during the Industrial Revolution 4.0 era, the availability of several IWB SmartBoards in the Electronic Engineering Department, is deemed necessary to have a learning model / strategy using an effective and integrated SmartBoard IWB with [www.elearning.unp.ac.id](http://www.elearning.unp.ac.id) is being tested in this year's research.

## II. METHODOLOGY

This type of research is R & D (Research and Development), focused on the product design phase of model development conducted in the Electronic Engineering Department. The development procedure in this study uses the 4D Model development method [4] consisting of: Define, Design, Develop and Disseminate. The design model that was developed can be a solution to increase the competency of vocational education graduates through the application of technological innovation strategies in the learning offered. The long-term goal of this

research is to develop an innovative and flexible learning model based on Smart Classroom through the study of the development of interactive learning models in technology education and vocational-based use of Smart Board Technology at Padang State University.

In the Define phase, the activities of defining the IWB media as a product are carried out through field studies and literature studies. Field studies conducted by direct observation in the Department of Electronics Engineering as the object of research. Observations were made by interview. The purpose of observation is to determine the media requirements that are appropriate and supportive as interactive media. Analysis through literature study activities by conducting theoretical studies through books, journals, and other sources of information related to planning (Design) interactive learning models using the Smart Board in the Department of Electronics Engineering. Development Phase (Development); Requirement analysis, product development, is carried out after analyzing needs and collecting work components and equipment. Analysis of the needs of components and work tools adapted to product design. Product validation tests through trials are conducted to obtain a statement of eligibility from media experts and material experts. This trial involves senior lecturers and lecturers to evaluate the product before it is applied in learning to test the practicality and effectiveness of the product model. The trial results are used as input to improve the product before it is disseminated.

## III. RESULT

The development of learning that is modeled is by using Smart Board Tools (Interactive White Board) as the main media in classroom learning. IWB as a medium in this research development uses the type of IWB as shown in Figure 1.



Fig 1:- Two Types of Interactive White Board (IWB) as the Media of the Model used in the Electronic Engineering Department

After the interactive learning model product based on IWB is completed, then there are several stages of product development testing carried out through several test stages. In general there are 3 (three) test stages of this study, namely the level of validity, practicality, and effectiveness of the IWB media. as follows:

**A. IWB as Media Validity**

The learning model product was validated by experts consisting of 3 experts (lecturers) at FT UNP. IWB media validation assessment instruments take the form of a validity assessment questionnaire. The validity results are used as a guideline in revising the product to be used. The

instrument for evaluating media validity consists of four components, namely content quality, learning quality, interaction quality, and display quality. Each assessment indicator is given a score of one to five. The results of the validity tests of the four components of the IWB media are presented in Table 1.

No	Assessment Components IWB media	Score Validity	Criterion
1	Content Quality	86,50	Very high
2	Quality of learning	86,80	Very high
3	Quality of Interaction	88,60	Very high
4	Display Quality	87,50	Very high
	Average	87,35	Very high

Table 1:- Media Expert Validation Results

The average value of the validity of using IWB Media with is 87.35, based on the Riduan (2012) validity criteria, it shows that the validity value is very high (in the range 81-100). During the validation process, the three validators provide comments and suggestions as a basis for revising the resulting product model, so that it can be used in the learning process.

**B. IWB Media Practicality Test Results**

After the validity test is done, then the next step can be done practicality test. The practicality test on the use of the IWB media model is conducted on the students participating in the course. Practicality analysis is seen based on the results of a questionnaire analysis containing 36 students' responses. The practicality assessment component for using the IWB model consists of 18 items of statement instruments. The results of the practicality test can be seen in Table 2.

No	Statement	Mean	Std. Deviation
1	Learning with IWB is more fun	4.18	.945
2	Learning with IWB is more interesting	4.13	.972
3	I participate more actively in lessons using IWB	3.75	.978
4	I understand better in lessons using IWB	3.76	.923
5	I am more creative in learning to use IWB	3.70	.953
6	My grades are better in lessons using IWB	3.60	.947
7	I complete more work in a shorter amount of time during lessons using IWB	3.75	.988
8	I remember more from lessons using IWB	3.69	1.028
9	I prefer lessons using IWB because I learn better when I do things	3.69	1.018
10	I feel more independent in learning to use IWB	3.66	1.049
11	I work in groups in lessons using IWB	3.45	1.104
12	I don't like lessons using IWB because I don't like technology	1.87	1.230
13	Learning using IWB is useful for difficult / abstract subjects (eg, Engineering)	3.85	1.188
14	Lessons using IWB are useful for easy subjects (e.g., Language learning)	3.42	1.193
15	My lecturer is skilled in using IWB	3.34	1.129
16	My learning style fits in with lessons using IWB	3.77	.950
17	I hope we can use IWB in all lessons	3.95	1.017
18	IWB will replace conventional boards in the future	4.04	1.193

Table 2:- Practicality Test Results for IWB Media Use

Based on the data presented in Table 2, it can be understood that, most students think that the lessons taught using IWB are more fun and interesting. Also a large number of students believe that the Interactive White Board (IWB) will and must replace conventional class boards today in the future. In addition, they report that IWB plays an important role in their understanding and success in difficult courses. Perhaps a strong indicator of the need to improve IWB learning at universities is a negative student response or strong disagreement with item 12, which highlights students' exposure to sophisticated technology. Students generally maintain neutrality when asked to

express their opinions about the ability of Lecturers to use IWB effectively.

This neutral response can be related to the fact that the use of IWB in these Universities is relatively new and until now Students have not fully understood the dynamics of their effective dissemination and therefore may not know when to use them properly or not like traditional teaching methods where students usually have an opinion about the effectiveness or ineffectiveness of their lecturers.

#### IV. CONCLUSION

Interactive whiteboards can make learning more real, interactive, and increase student participation, motivation, and concentration in the teaching and learning process. Interactive whiteboard has the potential to increase the interaction between the teacher and students in the classroom, where there is ICT and there are indications that teaching with interactive whiteboard is more fun, interesting, and influences the pleasant classroom atmosphere, speed in understanding something.

The implementation of research in one year is a short time in this interesting research, so it is felt that many things cannot be developed yet. The researcher suggests to other researchers to investigate the relationship between students' attitudes towards the use of IWB in education on the achievement of student learning outcomes; teacher background on attending training before or in the office about using IWB; teaching strategies, methods and techniques used by teachers with IWB; or the suitability of the software or material used with the IWB. On the other hand, lecturers or teachers as practitioners and education managers are advised to use IWB to get feedback from students about the productivity of using IWB in their classes or educational institutions.

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