The Heutagogy Model of Learning Innovation in Increasing the Skill Needs of the Digital Era of Vocational Students

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Abstract. The Heutagogy Model of Learning Innovation in Increasing The Skill Needs of The Digital Era of Vocational Students. The digital technology-based heutagogy learning model characterizes the progress of implementing vocational education in a nation. This study aims to develop a heutagogy learning model for vocational students by mapping its components. The method in this study uses descriptive qualitative. Research subjects include university lecturers, vocational high school teachers, and industrial employees. The research location is focused on East Java. The research instrument consisted of a questionnaire and documentation. The heutagogy component for vocational students includes critical thinking, collaboration, communication, and creativity. Mapping the four components supporting the application of the heutagogy learning model needs to be done to improve the quality of vocational students in the digital era.

Keywords: Heutagogy · digital technology · vocational students · Learning Innovation

1 Introduction

Learning the heutagogy model of the digital era is the main focus of education globally [1–3]. The heutagogy model emphasizes the independent learning aspect as an individual success entity. In vocational education, students are the key subjects for applying the heutagogy learning model. This model focuses on student learning independently by implementing an instructional curriculum (self-determined learning) [4–7]. Regarding vocational education, this has a positive impact on increasing student capabilities and competencies through personalized learning. However, the heutagogy learning model has not fully become the focus of developing vocational education learning models. These constraints are due to the absence of a mapping of the underlying component requirements.

Developing critical thinking components is a concern for the world of education in the digital era [8–10]. In this era, the emergence of various technologies affects the

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implementation of education in a country. The success of education is determined by the quality of the learning model used. Implementing the learning model is intended to encourage an increase in student abilities. Especially in vocational education, the development of critical thinking skills is the focus of all stakeholders. This component means that vocational education students must be able to have a critical spirit related to technological developments. However, the mapping of critical thinking component development needs has not been carried out by vocational education institutions. This phenomenon produces graduates who do not have a critical spirit in their field of work. So that the effectiveness and efficiency in working in the industry do not meet the specified standards, the industry confidence in vocational education institutions will continue to decline. This decrease impacts the low employment of vocational education graduates according to the field of expertise they are engaged in.

The emergence of digital technology encourages the birth of various innovations. Innovations can occur with the ability to work together between humans [11, 12]. Especially in vocational education in the digital learning era, it is intended to improve student collaboration skills. These components are essential to technological innovations, especially in expertise. Vocational education students are always encouraged to innovate to increase the productivity of a country's workforce. However, labour productivity in developing countries is still lagging behind that of developed countries. This is due to the lack of cooperation between individuals. In vocational education, collaboration between students is needed to increase the quality of a country's workforce.

The massive development of information marks a paradigm shift in modern education. In the era of modern education, freedom of access to knowledge can be done quickly by students. Technological developments can be mastered easily through unlimited access to information. Along with this, communication skills are essential to be mastered by vocational education students [13]. In the context of vocational education, students act not only as connoisseurs of technological progress-greater demands on students' readiness to convey technological developments. Therefore, good communication skills need to be developed by vocational education institutions. However, the weak development of communication skills during such massive information coming in from the outside world occurs in vocational education. The mapping of these components has not been carried out holistically in the concept of mutual benefit with the industrial world.

Innovation is the key to the quality level of vocational education in the digital era. Innovation can be born from the synergy of various stakeholders' creativity. Creativity skills are the answer to various challenges of change in various areas of life [14, 15]. In vocational education, student creativity is the concern of various parties. Increasing student creativity can be done by bringing up concrete problems in the world of work. However, the implementation of vocational education in developing countries has not been able to answer the problems that occur in the industry. This is characterized by the low absorption of graduates, low industry awareness of implementing vocational education, and the unavailability of adequate supporting facilities as needed.

This research intends to find solutions to various problems of vocational education, especially in applying heutagogy learning models in the digital era. The mapping is

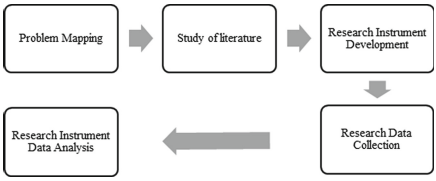

Fig. 1. Research Stages

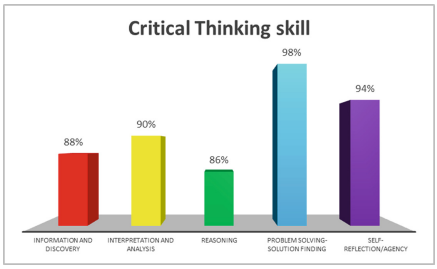

Fig. 2. Indicators of Critical Thinking Skill Components

intended primarily for the heutagogy of vocational students' critical thinking components, collaboration, communication, and creativity skills. Thus, this research aims to map the components of heutagogy for vocational students in the digital era.

2 Method

This study used the descriptive qualitative method. The selection of this method is adjusted to the research objectives. The research locations are in vocational universities, vocational schools, and state and private industries under the auspices of the government and the private sector in the province of East Java. The research stages are shown in Fig. 1.

3 Results

The heutagogy skill component of vocational students consists of critical thinking, collaboration, communication, and creativity skills. The critical thinking skill component is viewed from the three indicators shown in Fig. 2.

Figure 2 shows the results of mapping the needs of critical thinking skill components. Mapping the needs of each critical thinking skill component indicator in terms of information and discovery by 88%, interpretation and analysis by 90%, reasoning by 86%, problem-solving-solution finding by 98%, and self-reflection/agency by 94%. Furthermore, the collaboration skill component is reviewed from the four indicators shown in Fig. 3.

Figure 3 shows the results of mapping the needs for collaboration skill components. Mapping the needs of each indicator of collaboration skill components in terms of responsibility and initiative by 90%, cooperation, flexibility, and responsiveness by 90%,

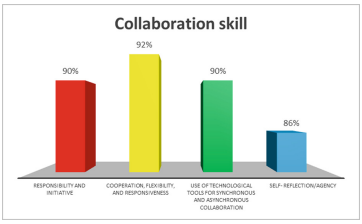

Fig. 3. Indicators of Collaboration Skill Components

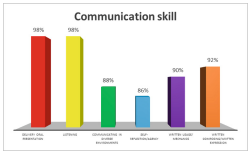

Fig. 4. Indicators of Communication Skill Components

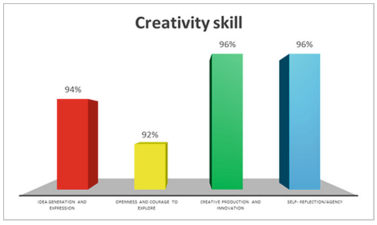

Fig. 5. Indicators of Creativity Skill Components

use of technological tools for synchronous and asynchronous collaboration by 90%, and self-reflection/agency by 86%. Furthermore, the communication skill component is reviewed from the six indicators shown in Fig. 4.

Figure 4 shows the results of mapping the needs of the communication skill component. Mapping the needs of each indicator component of communication skills in terms of an oral delivery presentation by 98%, listening by 98%, communication in a diverse environment by 88%, self-reflection/agency by 86%, written usage/mechanics by 90%, and written composing/written expression by 92%. Furthermore, the creative skill component is reviewed from the six indicators shown in Fig. 5.

Figure 5 shows the results of mapping the needs for the creativity skill component. Mapping the needs of each creative skill component indicator in terms of idea generation and expression by 94%, openness and courage to explore by 92%, creative production and innovation by 96%, and self-reflection/agency by 96%. So it can be concluded that the need for heutagogy components in the form of critical thinking, collaboration, communication, and creativity skills descriptively qualitatively proved to be needed significantly.

4 Discussion

4.1 Learning the Heutagogy Model Through Its Skill Components for Vocational Students in the Digital Era

The heutagogy learning model conceptually emphasizes independent learning patterns. This learning model is commonly known as self-determined learning. The self-determined learning model means that all learning components are centred on the individual as a learner [5, 16–18]. In the context of vocational education, it means that the achievement of capabilities and competencies to be achieved is student-centred. The success of the independent learning model is determined by the individual's ability as a learner. The development of students' abilities towards independence needs to be done to improve learning outcomes. This is in line with the concept of the digital era, which is centred on an ICT technology-based economy. Vocational students as agents of a nation's economy must be prepared to master ICT in learning so that the success of the heutagogy learning model focuses on individual development as the core subject of learning.

The heutagogy learning model develops students' critical thinking skills. Developing critical thinking skills is the main starting point for implementing modern education [9, 19]. In the heutagogy model, students must think critically about setting learning goals and the methods used to achieve these goals. Following the context of vocational education, students are required to think rationally and systematically according to their expertise. The development of digital technology influences students' critical thinking skills in the 4.0 learning era. The role of technology can encourage the development of critical thinking skills [8]. In the digital era, students must change traditional ways of thinking to modern ways of thinking following the facts of the development of digital technology. Critical thinking in the digital era has become a complex concept that emphasizes analytical and rational aspects according to emerging problems related to technological developments. This can be well facilitated by using the heutagogy learning model due to the role of students as critical individuals.

The heutagogy learning model develops the ability to collaborate between students. The ability of students to collaborate in the digital era emphasizes the importance of responding to developments in digital technology in learning in the classroom and in the work environment later [12, 20, 21]. Students can do tangible things through collaboration in using, modifying, and developing digital technology. The heutagogy learning model can facilitate the ability to cooperate between students in the digital era. This model facilitates students to collaborate in learning. Especially in vocational education, students are prepared to work together with others to achieve learning goals and goals to be achieved in the field of work according to their expertise later. A digital technology-based work environment characterizes the current field of work for vocational students so that there is synchronization and optimization of the use of learning models that emphasize aspects of cooperation between individuals in a digital environment.

The heutagogy learning model can develop the communication skills of vocational students. Communication skills mean that individuals must be able to receive and convey information effectively. Following technological developments, the development of communication skills is one of the critical aspects of education [22–24]. In vocational

education, student communication skills mean students' ability to explain and present ideas using digital technology according to their expertise. This ability can be increased due to the ability of students to understand and process information into a new form of knowledge that others can understand more easily. In line with this, the heutagogy learning model emphasizes the development of aspects of student independence in mastering digital communication skills. Digital communication means that students must be able to receive digital information and convey information digitally. In instructional design, students must receive learning content and present it to other students in digital presentations.

The heutagogy learning model develops the creative abilities of vocational students. Creativity is based on the ability to think about a task or problem uniquely. The development of creative abilities can be done in the learning process with the help of technology [15, 25]. In the context of vocational education, the creativity of vocational students is influenced by the increasingly massive development of digital technology. In the digital era, vocational students can create something unique and new according to their expertise to enrich technological developments. The heutagogy model with the concept of independent learning is in line with increasing student creativity. This model facilitates students to think about how to do the given task with unique creativity.

4.2 The Effectiveness of the Heutagogy Learning Model as a Supplement of Vocational Students in the Digital Era

The syntax of the heutagogy learning model conceptually emphasizes the importance of independent learning. Independent learning means self-determined learning [4, 6, 26]. So that the learning center for students. The syntax of the heutagogy learning model means that learning management from planning, implementation, and evaluation involves students' active role, which is contained in the design of the instructional curriculum. This is a response to the increasingly rapid development of digital technology in the field of vocational education. In functional design, the stages carried out according to the heutagogy model include the stages of determining learning objectives, the learning process, and the stages of adjusting learning objectives through the learning process.

The development of vocational students' organoware abilities can be facilitated by the heutagogy learning model. This model can increase the learning independence of students in the classroom as a forum for implementing learning activities. Learning activities as a form of implementing the selected learning model [27, 28]. This can be done with the independence of students working on assignments in a group. Students as individuals in vocational education organizations have an essential role as an indicator of the success of learning implementation. Through the heutagogy learning model, learning technology is optimized to achieve learning objectives. The first stage is determining learning objectives that involve students in the heutagogy learning model, facilitating the development of leadership effectiveness, the autonomy of work and organization. The second stage is determining the learning process that involves students in the heutagogy learning model, facilitating the development of stakeholder engagement and a climate of innovation and competition [29]. The third stage is adjusting learning objectives through a learning process to develop the ability of organization integrity vision so that

the heutagogy learning model in principle correlates with the increase in organoware of vocational students.

The development of vocational students' technoware abilities can be facilitated by the heutagogy learning model. This model can increase students' utilization and use of digital learning technology through more personalized learning [30, 31]. This can be done with the independence of students in utilizing and developing learning media based on digital learning technology. The key to developing technoware skills lies in the characteristics of the use of learning technology. In the first stage, the heutagogy learning model can develop the ability to operate, complexity, precision, and accuracy through digital technology that involves students in determining learning objectives. In the second stage, you can develop the ability to play material handling through digital technology to determine the learning process. The third stage can develop the ability of process control and mechanism [32].

Critical thinking skills are abilities students in the digital era must possess [10, 33]. Critical thinking skills are an essential indicator of student success in learning. In learning that emphasizes the importance of critical aspects, it is necessary to develop various learning models that can increase the achievement of these abilities. The heutagogy learning model, in principle, emphasizes the importance of the concept of critical thinking. Students in the heutagogy learning model must think critically about the set learning objectives. So critical thinking skills correlate with critical thinking components in the heutagogy learning model.

Collaboration skills are the ability to work together in the digital learning era 4.0 [11, 34]. This emphasizes the importance of the aspect of collaboration facilities in working on group assignments. One of the facilities to support this is the use of a learning model based on student independence. So that the learning model can increase the participation of students to work together in groups. The heutagogy learning model can facilitate collaboration between students. In this model, there is active collaboration between students. The components of the heutagogy learning model are related to developing students' ability to work together.

Communication skills are abilities needed to achieve successful learning in the digital era. Digital learning enhances student communication experience [13, 35]. This ability emphasizes good communication between students, students and lecturers, and students in an organization. The heutagogy learning model can facilitate interaction in the interactive learning process. This model emphasizes the importance of communication between students and students and lecturers who are supported by technology.

Creativity skill is the ability needed to develop a technology in the digital era. This ability focuses on the creativity of students to develop a technology that is unique from the previous one [14, 36]. So that students are not only users of technology. The heutagogy learning model emphasizes the importance of developing student ideas in a learning process. Student creativity is enhanced at every stage of the heutagogy learning process.

Students' abilities and competencies will increase with the heutagogy learning model. The heutagogy learning model has the complexity and ease of transferring learning content. This model focuses on increasing students' independence in developing their capabilities and competencies. Student capabilities are related to adapting to the future work environment [37, 38]. Meanwhile, competence is related to the maturity level of

the expertise occupied as the basis for conformity with the availability of employment opportunities. The learning process will occur interactively by focusing on students. So that students are more skilled in developing their skills.

Using the heutagogy learning model can improve the critical thinking skills of vocational students. This model is one of the potential models in today's digital era [39]. This can be realized through various complex activities arranged by students. The independent learning process can improve students' critical thinking skills by selecting interesting learning content. Students' critical thinking in finding solutions to problems related to their expertise will increase. On the other hand, students are increasingly sensitive to technological developments according to their expertise.

The use of the heutagogy learning model can improve student collaboration skills. This can be realized by having a task be completed together. Determination of group assignments is the key to the heutagogy learning model. So that students can stimulate the spirit of learning by collaborating with other students. The intended collaboration is formed from the process of choosing how to complete the work effectively. The long-term impact of students learning for life through the concept of the heutagogy learning model [7].

Using the heutagogy learning model can improve student communication skills [40]. This can be realized if students are given assignments to present. Presentation assignments can be shared project assignments. Before making a presentation, students conduct a discussion to finalize the work results on the assignment. So that students will have increased communication skills through presentation assignments. This phenomenon is in line with the concept of adopting a new way of learning that requires students to be more independent [41, 42].

The use of the heutagogy learning model can increase the creativity skills of vocational students through the use of new learning designs [43]. This can be done with a task that focuses on aspects of creativity. Creativity is intended in terms of the use of new methods and new product results. Tasks can be in the form of technology development to solve concrete problems in the field [44, 45]. So that students can channel creative ideas through the application of appropriate technology according to their knowledge.

5 Conclusion

This study maps the components of the need for applying the heutagogy learning model. The mapping carried out includes four components: critical thinking, collaboration skills, communication skills, and creativity skills. These components influence supporting the development of heutagogy learning models. The research conducted is limited to formal education that provides vocational education. Recommendations for similar research can be carried out to map the needs for developing heutagogy learning models in a wider scope of education.

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