



# E-Learning Model for Technical and Vocational Education: In Vocational High School

Seninil<sup>1\*</sup>, Mochamad Bruri Triyono<sup>2</sup>, Asnul Dahar Minghat<sup>3</sup>, Herman Dwi Surjono<sup>4</sup>, Siti Salina Mustakim<sup>5</sup>

<sup>1</sup>Vocational and Technology Education, Postgraduate Program, Yogyakarta State University, Indonesia

<sup>2</sup>Faculty of Engineering, Yogyakarta State University, Indonesia

<sup>3</sup>Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia, Malaysia

<sup>4</sup>Instructional Technology, Postgraduate Program, Yogyakarta State University, Indonesia

<sup>5</sup>Faculty of Educational Studies, Universiti Putra Malaysia, Malaysia

\*Corresponding author E-mail: [seninilyunus@gmail.com](mailto:seninilyunus@gmail.com)

## Abstract

E-learning has been to be a very popular choice in the 21st century education world. E-learning able to meet a variety of learning needs tailored to each level of education. E-learning makes it easy for a teacher to give lessons to students without being bound by space and time anymore. Students can receive subject matter anywhere and anytime while at home, at school, and at work. Students can take advantage of discussion forums to discuss remotely through the use of collaborative learning tools available in e-learning. The goal to be achieved is to know the e-learning model for vocational education, namely vocational high school (SMK). In particular, this paper reviews the technical literature on the concept of e-learning, e-learning models, and the development of e-learning models in the context of TVE. Regarding e-learning studies, journal articles, opinion papers, conceptual papers, etc. are analyzed for content related to the e-learning model on TVE. It was concluded that the use of e-learning in vocational education such as Vocational High Schools was needed to assist teachers in improving the learning process. E-learning needs for vocational high schools as an effective learning media adapted to the vocational characteristics of each school.

**Keywords:** E-learning; Technical and vocational education; Vocational high school.

## 1. Introduction

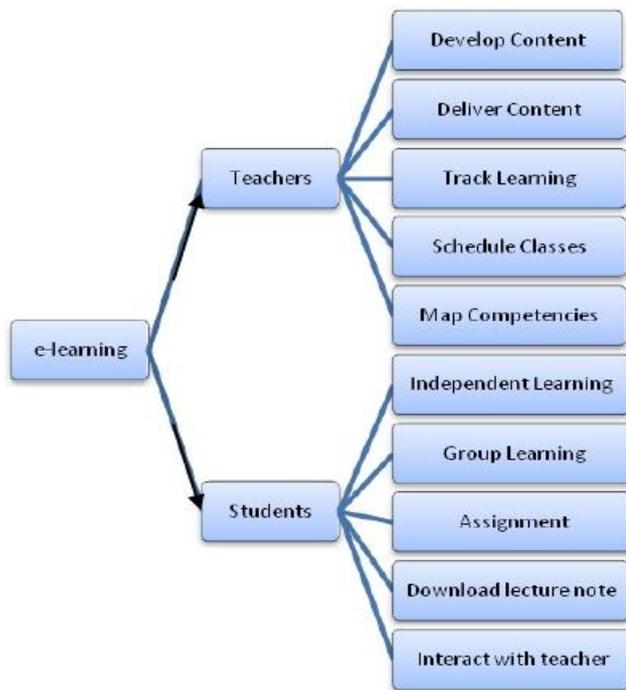
The development of information and communication technology today has penetrated into the world of education, especially in the learning process. The development of the use of Information and Communication Technology has five shifts in the process of defense learning, namely: (1) from training to display, (2) from the classroom to where and the hood, (3) from paper to online or channel, (4) physical facilities to network facilities, and (5) from time to time cycle [1]. The demands of using information technology in the learning process are considered to facilitate the learning process. E-learning does not only make it easy for educators to deliver subject matter but other benefits are saving time and not being bound by space. E-learning is distance learning who uses computer technology or now it has shifted to learning using internet. E-learning is learning web based ones can be accessed from the internet [2]. E-learning has made a variety of formal and non-formal educational institutions, ranging from basic education programs to higher education institutions, have combined learning with e-learning.

The problem statement in this paper will discuss the need for e-learning model for vocational high School. Given that vocational education institutions prioritize psychomotor competencies that support graduates to be ready to face the world of work. Use of e-learning in vocational schools only as face-to-face companions because in vocational learning cannot replace teachers in total. The objectives to be achieved in writing this paper are to knowing e-learning model for vocational high schools (SMK).

## 2. Literature Review

### 2.1 The Concept of E-learning

E-learning is one of the learning models utilizing information and communication technology that can be used to support the effectiveness of learning. E-learning has characteristics [3], including: 1) having content that is relevant to the learning objectives; 2) using instructional methods, for example presenting examples and exercises to improve learning; 3) using media elements such as words and drawings to convey learning material; 4) enable direct learning centered on the teacher or designed for independent learning; 5) building understanding and skills related to the purpose of learning either individually or increasing the performance of group learning. E-learning has characteristics [4], including (a) interactivity (b) independency; (c) accessibility, and (d) enrichment. The term e-learning is more precisely intended as an attempt to make a transformation of the learning process in schools or colleges into digital forms bridged by internet technology [5].



**Fig. 1:** Some benefits of e-learning to Teachers and Students developed from [6-7]

Learning uses an e-learning system still in the context of a teacher delivering lesson content to students only using intermediary media which in this case has shifted to internet usage. Content is a learning object. One of the parameters of the success of e-learning is learning content successfully delivered to students. The e-learning system must be able [8]:

1. Providing teachers centralized content which is instructional content that is edited, declarative and well-defined and clear;
2. Provide learners centralized content that is content that presents results (results) from the focus of teaching on developing creativity and maximizing independence;
3. Provide examples of work for content material to facilitate understanding and provide opportunities to practice;
4. Add content in the form of educational games as a medium to practice the question-making tool.

Some principles of making e-learning website includes [9]:

1. Formulate learning objectives;
2. Introducing learning material;
3. Providing assistance and facilities for students to obtain learning material;
4. Providing assistance and comfort for students to carry out tasks with clear instructions and directions;
5. Learning material is delivered in accordance with generally accepted standards, and in accordance with the level of development of the learner;
6. Learning material is delivered systematically and is able to provide learning motivation, and at the end of each learning material is summarized;
7. Learning material is delivered in accordance with reality, so that it is easily understood, absorbed, and practiced directly by students;
8. The method of explanation is effective, clear, and easily understood by students with illustrations, examples and demonstrations;
9. As a tool to find out the success of learning, it can be evaluated and ask for feedback from students.

Good e-learning is e-learning which can attract the attention of teachers and students. Some important things need to be considered when designing an e-learning. The first form of e-learning is simple meaning that students are easy to use so that

student learning time becomes more efficient because and the teacher does not have to spend time first to study the e-learning system, the second e-learning is private meaning that teachers can interact well like teachers who communicate with students in front of the class interactions become more personal and can monitor the development of student students. The third e-learning must have a service system that is fast in handling every complaint and student needs [10].

E-learning is identified as an interactive media environment that facilitates online teaching and learning through internet connectivity so that the learning process is easier. But in technical and vocational education, there are several problems that become challenges in implementing e-learning, namely [11-12]:

- Identify the skills needed by students who are accepted.
- Evaluating student progress.
- Identify the right teaching strategy.
- Choose to use electronic equipment in laboratory work and the resources needed to share a remote laboratory.
- Accrediting e-learning based engineering programs.
- Targeting interactions with international technical education institutions.
- Estimating the cost of resources that serve online technical education.
- It is estimated that human and technical infrastructure is needed.
- Assess student and staff satisfaction.
- Facing changes in the student advice protocol.
- Assess class software requirements.

## 2.2 Model E-learning development

E-learning as a learning media is one of the components of the learning system. The development of e-learning requires a model that fits the goals to be achieved.

### 1. Development model design learning

Development of learning is a systematic approach in designing, producing, evaluating, and using a complete learning system, including all the appropriate components and a management pattern for their use [13-14]. The learning development model with the stem approach to instructional design is a learning development activity that is a reference in this study, among others: identifying the topic, determining learning objectives, determining learning strategies, developing materials, and determining learning evaluation [15].

Development of learning design that is in accordance with vocational education generally leads to practical learning in vocational education, while theoretical learning can use instructional design in public schools. The approach is based on the latest information from observations and interviews with experts in the field of vocational education and learning media, experts in the field of expertise in both technology and service and with a qualification in the field of vocational education expertise. These seven sub activities then can be grouped into four activities, namely; needs analysis, selection and sequence of lesson content, lesson development, and instructional evaluation. Each activity will discuss the sub-activities that are carried out in stages [16].

### 2. Development model design multimedia products

Models of interactive multimedia product development include development models including the process of design, production, evaluation, and implementation and maintenance [17]. Other multimedia product development models include five stages, namely: the analysis, design, development, implementation and evaluation stages [18].

### 2.3 E-Learning in the Context of TVE

E-learning is increasingly popular in the field of education due to flexibility, simplicity, and affordability of facilities in all areas of human business [19]. The use of information and communication technology to foster legal work skills is recommended, therefore the application of e-learning to TVE in this context is no exception [20]. Preparation of TVE graduates and in training mode must also utilize e-learning in the teaching and learning process. E-learning (including ICT-based learning) allows students, trainees and teachers / instructors to interact virtually without physical contact. E-learning is the process of using technology to create, distribute, manage, and enable learning through electronic networks [21].

The impact of the above definition, one might wonder how the e-learning environment that is similar to distance learning in the design and presentation can support the nature of the courses offered in the TVE, given the fact that most courses require direct activities. But the definition above offers several explanations about that effect, such as the e-learning environment and its flexibility to enable the development of course content by lecturers / instructors, in order to provide opportunities for both teachers and students to upload and download subject matter (interaction) and of course material which relates to practical activities (directly) such as inquiries, measurements and so on [22].

The use of interactive electronic media has proven to be advantageous in recent studies in vocational education students and even seen as a solution to staff shortages and material in this field [23]. Integration of e-learning to facilitate problem-based learning in engineering and technical education will give students a kind of support to comfortably take part in learning activities, giving them the opportunity to work Retained Earnings independently and develop new ideas on the problems encountered [24].

## 3. Methodology

This paper is a literature review of the concept of e-learning for vocational high schools. The concept in question is e-learning needs analysis for vocational high school e-learning models and the development of e-learning models in the context of TVE. The study of e-learning originating from journal articles, losing opinions, conceptual papers, then analyzed for content related to the e-learning model for vocational education, namely vocational high schools

## 4. Results and Discussion

### 4.1 Analysis School E-learning needs Vocational high School

The use of e-learning for vocational secondary schools needs to consider several things, one of the important things is that in vocational education practical learning for mastery of skills competency requires more time. The important thing needs to be considered so that the application of e-learning uses a model that is in accordance with the needs of vocational schools making it easier for teachers and vocational high school students.

#### 1. Analysis Needs

This needs analysis use determine the condition of secondary vocational schools, the terms of what the needs at that time. Determining an e-learning model that is suitable for vocational high schools needs to pay attention to the expertise in the vocational high school. These areas of expertise related to the competencies required by the conditions of the working world. The need for learning with e-learning will be useful in certain areas of expertise that require repetition in independent learning or in areas of

expertise that require a lot of time to discuss theoretical lessons.

The application of e-learning in vocational high schools must also understand the goals of students. Learners who have had what Knowledge of e-learning and seem to have interest in learning to e-learning is a good precondition for the implementation of e-learning in the vocational school.

2. Determine the goals and objectives of e-learning  
The application of *e-learning* in vocational high schools must be related to the background of its creation. Some of the backgrounds in question are:
  - a. Strategies for achieving learning competencies  
The presence of e-learning is able to fulfill the objectives of fulfilling the competencies expected in vocational high schools
  - b. Cost and time efficiency  
The presence of e-learning for vocational secondary schools can optimize the time of learning implementation, facilitate the implementation of independent and group learning, facilitate access to learning resources, and the optimal cost of accessing learning resources.
  - c. The presence of e-learning can foster interest in independent learning
  - d. The presence of e-learning in vocational high schools can facilitate the dissemination of knowledge

The goal of e-learning in vocational high schools can refer to indicators of achievement of goals. The target of e-learning must be in accordance with the goals and achievements can be measured.

#### 3. User analysis

The use of e-learning in vocational high schools needs to know the condition of e-learning users, namely teachers and students. The conditions referred to are related to the devices used when accessing e-learning and the learning characteristics of e-learning users.

#### 4. Consideration of internal capacity

These considerations relate to the availability of learning resources both in terms of technology, access, applications and other supporting infrastructure.

#### 5. Feasibility of resources

The use of e-learning in vocational secondary schools must know the readiness of human resources, administration and funding.

## 4.2 Application of e-learning in institutions education

Various e-learning applications in several educational institutions can be seen in the results of the research below. Based on the results of the research from [25], the use of e-learning websites and their effects on motivation, performance and learning outcomes in vocational teachers and students in Central Java province, obtained: 1) The level of utilization of learning has a positive and significant effect on learning motivation; 2) The level of utilization of electronic learning has a positive and significant effect on individual performance; 3) Motivation has a positive and significant effect on learning outcomes; 4) Individual performance has a positive influence and significant influence on learning outcomes; and 5) The level of utilization of e-learning has a pseudo-negative and not significant effect on learning outcomes.

## 5. Conclusion

Instability competency is a very important competency in vocational education that must be possessed by a student. The use of full online learning model will make it difficult for student to

acquire these skills competencies. Therefore, the e-learning model that is suitable for learning that hones skills is the Mixed / Blended Model. This blended learning model places e-learning as a complement, as theory learning is done on line (in networks), while practical learning is held during face-to-face classes. Learning in vocational schools has more practical learning time than theoretical learning. E-learning in vocational education such as Vocational High Schools needed to make it easy for teachers to deliver lesson material that they did not have time to give face to face. The use of e-learning as a learning media can function as a complement to improve the effectiveness of learning in the classroom, so that it can help improve students' understanding of learning material and improve the motivation of student learning in vocational schools

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