Web-Based Project Assessment

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Abstract--This research is a library research that seeks to examine the literature relating to research problems by selecting, reading, and studying research relevant to the title of this research. Data was collected through literature surveys related to web-based assessment and project-based assessment. Data analysis was conducted by editing, classification, and interpretation. The purpose of this study is to examine a variety of previous studies that have discussed web-based assessment, strengths, and weaknesses. This study also seeks to review studies on project-based learning and assessment. The researcher briefly describes the definition of web-based assessment, then maps the advantages of web-based assessment. The results of this study indicate that basically, web-based assessment refers to assessment models such as e-test, e-assessment, computer-based test, and internet-based test. The advantages of web-based assessment are that it is more flexible, decreases paper consumption, data collection, and data analysis is fast, provides timely feedback, eases teacher assignments, and facilitates e-learning. However, there are several obstacles, including the visual design of the web interface that might be a problem for users. Ineffective menu layout and poor navigation cause users to waste too much of their time. It is also necessary to ensure that students can use the online learning system effectively. In practice, web-based project appraisal can adapt existing assessment methods, such as peer assessment, self-assessment, and group assessment. These methods can be alternative assessments that educators can choose to assess student projects on the web.

Keywords-- Project Assessment, Project Learning, Web

I   INTRODUCTION

The industrial revolution 4.0 has changed the way humans communicate and interact with each other. This change has a direct impact on the world of education. The internet and web 2.0 development has had a significant influence on what and how learning and assessment should be carried out. In response to the challenges of this development, education practitioners then developed various online learning methods [1-3] and online assessment [4-9].

The utilization of then internet into the learning and assessment process is expected to increase student involvement, considering the internet has become an integral part of their lives. The use of learning resources originating from the internet in various forms: text, audio, and video, should be able to motivate students in learning.

Along with the rapid development of the internet, there have been quite severe efforts in integrating information technology into the assessment process [9,10]. Murakami, Sasaki, Hirayama, & Wachs [11] developed a web-

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based portfolio system for their project that allows students to participate in presenting their research processes and results. This system will enable students to share their ideas, examine the content and progress of each work. Meanwhile, a research group at Northwestern University develops project-based learning through a web-based collaborative learning environment. Students present the results of collaborative learning and manage reflections in portfolios, while teachers provide their feedback and encourage peer feedback. Students at Abilene Christian University, Australia, use a web-based portfolio to collect and manage reflection content when doing project work [12].

Chang [13] concluded that web-based portfolios have the following implications : (1) helping students plan their learning direction; (2) assisting students to self-control and reflection in their learning process; (3) improve the quality of the project; (4) understanding classmates' learning situations to enhance interaction and sharing among classmates; (5) helps students understand the research interests of their classmates. Web technology plays a decisive role in Project-Based Learning activities and can develop students' abilities in project management, data collection, organizing, presentation, and reflection.

In general, the integration of information and communication technology (Internet) into education has been carried out and is widely used in the learning process. However, some researchers also acknowledge that the internet has not been utilized to its full potential, especially for assessment purposes. This is evidenced by the number of studies related to web-based assessment more dominated by assessment models, which only move the format of paper and pencil test into the computer.

Ching & Hsu [14] acknowledged that although web 2.0 applications have been used extensively in the learning process, they have not been used maximally, especially for assessment. They then show that web 2.0 can be used to assess the process of collaboration and interaction between students. The process and product of knowledge construction carried out collaboratively need to be assessed both at the individual and group levels. The results of the assessment can help provide information and improve the next iteration of the design of learning activities. Thus, the findings of this study support the theory of social constructivism where students can reflect, act, learn from one another, and build meaningful knowledge and skills through collaborative learning and interaction [7].

Considering the potential benefits to be gained by integrating project assessment into the web, this research was conducted to map the prior research findings. This mapping is essential to obtain an overview of the overall web-based project assessment so that it can be an alternative assessment that can be chosen by the teacher in assessing project assignments given to students.

II METHOD

This research is a library research that seeks to examine the literature relating to research problems by selecting, reading, studying, and studying research relevant to the title of this research. Data collection was carried out through literature surveys related to affective assessments and studies related to the use of social media in learning and assessment. Data analysis was performed by editing, classification, and interpretation.

Steps in analyzing data from previous research: (1) The description phase is that all data obtained is related to the problem. Then do the description stage. In this study the data collected in the form of research titles, abstracts,

sentences, paragraphs, and other quotations that reflect ideas, ideas, and concepts conveyed by the authors through their research; (2) The classification phase is the data that has been described and then grouped into their respective sections in accordance with the problems that have been determined. For example, affective assessment theory, the use of social media in learning and assessment, the benefits of social media for learning and assessment, and assessment methods using social media; (3) The analysis phase is the data that has been classified according to each group is analyzed according to structure then re-analyzed with descriptive analytical and critical approaches; (4) Data interpretation phase is an effort of interpretation and understanding of the results of data analysis; (5) Evaluation phase is data that has been analyzed and interpreted before drawing conclusions must be examined and re-evaluated in order to obtain research results that can be accounted for; (6) The final conclusion contains important points and suggestions.

III RESULTS

1. Web-Based Assessment

The development of information technology has encouraged the use of web-based assessment as an alternative assessment method, both for formative and summative assessments. In general, web-based assessment refers to the use of online computers to provide tests and analyze test results [15]. Web-based assessment is an assessment conducted through the internet, commonly referred to as e-assessment, e-test, internet-based test, computer-based test, and online assessment [15]. The general term associated with any form of computerized assessment is usually called Computer-Assisted Assessment (CAA). These terms are used interchangeably in various literature. However, in this study, the term used is the web-based assessment.

Elliott [10] asserted that educational change is a necessity, and the evaluation system must also change with changing times. Assessment models in the form of high stakes testing can prevent these changes. Elliot proposed a new type of assessment, which he called Assessment 2.0, which is an assessment that utilizes web 2.0 for assessment purposes. Assessment can be more advanced if you adopt some web 2.0 features and characters. This means embracing web 2.0 and the digital environment that most students inhabit as the millennial generation. It also means education moves from the analog world of the past to the digital world of the future. Doing so will be a challenge for teachers and education practitioners. Teachers must improve their skills to understand web 2.0 better and respect the digital world. Appraisal tools such as those needed in conventional assessments such as rubrics for assessing and measuring abilities must be developed. Collaborative assessment models, peer assessment, self-assessment can be adopted into web 2.0 based assessments.

Advantages

The web-based assessment has been applied widely in the field of education and is gradually increasingly crucial in teaching and assessment [16]. The web-based assessment has several advantages compared to traditional methods such as paper and pencil tests. Assessment experts and educational technology experts emphasize that web-based assessment plays an essential role in improving the quality of student learning experiences, especially in higher education [15]. This thinking is motivated by the fact that computers have become an integral part of everyday life.

The main advantage of web-based assessment lies in reducing the level of paper consumption, data collection, and fast data analysis. The web-based assessment also serves to correct answers as soon as possible, and examinees can get quick information about their test results. Thus, web-based assessments can provide timely feedback, ease teacher assignments, facilitate e-learning, and support peers, and student self-assessment [17,18].

The web-based assessment has the potential to reduce the amount of time and streamline the effort needed by teachers, so they can use more resources for other things to improve student performance. Besides, web-based assessment is useful in gathering data that is more diverse than traditional assessments [16]. Web-based assessment can shorten the time as in terms of scoring and reporting test results. Through web-based assessments, teachers do not need a long time to make and submit test results to students. This allows students to be able to receive feedback in a faster, even instant way. The web can also reduce the amount of time and effort needed to distribute assessments. The internet allows assessment to be carried out en masse without being bound by time and space [19].

Weakness

There are several web-based assessment constraints. The visual interface design of web-based assessments has the possibility of being a problem for users. Therefore, it must be sure that users efficiently operate the web that will be used for assessment purposes. This is very important because if the assessment is not administered correctly, the information obtained may be wrong [20].

Crowther, Keller, & Waddoups [20] want to ensure students can use online learning systems effectively. They record feedback when their students interact with the system. Besides, they asked several post-interaction interview questions. They found that the web-based rating system that they built had functional and navigation problems. Else, the use of this method encounters issues such as ineffective menu layouts that confuse users and poor navigation that causes users to waste too much of their time searching for information on how to use the system.

According to Akdemir & Oguz [21], the limitations of computer hardware and software can cause problems in the web-based assessment. It is not enough to change the test administration model, but administrators need to adjust the test to suit the computer hardware and software capabilities. In addition, this valuation method lacks flexibility [15]. Limitations on the types of assessment questions and answers are another problem that some researchers have revealed. For example, web-based assessment cannot assess a testing format that allows students to express their thoughts like essays. According to Bull & Mckenna [15], the objective format used in web-based assessment can be debilitating because it makes student participants inactive in the assessment process. Students may miss the opportunity to interpret questions or propose alternative ideas as they are limited to the set of answers given.

Chang & Tseng [12] developed a web-based assessment system to improve student performance in project-based learning. The results indicate that although the scoring system developed does not significantly influence student achievement. Statistically, it has a positive effect on students' self-perceived performance.

The results of this study are in line with the results of other studies [16,17], both show that the use of portfolio assessment is also integrated with communication and information technology can improve students' self-perceived. As an additional note, the results of the assessment done by teachers show the difference from the results of the self-assessment carried out by the students themselves.

The web-based assessment system developed in the above research did significantly improve students' self-perceived performance. Still, it was here that the teacher assessed was not a project produced by students. So, although Project Based Learning can use web-based assessment to support the learning and assessment process, teacher intervention should be reduced so that the learning process seems to run naturally. Students must be given the freedom to study independently and more time to work on their projects.

In line with Chang & Tsengs [12] research, Wang [22] developed a web-based assessment strategy to improve the self-regulated learning of junior high school students. This research refers to research suggested earlier by Pintrich [18] in the development of an assessment system of multiple choice-based webs. The purpose of this study is to facilitate students using self-regulated learning to improve learning effectiveness. The results show that students in the experimental class seemed more motivated to take the test compared to students in the control class. Besides, web-based assessment is significantly more effective in facilitating students using their self-regulated learning abilities than traditional assessments. Also, the web-based assessment model shows that there is no significant difference between students who have the capability of self-regulated learning is high and low in the experimental class than students in the control class.

Davies, Pantzopoulos, & Gray [23] use Wiki in assessments to create broader learning experiences and better learning outcomes. Assessment is carried out in the third week, where students are divided into small groups. The result shows that Wiki provides opportunities to students to share their work and duties to the public and then to work collaboratively and systematically to know the results of public votes in the environment around them towards the work that has been published.

Appraisal design that is consistent with the use of Wiki seems to be in line with what Davies, Pantzopoulos, & Gray [23] said, namely self-assessment and peer assessment. This kind of assessment can give learners collaborative learning experiences, professional dialogue, and inquiry. Students can focus on themselves as learners and can show subjective perspectives that are sensitive and critical of themselves and their questions. Students use personal accounts to voice uncertainties and questions. This is a way to have an open conversation. Students can share different ideas and points of view and avoid the possibility of being isolated by differences. The results of this study can also show that students with higher English writing skills tend to have more interaction with others and, therefore, can benefit more from the peer assessment process. To avoid students' rejection of peer assessments, teachers may have to give training sessions and appoint group leaders to guide and assist learning interactions. Besides, the teacher must be willing to spend much time checking and refining student assignments and comments. The limitation of this study is the relatively small number of participants.

2. Project-Based Learning

Project-Based Learning is a comprehensive learning approach by involving students in an organized group collaboration to investigate and solve specific problems. Kokotsaki, Menzies, & Wiggins [24] defines Project Based Learning as individual or group learning activities that take place over a certain period and produce products. It was further said that Project Based Learning usually has a timeline and other aspects of formative assessment as the project progresses.

Project-Based Learning is a student-based inquiry of complex questions or problems that serve to organize and encourage learning activities that lead to the final product that addresses queries or issues [25,26]. The result is that students develop a level of understanding, problem-solving, and communication skills are more in-depth that help them academically and workplaces later [27].

Heitmann [28] has identified four main orientations for project-based learning, namely professional, social, criticism, and education. The motive for professional direction is to bridge the gap between theory and practice, meeting the needs of industry, society, and the labor market. Social orientation has domestic and humanitarian motives to foster democracy and enhance social attitudes. Critical orientation aims to promote critical thinking and highlight the need for multidisciplinary research and education. Educational direction has a pedagogical motive using problem-centered and active learning methods to encourage holistic personal development.

Project-Based Learning is a complicated learning method, based on challenging questions or problems, which involves students in design, problem-solving, decision making, or investigative activities, allowing students to work relatively and autonomously for a certain period, and lead to a product or realistic presentation [29]. Other features of Project-Based Learning include authentic assessments and teachers as facilitators, cooperative, and reflective learning [12]. Project-Based learning includes learning activities related to the use of authentic questions, inquiry, and the use of technology-based cognitive tools [30].

The definitions above are reflected in constructivist learning theories where students build knowledge as they try to understand their experiences based on their current and previous knowledge. Grant [31] synthesizes previous studies conducted by Perkins, Piaget, and Vygotsky in the theory of constructivism that individuals build new knowledge based on old experience through interaction with the environment and investigation. The implication in Project-Based Learning is that students do meaningful learning through the process of exploring, interpreting, negotiating, and creating products as a result of the projects they are working on.

Project-Based learning reflects Vygotskian's perspective on learning. Vygotsky [32] theorizes that learning takes place through social interactions that encourage individuals to face cognitive challenges that are slightly better than their current level of ability. He further explained that the concept of understanding development occurs when students enter into meaningful discussions and interactions with peers and teachers. This allows students to model problem solving, help find solutions, monitor progress, and evaluate success as a form of their involvement in the Project-Based Learning process.

Krajcik, Czerniak, & Berger [33] say there are at least four benefits of Project-Based Learning for students. First, students can develop a deep and integrated understanding of content and processes. Second, students learn to work together to solve problems. Collaboration involves sharing ideas to find answers to questions. To succeed in the real world, students need to know how to work with people from different backgrounds. Third, this approach teaches about responsibility and independent learning. Fourth, Project Based Learning engages students in various types of assignments so that they meet different student learning needs.

3. Project-Based Assessment

Assessment and learning are interrelated [25]. What and how students learn depends significantly on how they think they will be assessed [26]. Project assignments challenge students to think beyond class boundaries, helping

them develop the skills, behaviors, and beliefs needed to succeed in the 21st century. Designing a learning environment that allows students to question, analyze, evaluate, and predict the possibility of their plans, conclusions, and ideas, direct them to higher-order thinking, requires feedback and evaluation that goes beyond letters or numbers.

Project assessment is an assessment of performance and products and can be done in various ways, ranging from conventional written tests to more innovative assessment models such as self- assessment, peer assessment, joint assessment, portfolio assessment, and reflective journals [34]. Teachers can assess students' cognitive abilities not only based on student work, reflection, evidence of progress and performance, but also their attitudes and learning progress. Through a project assessment, the teacher can simultaneously assess both the learning process and student project outcomes.

Project-Based learning emphasizes the integration of students' knowledge and skills in problem-solving. Project assessment focuses on various multidimensional processes. Project content that students work on focuses on the application of students' experience of the form of real work in the way of products they produce. Project-Based learning emphasizes the product as an output and as the primary outcome in learning. Dennis, Hardy, & White [17] concluded that reflections on Project Based Learning could be done at any time through observing the progress of the project being worked on by students. This allows the teacher to be able to guide students until the project they are working on is finished. Therefore, both Project-Based Learning and project assessment can be done simultaneously.

According to some literature, conventional assessment methods do not support students' understanding and skills gained from project-based learning [35]. This is the motivation of the researchers to develop alternative assessment models consisting of a combination of assessment methods. Tal, Dori, & Lazarowitz [36] present multidimensional assessment schemes in several way, (1) collaborative rating by experts, teachers, students, and community, (2) using several assessment tools: product exhibition, portfolio, peer assessment, and self-assessment.

The objects assessed are students and teams. Even though the team is often the object being assessed, the proposed alternative assessment model is still focused on each student and not the project team itself. Rate individuals compared to group assessment does not test or promote the construction process complex knowledge combine knowledge (e.g., content and knowledge methodological) and skills (e.g., conceptualizing and analyzing problems) in project-based learning.

Katzenbach & Smith [37], in their study of workgroups and teams, states that a team strives for something higher than its members can achieve. In short, a capable team is always worth more than the individual. This is in contradiction with the writings in most of the project-based learning literature where assessment must be based on individual contributions (i.e., reduction assumptions that are not following the synergistic perspective of the team).

Moursund [38] concludes that Project Based Learning supported by information technology can help students build a sense of responsibility, participation in self and peer assessment, and project work. Moursund [38] also indicated that Project Based Learning should adopt a portfolio as an assessment tool. Barker [39] proposes to use e-portfolios as an assessment tool in Project-Based Learning. Forkosh-Baruch, Mioduser, & Nachmias [40] applied web-based project work and portfolio assessment to curriculum and instruction reform. They concluded that both

Project-Based Learning and portfolio assessment could simultaneously be used to manage innovation in teaching and assessment.

In recent years, web-based assessment has been applied to Project-Based Learning. For example, Murakami, Sasaki, Hirayama, & Wachs [11] use the portfolio web system, which allows students to participate in the project to present the process and the products they produce. As students work on the project, teachers and students can use the web to check and monitor the progress of the project they are working on. This system allows students to share ideas and input with other students, examine the content and development of each project so that in turn will be able to increase work motivation for students. A research group at Northwestern University also develops Project Based Learning activities through a Web-based collaborative learning environment. Students present the results of collaborative learning and manage reflections in portfolios, while teachers provide feedback and encourage students to give feedback to peers. Likewise, with second-grade students in Indianapolis, they conduct online Project Based Learning activities on web-based learning with community systems and display their work through websites. Students at Abilene Christian University, Australia, use the web to collect and manage content while doing project work [17].

The above studies reveal that the performance and products produced by students in Project Based Learning can be assessed using the web. The assessment methods used can adopt innovative assessment methods that have been developed previously, both peer assessment, self-assessment, and collaborative assessment (panel). Through web-based project assessments using various methods, students have the opportunity to express their knowledge and skills, both in the real world and in cyberspace.

IV CONCLUSION

The development of web 2.0 technology can be used to facilitate the learning and assessment process. In the assessment, the advantage of web-based assessment lies in the reduction of paper consumption, data collection fast and quick data analysis. However, there are also drawbacks from the use of web-based assessment so far, for example in the appearance of the homepage must be sure to make it easier for students so that they do not spend time just trying every menu on the web site. Besides, hardware and software limitations also sometimes become obstacles. Likewise, with flexibility. Supposedly, assessment can be done when and where it, instead of just moving the problem from paper to computer.

Based on the weaknesses and limitations of the web-based assessment that has been used as described in some of the studies above, then further research should focus on efforts to overcome it with several things, first, regarding user convenience and hardware and software constraints. The valuation model projects based web developer can use a variety of frameworks and CMS that is supported by exciting themes, and plugins are user-friendly. Users can access the web site through a computer connected to the internet or only with smartphones that don't even require high specifications. The menu and navigation features will also be made as simple as possible so that users do not need to spend considerable time in trying out the menus.

Second, regarding flexibility. It must be recognized that the web-based assessment used so far is less flexible. Distribution, space management, schedule determination tests administered right, similar to traditional tests, so it

tends to give a burden to the person taking the test. Development of the project assessment based web forward needs to be focused on the ease of students in accessing the web and post their projects at any time and in which alone, through any computer or smartphone them. Likewise, panelists who will assess students' work, they can access the web, read the student's project, and then provide an assessment of the job without being bound by time and space.

Third, regarding the active role of students and their opportunities to explore their questions and answers. Through the web-based assessment model, students have the flexibility to be actively involved in the project and explore ideas and their ideas for the project. Of course, the grading assessment has been given to them. Web-based project assessment will not face the constraints of the question bank limitations and the limited choice of answers that can hinder students' active participation.

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