Cloud Computing Technology: the choice to Enhance the Learning Environment for Automotive Vocational Teacher Education Students as Autonomous Learners

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Abstract. Automotive vocational teacher education is an education that has a purpose to prepare their students to be a teacher or an instructor in automotive vocational education. Therefore, they need to become autonomous learners to stay updated related to the development of automotive technology whenever they need it. This is very indispensable to set the learning environment to support their study activities to become autonomous learning. This study aims to determine the way the learning environment could be built to support their independent learning activities based on the students’ perspectives. This study is descriptive research that contains quantitative and qualitative data. The data was collected from final-year Automotive Engineering Education department students at Yogyakarta State University by giving an open questionnaire. The results of the study are (1) 40.54% of respondents choose the development of cloud computing technology, 13.51% and 35.14% of respondents choose the development of physical things and non-physical things respectively as the way to build a supportive learning environment, then the rest 10.81% of respondents said that the existed learning environment has already been good, (2) online collaboration learning, online connection with industrial practitioners, blended learning, online resource center, and online educational media are the examples at most of several ways and competencies that are needed to build a supportive learning environment from the development of cloud computing technology, (3) practical lesson infrastructure and teacher’s administration for teaching are needed from the development of physical things, (4) comfortable, pleasant, relax, and not serious situation, discipline, friendly lecturers, and an atmosphere as if being a vocational teacher are needed to be built so as to have supportive learning environment.

1. Introduction
Vocational education is one of the educations that concern to prepare their students to be able to work according to their field. This education takes an important role to reduce the unemployment phenomena in society [1]. Besides that, vocational education holds the key to success in the globalization challenges [2]. Also, vocational training takes an action to make a prosperous society by equipping people in society with needed skills in the world of work [3]. Therefore, the improvement of vocational education is indispensable to gain several benefits to society.

Improving the quality of vocational education cannot be separated from the improvement of vocational teacher education institutions as they produce vocational teachers. This is because a teacher has an important role in building qualified teaching and learning processes to equip the students with sufficient needed skills and also bring them to get success in their learning [4]–[9]. These institutions
same as vocational education also have great roles and becoming important to be able to succeed in the globalization era dan making society more prosperous [10]. Therefore, by improving the quality of vocational teacher education, it could also improve the quality of vocational education.

Vocational teachers are people who teach needed skills in a special vocation or profession [10]. To become qualified teachers, they need to have six competencies, namely; teaching competence, educating competence, professional expertise/ professional competence, the competence of linking real work, communicative and language competence, the competence of self-reflection [11]. Besides, they need to stay updated on both their skills and knowledge related to the changes in science and technology according to their fields [11]. This means teachers should have the competence to learn autonomously whenever and wherever they are. Especially in vocational education, this competence is very crucial to be mastered by vocational teachers because science and technology in the world of work will change gradually become more sophisticated.

Self-directed learning is a tool for exercising students to become autonomous learners that bring benefits to their lifelong learning skills [12]. Besides, these autonomous or self-learning skills are positively related to students’ academic success [13]. These skills force the students to be able to be responsible for what they do in their learning processes. Also, these skills could reinforce the learning processes to master several competencies [14]. Therefore, especially in the vocational field, these skills are highly needed by students to survive in their future life.

To support the existence of autonomous or self-learning activities, the learning environment is needed because of its benefits to support those activities [15]. The learning environment has a role to provide tools to support the learning processes [16]. This paper provides information related to the learning environment that students want to support their learning activities including; (1) the tools category of learning environment that students need, (2) the activities in the category of cloud computing technology, (3) the activities in the category of physic things, and (4) the activities in the category of non-physic things.

2. Methods
This study is survey research with the students of the Automotive Vocational Teacher Education Department in Universitas Negeri Yogyakarta as the respondents. An open questionnaire was conducted in this study to gather students’ desire related to the learning environment that they want to support and help them in their learning processes. The data were analysed quantitatively and qualitatively with exploratory sequential mixed-methods data analysis.

3. Result and Discussion
3.1. Tools category on the enhancement of the learning environment
Below is the figure that illustrates the result of the Questionnaire related to the tools category that students want to be implemented to enhance the learning environment. A glance at the figure reveals that 40.54% of the respondents choose cloud computing technology as the tools to support their learning processes especially their learning environment. 35.14% of the respondents have an opinion to focus on enhancing non-physic things for the learning environment. On the other hand, 13.51% of the respondents chose physic things that need to be improved to get a sufficient learning environment. While the others, 10.81% of the respondents said that the existed learning or academic environment has already met their expectations. Based on this data, this means that more than a there-quarter of the students as the respondents give suggestions to pay attention to develop cloud computing technology and non-physic category to upgrade the quality of the learning environment. Especially for the development of cloud computing technology to support not only the learning environment but also to enhance the non-physic environment. Therefore, pay attention to develop cloud technology to enhance the academic and learning environment is the key based on this result.
3.2. Activities needed in the category of cloud computing technology
Cloud computing technology is chosen by the students’ perspective around 40.54% of them. This technology is a powerful technology that eliminates the needed hardware, space to save because of the use of a big server [17]. Besides, this technology is closely related to the use of the internet [18]. In education, this technology could conduct several activities such as; collaboration, saving data storage, sharing resources, and also data management [19]. Based on those statements, it can be concluded that this technology could be possible to be used in education to improve the quality of the learning environment especially.

Based on the result of the open questionnaire, students want to have several activities with the cloud computing technology such as online collaboration learning, online connection with industrial practitioners, blended learning, online resource center, and online educational media. Online collaboration activities in the educational area are needed in this era to help students gaining experiences related to collaboration in solving several problems under their field. Besides, these activities could be combined with the activities of the connection to the industrial practitioners, doing share resources together, and eventually solve the problem together. The online collaboration as a working together to achieve a goal [20] in the educational area could be divided into three kinds of activities which are collaboration discussion, small group collaboration, and collaborative exam or work [21]. Therefore, maintaining the activities of online collaboration could support the learning environment.

The online resource center is also needed to provide sufficient literature for students to support them in conducting several learning activities. This is very indispensable especially for vocational education to stay updated with the development of technology. Besides, this could deal with the educational gap [22] in several aspects. This facility is expected to support a learning environment for students to broaden their knowledge.

Blended learning and online educational media should be provided by instructors or lecturers to make students’ learning activities. This is used to guide students' activities during their learning. Blended learning has several positive effects in the educational area [23]–[28] to improve the quality of teaching and learning processes and eventually improve the learning achievement of the students. Therefore, building a blended learning system with online educational media is necessary to improve the learning environment.

3.3. Activities needed in the category of physic things
Physic things also need to be paid attention to enhance the learning environment for students. In this case, students pay attention to practical lesson infrastructure and the teacher’s administration for
teaching. These two things are closely related to learning activities. Practical lesson infrastructures are needed for conducting teaching and learning in the practical lesson area to equip the students with the existed required skills based on the development of science and technology. On the other hand, the teacher’s administration for teaching could help students to arrange their learning targets and activities during a period of learning. Those two items could improve the learning environment.

3.4. Activities needed in the category of the non-physic things
A category that cannot be separated from the learning environment is non-physic things during the teaching and learning activities. Students want to have comfortable, pleasant, relax, and not serious situations, discipline, friendly lecturers, and an atmosphere as if being a vocational teacher. A comfortable situation is necessary during teaching and learning activities [29]. Besides, discipline in the educational area, not only for enhancing the learning environment but also the learning achievement and to educate for the character of the students [30]. Therefore, having discipline, relaxation, and a comfortable situation is needed to be done during teaching and learning activities.

An atmosphere as if being a vocational teacher is a choice of the students’ perspective to enhance their learning environment. This is not only for that issue but also could prepare their readiness for being vocational teachers in their future life. It is indispensable that vocational teachers should prepare not only their knowledge and their pedagogical skills but also they need to master several skills in technical [31] so that they could deliver their skills to their students with their pedagogical knowledge.

4. Conclusion
To enhance the learning environment, most of the students chose cloud computing technology. Several activities; online collaboration learning, online connection with industrial practitioners, blended learning, online resource center, and online educational media are needed to be implemented in their teaching and learning activities.

5. References
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