The innovation of module training based heutagogy as an acceleration for increasing pedagogical supremacy of vocational education lecturers in the industrial revolution 4.0

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Abstract. This study aims to find the factors that cause the low pedagogical supremacy competence of vocational education lecturers and examine the attractiveness of heutagogy-based training module innovations to improve pedagogical supremacy of vocational education lecturers. This research uses the R&D method. The research focused on tertiary education in vocational fields in East Java. The results and findings in this study include: (1) the factors that cause the low pedagogical supremacy competency of vocational education lecturers include the management factors of students (understanding insight or educational foundation, understanding of students, curriculum/syllabus development, learning design, learning implementation that educates and dialogical, and evaluation of learning outcomes) and aspects of personality (active self-development activities, self-evaluation, designing self-roadmap, professional self-concept, and independent innovation); (2) the innovation of heutatogy-based training modules developed has a high level of acceptance. This is evidenced by the average score of indicators of 36.93 or the level of acceptance of 92.33%, and (3) the innovative heutagogy-based training module developed can be used as a relevant alternative reference in the development of other sophisticated media.

1. Introduction

In some developing countries, the capability of lecturers in vocational education is relatively less than the maximum in the pedagogical aspect [1]–[3]. Lecturers are fonder of conducting practice-based research. The duty of the lecturer is that he must have vital abilities. These abilities include the ability to understand students, the design and implementation of learning, evaluation of learning outcomes, and the development of students to actualize the various potentials they have. Currently, this ability is relatively rarely mastered by lecturers, especially in tvocational education. Some experts stated that often lecturers have difficulty in learning several teaching methodologies that are appropriate to the material and development of students [4]–[6]. Not only that, in the era of the Industrial Revolution 4.0, lecturers were required to master a proper and good evaluation system, which in turn increased the ability of students. That will certainly be able to form a lecturer who has a high pedagogical supremacy level.

In short, lecturer pedagogical supremacy abilities include the ability to explain the material, implement learning methods, give questions, answer questions, manage classes, and conduct evaluations [7]–[9]. Mastery of the characteristics of students must be seen from the physical, moral, spiritual, social, cultural, emotional, and intellectual aspects. Some experts stated that currently, the lecturer pedagogical supremacy ability is difficult to achieve because there are relatively many vocational teachers who prefer researching rather than teaching. In fact, students have the right to be educated and choose their own competencies.

The systematic phenomenon of the impact of the 4.0 Industrial Revolution today is one of which is a massive change in the education system, especially vocational education. All aspects of learning are required to develop digital and virtual media. This is also supported by the characteristics of 21st-century graduate competencies or termed 4C (communication, collaboration, critical thinking and problem solving, and creativity and innovation). The four skills are currently not fully fulfilled, even for developed countries. Some experts in developed countries state that vocational education requires the fulfillment of actual and relevant capabilities according to the needs of modern industry [10]–[12]. In reality, as much as 75% of the lecturers are still relatively unable to optimally use the latest learning technology [6], [13].

Based on the analysis of the problem, then steps are needed to resolve the problem. This can be done through the application of learning systems and interactive media for teaching. One innovative approach and now is a trend that is the application of the heutagogy approach. This approach focuses on improving learning, overall learning opportunities, and developing independent skills. This approach needs to be wrapped by a training module in its implementation. Thus, lecturers will be able to easily explore the stages and syntax of the heutagogy approach.

2. Method

This research uses research and development (R&D) methods. Before product development, researchers undertook a simple early-stage study to look at the factors causing the low pedagogical supremacy of vocational education lecturers. At this stage using qualitative methods, through surveys and interviews. The implementation of this research is focused on universities in East Java. Furthermore, the steps of this study are shown in Figure 1.

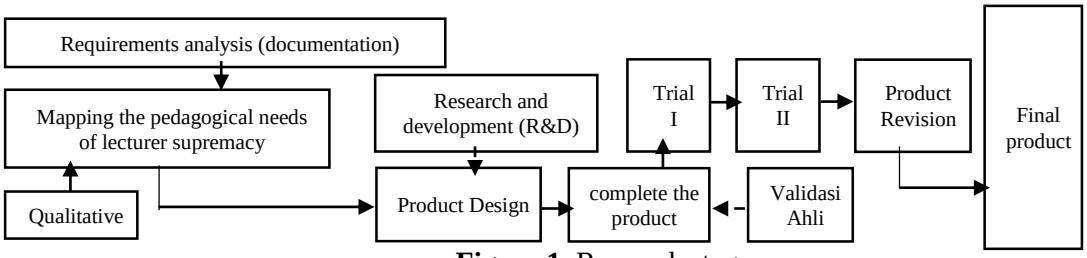

Figure 1. Research stages

Based on Figure 1., it was shown that there were two trials. The first trial was conducted on a small scale, and the first trial was on a large scale. Expert validation was carried out by two expert teams. These experts include instructional media experts and pedagogical material experts. At this stage, the product being developed is already ready and ready to use the product.

3. Results and discussion

The results of this study are grouped into two topics. The first topic is the large percentage of factors causing the low pedagogical supremacy competence of vocational education lecturers. The second topic is the results of the product validation developed. In the first topic, there are two factors causing the low pedagogical supremacy competence of vocational education lecturers. These factors include student management factors and personality factors. Next, the percentage of student management factors is presented in Figure 2.

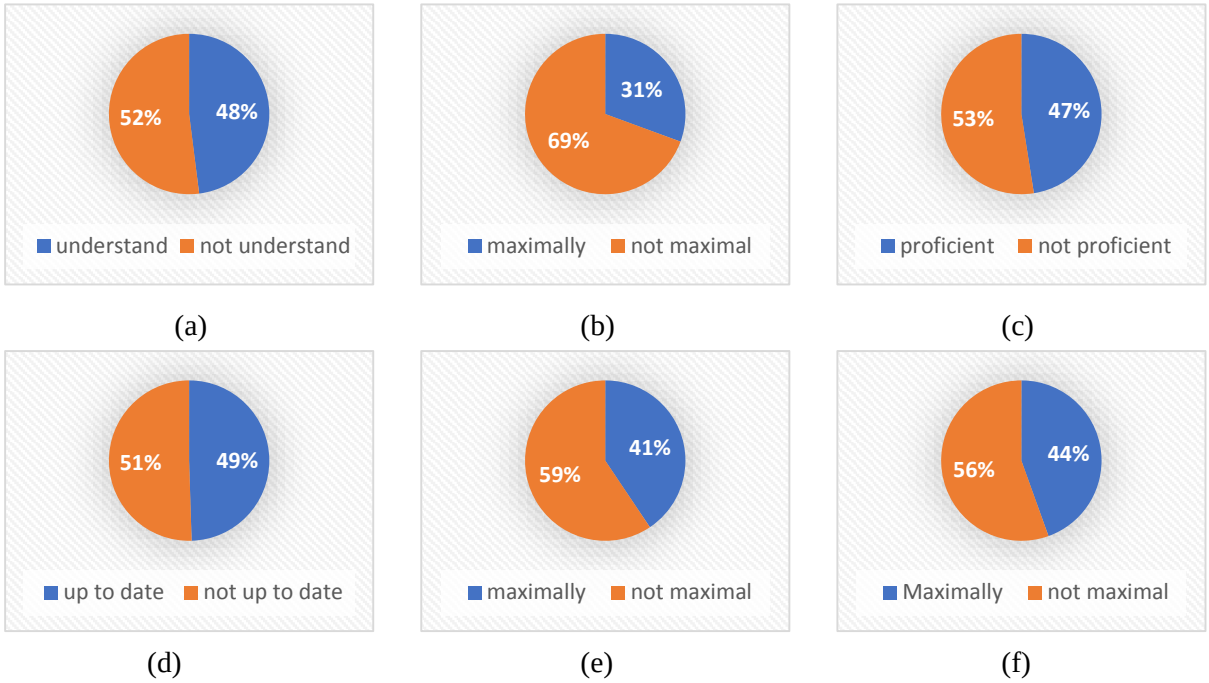

Figure 2. (a) understanding insight or educational foundation; (b) understanding of students; (c) curriculum/syllabus development; (d) learning design; (e) the implementation of educative and dialogical learning; (f) evaluation of learning outcomes

In Figure 2, it is shown that in student management factors, there are six indicators of the low pedagogical supremacy competency of vocational education lecturers. Next, the percentage of personality factors is presented in Figure 3.

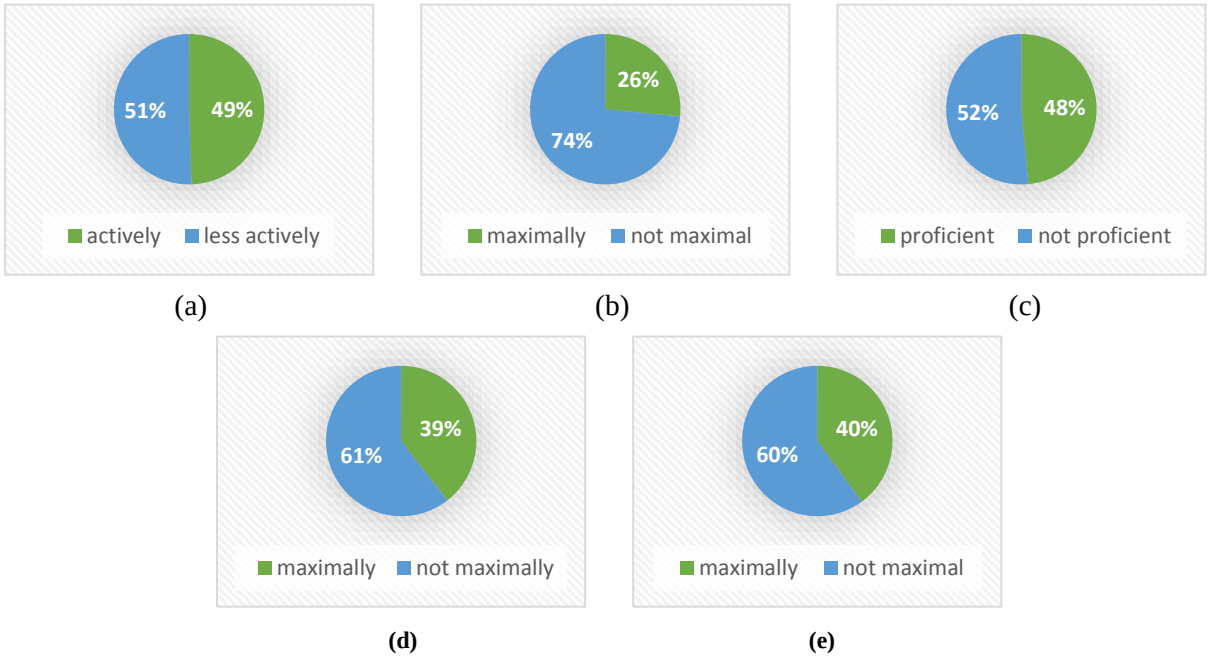

Figure 3. (a) active self-development; (b) self-evaluation; (c) designing a self roadmap; (d) professional self-concept; (e) self-innovating

In Figure 3, it is shown that in student management factors, there are five indicators of the low pedagogical supremacy competency of vocational education lecturers. Furthermore, the results of the validation by the expert media team are presented in Table 1.

Table 1. Results of media expert validation

No	Indicator Points	Score	%
1	Selection of template design by the material presented	3.80	95.00
2	The choice of symbols and their suitability for their purpose	3.50	87.50
3	The combination of colors, text, and images on the product	4.00	100.00
4	An explanation of each display menu	3.50	87.50
5	The communicative level of the product	4.00	100.00
6	Use of active sentences	3.50	87.50
7	Arrangement of menus and display content	4.00	100.00
8	Ease of operating the media	3.80	95.00
9	Users understand the functionality of the navigation menu	3.33	83.33
10	The level of competence of media using mobile phone media	3.50	87.50
	Average	**36.93**	**92.33**

Based on Table 1, the average score of indicators is 36.93 or the acceptance level is 92.33%. it shows that the innovation of heutagogy-based training modules has a high level of attractiveness. Of the ten indicators, there are three indicators that have a maximum score. These indicators include the combination of colors, text, and images on the product, the communicative level of the product and the arrangement of menus and display content.

Based on these results, the discussion in this study is grouped into two topics. The first topic is the factor that causes the low pedagogical supremacy competence of vocational education lecturers. The second topic is the heutagogy-based training module innovation as an alternative to improving pedagogical supremacy of vocational education lecturers.

3.1. The cause of the low pedagogical supremacy of vocational education lecturers

This study revealed that there are two factors causing the low pedagogical supremacy competence of vocational education lecturers. These factors are student management factors and personality factors. In the student management factor, one of the leading causes of indicators is the aspect of understanding insight or educational foundation. Some experts claim that the mastery of educational insights is a matter that must be mastered by educators. That is because every process of learning transaction needs to be wrapped with mastery strategies in educational material. So, students can easily digest every content presented. On the other hand, the lack of understanding of the condition of students is also a major cause of the low competence of lecturer pedagogical supremacy. Lecturers are required to always be sensitive and reactive in reading the attitudes and mindsets of students. In addition, another cause is that lecturers have not been maximized in developing curriculum/syllabus, designing learning, and evaluating learning outcomes. Some experts state that the quality of pedagogical supremacy will decrease if the lecturer is less active in developing his knowledge related to learning tools [14]–[16].

Another factor is the personality factor. The lecturers need to routinely conduct self-evaluations. Evaluation of things that have been achieved and will be achieved. In the realm of vocational education, the concept of implementing self-development must be organized in order to be able to keep up with every technological development and industrial needs. The low pedagogical supremacy simultaneously is the impact of the weakness of individuals in innovative thinking [17], [18]. On the other hand, some experts stated that in developing countries, the lecturers were relatively less concerned about the roadmap of their own development [4], [19]. Not many lecturers are able to focus on sticking to their specifications, resulting in gaps in certain competencies. The impact of the length of the lecturer's supremacy pedagogical competence can be felt on the graduate students. They will tend to not understand how to convey their knowledge to the public. That certainly drastically reduces the quality

of education globally. In fact, vocational education graduates are printed to be active and innovative individuals who are able to benefit society as a whole.

3.2. Heutagogy-based training module innovation as alternative to enhancing pedagogical supremacy
The developed innovation is a heutagogy-based training module. The module that was developed refers to the previous discussion related to the factors causing the low pedagogical supremacy. In the developed module, it is equipped with material, syntax, procedures, and analysis of various aspects needed by lecturers to improve pedagogical supremacy. The heutagogic approach was chosen because in principle, this approach has a learning focus on the personal desires of students [20]–[22]. The concept of heutagogy emphasizes placing students truly in positions of responsibility for what they learn and when they study. Heutogogy provides a framework for learning that places students as responsible adults for advancing [23], [24].

Based on the results of the validation from the media experts, the heutagogy-based module developed has met the eligibility and attractiveness criteria. There are ten aspects assessed in the validation process. Of the ten indicators, there are three indicators that have a maximum score. These indicators include the combination of colors, text, and images on the product, the communicative level of the product and the arrangement of menus and display content. This is in line with the statements of some experts that innovative learning media is determined by the communicative level of the content and content presented [25], [26]. The developed module will be the main alternative for lecturer's guidance in improving their pedagogical supremacy. Validation in the aspect of ease of use of the media received a percentage of acceptance of 95%. This proves that the module developed is easy to understand and has an efficient concept. Learning media in the form of modules will have great benefits if anyone can use it without having to understand it.

4. Conclusion
In this study, three crucial points can be concluded. First, the factors causing the low pedagogical supremacy of vocational education lecturers include student management factors (understanding insight or educational foundation, understanding of students, curriculum/syllabus development, learning design, implementing learning that educates and dialogues, and evaluating learning outcomes) and aspects personality (active self-development activities, self-evaluation, designing a roadmap of self, professional self-concept, and innovating independently). Second, the heutatogy-based training module innovation developed has a high level of acceptance. This is evidenced by the average score of the indicator of 36.93 or an acceptable level of 92.33%. Third, the innovative heutagogy-based training module developed can be used as a relevant alternative reference in the development of other leading media.

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