

Developing a Web-Based Monitoring and Evaluation Model of Vocational High School Teachers' Performance after Certification Program

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Abstract—The aim of this research is to develop a web-based monitoring and evaluation model of vocational teachers' performance in the form of web-based SIMonev PKG Online, which produces: (1) a product that can run online and offline, (2) description and comprehensive information to schools and relevant institutions about the monitoring and evaluation implementation of teachers' performance, (3) a highly reliable and valid, and (4) a model that can overcome the weaknesses of conventional monitoring and evaluation model. This was research and development using the development model of Borg & Gall simplified into five stages: (1) need analysis of product, (2) initial product development, (3) experts' validation and revision 1, (4) limited field testing and revision 2, and (5) wide-scale field testing and the final product. The instruments used to develop this system were interview guide, questionnaire, information system modeling diagram, and performance assessment forms of classroom teachers or subject teachers. The validity and reliability of the model was assessed by experts on web programming and also the end-users of the system developed. The results of this study show that developed SIMonev PKG Online is practically utilized as a monitoring and evaluation system of vocational teachers' performance, because the developed model is able: (1) to display the teachers' profiles in the form of tables and graphs; (2) to communicate through interactive user interface, (3) to save, to manage and to present the data in many formats, and (4) to be accessed by multi-users at real-time. The test results have also shown that the model is valid, reliable and practical describe by Aiken's V of more than 0.750, alpha Cronbach $\alpha > 0.718$, and that its practicality is high when used for monitoring and evaluating teachers' performance.

Keywords—*monitoring and evaluation; teachers performance; certification program*

I. INTRODUCTION

Improving the quality of education in Indonesia is still a superior program from the government in the education sector. One of the efforts made in order to improve the quality of education is to improve human resources, namely teachers. The success of education will basically be influenced by various factors, including: teachers, students, facilities and infrastructure, educational environment, curriculum, and policy and politics. One of the influential factors is the teacher, where

the teacher becomes a very important component in determining the success of education, especially those related to the activities of the learning process in school. As for the series of activities in the school, the teacher holds the most strategic position which is directly in contact with students. In line with the opinion of UNESCO quoted by Abdul Kadir [1].

According to Abran and Moore, the role of teachers is very decisive in efforts to improve the quality of education [2]. For that teachers as agents of learning are required to be able to carry out the learning process as well as possible within the framework of national development. The same thing was expressed by Agarwal et al., Aiken et al., and Gordon who stated that, "Professional standards in teaching are developed in education systems, with professional learning and quality assurance of these standards", it shows that professional standards in teaching will improve quality in some education systems [3-5]. Teachers have a strategic role in the field of education, even other adequate educational resources are often insignificant if they are not accompanied by adequate teacher quality. In other words, the teacher is the spearhead in efforts to improve the quality of services and educational outcomes [6-10].

Recognition of the position of the teacher as a professional is proven by conducting certification for teachers in positions. Furthermore, for teachers who already have an educator certificate are entitled to obtain income above the minimum living needs and social welfare insurance. Earnings above the minimum life necessities include basic salary, allowances attached to salary, and other income in the form of professional allowances, functional allowances, special benefits, and additional benefits related to his duties as teachers which are determined by the principle of appreciation on the basis of achievement. This is in accordance with the purpose of holding teacher certification, namely: (1) determining the feasibility of a person in carrying out their duties as a learning agent; (2) improving the quality of educational processes and results; and (3) increasing teacher professionalism [7-13].

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Certification is the process of providing educator certificates for teachers. Certification for teachers is carried out by LPTK (Institute of Education Personnel Organizers) that are accredited and determined by the Government. The implementation of certification for teachers is in accordance with Minister of National Education Regulation Number 18 of 2007 concerning certification for teachers to regulate the implementation of teacher competency tests. In article 2 of Permendiknas No. 18/2007 it is stated that the sequence carried out in order to obtain educator certification, can be done by competency tests in the form of portfolio assessments, or participating in professional teacher education and training (PLPG) and competency exams, or repeat competency tests who did not pass.

Based on the description of the competence and role of the teacher, certainly an ideal teacher's performance can be identified in carrying out their roles and duties. Performance is performance or performance [19]. According to the 1992 State Administration Institute (Ministry of National Education, 2008: 20), performance can also be interpreted as work performance or work performance or performance results. While according to August W. Smith in the Ministry of Education [9], performance is the performance of output is deriving from processes, human otherwise, meaning performance is the result of a process carried out by humans. According to some opinions above it can be concluded that performance is a manifestation of the behavior of a person or organization with an achievement orientation. A person's performance is influenced by several factors such as ability, capacity, held, incentive, environment and validity [19-23].

The measure of the teacher's performance can be seen from his sense of responsibility in carrying out the mandate, his profession, his moral responsibility on his shoulders. All of that will be reflected in their compliance and loyalty in carrying out their teacher duties in the classroom and their educational assignments outside the classroom. This attitude will be accompanied by a sense of responsibility to prepare all teaching equipment before carrying out the learning process. In addition, the teacher has also considered the methodology that will be used, including the educational media tools that will be used, as well as what assessment tools are used in the evaluation.

In line with the development of the world of information that has become more advanced lately, then to monitor and evaluate the performance of teachers who already have an educator certificate should be able to be carried out

simultaneously through the internet network or directly with portfolios. The process of monitoring and evaluation (monev) can be carried out by competent institutions and should be carried out through direct means both offline and can also be done online through the internet network. Likewise, the instrument model for standardized M & E can be available in hardcopy or softcopy.

Another thing that is considered for monitoring and evaluation using internet networks is the location and location of vocational schools in West Sumatra in particular, geographically located scattered to remote areas even to the islands. Geographically, the West Sumatra region is located between 0 ° North Latitude to 3 ° South Latitude and 98 ° and 101 ° East Longitude, and physically most of them are mountainous and the Bukit Barisan plateau which stretches and Northwest to Southeast [21]. While the number of SMKs will be monitored and evaluated as many as 185 SMKs in 19 districts/cities.

On the basis of the problems described above, the authors conducted a research on the Development of a Monitoring and Evaluation Model of Vocational School Teacher Performance after WEB-Based Certification. Teacher performance evaluation is essentially a process of evaluating or testing the teacher's ability systematically which contains evaluation methods and procedures for teacher performance reports. While monitoring activities are monitoring the implementation of teacher performance evaluation activities. In this case the monitoring and evaluation of teacher performance that will be carried out is to monitor and evaluate the teacher in carrying out his professional duties as an educator and teacher. To obtain information objectively in all matters relating to monitoring and evaluating teacher performance is about the events of the competency activities of the teacher (teacher) and determine the level of compatibility between evaluating these competencies with established criteria and communicating the results to interested parties.

In order to develop a model of monitoring and evaluating the performance of vocational teachers after certification using this WEB, the writer essentially wants to produce a product in the form of an information system model for monitoring and evaluating the performance of vocational teachers after WEB-based certification that can run both on line and off line. The product is expected to provide a comprehensive picture and information for schools and related institutions on the implementation of PKG monitoring and evaluation with the existence of a web-based PKG Monitoring and Evaluation Information System that has a high level of validity and reliability and has a high level of practicality and effectiveness for users. So that a web-based PKG Monitoring and Evaluation Information System can overcome the limitations of conventional PKG Monitoring and Evaluation.

The results of the development of a monitoring and evaluation model for the performance of WEB-based post-certified Vocational teachers are expected to be used as a model for monitoring and evaluating the performance of WEB-based post-certification Vocational teachers that run well online or off line. Besides that, it can be used as a supporting tool in monitoring and evaluating the performance of post-

certified vocational school teachers in the education office, it can also be used as a guide for post-certified vocational school teachers to see the results of teacher performance monitoring and evaluation. Likewise, it can be used as a basis for policy makers by relevant agencies after monitoring and evaluating the performance of vocational teachers after certification.

II. RESEARCH METHODOLOGY

This study uses a research and development approach with the development of a monitoring and evaluation system performance model for post-certified Vocational School teachers. The research approach used in this study is quantitative. Qualitative because it will describe in depth the static or dynamic characteristics related to the development of a teacher performance monitoring and evaluation model in relation to the teacher certification program which has an impact on providing teacher performance appraisal after certification and granting credit points for promotion.

The main data collection is done by documenting data relating to teacher performance appraisal, educator professional competence, and relevant evaluation models. In addition, an in-depth study was carried out specifically related to the application of evaluation models in other professional fields that have very supportive relevance in the development of evaluation models to support teacher certification (teacher) programs.

This research is a type of research and development (Research and Development), in this case is the development of a web-based teacher performance monitoring and evaluation system model. The implementation of this study was carried out between 2014 and 2016. The location of the study was conducted in four SMKs in Padang, namely SMK 1 Padang, SMK 5 Padang, SMK N8 Padang, and SMK 1 Sumbar. As the subject of research there are four Vocational Schools in the City of Padang. Limited field trials are only carried out in SMK N 8 Padang only, but a wide-scale field test involves four of these Vocational Schools. In the limited field tests carried out on the test subjects, namely 1 school administrator, 6 assessors, 10 teachers, and 4 principals / supervisors. While large-scale field trials, the subjects tested were 10 assessors, 20 teachers, and 6 principals / supervisors. While specifically for testing validity and reliability, only five web programming experts involved three experts from the world of education and two experts from practitioners.

Based on the concept of product research and development (R & D) from Borg & Gall as explained on the theoretical basis. Research and Development is a process used to develop and validate educational products [12]. The steps of this process are usually referred to as the R & D cycle, which is to study research findings related to the products to be developed, develop products based on findings, test fields in settings where the product will be used later, and make revisions to correct deficiencies found at the testing stage. Products developed in education can be hardware (such as learning aids, textbooks, modules or learning packages) or software (such as education and learning programs, learning models, and curriculum). According to EACT, information system product development, both hardware and software must consider the

following aspects [21], namely: The development of PKG Online SIMonev follows the procedure of Borg & Gell's research and development, by simplifying it into 5 main stages of development. The consideration for choosing these 5 stages of development is because the Development of PKG Online SIMonev aims to produce effective information system products so that they do not need to do those ten development steps [17].

III. RESEARCH RESULTS AND DISCUSSION

The results of the analysis of hardware requirements to develop to run SIMonev PKG Online with planned features are: (1) computer hardware or laptops that can work on Windows 7.0 or higher operating systems and support the operation of Internet Explorer 10 or Firefox browser software 40 recommends hardware with specifications: Intel Pentium IV 1.4 GHz or AMD processor (equivalent to SSE2 processor technology), 2 GB RAM (recommended 4 GB), 2 GB swap space (recommended 4 GB), 3 GB HDD (free), Direct3D 10, and VGA 1GB; (2) software for localhost is; WAMP server version 2.5 that merges (Apache Webserver version 2.4.9 which functions as a web server, MySQL version 5.6.17 functions as a database server, and PHP version 5.5.12 functions as PHP script translation software); (3) web hosting software supports PHP, Java Script, and MySQL, and has facilities; sub-domain, cpanel, mail server, ftp server, and php MyAdmin; (4) Rented web hosting is niagahoster.com personal package with unlimited capabilities of Disk Space, Bandwidth, POP3 Email, Databases, Addon Domains, and SSL for free forever, and is equipped with instant backup, private name server, and Spamassin Mail Protection.

SIMonev PKG Online developed in this study has followed the conventional PKG writing format. As explained on the theoretical basis, conventional PKG has sections as listed in the Teacher Professional Development and Development Book 2 about the Implementation Guidelines for Teacher Performance Evaluation, as follows: (1) Form 1B, there are teacher biodata such as names, nip / serial number , rank / class, number, NUPTK / NRG, Date starts working in school, PKG period and contains approval for PKG results; (2) Form 1C, containing the teacher's biodata assessed by KG, name, nip, place / date of birth, rank / position / class, but as teacher, length of service, gender, final education / specialization, expertise program taught and school information teaching place and contains a summary of teacher competency assessment; (3) Form 1D, containing the biodata of the teacher assessed by KG, name, nip, place / date of birth, rank / position / class, but as teacher, length of service, gender, final education / specialization, expertise program taught and school information teaching place and contains a summary of teacher competency assessment which is equipped with a credit point value; (4) indicators or achievements; (5) supporting information; (6) PKG evaluation monitoring.

The results of conceptual design from observations and discussions with the school obtained information that the outside entities involved in using SIMonev PKG Online are; Administrators, Assessors (teachers), Principals, Supervisors, Teachers, and Guests (other outside users). The administrator on SIMonev PKG Online will be fully responsible for the

system, starting from installing the system to the server to maintaining the system continuously. The form of relationships between entities with SIMonev PKG Online is as a source of data / information and as a data / information destination. The arrow that comes out of the entity and goes to SIMonev PKG Online, means that the entity is the source, while the arrow leading to the entity means the entity as the information destination.

In more detail the relationship of external entities with SIMonev PKG Online can be seen in Figure 2. Through this diagram, we can know the sub-processes and data stored in each of the sub-processes. Processes and sub-processes are used to design processes and store data used for database tables. The results of this conceptual design are used to design the process and program code. The final product of SIMonev PKG Online can be accessed via the URL <http://www.pkg.taali.web.id>.

The next stage is the results of the SIMonev PKG Online design validated by web programming experts. The test is done by calculating the value of the Aiken coefficient (Aiken's - V). Based on the results of the validity test, it shows that all questionnaire question items are valid because the Aiken coefficient value (Aiken 's - V) is above 0.6. While the results of the reliability test questionnaire of web programming experts assessed the questionnaire with the Cronbach Alpha reliability coefficient value of 0.757. Thus, SIMonev PKG Online in terms of programming and software engineering is feasible to use in monitoring activities and evaluation of teacher performance appraisal is appropriate as planned in the study.

After the PKG Online SIMonev model has been designed and installed on the computer, the next step is to do the testing. This test includes testing validity and reliability by web programming experts; testing the practicality of assessors, principals / supervisors, and teachers; and testing the level of effectiveness and efficiency by assessors. The categorization of scores above applied to the web programming expert questionnaire was obtained: (1) The lowest score = $1 \times 5 = 5$, because the lowest value of the questionnaire item was 1 and the number of respondents was 5; (2) The highest score = $5 \times 5 = 25$, because the highest value of the questionnaire item is 5 and the number of respondents is 5; (3) Distribution distance = $25 - 5 = 20$; (4) Standard deviation units $\sigma = 20/6 = 3.33$ (distribution distance divided by 6, and 6 are normal curves for 3 categories); (5) Theoretical mean $\mu = 5 \times 3 = 15$ (5 is the lowest score and 3 is the t-table value); (6) Questionnaire answer categories:

| | |
|------------------------|---------------------|
| $X < 11,67$ | : Low categories |
| $11,67 \leq X < 18,33$ | : Medium categories |
| $X \geq 18,33$ | : High categories |

The validity of the programming expert questionnaire was tested using the Aiken formula and the reliability test used an inter-rater agreement test (Intraclass Correlation Coefficients, ICC). The results of the assessment of the five web programming experts (rater) showed that all questionnaire question items were valid because the Aiken coefficient value (Aiken 's - V) was above 0.6. While the results of the

questionnaire reliability test by web programming experts assessed the questionnaire with the Cronbach Alpha reliability coefficient value of 0.757. This shows that in general the design results of SIMonev PKG Online can be said to be valid and reliable to use / implement.

The practicality test results through questionnaires according to assessors, principals / supervisors and teachers both in limited field testing and extensive field tests show that the level of practicality is high. This shows that the PKone Online SIMonev product is very practical to use. The test results of effectiveness and efficiency through questionnaires according to assessors' assessments both in limited field testing and extensive field tests show that the level of effectiveness and efficiency is high. This shows that SIMonev PKG Online products are very effective and efficient to use. After SIMonev PKG Online limited field testing was carried out and extensive field testing was declared feasible to be implemented, although it was only limited to monitoring and evaluating the assessment of the performance of class / field teachers. The display that is very useful for monitoring and evaluating the performance of vocational teachers for principals, supervisors and related agencies is to display the teacher's individual profile graphically and percentage.

Individual profiles of teachers in the form of PKG results recapitulation, teacher performance score graphs based on 14 professional teacher competencies for each assessment period and graphs of teacher performance scores based on 4 main competencies of professional teachers for each assessment period. Teacher profiles for each school in the form of a percentage display of PKG entry data achievements in progress, display of PKG Recapitulation results per study program, display of PKG results recapitulation per competency for each study program.

IV. CONCLUSION

The conclusions of the results of conducting research and developing SIMonev PKG Online in Padang city Vocational Schools are: (1) through the development that the authors did, the web-based model of monitoring and evaluation of vocational school teachers' performance has been successfully implemented through SIMonev PKG Online. That has been determined so that it can also be operated Offline via localhost; (2) has a high level of validity and reliability from the results of the questionnaire assessment of web programming experts. This indicates that the valid and reliable SIMonev Online PKG is used as a system for implementing teacher performance monitoring and evaluation; (3) have a high level of practicality from the results of assessments of assessors, principals / supervisors and teachers. This indicates that the PKG Online SIMonev is very practical to be used by users, (4) has a high level of effectiveness and efficiency from the results of assessments of assessors, principals / supervisors and teachers. This indicates that SIMonev PKG Online is very effective and efficient to use by users. (5) the results of the field trial of SIMonev PKG Online are able to display the profile of the teacher as a result of its performance appraisal in the form of recapitulation of PKG results and graphs of performance achievements; (6) able to overcome weaknesses in conventional PKG because SIMonev PKG Online is equipped

with information technology support that can represent information in various formats (text, audio, images, and videos) so as to be able to display information as needed.

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