

Web-based evaluation for teacher professional program: Design and development studies.

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Suggested Citation:

Saptono, B., Herwin, H., & Firmansyah, F. (2021). Web-based evaluation for teacher professional program: Design and development studies. *World Journal on Educational Technology: Current Issues*. 13(4), 672-683.
<https://doi.org/10.18844/wjet.v13i4.6253>

Received from July 8,2021; revised from August 28,2021; accepted from October 24, 2021.

Selection and peer review under responsibility of Prof. Dr. Servet Bayram, Yeditepe University, Turkey.

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Abstract

This is a design and development carried out to develop a web-based evaluation model in teacher professional programs. The subject of this research were participants in the professional teacher program in 2021. In addition, experts in the field of technology and evaluation are also the subject of this research to assess the feasibility of the developed model. The data collection technique used in this study is a questionnaire technique. Data analysis was carried out by descriptive quantitative analysis. Proof of the validity and reliability of internal consistency using the Gregory method. The results show that a web-based evaluation model has been developed by measuring four program components, namely context, input, process, and product. The results of the expert assessment indicate that this model is feasible and meets content validity. The developed model is also reliable based on internal consistency and meets the aspects of practicality and effectiveness based on user ratings.

Keywords: Web-based evaluation, teacher professional program;

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1. Introduction

The teacher professional program (PPG) is a program of the Government of Indonesia to improve the quality of education through improving the quality and professionalism of teachers (Haq et al., 2019). This program is organized by the Ministry of Education and Culture and the Ministry of Religion to prepare teachers and prospective teachers to become professionals according to their profession. This is considered very important because the quality of teachers is a very influential factor on the quality of education (Malkab et al., 2015; Tjabolo & Herwin, 2020; Wuryandani & Herwin, 2021).

In accordance with the law regarding teachers and lecturers in Indonesia, it is stated that professional teachers and lecturers are professional activities played by someone who is not arbitrary but those who have certain skills and expertise according to the criteria set by law. In addition, this work is also used as the main income in living his life (Mulyani, 2009; Wukir, 2008). For this reason, the implementation of teacher professional education is carried out annually by involving several educational universities appointed by the government to provide professional certificates for teachers who already have teaching experience as well as prospective teachers who have just finished their undergraduate education. Everything is done in the interest of obtaining quality teachers (Fauzan & Bahrissalim, 2017).

Based on several descriptions, it shows that this teacher professional program is an important thing and is very much needed in Indonesia. However, the current phenomenon has changed drastically since Covid 19 hit Indonesia. Some educational program services have been disrupted due to various changes and adjustments that must be made. Covid 19 brings a very big crisis and has affected the mobility of human life in the world (Grek & Landri, 2021). Since the pandemic, all human activities have begun to be limited, especially activities related to mobility that involve many people. This activity limitation also applies to teacher professionalism program services that involve many people.

Education is one of the aspects most affected by the Covid-19 pandemic (Al-Okaily et al., 2020; Cahapay, 2020; Edgar & Elias, 2021; Song et al., 2020). Due to the pandemic, all face-to-face educational service activities must be shifted to online-based long-distance services (Herwin et al., 2021). This of course also has an impact on teacher professionalism program services. Services that were previously carried out face-to-face were shifted to online services. This situation has become a problem for program services in the field and requires immediate adjustment.

Generally, a service program is implemented based on planning, process, and outcome (Herwin et al., 2020). This also applies to teacher professional development programs. A good program is a program that can achieve its objectives effectively and efficiently. To obtain this information, it is necessary to carry out a program evaluation. This is needed to obtain systematic information related to the program framework and program achievements against the stated objectives (Linzalone & Schiuma, 2015). This information is very important for the government as a policy maker to determine the direction of further programs (Rallis & Bolland, 2004).

This study designs and develops evaluations that are integrated with information technology to adjust the pandemic situation. This is based on the lack of accessible information related to the effectiveness of program implementation. In addition, the current evaluation instruments need to be further supported. The product developed is a website-based program evaluation. This product is expected to help users to evaluate programs without having to conduct face-to-face meetings which currently violate health protocols if there are large crowds of people. In addition, this website-based evaluation product is expected to provide effective and efficient solutions for evaluators in carrying out their duties immediately.

Although the development of this product was initially based on the existence of a pandemic situation, this web-based evaluation has also been considered to be adapted to all situations. This means that this product will still be applicable even though the pandemic situation has ended. Adjustments in each evaluation component are expected to remain relevant to various situations. Effectiveness and

practicality are also important considerations in developing this product. Based on this, the aim and focus of this is to design and develop web-based evaluations for teacher professional programs.

2. Methods

Research Model

This research is quantitative research with the type of Design and Development. The selection of this type of research is based on the aim of developing non-instructional products and models in educational activities. (Richey & Klein, 2007; Spector et al., 2014; Klein, 2014). The product that is the main target in this design and development is a web-based evaluation model for the teaching profession program. This development process will use the type of research model.

Participants

The subject of this research were participants in the professional teacher program in 2021. The program participants used are those from batch 1, batch 2 and batch 3, for the 2021 Academic Year. The selection of research subjects was carried out purposively by considering the representation of each batch and region of origin.

Data Collection

Based on the research approach used, the model development procedure in this study refers to Ellis & Levy (2010) which consists of six phases, namely: problem identification, goal setting, model design and development, model testing, evaluation of model testing results, and model deployment. The data collection technique used in this study is a questionnaire technique. To support the health protocol during the pandemic, all data collection is done through an online form.

Data Analysis

Data analysis was carried out by descriptive quantitative analysis. Proof of the validity and reliability of internal consistency using the Gregory method with the following techniques.

Table 1. *Expert rating and agreement table*

		Expert 1	
		Weak	Strong
Expert 2	Weak	A	B
	Strong	C	D

Based on the presentation of Table 1, items that are declared valid based on expert agreement are items that are in cell D. In addition to calculating internal consistency, the following formula can be used $V = \frac{D}{A+B+C+D}$ (Gregory, 2014; Retnawati, 2016).

3. Results and Discussion

This research was conducted based on the focus, namely product design and development. To do this work, a development procedure model is needed that is used as a guide from planning to producing a product. The procedure carried out in this study consisted of six phases, namely: problem identification,

goal setting, model design and development, model testing, evaluation of model test results, and model deployment. The results of the research related to these phases are explained as follows.

Problem identification

The problem identification phase is the phase of determining and testing research problems. In this phase, identification is carried out regarding the feasibility or suitability of the problem with the Design & Development approach that has been used. The results of related research in this phase indicate that various obstacles have been faced by program managers since the Covid 19 pandemic. Through the policy of distance learning, all agendas that are usually carried out face-to-face must be turned into online activities. The same thing also happened to the monitoring and evaluation activities of the implementation of the teaching profession program that must be carried out with an online system. Findings in the field indicate that the current evaluation system needs more support to obtain information regarding the constraints and success of existing programs. This shows that there is a need for an evaluation tool to carry out this task, which is adapted to an online-based remote system.

The results of this study indicate that the identification of these problems is urgent. This means that if it does not get support, it has the potential to have a bad impact. This is supported by Beltekin & Kuyulu (2020) that even though we are currently struggling to maintain our health and that of others, we must also think about future generations, especially that the quality of education remains one of the main priorities. Obstacles that have the potential to disrupt the course of education must be immediately assisted and supported so that educational goals can still be achieved. A scientific approach must be taken to find practical solutions to the problems faced by the implementation of education (Rose, 2020).

Goal setting

This phase is the phase of explaining the research objectives. The intended purpose is the purpose of developing a web-based evaluation for the teacher professional program studied in this study. The product of the design and development study aims to provide information on the results of evaluation and monitoring of the implementation of the teacher professional program. This evaluation measures four main components, namely context, input, process, and product. Details related to the evaluation component are presented in Table 2 below.

Table 2 *Program evaluation component*

No	Dimensions	Indicators	Criteria
1	Context	Program general information	Very good
2	Input	Facilitator qualification	Good
		Facilities and infrastructure	Enough
		Program implementation planning	Not good
3	Process	Program implementation	Need improvement
4	Product	Increased teacher knowledge related to professional competence	
		Professional certificate	

Table 2 shows the distribution of evaluation components that are the objectives of developing a web-based evaluation in this study. Through this evaluation model, it is hoped that information related to

the quality of program implementation can be measured properly even if it is done online or done remotely with users who are respondents as well as assessors of this program. Based on the existing objectives, this evaluation model was developed using the Likert scale. This scale is used on the recommendation of several previous findings that show the suitability of this scale with the CIPP model (Keskin & Yazar, 2020). In addition, evaluators can obtain in-depth information related to the program by utilizing this scale in measurement practice (Akdoğan & Uşun, 2017; Özaltaş Serçek & Oral, 2016; Uğur et al., 2016).

Model design and development

This step is an activity to develop a product that is designed as an initial design. This activity takes place based on theoretical studies and some relevant research to strengthen and support the development of a web-based evaluation model for the teaching profession program. In addition, in this activity the initial design product can be seen, and this product will then go through a product evaluation step to obtain information related to its quality. The results obtained through this activity show the initial product related to web-based evaluation for teacher professional programs. In this initial design, the front page of the website has been developed which contains how respondents log in if they already have an account and information on how respondents can create a new account. An example of the front page is presented in Figure 1 below.



Figure 1. Example of the front page

After the user enters the website link correctly, the user will find the front page as presented in Figure 1. The landing page displays the participant login page, account registration, forgotten password, about the application, infographics, guru-pro, related news, as well as criticism and suggestions. Participants who complete the evaluation and monitoring of program implementation are asked to log in using the program email and password they created. If participants have not done the registration process, they will be directed to register first.

The registration process will ask for participant identity, class and year of program entry, email used by participants, and required password when logging into the system. On the registration page, there is also a link regarding the terms and conditions for the data provided. If the participant has problems logging in because he forgot his password and email, the user is given the opportunity to reset the password via the link sent to the user's email or contact the admin if he has problems forgetting his

email. When clicking the reset password link in the email, the user will be directed to the page to create a new password.

After the user successfully logs in, the user will be directed to the evaluation and monitoring dashboard which contains brief biodata of participants, evaluation form of program implementation in terms of context, input, process, and product, exit menu, return to dashboard home page, as well as criticism and suggestion features. On this page, the user will be asked questions and asked to fill in the questions using a Likert scale. Based on the design of the model that has been designed, this section uses 50 question items. The items are spread over the four components measured, namely: context as many as 7 items, input as many as 19 items, processing as many as 14 items and products as many as 10 items. The process can be seen in Figure 2 below.

Figure 2. Program evaluation form

Figure 2 shows the main components in implementing a web-based evaluation for the teaching profession program. In this section, users are given the opportunity to evaluate the implementation of the program based on aspects of context, input, process, and product. Figure 2 shows a very simple design model for evaluating program implementation. In addition, the design of the model is intended to adapt to changing situations during the pandemic. On the other hand, previous technological developments have changed the pattern of people's lives (Muchdie & Nurrasyidin, 2019; Naikoo et al., 2018; Younes & Al-Zoubi, 2015). In line with the current situation, it is also necessary to integrate technology in the program evaluation process (Yurdakul et al., 2014).

Ideally, program evaluation is planned and carried out scientifically in line with an evaluation model that is in accordance with the characteristics of the program (Akinici & Kose, 2021). This is very important so that decision makers can find out whether the program is effective and efficient (Fitzpatrick et al., 2010; Stufflebeam & Coryn, 2014). This is what underlies this evaluation, which is designed and developed according to the CIPP model because it has relevance to the characteristics of the program that is the object of evaluation.

Model testing

After the initial model or prototype has been completed, then in this phase, the model is then tested to test the feasibility of the model scientifically. The testing in question is carried out through expert assessment and testing on target users. The assessment by the expert is intended to prove the content validity of the designed model. The results of developing the model with content validity referred to in this study are the quality of the instruments used to measure and evaluate the program in terms of context, input, process, and product. The results of this development are assessed as to the extent to which the quality of the instrument developed measures its theoretical aspects. The theoretical aspect in question is the extent to which the quality of the attitude instrument towards history learning can measure the dimensions and indicators according to each component, namely context, input, process, and product.

For the validity of the model in terms of the content aspect, this study used content validity estimation using the Gregory technique through an agreement table from two experts. In the estimation of content validity, the researcher asked for the help of two experts to give an assessment based on their expertise. The results of the assessment or study of these two experts are used as the basis for deciding the validity and inputted for estimating internal consistency with the Gregory technique. The results of the expert assessment are presented in the agreement table as follows.

Table 3. *Expert assessment results*

		Expert 1	
		Weak	Strong
Expert 2	Weak	0	1
	Strong	3	46

Based on these results indicate that based on the initial model, from a total of 50 evaluation items designed there are 46 items that have been valid according to the assessment of the two experts. In addition, there are four items that require improvement based on expert advice. Furthermore, based on the results of calculations using the Gregory formula, V of 0.92 is obtained. Because $V > 0.70$, the web-based evaluation instrument is reliable based on internal consistency (Beyera et al., 2020). In the results of the expert assessment, there are four items that are considered less relevant by one of the validators. However, these items are still used after improvements have been made based on expert advice and judgment.

Other tests were conducted on a sample of users to determine the effectiveness and practicality of the developed model. The test results show that users judge that this web-based evaluation model can be used easily either using a computer, laptop or using a smart phone. The test results show that users do not find it difficult to use this evaluation model. Practicality is very important in a product or model. This is very important because it concerns the ease with which a product can be used properly. This can be seen from expert statements related to the practicality of the product as well as ratings from users that the product can be applied in real terms (Musthan, 2013). In addition, effectiveness is also very important in product development. Products will be effective if they have clear objectives, involve users, and provide understanding to users regarding how to use the resulting product (Hasmawaty et al., 2020).

Evaluation of model test results

The next phase after testing the model is the evaluation phase. In this phase, an evaluation of the results of the model testing is carried out, analyzing the feasibility of the model based on certain criteria that have been determined in this study. The results of the previous model test found that the web-

based evaluation model that was designed had met the validity aspect and was declared content valid based on the assessment of an expert who was trusted to provide an assessment. If it is associated with various previous findings as stated by Haynes et al (1995) which states that content validity is information that shows a measuring instrument represents a construct that has become a measuring characteristic of the measuring instrument. This finding indicates that the measuring tool used in this web-based evaluation model has been able to represent the targeted construct.

The same thing was stated by Gillespie et al (2011) that content validity describes the accuracy of a sample of items included in the measuring instrument to represent its contents. This is relevant to the research findings which explain that this web-based evaluation sample has been able to accurately represent its contents. The content in question is an indicator of the four dimensions, namely context, input, product process. This means that the sample items used have measured the target indicators.

Another thing that is explained in this finding is about the reliability of the evaluation model developed. If viewed from the research findings, it was shown that the evaluation instrument developed was reliable. If these results are associated with the statement put forward by Ziegler & Detje (2013) which views reliability as the consistency of a measuring instrument in general in its repeated use. In addition, a reliable measuring instrument is a measuring instrument that has good stability. (Lietz, 2010). Measurements that have high reliability are said to be reliable measurements. The higher the reliability, the smaller the measurement error that occurs (Beyera et al., 2020; Ehrenbrusthoff et al., 2018; Kimberlin & Winterstein, 2008). However, the main idea contained in the concept of reliability is the extent to which the results of a measurement can be trusted (Herwin & Mardapi, 2017; Herwin & Nurhayati, 2021).

Model deployment

After the model has met the criteria in the previous phases, the model has been declared ready to be deployed and implemented in accordance with the expected goals and functions. The results of this study have designed and developed 50 evaluation items that aim to measure the context, inputs, process, and products in the teaching profession program. Because this product was developed in a pandemic situation, this product is designed in the form of a web-based evaluation. This is to continue to run the evaluation program and pay attention to the health protocols that apply during the pandemic. The following is a sample website at the time this product was opened.

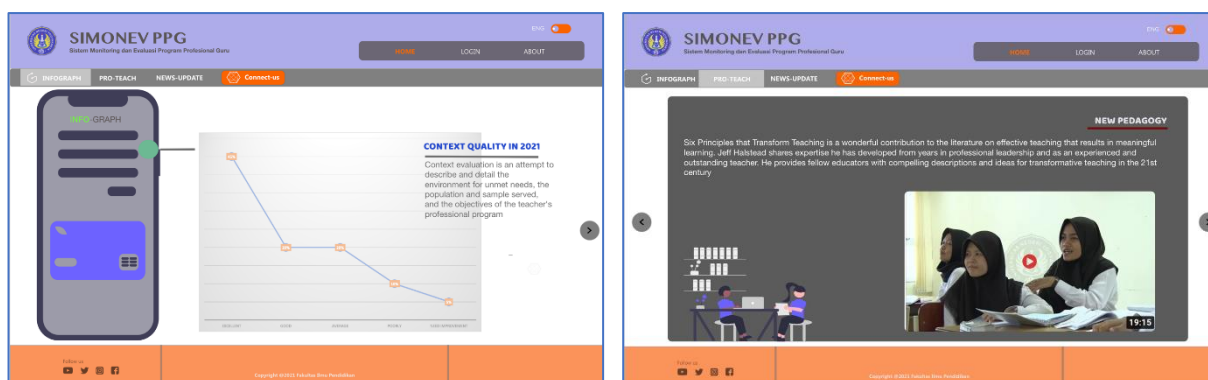


Figure 3 and Figure 4. Web-based evaluation content samples

Figure 3 and Figure 4 show two samples of web-based evaluation content that have been developed in this study. Based on the results of the distribution to users, feedback is obtained that this evaluation model is very practical and suitable for distance education situations. This product can be run easily either using a computer, laptop or using a smart phone. During the pandemic and distance education, the integration of technology in the educational process is the main choice to solve various problems

and limitations that exist (Ain et al., 2016; Cavus & Momani, 2009; Hutchison, 2019; Wiradimadja et al., 2021). This is relevant to the findings of this study that with the existence of a web-based evaluation model in the teacher professional program, it is expected that one of the integrations of technology in the educational process is implemented, namely the application of technology in the evaluation of educational programs. For the first stage, this product is used in teacher professional education programs and for internal institutions. This program will continue to be refined further until it is ready to be distributed nationally.

4. Conclusion

This study concludes that a web-based evaluation model has been developed by measuring four program components, namely context, input, process, and product. A total of 50 items spread across the four components which are divided into 7 items measuring context, 19 items measuring input, 14 items measuring process, and 10 items measuring product. These items measure general program information, facilitator qualifications, learning facilities, program planning, program implementation, and program impacts and outcomes. The results of the expert assessment indicate that this model is feasible and meets content validity. The developed model is also reliable based on internal consistency and meets the aspects of practicality and effectiveness based on user ratings. The use of a web-based evaluation model that has been designed and developed in this study is the main recommendation offered. Because the evaluation results are needed to improve the quality of the teacher professional program, it is hoped that this research product can be applied continuously. In addition, the expansion of the subject as a user is also needed so that the quality of this evaluation model can be known and improved in the future.

Acknowledgements

We express our deepest gratitude to the professional teacher program students who have taken the time to provide data in the development of this web-based evaluation model. In addition, thanks also to the funder of this research, namely Universitas Negeri Yogyakarta and all parties who have assisted in the completion of this manuscript.

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