E-System Technology of Powtoon Concept with a Panicgogy Model to Upgrade The Adaptive Skills of Post-Pandemic Vocational Education Students

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**Abstract.** The COVID-19 pandemic has experienced a significant increase in all areas of life. In this era, all activities of human life are disturbed. Various impacts emerged, which resulted in a surge in patients throughout the hospital. This resulted in the paralysis of the health sector. The objectives of this study include (1) developing an e-system technology with a powerful concept with a panicgogy model; (2) testing the feasibility of e-system technology with a powerful concept with a panicgogy model, and (3) test the attractiveness of e-system technology with a powerful concept with a panicgogy model. The Research and Development (R&D) research method was chosen in this study to answer the research objectives. The results of this study include: (1) the e-system technology with the powtoon concept with the panicgogy model, which has a mainstay feature in the form of gradual clustering of adaptive skill levels; (2) the validation results of e-learning experts, the technology developed had a good level of validity with a score of 80%; (3) the validation results of vocational materials experts, the technology developed had a good level of validity with a score of 88%; and (4) this study concludes that the e-system technology with the powtoon concept should be integrated with the panicgogy model to obtain concrete benefits in developing the adaptive skills of vocational education students.

# Introduction

The phenomenon of the COVID-19 pandemic in the 21st century is currently a severe concern of the world [1]–[5]. The COVID-19 pandemic has experienced a significant increase in all areas of life. In this era, all activities of human life are disturbed. Various impacts emerged, which resulted in a surge in patients throughout the hospital. This resulted in the paralysis of the health sector. All world leaders have made various efforts to overcome this. However, the latest developments on the increase in positive cases of COVID-19 have not been entirely resolved. The impact of the pandemic in various countries threatens the activities of the world of education. The world of education has become paralyzed due to the impossibility of the learning process in the classroom [6]–[12]. Various levels of primary education, secondary education, and higher education were significantly affected. This policy was taken to save the entire education community. However, this has consequences with the emergence of the phenomenon of loss learning. Loss of learning can occur due to a lack of interaction between lecturers and students and learning resources. In the long term, this phenomenon can reduce the quality of a nation’s human resources.

As a productive human printer of a nation, vocational education is responsible for carrying out quality learning [13]–[16]. One of the characteristics of vocational education that general education does not have is that the practicum learning process has a long duration of time. This is intended to hone and improve student skills. However, in the current era of the COVID-19 pandemic, the practical learning process is significantly affected [17]. The entire practicum learning process was stopped and replaced with online learning. The real impact of this can reduce student skills because they only learn through the online learning process. As a result, the quality of vocational education learning has decreased significantly. One of the essential skills in the current learning era is adaptive skills [18]. The field of vocational education emphasizes aspects of mastery in the field of adaptive skills for graduates. Vocational education graduates are required to have the ability to adapt to the work environment. Therefore, learning in vocational education concentrates on adapting to the needs of the industry where graduates work. This requires vocational education graduates to have adaptive skills to succeed in their careers in the workplace.

The learning paradigm in this pandemic era has suddenly shifted from classroom learning to online learning. This phenomenon gave rise to the term panicgogy. Panicgogy means a very fast and unprepared transition process from a learning process due to the pandemic [19]. Practically, panicgogy focuses on learning using technology. As a result, the role of learning technology has a significant influence on students’ success in improving adaptive skills which are the goals of vocational education.

On the other hand, the development of learning technology has made significant progress to facilitate the learning process. E-learning is one of the learning technologies that is currently developing [20]–[22]. Therefore, in this study, the main objective is to develop an e-system technology with a powtoon concept with a panicgogy model, which has the advantage of being a mobile-based application system containing many materials related to improving adaptive skills with a display concept according to the needs of the panicgogy model.

# method

The research conducted is a type of Research and Development (R&D) research, which aims to develop a new product or improve an existing product. The development model selected according to the research objectives used a modified ADDIE model. The stages carried out in this research include analysis, design, development, validation, and implementation. The complete stages of the research carried out are shown in Figure 1 below.

**Figure 1.** Learning technology development flow

Figure 1 shows the stages passed by researchers in developing learning technology products. In Figure 1, there are five stages which include: the needs analysis stage of product development, the initial product design stage, the product development stage as needed, the validation stage for experts in the field of e-learning and vocational materials with a total of two experts, and the last stage is the implementation of an excellent final product. Data collection was carried out using a validation questionnaire of learning media experts and vocational materials. Data analysis used quantitative descriptive statistical analysis techniques to determine the level of validity of the developed product.

# Results

The research results section includes two aspects: the results of the development of e-system technology with the powtoon concept with the panicgogy model and the validation results of the e-system technology experts with the powtoon concept with the panicgogy model.

## The Result of the Development of Powtoon Concept E-System Technology with the Panicgogy Model

The technology developed in the form of an android application contains materials for improving students’ adaptive skills relevant to the world of work. The development of this product focuses on the benefits and goals of better learning. The technology developed is mobile-based. More details are shown in Figure 2 below.

Graphical user interface, application

Description automatically generated

**Figure 2.** Display of e-system technology with a powtoon concept with a panicgogy model

Figure 2 above shows the appearance of the e-system technology with the powtoon concept with the panicgogy model, which has a mainstay feature in the form of gradual clustering of adaptive skill levels. It is starting from skill 1, skill 2, to the highest, skill 10. In Figure 2, it is shown that the display of the application developed is a mobile-based with several page display concepts. Each level has a different level of achievement.

## Validation Results of E-System Technology Experts with Powtoon Concept with Panicgogy Model

The results of expert validation from the development of e-system technology with the powtoon concept with the panicgogy model in this study include expert validation of e-learning and expert validation of vocational materials. The details are shown in Table 1 and Table 2 below.

|  |  |  |
| --- | --- | --- |
| **TABLE 1.** E-learning expert validation | | |
| **Aspects Observed** | **Score** | **Criteria** |
| Content section Layout Proportions | 3 | enough |
| Proportion Layout of the learning material section | 3 | enough |
| Header design suitability | 4 | Well |
| Easy navigation language and widgets on the program | 4 | Well |
| Ease of use of the program | 5 | Very good |
| Ease of logging in and logging out of the program | 4 | Well |
| Easy to understand navigation structure | 4 | Well |
| Color proportion match | 4 | Well |
| Suitability of font size selection | 5 | Very good |
| Amount | 36 | Very good |
| Average | 4 | Well |

Table 1 above shows that based on the validation results of e-learning experts, the technology developed has a good level of validity with an average score of 4 or 80%. These results follow the research objective to develop e-learning technology to improve the adaptive skills of vocational education students. The results of the validation of the vocational material experts are shown in Table 2 below.

|  |  |  |
| --- | --- | --- |
| **TABLE 2.** E-learning expert validation | | |
| **Aspects Observed** | **Score** | **Criteria** |
| The suitability of the application material on the achievement of competencies and learning objectives of vocational education | 5 | Very good |
| The truth of the concept of material in terms of scientific aspects. | 5 | Very good |
| Apperception presentation reminds users of previous material | 4 | Well |
| Clarity of learning topics. | 4 | Well |
| Accuracy of materials and examples to develop independent learning. | 4 | Well |
| The suitability of language with the level of user’s social-emotional development in vocational education | 4 | Well |
| Media capabilities increase knowledge in the vocational field | 5 | Very good |
| Ease of understanding the flow of material through the use of language. | 5 | Very good |
| Completeness of the material on the application system | 4 | Well |
| Amount | 40 |  |
| Average | 4.4 | Well |

Table 2 above shows that based on the validation results of vocational material experts, the technology developed has a good level of validity with an average score of 4.4 or 88%. So it can be concluded that the product developed has a good level of validity based on the validation results of e-learning experts and vocational material experts.

# discussion

The discussion section in this study covers three aspects, namely: (1) the component of e-system technology with the powtoon concept with a panicgogy model to support the upgrading of students’ adaptive skills; (2) the process of digitizing the adaptive skills of vocational education students in the pandemic era; and (3) E-system technology efficiency with a powtoon concept with a model panicgogy to upgrade the adaptive skills of post-pandemic vocational education students.

## Powtoon Concept E-System Technology Components With Panicgogy Model Supports Upgrading of Student Adaptive Skills

The e-system technology with the powtoon concept with the panicgogy model has a material component with clustering of increasing students’ adaptive skills according to their level of understanding. This technology component plays an essential role in honing students’ adaptive skills. Students learn the material in the application easily and can be accessed anywhere. The application system developed is different from the learning technology that is generally used. This is because in the development of android applications using futuristic and artistic designs [23], [24]. This design was created with the support of a powtoon website that can display interactive designs for students. In addition, this system accommodates the need for developing students’ adaptive skills in the world of work, especially in the era of the covid-19 pandemic. The system developed supports a constructivist panicgogy learning model following the objectives of vocational education.

The real implications of the research support the findings of previous research, especially in the field of e-learning technology development. E-learning technology has benefits for improving student learning abilities [20], [22], [25]–[27]. Students in the current era are familiar with the presence of learning technology. Therefore, the display of the technology developed must be following the needs of the research subject. The technology developed has a good level of ease of use in terms of application validity. In addition, this technology has a depth of material following the learning objectives of vocational education. It is important for the development of learning technology that the developed e-learning technology must pay attention to two important aspects in terms of ease of use and the level of suitability of the material.

## The Process of Digitizing the Adaptive Skills of Vocational Education Students in the Pandemic Era

Digital learning has benefits for improving various skills [28], [29]. The digitalization of the adaptive skills of vocational education students in the era of the COVID-19 pandemic requires a change in the learning system. Information about adaptive skills that used to be presented non-digitally is now all converted to digital. This provides good benefits for students in developing their adaptive skills. Especially in vocational education, adaptive skills are defined as the abilities needed in the world of work to adapt effectively in various situations. Vocational education graduates must master this skill. Vocational education students in everyday life are required to have a mindset and behavior that reflects the development of their adaptive skills. The learning model of the COVID-19 pandemic era is characterized by the full use of the role of learning technology [30]–[34]. This, if associated with the era of education 4.0, is commonly known as the digitalization of education. Especially in vocational education, direct learning changes using real objects are replaced by online learning. Online learning can run well with the use of technology in learning. The use of this technology is expected to increase student independence. Vocational students who are prepared through digital-based learning models must adapt to the demands of work standard competencies [35], [36].

The technology developed can hone the development of students’ adaptive skills. Students are trained daily on various adaptive skills needed in work through displays in technological systems. Various levels of adaptive skill levels are displayed in digital form. Concepts like this allow great benefits in the learning process in the era of the covid-19 pandemic and student needs for digital content [37], [38]. So it can be concluded that the development of students’ adaptive skills digitally can be done by implementing learning technology and technology-based learning models. The integration of integrated learning models with interactive learning media for the preparation of superior human beings in the vocational field is the focus of learning in the era of the covid-19 pandemic [39]–[42]. Innovative and interactive learning media are prepared to attract current vocational students’ interest in learning. One of the most recent learning media is currently interactive learning media using the Powtoon application. This application can display animations about how a system works using sophisticated technology. This sophistication can reduce the gap between online learning and ideal face-to-face learning in special classes for vocational students. So it can be said that innovative learning models combined with interactive learning media are the most effective alternative solutions today [43], [44].

## E-System Technology Efficiency with Panicgogy Model to Upgrade Adaptive Skills of Vocational Education Students

The efficiency of the learning process has been known as the outcome variable of a learning process following the learning taxonomy concept proposed by the experts [45], [46]. The efficiency of improving the adaptive skills of vocational education students after the COVID-19 pandemic can be done with the help of technology. The e-system technology with the powtoon concept with a panicgogy model allows vocational education students to upgrade adaptive skills efficiently. This efficiency can be seen in students’ cost efficiency and time efficiency to learn adaptive skills. In terms of cost-efficiency, students can save on expenses because there is no need to pay for continuous visits to the industry in studying the world of work later. So that student spending becomes smaller. Meanwhile, in terms of time, students can learn adaptive skill material anywhere and anytime using unlimited access through cheap technology devices with low specifications. It can be concluded that the e-system technology with the powtoon concept with the panicgogy model can be used to efficiently improve the adaptive skills of post-pandemic vocational education students [47], [48].

The panicgogy phase learning model through the expansion of e-system technology with the powtoon concept as upgrading adapting skills means optimizing the role of models and learning media in realizing capable (adaptive) student graduates. The learning model has a significant role in developing students’ adaptive skills through optimizing the concept of panicgogy [49], [50]. This is because the learning model is a planned and structured step in realizing learning objectives. The learning objectives of vocational students are currently focused on their success when entering and having a career in work. The role of powtoon-based interactive learning media has strategic benefits in learning [51]–[54]. This benefit can visualize the character and work culture later. In addition, the achievement of learning objectives can be done effectively. This is because technology-based learning models combined with learning media in interactive animated videos can accelerate the learning process. So it can be said that the development of adapting skills of vocational students can be optimal by using the panicgogy phase learning model through the expansion of e-system technology with the powtoon concept as upgrading adapting skills.

# CONCLUSION

The conclusion in this study include: (1) the e-system technology with the powtoon concept with the panicgogy model, which has a mainstay feature in the form of gradual clustering of adaptive skill levels; (2) the validation results of e-learning experts, the technology developed had a good level of validity with a score of 80%; (3) the validation results of vocational materials experts, the technology developed had a good level of validity with a score of 88%; and (4) this study concludes that the e-system technology with the powtoon concept should be integrated with the panicgogy model to obtain concrete benefits in developing the adaptive skills of vocational education students.

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