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E-RUBRIC TO MEASURE EMPLOYABILITY SKILLS

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Abstract

The need for an evaluation instrument to test employability skills motivated this study. The purpose of this study was to design an electronic assessment method for rubric. This research was conducted to develop an electronic rubric that can be used as a tool for evaluating employability skills. In assessing the skills of students, not all teachers utilize standard assessment tools. This circumstance encouraged researchers to develop assessment tools that can be use during the process of measuring employability skills, specifically in vocational education. The research method used is Designed Based Research to develop a prototype of a performance appraisal tool. The design of the performance assessment in this study was web-based using the SmartRubric framework. The SmartRubric program uses browser technology to optimize it and is accessed through a computer network. In addition to the use of this application of a computer or laptop system using a mobile device, such as Smartphone, Tablet PC, Mac, Android, BlackBerry, and another mobile device that have a browser application for internet access. The SmartRubric application has a program that is stored on a server, sent over the internet, and accessed through a browser interface, so it can be access through a web browser through the internet or an intranet network. The use of the SmartRubric framework by computer software written in programming languages that support web-based software, such as HTML, JavaScript, CSS, Ruby, Python, Php, Java, and other programming languages.

Keywords: Electronic rubric, Employability skills, Performance assessment.

1. Introduction

Education is an attempt to improve a person's quality [1]. Vocational education was established to enable the graduates to have skills to work [2, 3]. Formal and non-formal education is a prerequisite that can improve the life of a person in the future [4]. The changing working environment requires students to keep updated on technologies and changes occurring in the industrial world [5]. It is teacher's responsibility to make students have the skills needed [6]. Formal education requires learning methods that can improve the quality of students. Competency-Based Education (CBE) is believed to be able to improve the development of learning for students (Riek Education, 2015). Competency-oriented learning is a good alternative for vocational education [7, 8]. The world of vocational education will closely intertwine with employability skills that should be prepared at the earlier stage to meet the needs and the demands of the industry [3, 9].

Competency-based education systems have the advantage of being based on a market-based curriculum strategy, accreditation, transparency, and task analysis. [10]. Besides learning, good assessment methods can also improve the students' competency [11]. Competency-based assessment is believed to be effective since it demonstrates that students are eager and willing to develop their skills [12]. One model that can be used in vocational education is Work-Based Learning (WBL). WBL allows students to learn in practical terms of various circumstances and demands from the industry [13].

Education is closely related to varied stages and assessment is one of the important stages to see the learning outcomes and feedback in the learning [14]. The learning assessment is based on the knowledge of student competencies. One of the assessments used in vocational education is the rubric [15]. A rubric is a scoring guideline used to assess student performance based on the total score of several criteria [16]. Amid the Fourth Industrial Revolution (Industry 4.0), various changes and shifts occurred including in education. Optimizing the use of the Internet of Things (IoT) and Cyber-Physical System (CPS) accelerates the digitization process in the world of education, one of which is an assessment tool used in the world of vocational education [17]. The assessment rubric also uses digital transformation so it can be used easily and efficiently. Therefore, the rubric is currently using the Electronic Rubric (E-Rubric) modifications.

E-rubric is used by students during assessment [18]. E-rubric is used for the assessment of student skills and can support learning assessment so that assessment standards are better [19]. E-rubric is feasible because 86% of students choose to use it. It has also been implemented at the university for competency-based learning [20]. E-rubric is relevant as an evaluation tool in competency-based learning systems. The purpose of this study was to design and improve the E-Rubric as an introduction to the assessment needs in which an evaluation format exists to measure the improvement in student employability skills using a work-based learning model.

2. Method

The research method used was Designed Based Research to develop a prototype of a performance appraisal tool or performance assessment. The research was a design to produce a tested assessment product. Figure 1 shows the illustration electronic rubric design flow. The design was done by conducting a need assessment of the

student's employability skills and then made an assessment design to develop it into an electronic rubric.

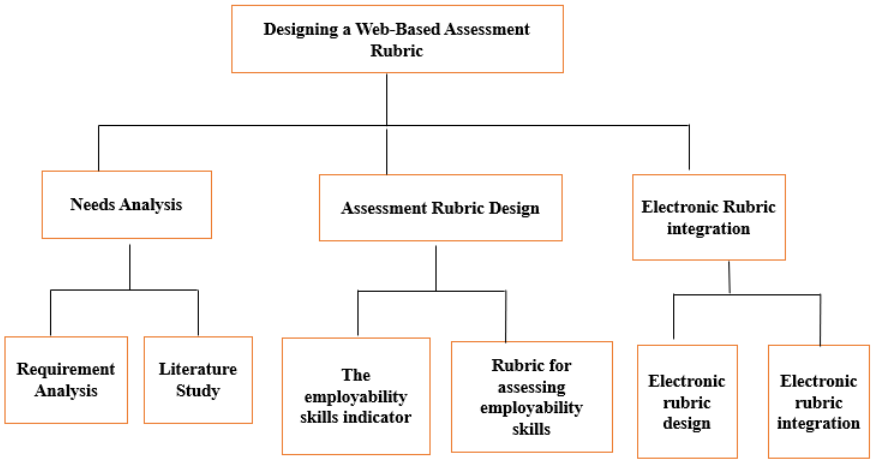

Fig. 1. Electronic Rubric design flow.

The design of the employability skill assessment rubric is divided into three stages. The first stage is the needs analysis which is conducted as the basis for the employability skill assessment design as an assessment using the electronic rubric. This stage is conducted by examining the literature review and then processed as the foundation of the electronic employability skills assessment. The second stage is the assessment rubric design. This stage describes the process starting from the selection of employability skill indicators for the design and creating employability skills assessments in a rubric. The third stage is the core stage of this research activity which is the electronic rubric development stage. At this stage, the researcher used the electronic rubric available on the web and the platform used was SmartRubric.

SmartRubric is a web-based application that was integrate with a browser; this application can be run using a computer network or mobile network. The programs in this application can be accessed via internet or intranet networks, and these programs and databases are stored on a server that is sent via a network connected to the internet. Design and assessment using the electronic rubric offer simplicity in its operation, and this application is one of the solutions for integrating the electronic rubric as an assessment tool. SmartRubric is a web-based application that can be accessed through a computer using coding and programming languages that can support web-based software, such as HTML, JavaScript, CSS, Ruby, Python, Php, Java, and other programming languages [21]. Figure 2 presents an illustration of flowchart of the SmartRubric application program.

3. Result and Discussion

The researchers developed a rubric electronic design to use a web-based platform. This application can be accessed at https://www.smartrubric.com/. The system in this application is equipped with a range of key features, namely *login, Assessment, Rubrics, Classes, Students, Admin*. Along with the development of technology, ICT devices are more mobile. The system in this application can also be used using a mobile application

such as Handphone, Smartphone, Tablet PC, Mac, Android, BlackBerry, and other mobile dived which have a browser application for internet access.

Figure 3 illustrates the SmartRubric start page, which contains seven options. The first choice is the 'New! SmartRubric Goals'.

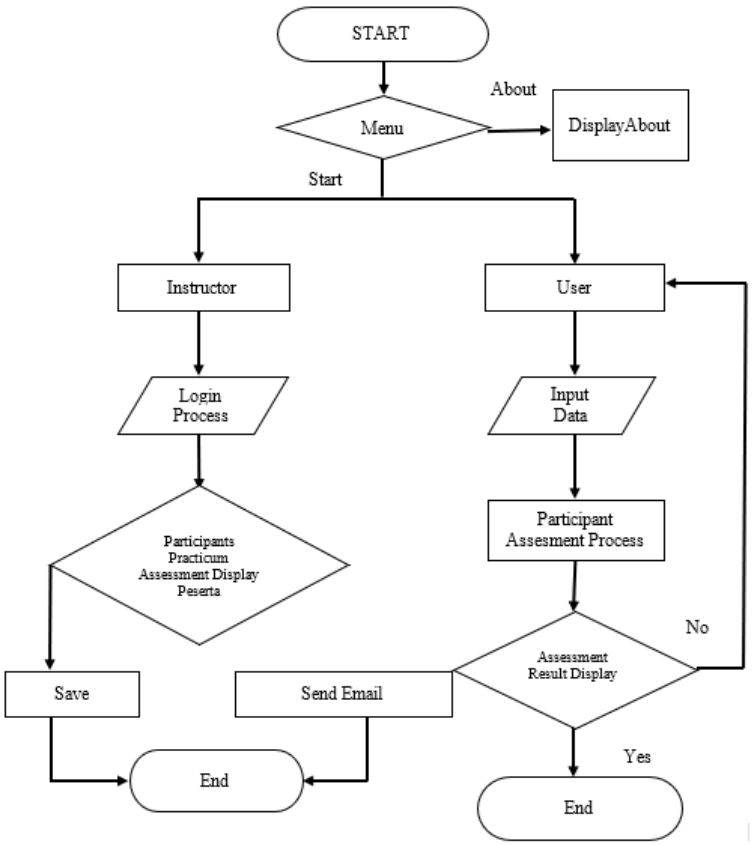

Fig. 2. Flowchart of the SmartRubric application program.

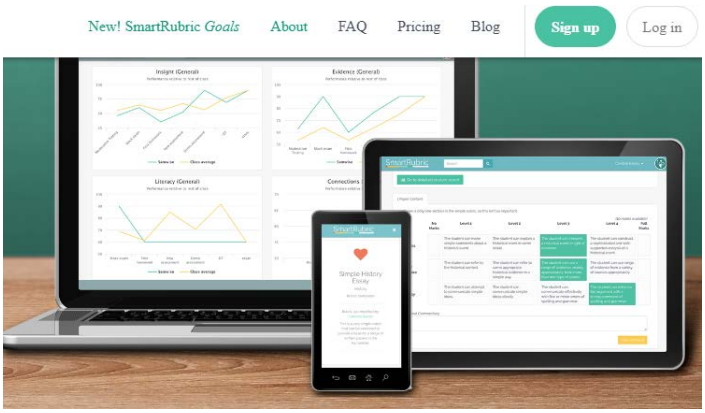

Fig. 3. SmartRubric start page.

This page shows the new products in SmartRubric. About, this page contains the specifications and profiles of SmartRubric products. The FAQ is where the SmartRubric development team address could be found. Pricing is a page that outlines the price requirements of using the SmartRubric program, even though this software is a paid program, but the development team still offers a free version with limited features that can be accessed. The next page is a blog, a blog containing news related to the development of SmartRubric, in this blog users can communicate and have a community in the design and use of SmartRubric. The next page is Sign-Up, this page facilitates users to register to be able to access the features of the SmartRubric. The next page is log-in, this page can be accessed if the user has first registered on the Sign-Up page. Figure 4 presents an illustration of SmartRubric Log-in Page.

Fig. 4. SmartRubric log-in page.

On the Sign-Up page, users can register and choose a package based on their needs, either for personal use or professional use that is integrated and connected to the school or related institution. Options can be adapted to users' needs. If the user chooses the personal preferences, it will be free of charge, but the features are limited. On the other hand, if the user chooses the paid plan, the user can use various accesses and options according to their needs.

Furthermore, in this page, the researcher can create an assessment analysis tool that can be organize in an assessment rubric. After the user logs in, the user will be directed to the Home page which contains the development of assessment tools, namely Assessments, Rubrics, Classes, Students, Admin. Figure 5 presents an illustration of SmartRubric home page.

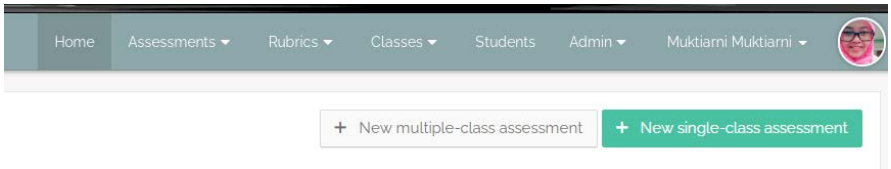

Fig. 5. SmartRubric home page.

The SmartRubric application makes it easier for users to design assessment rubric, and users can easily design and access different types of score rubrics. On the assessment page, users can create an assessment tool based on their needs. Many

features that can be accessed, such as recent assessments, archived assessments, new and new multi-class assessments. Features SmartRubric can see in Fig. 6. SmartRubric assessments page. The recent assessments page contains active assessments that can be used by users. This assessment list has previously been used by the user and will be recorded on the system. Archived is a page that contains an archive of the assessments made by the user. This page stores a database of the assessment designs that been made by the user while the new page provides user access to design new assessment tools according to user requirements.

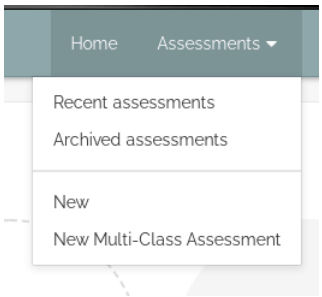

Fig. 6. SmartRubric assessments page.

SmartRubric makes it easy to develop and apply assessments. Rubrics SmartRubric page can see in Fig. 7. After an assessment been made, the user can develop an assessment rubric on the Rubrics page.

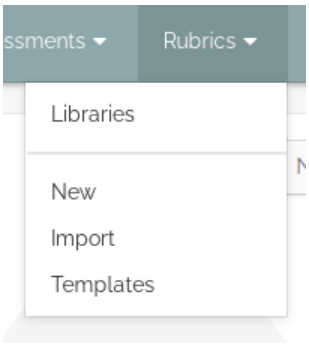

Fig. 7. Rubrics SmartRubric page.

Rubric gives users several options such as new, import, and templates. New is a feature that contains the development and design of a new rubric. Users use this if they want to build a rubric according to the required design. The Import menu includes features that make it easier for the user to import the previously created rubrics in the computer program. The templates menu contains a rubric feature can see in Fig.8. Assessment employability skills display that was created by the SmartRubric development team. On this menu, the user can select a rubric for different assessments according to their area of study.

Figure 9 illustrates the SmartRubric classes' page. The development of SmartRubric gives easier access to users in the assessment process. The next stage is class creation. The menu can be accessed in classes. There two main parts in the classes which are current

classes and archived classes. Almost the same as the previous feature, this class also makes class classifications easier to make for the assessment process.

The established class is then stored and archived in the database system. Achieved in the database system can see in Fig. 10. Students SmartRubric page. The next process is to enter the student database on the Students menu to classify the class.

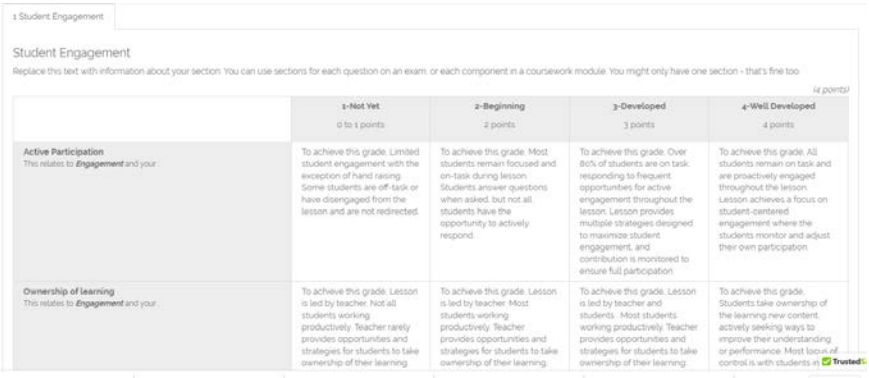

Fig. 8. Assessment Employability Skills Display.

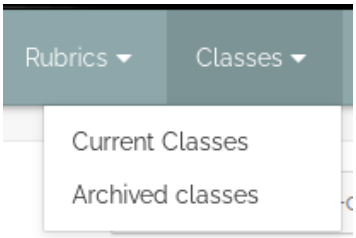

Fig. 9. SmartRubric Classes page.

ID	First name(s)	Last name	Gender	Year	Email address
1705029	ANGGITA	DWIREVYANTI ISKARNO	F		Anggitadwire@gmail.com
1700216	NAURA	KAMILA	F		nauraggk@gmail.com
1703474	SALSABILA	S HASNAA FADILLAH	F		Salsabilashfg@gmail.com
1707906	YAN	ALDI NUGRAHA	M		yanaldigg@gmail.com
1704157	NAUFAL	ASHARI	M		Naoashari@upi.edu

Fig. 10. Students SmartRubric page.

A student has features that are quite easily accessible. Previous users can import data from a computer in Microsoft Excel form which contains a student database which includes ID, First Name, Last Name, Gender, Academic Year, and email address. The data is used as a student database to facilitate the assessment process. The last menu in the SmartRubric application is the admin menu. This menu provides easy access for each user to integrate and synchronize with institutions or schools. This is used if an institution or school wants to collaborate with the

SmartRubric development team. Overall, the menu in the SmartRubric application can be accessed easily by the user. The stages used are not difficult for the user, therefore all users can access them easily.

A rubric is an assessment guide that consists of predefined performance criteria. The rubric was used to evaluate the students' performance. One technique that can be used in evaluating student responses is through an assessment rubric [22]. A rubric is generally a type of special assessment instrument to assess and evaluate the students' performance or to assess the resulting product as a performance task completion [23]. A rubric is a criteria-based assessment guide consisting of fixed measurements (4 points, 6 points, or as appropriate) and a description of the characteristics for each score. Rubrics describe the degree of quality, ability, or understanding in a series [24]. Assessment as an evaluation tool is one of the primary factors in achieving the learning objectives, the efficient implementation of learning according to the goals of the learning process, and the outcome. Therefore, the evaluation tool has an important role in seeing the achievement of learning objectives and student competencies. The employability skills needed by graduates of vocational education in Indonesia are adapted to the needs of the business for the employability of prospective employees. The researched conducted on employability skills listed that the skills needed by prospective workers, especially prospective workers in the fields of technology and engineering, information and communication technology, health, tourism, agribusiness, and agro-industry as well as business and management skills are as communication skills, foreign languages skills, computers /ICT skills, and collaboration skills.

4. Conclusion

The implementation of online evaluation is one of the types in the Learning Evaluation System. It is designed to facilitate and support the assessment process. SmartRubric is a web-based application that can be used as an online evaluation tool. This provides solutions and convenience for lecturers in carrying out assessments, from manual to online, and there be many positive impacts of SmartRubric. SmartRubric answers problems in the evaluation process, this application can be accessed from various devices, from computers to mobile phones and tablets. This has a strong value in terms of flexibility for the user since it can be easily accessed anytime and anywhere. Lecturers can always access and see the progress of student assessments easily because all databases are recorded automatically in the system. The SmartRubric application has features that are quite simple and easy to use, making it a user-friendly interface that allows many users to use it in the assessment process, specifically in vocational education which demands skills in the learning process. This encourages lecturers to develop an assessment tool. SmartRubric has become one of the solutions to the assessment process, particularly in vocational education.

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