

## The Development of Industrial Work Practice Monitoring by Using “Simorin” at Vocational High School

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### Abstract

Vocational High School graduates are expected to have work experience in industry and ready to enter the workforce. Industrial work practice (Prakerin) is a learning program that must be implemented by students in the industrial world. Prakerin program is organized together between school and the world of work to meet the students' need for competencies that are unworkable in schools. There are still major obstacles in monitoring the implementation of Prakerin due to distance and time problems. These constraints are expected to be solved using information system.

This research and development aims to produce an effective and effective information system on industrial work practice monitoring to be used in vocational high school. This study developed information system named "Simorin" which is an acronym of the Industrial Work Practice Monitoring Information System. The method used in the study was research and development (R & D). Stages in this study included analysis phase, data requirement by using literature study and field study. The test phase was performed with validation and revision followed by a limited trial of Simorin products.

Based on the development, test and analysis, it can be concluded that Simorin was feasible and effective for use in Prakerin monitoring process in terms of usability. Students, Teachers and industries could communicate with each other in real time. Recommendation of further development of Simorin is that it can be integrated with distance learning (e-learning).

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## INTRODUCTION

The link and match policy intends to position the vocational secondary education in its supposed position (Djojonegoro, 1988: 67). Vocational High School as a form of vocational secondary education providers under the auspices of the Directorate of Vocational Education is a vocational education institution which orients to the formation of Life Skills, which is to train students to master the skills required by the industry. Learning in Vocational High School is more emphasized on the good practices done in schools and industrial work practices, so that it's graduates are expected to have work experiences in industry and ready to enter the workforce. In order to improve the quality and relevance of vocational education, the government has launched a dual system education program (PSG) as stipulated in Decree of Minister of Education and Culture number 323 / U / 1997 on the Implementation of Dual System Education at Vocational High School.

The dual system education program is the organization of industrial work practices abbreviated as "Prakerin". This practice in industry is in accordance with the principles of vocational education according to Charles Prosser (Prosser and Allen, 1925 in Djojonegoro 1988: 38-39), three of which are as follows: (1) Effective vocational education can only be provided if the exercise tasks are performed in the same manner, tool, and machine as applied in the workplace; (2) Vocational education will be effective if individuals are trained directly and specifically to get used to thinking and working on a regular basis; (3) Growing effective work habits to students will occur only if training and learning are given in the form of real work and not just training.

Currently, there is a need to change the system from the manual data processing system into a computer-based data processing system as a data center or database that serves to store data related to teacher and student data, which serves as a data storage to improve the effectiveness and efficiency of time, place and cost. This is in

line with the opinion of Madiha Shah (2014: 2799) who examined the impact of management information systems (MIS) in schools that the use of information technology in management education had increased rapidly because of its efficiency and effectiveness. On the basis of the above thought, it needs to develop information system for industrial work practices. This research and development aims to produce information system of industrial work practices monitoring and to know the feasibility of using information system of monitoring industrial work practice in Vocational High Schools. The information system products that are produced can be used as Prakerin alternative management based on information technology in Vocational High Schools.

## METHODS

This study aims to develop Prakerin information system. This developed information system named "Simorin" which is an acronym of the Industrial Work Practice Monitoring Information System. Study method used in this study was Research and Development method (R & D). The analysis combined qualitative and quantitative data to find out how big the utilization of information system. Steps and development in this study consisted of 4 main steps, those were: (1) Analysis Phase, ie the phase data needs analysis by using literature study and field study; (2) Design Phase, this phase was the phase of Prakerin monitoring information system design, which was architectural design and interface design; (3) Development Phase, this development phase was the process of making Prakerin monitoring information system; (4) Test Phase, this phase was performed with expert validation, then limited trial, product improvement, conclusion and reporting;

The implementation of limited trial on Simorin was conducted from December 11, 2016 to March 11, 2017, which involved 73 students, 10 supervising teachers, 12 industries, and 2 Prakerin working groups' administrators. Implementation of Prakerin by using Simorin

was divided into three phases, namely preparation, implementation and evaluation.

Data collection techniques conducted in this study were: (1) the method of Literature Studies; (2) interview; (3) documentation; (4) observation; (6) questionnaire; The collected data were then analyzed descriptively by presentation of percentage, mean, standard deviation data and diagrams.

**RESULTS AND DISCUSSION**

Simorin's architectural design designed was described in Use case Diagrams, Context Diagrams, Data Flow Diagram, and Data Base. Simorin interface design (wireframe) was designed to be responsive with browsers based on desktop PC, Tablet and Smartphone screen sizes.

Simorin's creation process began in December 2015. Simorin was created by using the PHP programming language: Hypertext Pre-processor with the assistance of sublime text editor version 3 application. For the creation of the interface to be responsive, the researcher uses the Bootstrap framework version 3with jquery.

Prior to usability test on the use of Simorin in Prakerin activities by Prakerin working groups, supervising teachers, industries, and students of Prakerin participants, the Simorin products developed by the researchers were validated firstly through expert validation. In this validation the researchers involved 7 experts from academics and practitioners. This validation was performed to obtain data on the feasibility of Simorin to be used as a media tool in the Prakerin's operations. Validation by these experts aims to obtain information, criticism and recommendation that Simorin developed by the researchers became a quality product in terms of software engineering elements, design, and contents.

The results of the assessment of these experts then were analyzed with the percentage to obtain the feasibility of the use of Simorin products. The feasibility of software engineering elements in terms of functionality, reliability,

efficiency, usability, maintainability, and portability of the assessment of experts was equal to 88.33% which means very good. The feasibility of design elements in terms of Layout and Composition, Color, Typography, Texture, and Imagery was 90.07% which means very good. Then for the feasibility of the content of the material in terms of planning, implementation, and evaluation was 90.99% which means very good.

In this study we used the help of SPSS17 for windows computer program to test the validity. The result of validity test of all items was as many as 24 statement items about Software Engineering, where 5 items related functionality, 6 items on learnability, 3 items on efficiency, 4 items on memorability, 4 items on errors, 5 items on satisfaction. Below are the results of data processing for the study questionnaire validity

Table 1 Validity of Questionnaire Instrument

Item No	Correlation of Item Score and Total Score (r_Count)	r_Tablel	Notes
<i>learnability1</i>	0.605	0.119	Valid
<i>learnability2</i>	0.593	0.119	Valid
<i>learnability3</i>	0.418	0.119	Valid
<i>learnability4</i>	0.458	0.119	Valid
<i>learnability5</i>	0.576	0.119	Valid
<i>learnability6</i>	0.423	0.119	Valid
<i>efficiency7</i>	0.653	0.119	Valid
<i>efficiency8</i>	0.658	0.119	Valid
<i>efficiency9</i>	0.217	0.119	Valid
<i>memorability10</i>	0.365	0.119	Valid
<i>memorability11</i>	0.354	0.119	Valid
<i>memorability12</i>	0.524	0.119	Valid
<i>memorability13</i>	0.483	0.119	Valid
<i>errors14</i>	0.458	0.119	Valid
<i>errors15</i>	0.217	0.119	Valid
<i>errors16</i>	0.280	0.119	Valid
<i>errors17</i>	0.653	0.119	Valid
<i>satisfaction18</i>	0.678	0.119	Valid
<i>satisfaction19</i>	0.437	0.119	Valid
<i>satisfaction20</i>	0.254	0.119	Valid
<i>satisfaction21</i>	0.395	0.119	Valid
<i>satisfaction22</i>	0.524	0.119	Valid

On the basis of such excellent scores and consideration of the advice from experts, the Simorin product was feasible for use with improvement. After the improvement then according to the advice of experts, Simorin could be tested in a limited way. Prakerin flow by using Simorin is as follows:

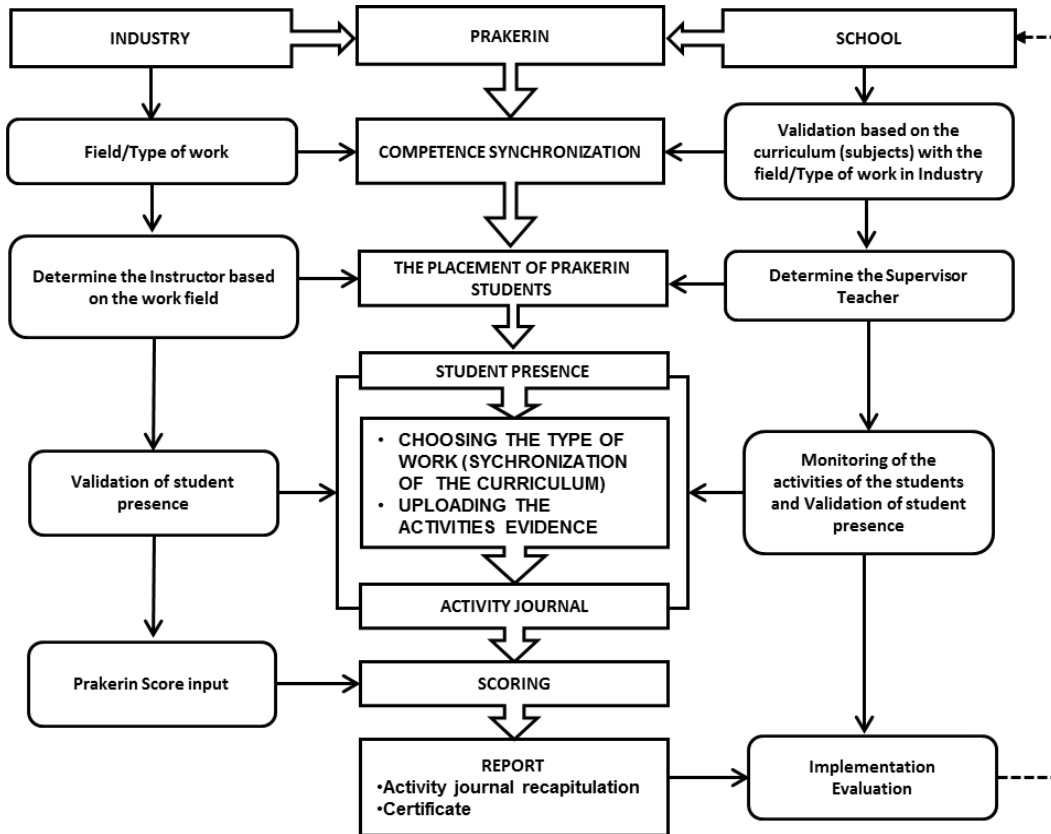


Figure 1. Prakerin flow by using Simorin

From the study results, Simorin could assist in the process of monitoring, reporting, and guidance so that Prakerin management became more effective and efficient. Simorin usability test results were illustrated in the following diagram:

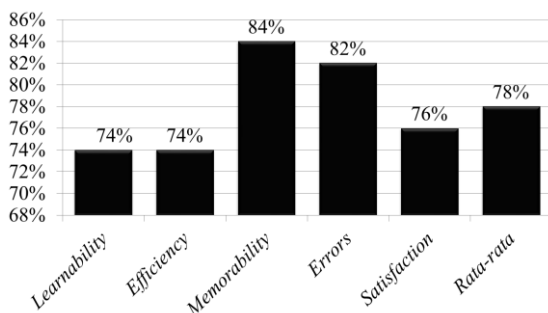


Figure 2. Simorin usability test results

From the learnability aspect was measured from the instrument that directed how fast the advanced users in operationalization/used the system, as well as ease in running a function and what users wanted, the respondents could get them all so that the aspect of ease (learnability) was met.

The results of the study showed the answers of Prakerin Students, Supervising teachers, and Industries, which more than 74% stated that the usability in the ease of Simorin use "Good". From the efficiency of Simorin to achieve accuracy and completeness of reporting stated by Prakerin students, making it more efficient in costs incurred. The results of the study showed the answers of Prakerin Students, Supervising Teachers, Industries, which more than 74% stated the effectiveness in the use of Simorin as "Good" so that Prakerin reporting process was easier and economical. Display of an application or web is of course designed to be easier in use and also easy to remember even in the long term. By providing a complete information menu, it is expected to help the users from the design side and the availability of the menu presented. More than 84% users rated "Good" in terms of display and availability of information so it was easy to remember. The study results showed anticipating errors and strengthening the security of a system, then Simorin in its use facilitated prevention information or error

handling. More than 82% stated "Good" when they used Prakerin. Satisfaction in the use of Simorin was measured by the statement of freedom from equality, and a positive attitude towards the use of Simorin in terms of appearance, suitability of functions and abilities. More than 76% stated "Good".

In this study, seen from the aspects of learnability, efficiency, memorability, errors, and satisfaction, Simorin was expressed to have good usability. Therefore it can be concluded that Simorin effectively assisted in the implementation of Prakerin in Public Vocational High School 1 Bawang Banjarnegara to reduce the problems that have been happening.

Of course Prakerin problem was not only happened at Public Vocational High School 1 Bawang Banjarnegara. Complaints against the low quality of Vocational High School to date are still heard, especially from the Business/Industrial World as a place for graduates (Sudana 2011: 136). By using Simorin, schools will get feedback or recommendation directly from Business/Industrial World in Prakerin implementation. Recommendations and input from Business/Industrial World can be used as materials for school evaluation to improve the quality of graduate competencies to meet the needs and demands of Business/Industrial World. Feedback recommendations from Business/Industrial World that were accommodated through Simorin showed no complaints from the students or teachers. Recommendations and inputs received were positive in order to improve the competence of graduates in order to continue to adjust the development of the era.

Simorin could be used as data presentation media for evaluation of Prakerin implementation. According to Hassan Aldarbesti and Saxena (2014: 36) the process of data, information and decisions were interconnected with one another. Data after processing was converted into information and information was the basis of decision making. It was important to have relevant information about the correct, timely and effective decision. In line with that opinion, the data entered in

Simorin was then processed as material for decision making and evaluation of Prakerin implementation in Vocational High School. According to Madiha Shah (2014: 2799), management information system (MIS) could provide information and information to administrators and teachers for informed planning, policy making, and evaluation. From that opinion, it is consistent with Simorin's function as an effective medium for presenting material data for evaluation and decision making of Prakerin working group and principal in Prakerin's administration. So the problem of Vocational High School disclosed by Sudana (2011: 136) can be minimized by using Simorin..

Simorin requires the students to interact among their users every day. Students are required to attend every workday that will be validated by teachers and Business/Industrial World instructors with a laptop device or smartphone they owned. In the previous Prakerin management, the presence journal was made manually. According to Awode, et al (2014: 363) some problems encountered with manual presenting systems are less user friendly, difficulty in report generation, manual control, multiple documents, and time consuming. The proposed system enabled efficient monitoring of the attendance and timeliness of all employees. This opinion is in line with Simorin's function in the management of student presence. Students will be monitored by the Business/Industrial World instructor and supervising teacher. This is also in accordance with the statement of Shradha, et al (2014: 50) that presences application he developed helped the teachers to reduce their workload by reducing the time and calculations required.

In a study conducted by Somasundaram (2016: 4) entitled "Mobile Based Attendance Management System" it was said that Presence Information System developed was very helpful for students and staff members because the system could maintain and provided information about students easily. This opinion is consistent with the results of the Simorin trial. Simorin was able to run by using a mobile device (smartphone). By using Simorin, the

Presence management of Prakerin student became more easy (learnability) and efficient because Simorin was able to manage data digitally and presented the data in real time anywhere by using the device owned by users.

Simorin was developed to increase interaction among its users because simorin was developed by using the principle of Web 2.0. This is in line with the opinion of Wibawanto (2012: 821) that the principle of Web 2.0 was a website that could facilitate the interaction between the site manager with its users. Each user could interact with the data served by Simorin. The data presented could be viewed, assessed, and commented on as social media with memorability functions and menus. The communication interaction between the student and the companion teacher and the Business/Industrial World Instructor was the interaction in which there was monitoring of daily activities to monitor the student's Prakerin activities.

Simorin that has been developed can be utilized by Vocational High School for Prakerin management to be more effective and efficient (efficiency). This is similar to Madiha Shah's (2014: 2799) research result that the purpose and use of management information system (MIS) was to improve the efficiency of school activities. By using Simorin, Prakerin student activities could be monitored at any time without limit of space and time. Financing of prakerin monitoring could also be economical because the monitoring of student activities could be facilitated by Simorin.

## CONCLUSION

This study has resulted in an information system of industrial work practice monitoring called Simorin. The results of the limited trial on the use of Simorin to assess the usability aspects which engaged Prakerin participants, supervising teachers, and the industries and Prakerin working groups showed good results, and the description of user responses during Prakerin activities by using Simorin was very positive. From the results of data analysis it can

be concluded that Simorin was feasible and effective to be used to assist the monitoring process of Prakerin activities conducted by Vocational High Schools

## RECOMMENDATION

Further development of Simorin products can be done on Simorin development which is integrated with distance learning (e-learning) to assist students' learning process during implementing Prakerin in industry. This study only examined the usability aspects of Simorin users. For further study, it is recommended to conduct a test on functionality, reliability, maintainability, and portability aspects in Simorin users.

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