

Web 2.0 and Project-Based Learning To Improve Students' 21st Century Skills

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Abstract. This study aims to improve students' higher order thinking skills (21st Century Skills) using Web 2.0 applications and Project-Based Learning using Flat Classroom Projects as the learning method. This was a Classroom Action Research (CAR) in the "ICT in Language Learning class" as the research subject. This research was conducted in the English Education Study Program, Universitas Negeri Semarang. The significances of this research are theoretical, practical and pedagogical. Theoretically, this research has a contribution to the use of technology, especially Web 2.0 in the digital era in learning English in universities. The results of this study also prove that current learning is more constructive in that the parties involved in learning need to adapt to changing times. Then, practically the results of this research can be useful for 1) students, 2) lecturers, and 3) universities. For students, they will open their paradigm that the goal of education today (digital era) does not focus on individual abilities alone but rather on the ability of students to work together with others in solving problems with the provision of high-order thinking skills. For lecturers, they will feel more responsible in learning activities where their role is not only as teachers but as facilitators who can direct the role of students in the current digital era. Then, for universities the results of this research can be a new fact that universities must prepare and facilitate the learning process in accordance with the current digital era (from andragogy to heutagogy). Pedagogically, this research is part of the academic responsibility that education is dynamic (always changing) so that students and lecturers are required to always adapt to educational changes.

Keywords: 21st Century Skills, Project-Based Learning, Flat Classroom Project, PTK

1 Introduction

Currently the world of higher education is in the Digital Age. All forms of learning activities in higher education use technology products to facilitate learning goals and targets. These learning activities include classroom management systems, learning, teaching, learning resources, assessment, etc. One of the most recent technological products used in universities in the current digital era is Web 2.0 technology. The term Web 2.0 was first introduced in 2004 at a seminar with the theme 'The O'Reilly Media Web 2.0 Conference'. Web 2.0 is defined as an application that makes it easy for users to participate in information creation,

exchange of digital learning resources (sharing of learning digital materials), web design and collaboration by Web 2.0 users (Sachs & McHaney, 2003). 2016).

In today's digital era, many students and lecturers use Web 2.0 applications with various variants such as social media (Facebook, Twitter, LinkedIn, Instagram) as the main media for communicating with friends, family, business, education, etc.; class management system or Learning Management System (Moodle, Edmodo, Elena) for online class management activities; gamification (Kahoot, Quizzes) for brainstorming activities; etc. The use of the application starts from the premise that humans are currently communal which requires interaction using voice, video, and writing. In addition, Web 2.0 applications also support various kinds of interactions in the digital environment for users to share, add, filter and consume information in various forms. With this latest application and the awareness of humans interacting online will shift human social relations into digital platforms. Hence, there is a shift in communication skills. This is the concern of higher education institutions.

With the current changes in education, which is marked by the increasing number of lecturers and students using Web 2.0 applications, it will shift their skills. Students can use Web 2.0 technology to post content that can generate interaction. These posts can be in the form of text, audio, video, artwork, cartoons, documents, books, etc. so that they can promote knowledge sharing, democratize information (information democratization) and create content producers. However, technological developments also cannot run smoothly if users do not have the latest skills or 21st Century Skills. These skills are closely related to the individual's ability to solve problems that occur around them by utilizing Web 2.0 applications and appropriate learning methods.

In addition, learning in the digital era now does not only emphasize individual abilities and skills but rather on how students are able to work together with other students in the form of group work based on the spirit of global education (global education) to solve common problems that are around them. This spirit can be carried out by working together in groups to work on projects according to student interests with the guidance of the lecturers. The spirit of global education according to Peter (2009) is empathy for others (spirit in learning that emphasizes the introduction of the outside world with cultural exchange and communication), finding new ways to enrich and engage (individual awareness that they are also part of the global world who need to know one another), with others), and the desire for social justice (the spirit to realize social justice).

To realize digital era learning, students need to have high-level thinking skills (21st Century Skills). Therefore, it is necessary to conduct a study that focuses on how students have these skills by facilitating them with project-based learning using Web 2.0 technology media. This research needs to be carried out with a long process or cycle with lecturer assistance so that from the beginning to the end the process can be identified properly.

2 Road Map of Universitas Negeri Semarang

Universitas Negeri Semarang is one of the state universities in Indonesia which was founded in 1965 and until now UNNES has 8 faculties (Faculty of Education, Faculty of

Languages and Arts, Faculty of Social Sciences, Faculty of Mathematics and Natural Sciences, Faculty of Engineering, Faculty of Sports Science, Faculty of Economics, and Faculty of Law (unnes.ac.id) UNNES is a university that was originally known as Semarang State IKIP and over time changed to UNNES which has now been transformed into a state university and is one of the LPTK's the largest in Indonesia with a vision to become a conservation university with an international reputation and a mission to organize and develop superior and international standard education in the field of education and non-education, develop and create and/or disseminate science, technology, arts, and sports that are meaningful and meaningful benefits; and develop national culture and civilization that upholds conservation values. UNNES has a great responsibility in building an academic community in the field of education. To support the achievement of its vision and mission, UNNES is supported by an institution that has a strategic role, namely the Institute for Research and Community Service (LP2M).

The Institute for Research and Community Service (LP2M, hereafter) is one of the academic implementing elements at Universitas Negeri Semarang under the rector who carries out some of the duties and functions of UNNES in the field of research and community service (Permendiknas No.59/2009 on Organization and Work Procedures of UNNES Chapter VIII Article 43). In carrying out its functions as a research and community service institution, LP2M has a vision to become an international standard institution based on healthy, superior and prosperous conservation and has 9 missions, namely conducting research and community service oriented to the development of human resources and science and technology, organizing management training and research methodology and community service, facilitating the development of research groups and community service in various sciences and interdisciplinary fields, facilitating the development of quality and highly competitive research proposals and community service, conducting research and community service with regard to efforts improve the nation's intelligence, apply research results in the form of community service in particular to improve the quality of education, increase research centers and community service national and international standards, developing an information and communication system for research and community service that is acceptable and accurate, and developing research and community service networks with various institutions and universities at home and abroad. Looking at the road map above, the research that has been carried out is very appropriate and needs to be done to support the success of the University road map namely Educational Conservation.

There are several studies that have been carried out by many researchers related to Web 2.0 technology, 21st Century Skills and Project- Based Learning. The first research was conducted by Nurhajati (2016) with the title 'Project-Based Learning Used to Develop Supplementary Materials for Writing Skill'. The research objective is how Project-Based Learning is implemented to develop writing materials. This implementation includes the material developed, steps for learning to write and students' writing skills. The research method used a qualitative approach carried out in private schools in East Java with the research subjects seventh grade students. The results showed that Project-based Learning could improve students' writing skills. The next research was conducted by Tarasova (2016) with the title 'Professional English Teaching on the Basis of Blended Learning'. The purpose of this study is to describe professional learning with Blended Learning. Tarasova uses Moodle-type Web 2.0 technology for learning and getting feedback from the implementation. The subjects in the research are Master's Degree students in the Power Engineering program. The thing that is emphasized in his research is the subject's positive and negative experiences with Blended Learning with the Moodle application. The results of this study indicate that Blended Learning using Moodle produces two positive experiences, namely face-to-face learning and the use of electronic media. Further research was conducted by Priyatmojo & Areni (2019) entitled 'Improving Learning Literacy of International Students at Semarang State University with Blended Learning'. The Web 2.0 technology used is Edmodo. The purpose of this research is to introduce Edmodo's Web 2.0 technology to international students. The two partners in this activity are BPMPK and the Department of English Language and Literature. The form of activity is a workshop on two international classes. The results obtained are that students in general are very enthusiastic about Web 2.0 technology, especially Edmodo as a Learning Management System media to manage learning classes.

Based on some of the research examples mentioned above, there are some similarities and differences. The theme in previous research activities is the same, namely the application of Web 2.0 technology in learning activities. However, in the research that will be carried out, it will combine Web 2.0 technology using Project-Based Learning learning techniques. The purpose of this activity is to find out whether Web 2.0 technology and Project-Based Learning learning methods can improve high-level thinking skills (21st Century Skills) of students who are the subjects of this study.

2.1. Web 2.

Web 2.0 has been described as a social way of using Internet technology. This description does not refer to software or hardware but how Web 2.0 is used in businesses, universities, communities, organizations and individuals. The main components of Web 2.0 according to Sachs & McHaney (2016) are 1) social media, 2) filters and searches, 3) content, and 4) applications. The use of technology is increasingly changing where initially only a few parties have access but now every individual has access to information with technology products. Web 2.0 makes collaboration, sharing and interaction easily. An overview of technology over time can be illustrated in the table below:

Table 1. The Development of Technology Web 2.

Users	Era	Characteristics
Public	Mainframe Computer (1945-1965)	Information is controlled by one person
Personal	Personal Computer (1965-1985)	Informasi moves to dekstop so many people can control the data
Private	Mobile Device (1985-2005)	Informasi moves to an individual so every one can access the data with the facilities
Intimate	Self-Technology (2005-2025)	Information combines the skills of communication and technology

(Sachs & McHaney: 2016, p.16)

2.2. Project-Based Learning

With the current digital era, learning in universities should consider technology integration strategies to achieve instructional learning goals. According to Boss, S. & Krauss, J. (2007) in today's digital era, students have the following characteristics:

- a. Students like challenges
The digital world has entered all lines of their lives. Students are very ready to take part in changing times.
- b. Program needs effort
Every lecturer needs to change for the better, including in the implementation of learning.
- c. Students live and learn about the real world
According to the students' perspective, they prefer an authentic learning process where they practice their own learning activities with technological facilities.
- d. New contexts drive new approaches
New learning contexts will give birth to new approaches involving technology and project- based learning.

One form of Project-Based Learning is the Flat Classroom Project. The implementation of this activity is that the lecturer gives projects to students using a blog. Projects given can be in the form of things that interest students or issues given to them by lecturers. These issues need to be contemporary, for example, climate change, social injustice, cross-cultural understanding, etc. The results of student discussions will be posted on the Blog

so that the Blog can be viewed and become a material for discussion with local, national or international communities who have the same ideas about the issue. One of the blogs that has often been used in the Flat Classroom Project is Classroom Ning (www.ning.com) which can be seen from the following views, although there are still many other blogs that can be used:



Figure 1. Website of Ning



Figure 2. Registration

With discussions involving students with the wider community, students have high-level thinking skills to describe, discuss, explain, etc.

2.3. 21st Century Skills

In learning activities in the current digital era, students' thinking levels change from andragogy to heutagogy (Kitchenham, 2005). Therefore, in learning activities, students should be encouraged to help students develop the 21st Century Skills. Learning activities do not only focus on mastering the material, but also other important skills such as attitudes and habits. A good learning activity in the digital era must spur students' intellectuality which is not found in learning in general. This intellectuality is in the form of skills according to Bloom which were originally from the low category (more typical instructional fare) such as remembering (knowledge), understanding (comprehension) and applying into high

categories (the realm of project) such as analysis, evaluation and creation (synthesis). Of the skills above, there are three that are relevant to Project-Based Learning according to Boss, S. & Krauss, J. (2007). These three are also known as higher order thinking skills or 21st Century Skills. In learning activities, lecturers can use the following higher- order thinking skills in a program. With high- level thinking skills or 21st Century Skills, it can improve student literacy to think globally.

Table 2. List of 21st Century Skills

Analyze	Evaluate	Create
Examine, explain, investigate, characterize, classify, compare, deduce, differentiate, discriminate, illustrate, prioritize	Judge, select, decide, justify, verify, improve, defend, debate, convince, recommend, assess.	Adapt, anticipate, combine, compose, invent, design, imagine, propose, theorize, formulate

3 Methodology

3.1. Research Design

The research design used in this research is Action Research. The following is an overview of the cycle used in this research activity:

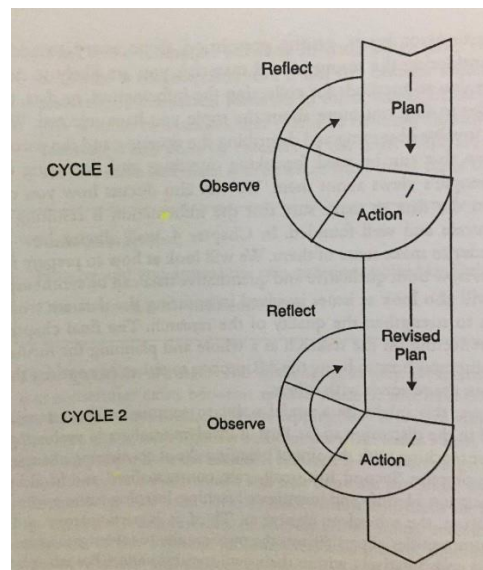


Figure 3. Action Research Cycles (Kemmis & McTaggart, 1988) cited in Burns (2010).

3.2. Research Locations, Subjects and Objects

- a. Research sites

This research was conducted in the Department of English Language and Literature

b. Research subject

One class of ICT in Language Learning courses is the subject of research. This class was used as a research subject because this course is relevant to the research theme.

c. Object of research

This research is themed about technology, so the object of research is learning activities using Web 2.0 technology and Project-Based Learning methods for 6th semester students in the ICT in Language Learning course.

1.3. Research Instruments

a. Worksheet

Worksheets were used as a guide in learning activities that contained types of Web 2.0 technology and group work instructions in Project-Based Learning.

b. Observation sheet

Observation sheets were used to monitor the process during learning activities. This observation sheets were also used to observe students' higher order thinking skills.

c. Questionnaire

Questionnaires were used to see students' responses to the implementation of learning using Web 2.0 technology and the Project- Based Learning method.

1.4. Research Procedure

a. Planning

At this stage, planning learning activities using Web 2.0 applications and Project- Based Learning using Flat Classroom Projects.

b. Action

Learning activities were carried out in the ICT in Language Learning class.

c. Observation (observation)

The research team systematically observed the effects of learning with Web 2.0 and Project-Based Learning by documenting the context, actions and opinions of students regarding learning activities. Data was taken in this observation activity in an 'open-eyed' and 'open-minded' manner so that accurate information was obtained regarding what was happening in the learning classroom.

d. Reflection

At this stage, the research team reflected, evaluated and described the effects of the action to get a clear picture and understand. Furthermore, the next cycle can be carried out referring to the results of this reflection.

2. Finding and Discussion

Web 2.0 technology used in learning activities Based on the results of the study, it was found that the Web 2.0 technology used by students in learning activities was dominated by applications that were not only used for two-way learning activities but also for learning management systems.

4.1. Implementation of Project-Based Learning in the learning classroom

The followings are Project-based Learning carried out in learning classes in the form of Blog products with different issues:

- a. <https://createdbykelompoktiga.blogspot.com>
- b. <https://edu-boards.blogspot.com>
- c. <https://lansperadolearner.blogspot.com>
- d. <https://allaboutonlinelearningeducation.blogspot.com>
- e. <https://covidorious.blogspot.com>
- f. <https://digitalliteracyforyounglearner.blogspot.com>
- g. <https://1percentknowledge.blogspot.com/>

4.2. High-level thinking skills possessed by students after learning activities with Web 2.0 technology and Project-Based Learning

The higher order thinking skills possessed by students can be found in the comments columns on blogs that are blinded by the group. Also, students' articles related to the current issue have been published in a book as the following:

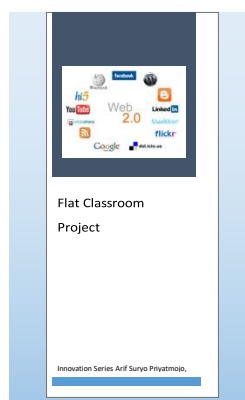


Figure 3. Book on Flat Classroom

2.3. Suggestion

- a. Most of the Web 2.0 products used by students are divided into two categories, namely

- social media and LMS. The social media used are Blogs and LMS using Elena and Edmodo
- b. Project-based learning that is applied is the Flat Classroom Project model. These activities include the creation of a blog with one theme containing articles in English according to the current issues.
 - c. Students' thinking skills are increasing with indications in the comments column on blogs written by one group or another so that there is a discussion that demands a high way of thinking.

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