

AUTOMOTIVE VOCATIONAL TEACHER CANDIDATES: PROBLEMS AND SOLUTIONS NEEDED

Dwi Widjanarko

Semarang State University

dwi2_otosmg@yahoo.com; dwi2_otosmg_tm@staff.unnes.ac.id

Abstract

This research was conducted to study the problems faced by automotive vocational teacher candidates especially in automotive electrical subject. The subject in this research was limited in automotive ignition system controlled by electronic control unit which generally become the main problem. This research was an expose facto research to reveal the real handicaps met by vocational teacher candidates. The population was the automotive student of teacher training in Yogyakarta and Semarang consisting of 145 students who had passed automotive electrical system subject. All of the population members were to be the sample of this research. The result showed that 70% student got difficulties in mastering computer controlled ignition system. The most difficult matter (56%) was in understanding the operation of the ignition system. Learning the matter through reading books was not effective for 62% respondent stated difficult. Although there were learning media, they did not helped yet. Based on the result, it is concluded that automotive vocational teacher candidates suffer from difficulties in understanding the operation of computer controlled ignition system. The available reading material and learning media were not effective yet. That's why computer based multimedia being able to facilitate the basic principle and operation of computer controlled ignition system is urgently needed.

Keywords: vocational teacher candidates, automotive electrical system, ignition system

1. Introduction

Now days in Indonesia, vocational education is being developed to fulfill work force in any sector of industries and economical society. Vocational education is designed to prepare individuals or skilled personnel for one or a group of occupations, trader or jobs [1]. There are three different purposes which a vocational education and training (VET) system needs to support if it is to make a valuable contribution to society, these are the labor market, the wider education system, and the historical position: at any point in time a VET system is on a trajectory of adaptation from what went before towards new social and economic circumstances [2].

To produce skilled personnel, vocational school must be equipped by competent teachers. Teachers' competence is crucial for students' academic achievement. The quality of teachers is thus crucial to the quality of the education system. The only way to improve performance is to improve education [3]. The concept of vocational and technical education is rooted on preparation of students for acquisition of necessary skills, knowledge and attitude to earn employment as expert assistant to professional in any field of technology and engineering [4]. The vocational technical education is basically occupational

education which makes individuals self-sufficient and reliant[4].

vocational technical education (VTE) which is seen by many as an essential educational system going by its great and intimidating qualities and potentials should be properly and adequately administered and supervised if its goals and objectives are to be attained. Also, for VTE to be functional, all processes that are involved must be strengthened, adequately and properly packaged, efficiently and effectively delivered [5]. In vocational education, teacher or instructors teach in an environment that requires simultaneous academic and occupational instruction that integrates theoretical and hands-on knowledge while working with a unique student population that has distinct learning needs [6]. Therefore, vocational teacher candidates should be prepared well to meet the requirements of vocational teachers.

Pre-service and concurrent teacher education program is generally a fully institutionalized scheme of training in which student teachers participate on full-time basis with a curriculum consisting of subject area content, professional preparation, including principles and methodology of teaching, philosophy, sociology, curriculum theory, educational administration, planning, measurement, finance, history and psychology and teaching practice both micro and field practice [7]. Teaching is a profession that needs specialist

knowledge and skill. Because of this, education of teachers is crucial process [8]. Vocational teachers have entered the teaching profession using criteria much different from other common school teachers. This made a different road map for vocational teachers as compared to general education teachers [9].

Teaching/education and training play a critical role in developing societies by making intended changes in individuals' behaviors and attitudes with the aim of developing their abilities and providing them with the necessary experiences which enable them to successfully take parts in various tasks and roles [10]. Candidates preparing to work in schools as teachers or other school professionals know and demonstrate the content knowledge, pedagogical content knowledge and skills, and professional dispositions necessary to help all students learn. [11].

In preparing vocational teacher, there are some problems faced by teacher candidates. There is a noticeable lack of teacher preparation and in-service programs and also difficulty in recruiting well educated teachers with skills and competence in vocational and technical education [12]. Also, there are lacks of professional and experienced teachers. The implication of this is that teachers should be professionals and experienced in the teaching of vocational subjects, teachers should be motivated to teach, and there should be cordial relationship between teachers and students [13].

In automotive field, one of the subject area content which has to be mastered by vocational teacher candidates is automotive electrical system. Based on research, after automotive electrical learning process, the students' competence to describe automotive electrical system operation was not satisfying (average score less than 50). As automotive teacher candidates, they are demanded to master automotive electrical system before teaching practice at vocational high school. The lack of competence to describe automotive electrical system is an urgent problem to solve [21]. Based on the lack of competence to describe automotive electrical systems of the automotive teacher candidates, the problem of this research to be revealed is what makes the automotive teacher candidates difficult to master automotive electrical system? The electrical system studied in this research is limited on automotive ignition system controlled by electronic control unit (computer control ignition system) which generally become the main problem.

Method

This research was an expose facto research to reveal the real handicaps met by vocational teacher candidates. Ex post facto research is a research

started by a phenomenon and looking behind to identify the causal factors. The phenomenon in this research is the difficulty of mastering automotive electrical system especially in automotive ignition system controlled by electronic control unit. This research is conducted to identify the causal factors. The population was the automotive students of teacher training in Yogyakarta and Semarang consisting of 145 teacher students who had passed automotive electrical system subject. All of the population members were to be the samples (participants) of this research. Instrument used in collecting data was a questioner consisting 8 items. The items were developed from four aspects namely subject matter, reading books, teaching media, and difficulty in studying automotive ignition system. The instrument was validated by six experts concerning with this research topics.

Result and Discussion

Based on data collected, it is showed that 65% of respondents got computer controlled ignition system matter as having automotive electrical system subject. It means that most of lecturer teaching the subject explained computer controlled ignition system. Although the students had received the matter, unfortunately 70% of students felt difficult to learn computer controlled ignition system. The most difficult matter (56%) to be understood is to comprehend the operation of computer controlled ignition system, followed by basic principle, and components and their function, 29% and 15% respectively. 50% students said that text books concerning with the matter were easy to get, but by reading books 62% respondents were still difficult to learn. Actually, there are also enough teaching media (79% student had learning media), but 57% students were not helped yet. 56% learning media were given by lecturer/ teacher.

Based on the result, some problems faced by automotive teacher candidate can be identified as follows: 1) most of student got computer controlled ignition system matter but most of them feel difficult to learn, 2) the most difficult matter is to understand operation of computer controlled ignition system, 3) text books are available but they do not facilitate yet to comprehend the matter, 4) the existing learning medias do not help the students yet.

As vocational teacher candidates, the students have to master the automotive electrical system especially computer controlled ignition system, for recent development of vehicle lies on computer control system including ignition system. The ability of teacher candidates to master the operation of ignition system is the basic knowledge to be able to troubleshoot the failure of ignition system. That's why operation of ignition system must be mastered

by automotive teacher candidates. Learning the matter through reading books was not effective yet. Although there were also learning media, they did not help yet. Based on the result, it is concluded that automotive vocational teacher candidates suffer from difficulties in understanding the operation of computer controlled ignition system. The available reading material and learning media were not effective yet. That's why computer based multimedia being able to facilitate the basic principle and operation of computer controlled ignition system is urgently needed.

The multimedia has to describe the matter in detail, systematically, and can animate the flowing current in computer control ignition system slowly. Based on the problem mentioned above, the characteristics of needed learning media which enable to solve the problems are 1) easy to learn; 2) easy to use; 3) describing basic principle of computer control ignition system, components and their functions, and operation of ignition system in detail; 4) each phenomena occurred during ignition system operation should be illustrated well; and 5) computer operated media being easy to learn anytime and anywhere.

Using computer operated media, automotive teacher candidates can improve their ability in utilizing computer as a teaching tool. A potential challenge to experiential nature of service and vocational education programs in the 21st century is the potentially narrow usage of computer in schools. The challenge to vocational/experiential educator is to ensure that using computer and the internet have experiential components or that the computer features of the courses are designed to enhance community-connected activities [14]. Applying computer in education has become a must, as a form of technology diffusion to gain an effective learning and teaching. Effective teaching is all about obtaining results in the form of student achievement. It's not about covering the subject matter, it is about student learning [16].

Computer-assisted education has been used frequently in modern educational systems because of its benefits like providing persistence in learning in general, providing a learner-centered learning process, getting the event of learning out of four walls and making it independent from space and time, providing the possibility to practice frequently and providing a quick access to information [17]. Concerning with automotive electrical system, computer can be optimized to facilitate learning process in order all students can use it to make learning easier.

Improving capability of vocational teacher candidates will also increase the quality of vocational education. Education enhances the skills

of labor and facilitates the diffusion of technology, which raises productivity and economic growth. There is a positive and significant correlation between economic growth and vocational education and technical training. Mass vocational education enhances technology diffusion, labor productivity and economic growth [15]. Rethinking of educational programs like teacher education programs, calls for integration of ICT goals such as computer literacy. Pre-service teacher trainers are yet to adequately integrate ICT tasks in the teaching and learning [18]. Need for aggressive implementation of the use of ICT in teaching-learning processes in technical and vocational education beyond Email access and social networks [20].

Computer assisted learning applied in automotive electrical system subject will create an active learning and student centered learning. Student are able to study automotive electrical system anytime and anywhere with minimizing teacher roles. In learner-centered teacher education, through reflective thinking it is possible for teachers to develop important skills for their profession, such as reflecting on learning experiences that enhances learning and analysis, understanding the events in the classroom, creating a classroom environment that induces critical thinking, organizing activities that aim at developing creative thinking, supervising their own professional development, and reorganizing their teaching-learning environment based on the new concepts [19].

Conclusion

Some problems faced by automotive teacher candidate can be identified as follows: 1) most of student got computer controlled ignition system matter but most of them feel difficult to learn, 2) the most difficult matter to study is to understand operation of computer controlled ignition system, 3) text books are available but they do not facilitate yet to comprehend the matter, 4) the existing learning medias do not help the students yet. To overcome that problems, the characteristics of needed learning media which enable to solve the problems are 1) easy to learn; 2) easy to use; 3) describing basic principle of computer control ignition system, components and their functions, and operation of ignition system in detail instead of reading books; 4) each phenomena occurred during ignition system operation should be illustrated well to equip existing media; and 5) computer operated media being easy to learn anytime and anywhere.

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