

Proceeding of 5th UPI International Conference on Technical and Vocational Education and Training (ICTVET 2018)



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It is a great honor and pleasure to bring you this collection of articles from the 5th UPI International Conference on TVET in conjunction with 5th UNP ICTVET. This conference was organized by the Faculty of Technology and Vocational Education and TVET Research Center (TVETRC), Universitas Pendidikan Indonesia (UPI) in collaboration with Universitas Negeri Padang (UNP), Universitas Palangkaraya (UPR), Universitas Negeri Manado (UNIMA), and Rajamangala University of Technology Thanyaburi (RMUTT), Thailand. This conference was held in The Trans Luxury Hotel Bandung, Indonesia, September 11th, 2018.

We would like to express our gratitude to all keynote speakers from overseas who travelled to our country to deliver and exchange their ideas. Our appreciation also goes to all the committee members who have worked hard to make this event possible.

The theme of the conference focuses on “Globalization, challenges, and disruptions in TVET” which implies that the world of TVET is undergoing substantial change to reconsider the role of TVET systems in a more globalized accentuated by interlinkages and convergence among social, economic and environmental issues. These issues pose the distinct challenges for TVET in terms of adapting to education markets, economic restructuring, and the migration flows. So, the role of rapidly growing technology provides not only new opportunities but also disruptions in unprecedented changes.

This volume of proceedings provides an opportunity for readers to engage with a selection of refereed papers that were presented during the TVET conference. Themes for the sections will be of interest to TVET scholars, professionals, and stakeholders from all parts of society and all regions of the world to disseminate their knowledge, experiences, concepts, examples of good practice, and critical analysis with their international peers. And so the reader will sample here reports of research on topics through a suite of issues related to standardization, policies, skills and personal development, curriculum design, social and culture, pedagogical innovations, and resource mobilization.

We wish you enjoy and discover valuable your engagement with their ideas in sustaining your own professional development in the world of TVET. Thank you.

Editor in Chief

Ade Gafar Abdullah

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Ongoing Process of Change Curriculum: Teaching and Learning Strategy of Vocational Teachers in Western Part of Indonesia

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Abstract—Rapid technological change, especially in information technology, brings major changes in teaching and learning strategies for teachers to deal with millennial. The purpose of this study was to identify teaching and learning strategies used by vocational teachers, especially in applying the 2013 Vocational High School Curriculum (K13). This research is a type of survey method, data collected from 6 cities in the western part of Indonesia, namely Jakarta, Medan, Padang, Lahat, Bukittinggi, and Batam. 400 vocational teachers were actively involved as survey respondents. Two questionnaires were developed, namely teaching and learning strategies and IT (Information Technology) used by vocational teachers as learning media. The results showed that the majority of teachers (68.09%) used student central learning in teaching and learning theory in their classrooms, and 78.73% of teachers, facilitating students with practical work. The highest web application used by vocational teachers is the Microsoft office (64.25%) and Google (49.25%). In conclusion, the teacher center learning approach has undergone a shift to center-student learning, the teacher acts as a facilitator in learning by integrating technology in the classroom. The teacher is also required to be able to innovate and develop in using the right information technology in the learning situation at hand.

Keywords—change; vocational teachers; teaching and learning strategy; K13

I. INTRODUCTION

Global encouragement in building education achievements in the 21st century makes all education stakeholders change the education curriculum especially Technical Vocational Education and Training (TVET). The 21st century integrates ICT in education [1]. This is done to create a 21st-century learning environment so students can learn independently with the resources provided [2]. Various countries in the world have collaborated with other stakeholders to be able to provide ICT facilities needed by the school to create a 21st century that is relevant to the school environment. Training was carried out for each teacher TVET to be able to use ICT in the teaching and learning process [3]. In conducting this business the Indonesian government made a long curriculum change into the 2013 curriculum from the Learning Teacher Centre to

become a Student Centre Learning where this curriculum is integrated with ICT, attitudes, knowledge, and skills [4,5].

The 2013 curriculum goal is to prepare Indonesia young generation to have life skills as personal and citizen who are productive, creative, innovative, affective (religious and social attitudes) and competent to contribute to the betterment of social, national, and political lives, and humanity. The curriculum also aims to provide students with the competencies to contribute to the well-being of humanity. This statement has never been explicitly or implicitly stated in the previous curriculum [6]. This noble statement was actually revealed for the first time by several leaders when they drafted the first Indonesian education law. To have such qualities, a student must have creativity, innovation, and care for the welfare of the community. By having this quality, they will become independent learners and care about what happens, and provide what they have to contribute to the development of a better society [7]. The 2013 curriculum has eight standards of outcome competency standards, content standards, process standards, and assessment standards that are closely related to curriculum development and facility standards, management standards, libraries, and teachers that are directly related to the implementation of the curriculum [8].

However, the implementation of the 2013 curriculum there is still many shortcomings. The difficulty of changing the teacher's mindset, changes in the learning process from the central teacher to the student centre, low attitudes, culture, reading, and spiritual research are still low. Then, the lack of mastery of information technology, the weak mastery of administrative fields, and the tendency of teachers to emphasize the aspect of knowledge [9]. In fact, the teacher should also provide the same portion of attitudes and skills. A teacher is required to continue to increase knowledge and broaden his horizons, especially after the 2013 curriculum [10].

To answer this challenge, the government made efforts to improve the quality of teachers in various ways such as socialization, training for teachers to improve the quality and ability of teachers. In the early stages of implementing the 2013 curriculum, explicitly listed formal socialization activities [11]. The 2013 Curriculum socialization was carried out to

principals, teachers, and supervisors. Principals and teachers are two important elements in the implementation of the 2013 curriculum. Through various training carried out starting from the regional level to the national level by the government by providing basic ICT facilities needed in the teaching and learning process [12]. All teachers are given basic training in computer or internet use through workshops or training. In addition to basic ICT, teachers are also introduced to the use of free learning media and e-learning. Teachers must follow the 2013 training curriculum for at least 58 hours to be able to understand and understand the 2013 curriculum [13].

With this development, logically teachers are expected to be teachers and students can use the teaching and learning process by integrating with ICT maximally and innovatively and it is therefore assumed that teachers in schools have explored and developed new learning strategies by integrating ICT and pedagogy. With the efforts that have been made by the government and other stakeholder commitments which are in the form of training to teachers, it is hoped that now the teacher has adjusted its role as a facilitator in the classroom in accordance with the 2013 curriculum guidelines. In accordance with the demands of the 21st century. This article will discuss the development and progress of the teacher's orientation in learning and teaching strategy particularly in the implementation of curriculum 2013 after the last few years being implemented, especially in Western Part of Indonesia.

II. LITERATURE REVIEW

The development of the 21st century is marked by the rapid progress of information technology [14]. Technological developments penetrate all aspects of life and change human activities and culture [15]. This also enters social, economic and political institutions, gradually making people interact with technology so that the ability to communicate with technology is a basic human ability [16]. For example the use of ICT in government, banks and educational practices [15]. Besides being used in administration. ICTs can also be used in classrooms in the learning process, such as the World Wide Web which can be accessed by teachers and students who can be accessed anytime and anywhere [17]. Teachers can plan to learn online, innovate using techniques, approaches, teaching methods with the renewal of pedagogical knowledge [18,19]. Students can access information widely about learning the material to deepen their understanding of the material at school [20].

Online social media facilitates students and teachers to calibrate in the learning process and be able to expand communication with discussions between students and students and teachers and students in the classroom and outside the classroom [21]. In learning the use of power points and other technologies in presentations helps teachers attract students' attention. The use of interesting learning media will help students understand the material described by the teacher [22]. This technological development is a 21st-century learning environment, where students and teachers are not only limited to classrooms but can study anywhere and anytime [23,24].

The process of transferring knowledge in learning activities will be easily accepted by students if the teacher uses

appropriate ICT media [25]. Pedagogy Wheel is based on educational goals by using technology as a learning application [26]. There are three aspects of pedagogy, namely taxonomy bloom, web application, and SAMR model [27]. Pedagogy wheel shows that TVET special teachers can adopt technology in the teaching and learning process, representing elements that exist in vocational pedagogy theory [28]. Learning strategies are used to identify the learning approaches used by TVET teachers based on theory, content, practical and technical. Elements of pedagogy are used to identify TVET teachers in achieving learning outcomes and web applications that are used in general. In the integration of technology with the Substitution Augmentation Modification Redefinition (SAMR) Model, there are four stages that will be implemented. This approach is called blended learning, the four steps are [29]:

- Substitution: Technology acts as a direct tool substitute, with no functional change
- Augmentation: Technology acts as a direct tool substitute, with functional improvement.
- Modification: Technology allows for significant task redesign
- Redefinition: Technology allows for the creation of new tasks, previously inconceivable.

SAMR learning model is used in mobile-based learning. To maximize the learning process using learning media, the teacher must be able to innovate, work hard and experiment in the development of instructional media [30]. Educational Technology has an impact on the learning process starting from the process of transfer of knowledge, learning materials, providing facilities in exchanging information, the assessment process and how students feedback on the material that has been given [31]. But the technology used now is quickly obsolete. Therefore the teacher must focus on how to create learning activities and know how to choose the right technology in the learning situation being faced [32]. The ICT framework can be divided into three characteristics (1) Promote technology used based on learning enhancement abilities (2) How to use computer software and hardware (3) Development of institutional facilities and capacities such as the provision of computers, software, and internet app devices [32].

Constructivism theory states that students have a very large role in building their own knowledge. Students fully play a role in doing so with the environment in making the learning process [33]. Learning activities more viewed in terms of the process in terms of obtaining knowledge from facts which is loose. Giving meaning to objects and experiences by individuals it is not done alone by students but through deep interaction unique social network, which is formed both in culture in the classroom and outside class culture.

A question appeared in practice that “ do vocational teachers change their strategy of teaching and learning and do they use ICT in their teaching and learning process.

III. METHODOLOGY

This study is designed to find out how teacher’s development in learning approaches based on curriculum 2013 and using the ICT facilities provided in schools to determine the existing pattern of ICT integration in schools. The study was also intended to find out if teaching and learning in schools have changed as a result of the ICT facilities provided; to determine the changing pattern of pedagogical practices in schools. A quantitative study was conducted using the survey method [34]. Quantitative research is a study conducted using the figures from the data collection, interpretation of data and results of the study. Before the survey was conducted, a discussion on the literature review was carried out. Quantitative data in this study was obtained by distributing questionnaires to respondents of the study. The data collected from 6 cities in the Western part of Indonesia namely Jakarta, Medan, Padang, Lahat, Bukittinggi, and Batam. 400 vocational teachers were involved actively as respondents of the survey. Jakarta 70 teachers, Medan 60 teachers, Padang 100 teachers, Lahat 50 teachers, Bukittinggi 50 teachers, and Batam 70 teachers.

IV. RESULT

The results showed that respondent demographics according to gender, age, education level, and service duration are shown in table 1.

TABLE I. DEMOGRAPHICS ACCORDING TO GENDER, AGE, EDUCATION LEVEL, AND SERVICE DURATION ARE SHOWN IN TABLE

| A. GENDER | | f | % |
|---------------------|----------------------------|-----|-------|
| 1. | Female | 186 | 46,5 |
| 2. | Male | 214 | 53,5 |
| B. AGE | | f | % |
| 1. | Less than 30 years | 45 | 11,25 |
| 2. | 31 – 40 years | 95 | 23,75 |
| 3. | 41 – 50 years | 136 | 34 |
| 4. | 51 and above | 124 | 31 |
| C. EDUCATION LEVEL | | f | % |
| 1. | Diploma | 6 | 1,5 |
| 2. | Bachelor Degree | 54 | 13,5 |
| 3. | Masters Degree | 336 | 84 |
| 4. | Doctor of Philosophy (PhD) | 1 | 0,25 |
| 5. | Others | 3 | 0,75 |
| D. SERVICE DURATION | | f | % |
| 1. | Less than 3 years | 35 | 8,75 |
| 2. | 3-9 years | 102 | 25,50 |
| 3. | 10-19 years | 104 | 26,00 |
| 4. | 20-29 years | 119 | 29,75 |
| 5. | More than 30 years | 40 | 10,00 |

Result of the study Teaching and Learning strategy used by Respondents (Theory) can be shown in table 2 and figure 1. Result shown about Teacher have used Teacher Centre Learning than Didactic.

TABLE II. TEACHING AND LEARNING STRATEGY USED BY RESPONDENTS (THEORY)

| No | City | Theory | | | |
|----|---------|--------------|-------|----------|-------|
| | | Facilitative | | Didactic | |
| | | F | % | F | % |
| 1 | Batam | 53 | 75,71 | 17 | 24,29 |
| 2 | Padang | 79 | 79 | 21 | 21 |
| 3 | Jakarta | 47 | 67,14 | 23 | 32,86 |

Table 2. Cont.

| | | | | | |
|-------------|-------------|--------------|-------|--------------|-------|
| 4 | Bukittinggi | 28 | 56 | 22 | 44 |
| 5 | Medan | 40 | 66,67 | 20 | 33,33 |
| 6 | Lahat | 32 | 64 | 18 | 36 |
| Mean | | 68,09 | | 31,91 | |

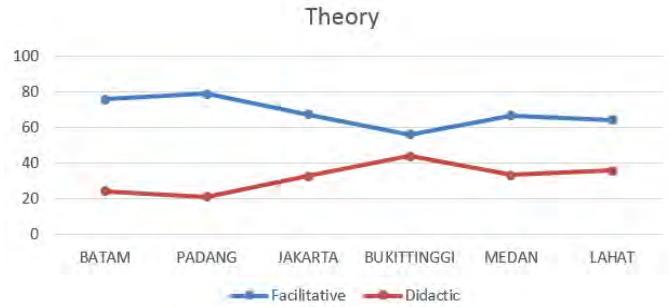


Fig. 1. Histogram of Teaching and Learning strategy used by Respondents (Theory).

Based on the results of the table 2 and figure 1, can be seen the role of the teacher is more towards facilitative with an average of 68.09 compared to didactic with an average of 31.91.

Result of the study Teaching and Learning strategy used by Respondents (Practical) can be shown in table 3 and figure 2. Result shown about Teacher have used Teacher Centre Learning than Didactic.

TABLE III. TEACHING AND LEARNING STRATEGY USED BY RESPONDENTS (PRACTICAL)

| No | City | Practical | | | |
|-------------|-------------|--------------|-------|--------------|-------|
| | | Facilitative | | Didactic | |
| | | F | % | F | % |
| 1 | Batam | 61 | 87,14 | 9 | 12,86 |
| 2 | Padang | 84 | 84 | 16 | 16 |
| 3 | Jakarta | 55 | 78,57 | 15 | 21,43 |
| 4 | Bukittinggi | 35 | 70 | 15 | 30 |
| 5 | Medan | 46 | 76,67 | 14 | 23,33 |
| 6 | Lahat | 38 | 76 | 12 | 24 |
| Mean | | 78,73 | | 21,27 | |

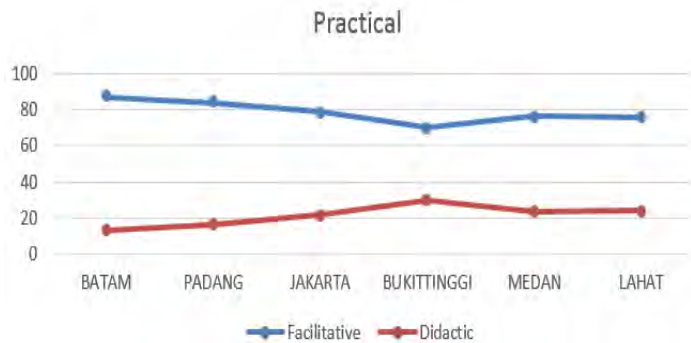


Fig. 2. Histogram of Teaching and Learning strategy used by Respondents (Practical).

Based on the results of the table 3 and figure 2 can be seen the role of the teacher is more towards practical facilitative with an average of 78.73 compared to Didactic with an average of 21.27.

There are many application ICT used by the respondents in teaching and learning. The highest application ICT used by the respondents is Microsoft word (64,25%) and Google (49,25%). The use of web applications in each city is different, but all

cities have been directed to use web applications for all learning. This shows that the intensity of web application use has led to K13. The result can show in figure 3. The Dominant Web Application

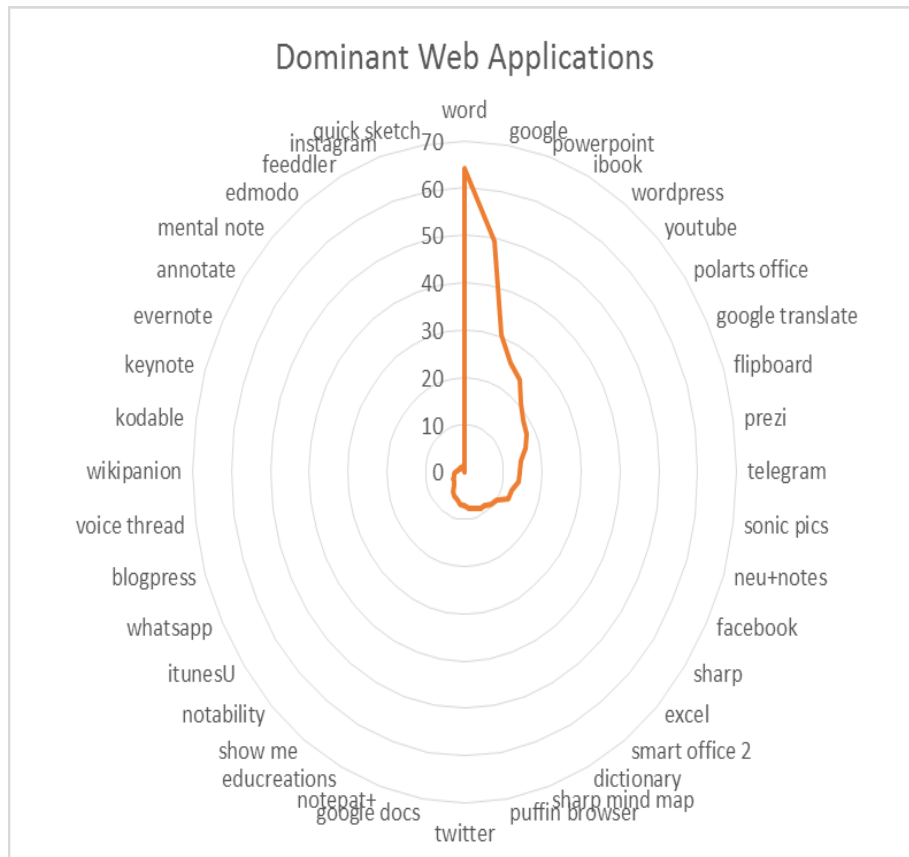


Fig. 3. The Dominant Web Application.

V. DISCUSSION

The learning model that has been carried out is the faculty teaching model or known as the Centre Learning Teacher such as the lecture model, thick with an instructional atmosphere and felt to be less in line with the rapid development of science and technology [35]. Changes in the curriculum also provide the obligation of education to be required to also include moral values, noble character, creativity, independence, and leadership, which is very difficult to do in a conventional learning system, where soft skills are very helpful for graduates to succeed in the world of work [24].

The conventional learning system is less flexible in accommodating the development of lecture material because the lecturer must intensively adjust the material to the latest technological developments. It is unwise if technological development is much faster than the teacher's ability to adapt lecture material to these developments because it is certain that graduates will have less competence (mastery of the latest technology knowledge). So with this background, conventional learning patterns start to change to Student Centred Learning (SCL) [36].

Based on the results of research conducted to prove that there is a shift between Centre Learning Teachers to Student Centre Learning this is influenced by compulsory training that must be followed by the teacher for 58 hours because in training teacher learning about student centre learning and how use the ICT in the learning [7]. In the theoretical learning of the six cities that were used as research sites in Padang, a significant shift was affected by the cooperation of universities with vocational schools, such as sending lecturers to vocational schools. For other cities too, it has experienced a very significant shift in theoretical learning. Furthermore, in practice learning from the six cities that became the sample of the Batam city study experienced a significant shift in the learning approach. This is influenced by infrastructure facilities and infrastructures that exist in vocational schools that are industry-based [37].

From the results of the study showed that the teacher was able to integrate technology in the classroom as a learning support tool. Teachers have predominantly used Word, Google, and PowerPoint. This is also influenced by some training that has been carried out by the government in the use of technology, starting from the regional level to the national level [11]. Availability of a computer and overhead LCD projector for teachers use in the classroom is a critical factor that affects

the integration of ICT in classroom teaching. Generally, the integration of ICT in classroom teaching at the very basic level starts with the use of a computer and the LCD overhead projector. With these facilities, teachers can bring real-life situations to the classroom by projecting relevant video clips, images and animated short-stories (locally generated or available online) in teaching subjects. Thus, helping learners to see the relevance of what they are learning in real life situation [38], making learning more meaningful and concrete. Because of this critical role, the availability of a computer and the overhead LCD projector for teachers use in every classroom (rural or urban) is a considered a basic necessity for ICT integration in pedagogical practices [39].

VI. CONCLUSION

The 21st-century learning environment is inseparable from technology. Learning must be innovative in adopting the technology, this is the basis of the shift in learning strategies and approaches in the 2013 curriculum. The teacher center learning approach has experienced a shift to student-center learning, the teacher acts as a facilitator in learning by integrating technology in the classroom. Teachers are also required to be able to innovate and develop in using information technology that is right in the learning situation faced. However, Vocational teachers are still on the way to change to be the 21st century.

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