Batik as the Local Content Subject in Elementary Schools: Skills to Respond to Industry 4.0

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ABSTRACT

This study aims to describe learning methods that can be used to enhance creativity in the Batik local content subject in elementary schools. Innovative learning methods are used as skill capitals to face the Industrial Revolution 4.0 era. One step taken to achieve 21st-century skills is through the use of a project-based approach. The approach taken is an attempt to answer the challenges in the era of the Industrial Revolution 4.0, which is prepared early on at the elementary school level through learning the local content of Batik. The learning results when the project-based learning method was implemented in this subject showed that (1) the learning process using the project-based learning method by giving assignments in the form of projects with integrated planning made students more creative and work better, (2) the use of project-based learning methods in the Batik local content subject could increase the creativity and independence of students, especially in the practice of making batik from the design planning process to the finishing process. The use of project-based learning methods can be a 21st-century skill capital in the context of preparing superior human resources in the Industrial Revolution 4.0 era.

Keywords—*Batik Local Content, elementary school, Industrial Revolution 4.0 era*

1. INTRODUCTION

Education is essential for everyone, and therefore, everyone has the right to access it. The need for education lies in the fact that it produces people of quality. Education is not restricted to specific circles. It is now accessible for everyone because the government has provided facilities and scholarships for people with low economic ability. In improving the quality of education, the government has started conducting improvement efforts in terms of both physical and non-physical aspects [1]. The advancement of technology and science makes education available for everyone.

However, the rapid development of technology and science also makes Indonesian national development more complicated. Therefore, it is critical for everyone to improve their quality to face challenges in Industry 4.0.

In response to Industry 4.0, education, especially the elementary school level, should not only emphasize cognitive aspect but also students' creativity. Therefore, the curriculum and learning system that encourages creativity should be in synchronization. Unfortunately, creativity is still largely neglected in the Indonesian education system. Student management system still employs the conventional methods emphasizing cognitive development without providing opportunities for creativity growth. This is unfortunate because creativity helps students to solve the problems in their life, and it is needed to compete globally. According to Clark Moustakas [2], creativity is the experience of expressing and actualizing one's identity in an integrated manner in terms of relationships with oneself, nature, and other people. In general, creativity is defined as a person, process, press, and product. The four "P"s are interrelated: an individual (person) should involve in creative activities (process), with supports (press) from the surrounding environment, to develop innovative products.

Students' creativity might be hindered if the learning process does not encourage creativity growth. Several factors prevent creativity development, one of which is the monotonous teaching method (lecture). This teaching style is based on the perspective that a teacher knows more than the students. However, this contradicts the current trend where students can access information on various fields using the Internet technologies available in Industry 4.0.

The learning process in elementary schools especially that of Batik Subject, is more theoretical than practical. The hands−on learning is limited to designing Batik patterns. Students do not experience the manufacturing process first hand. Therefore, the learning objectives have not been fully accomplished. This is due to the limited time allocation (2 X 35 minutes) per week. After interviewing several elementary school teachers in Yogyakarta, it was found out that most teachers only offered theoretical understanding of batik definition, patterns, manufacturing techniques, and manufacturing processes. The only hands−on activity the students experienced was designing various batik patterns and some of the classic patterns such as the pattern of *kawung, parang*, and *truntum*. The limited-time allocation was the main reason why the teachers focused on theories. A teacher of Muhammadiyah Elementary School stated that "we only do practicum when there is an FLSSN Batik

Competition." Another teacher said, "We practice making batik on a cloth sized 50 cm x 50 cm, and it can be finished in 4-5 meetings. Because of the limited time allocation, we provide a brief batik making experience. The important thing is that students know how to hold *canthing*, a batik production tool."

These phenomena suggest that it creative teachers are needed to develop students' creativity. Teachers are the ones who deal with students directly and decide where they want to take the subjects to because there are no fixed guidelines about the Batik Local Content in the curriculum. Teachers' creativity is required to design innovative learning methods that can develop students' creativity needed in Industry 4.0. If in elementary schools, a student possesses great creativity, he/she will have a prior skill (being creative and competitive) when he/she join the higher educational level.

Batik is a local content subject in elementary schools. Through this subject, students are expected to be able to recognize and preserve the Indonesian cultural heritage. Introduction to the socio-cultural environment through education is supported by the enactment of policies related to the inclusion of the local content subject in the elementary school curriculum. Elementary schools in Yogyakarta develop batik curriculum through extracurricular activities as the local content subject. In the elementary curriculum structure, local content subjects are only allocated 2 hours per week [3]. Batik local content subject is offered for the third and fourth-grade students with 2 period's time allocation (2x35 minutes) per week. This limited-time allocation requires innovative teaching and learning methods if it aims to develop students' creativity.

The local content subjects in Yogyakarta are intended to develop the potential of the local area as an effort to improve the quality of education. The local content curriculum in Yogyakarta consists of dance arts, musical arts, and batik, all of which are intended to introduce and preserve local culture. Many elementary schools in Yogyakarta have been recognized as the Cambridge Centers. Thus, the preservation of local culture is needed.

According to the elementary school curriculum, there are three local content subjects, but only one is mandatory. The school has the rights to choose one out of the three subjects. If the school is willing to offer the three local content subjects, then it would have been better if the students are required to choose one among the three.

Through the implementation of the 2013 curriculum with a thematic and contextual approach, it is expected that students will be able to improve and use their knowledge independently, and study, internalize as well as personalize noble values in daily life [4]. However, Batik subject is delivered casually without any special attention. This is rather unfortunate because this subject has great potential as a media to cultivate students' creativity. The policy of Yogyakarta's Government on the account that every elementary school student should make their own batik uniforms also supports Batik local content subject.

Batik Local Content Subject should cover theoretical and practical learning. However, the learning processes are more theoretical than practical. Therefore, it could be said that this subject has not been optimally implemented. Schools should take the policy of Yogyakarta's government on self-made batik uniform into account and make improvement on Batik Subject.

Responding to this issue, teachers of Batik Local Content Subject should be able to choose appropriate learning methods in order to hone students' creativity and maximize learning within limited time allocation. One of the innovative learning methods that can be applied to Batik local content subject is Project-Based Learning. Project-based learning (PjBL) is a learning model that uses projects as learning activities to achieve competency that covers attitudes, knowledge, and skills.

Rector of Yogyakarta State University Prof. Dr. Sutrisna Wibawa stated that the learning method that can be used to achieve the 21st-century skills, among others, is the project-based approach. The 21st Century skills that can be obtained through Project-based Learning are critical thinking skill to solve problems, creativity and innovative drive, as well as communication and collaboration skills. Besides, students can acquire skills in finding, managing, and conveying information as well as skills in responding to information and using technology. These skills are essential in Industry 4.0 where machines, workflows, and system are combined by intelligent networks to control each other independently [5].

Thus, the learning process that takes place in Batik Local Content Subject is no longer limited to theories or minor practicum activities. The learning process should be well designed. Activities in project-based learning will stimulate students to generate creative ideas to produce batik. With the increase in student creativity, it is also expected that there is an improvement in learning outcomes and students' personality such as independence, accuracy, responsibility. Through project-based learning, students are expected to be able to carry out information exploration, assessment, and interpretation to obtain various learning outcomes (knowledge, skills, and attitudes). This approach can also motivate students to reflect on what they are learning in a real project.

2. FINDING AND DISCUSSION

2.1. Batik Local Content Subject

Based on the Decree of the Governor of the Special Region of Yogyakarta, No: 423.5 / 0912 dated March 29, 2005, stipulates that Javanese language subject is a compulsory local content subject for elementary/junior high/high schools. Local content subjects are divided into two: mandatory and optional local contents. Schools have the rights to determine which optional local content subjects will be offered in their institution based on their vision and mission or their distinctive character. One of the local content subjects is Batik subject. In this subject, students are expected to understand more and respect the

values contained therein to evoke their curiosity, creativity, disciplined and independent traits

2.2. Industry 4.0

Istilah revolusi industri dikenalkan pertama kali oleh Louis Auguste Blanqui dan Friedrich Engels di pertengahan abad ke 19. Revolusi industri ini pun berjalan dari masa ke masa. Pada fase keempat ini (4.0) telah menghadirkan digitalisasi dan otomatisasi perpaduan internet dengan manufaktur [6]. Di dalam dunia pendidikan sering dikenal dengan istilah pendidikan 4.0. Pendidikan 4.0 merupakan fenomena yang merespon kebutuhan munculnya revolusi industri keempat dimana manusia dan mesin diselaraskan untuk mendapatkan solusi, memecahkan masalah dan tentunya diharapkan dapat memperoleh inovasi baru. Kesuksesan dalam menghadapi revolusi industri 4.0 erat dengan kaitannya dengan inovasi yang diciptakan oleh sumber daya manusia yang berkualitas, sehingga sejak dini khususnya pada jenjang sekolah dasar sudah disiapkan disesuaikan dengan kompetensi dan kurikulum pendidika yang ada guna menjawab tantangan tersebut.

The term Industrial Revolution was first introduced by Louis Auguste Blanqui and Friedrich Engels in the middle of the 19th century. The Industrial Revolution went on from time to time. In this fourth phase (4.0), digitalization, automation, and the integration of internet and manufacture are developing rapidly [6]. Education 4.0 is a phenomenon that responds to the need for the emergence of a fourth industrial revolution in which humans and machines are aligned to get solutions, solve problems and are certainly expected to obtain innovations. Success in dealing with the Industrial Revolution 4.0 is closely related to innovation created by quality human resources, so that early on, especially at the elementary school level, it has been prepared adjusted to the competencies and existing educational curriculum to answer these challenges.

The term Industrial Revolution was first introduced by Louis Auguste Blanqui and Friedrich Engels in the middle of the 19th century. The Industrial Revolution have been developing continuously since then. In this fourth phase (4.0), digitalization, automation, and the integration of internet and manufacture are developing rapidly [6]. Education 4.0 is a phenomenon that responds to Industry 4.0 in which humans and machines are aligned to get solutions, solve problems and make innovations. Success in dealing with the Industrial Revolution 4.0 is closely related to innovation created by quality human resources. The curriculum of elementary school has adjusted to this challenges.

2.3. Project-Based Learning

Project-Based Learning is a learning method that emphasizes solving problem that occurs in everyday life through hands-on learning experiences in the community. Project-Based Learning can also be interpreted as a learning education that is rooted in real-life problems [7]. Project-based learning is a theory originating from Vygotsky's social constructivism that provides a foundation for cognitive development through the increased intensity of interpersonal interactions [8].

Project-Based Learning is oriented to CTL or Contextual Teaching and Learning Process [9]. CTL is a learning concept that helps educators to link learning materials with real-world situations and encourages students to use the knowledge they have in their lives as members of the community. Batik Local Content Subject might be an alternative for students to develop their creativity and deepen their understanding of batik as Indonesian culture which can later become a provision for themselves in social life, especially in the era of the Industrial Revolution 4.0.

2.4. Project-Based Learning in Batik Local Content Subject

Thomas [10] proposes phases and activities for PjBL are as follows:

1) Preparation Phase: students try to understand each other by introducing themselves and expressing their expectation of the project.

2) PjBL process: group formation, project selection, information gathering, and project work steps.

3) Evaluation Phase: providing students with the opportunity to work autonomously to construct their own knowledge, and reach its peak in producing tangible products.

The learning material of Batik Subject in elementary schools covers batik jumputan, shibori, 50cm x 50cm batik clothes. This subject is conducted in 2 x 35 minutes per week. There is no clear timeline for each topic. The Batik Subject with PjBL aims to provide projects of making school uniforms from self made batik clothing.

The PjBL activities in Batik Local Content Subject are as follows:

1) Determining the fundamental questions (observing and asking)

In this activity, students design a project: making batik clothing material for school uniforms in 1.15 m x 1 m size (a standard measurement of IV students). Then, the students design the pattern following their creativity. The theme is the cultural wisdom of Yogyakarta. This activity requires students to be active in finding information through the internet, processing it, and expressing it as batik motifs, and lastly creating the patterns. The tools and materials should be included in the planning list as well.

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Figure 1 Determining fundamental questions

1) Planning the project (asking and processing information)

   I In this activity, students design a project: making batik clothing material for school uniforms in 1.15 m x 1 m size (a standard measurement of IV students). Then, the students design the pattern following their creativity. The theme is the cultural wisdom of Yogyakarta. This activity requires students to be active in finding information through the internet, processing it, and expressing it as batik motifs, and lastly creating the patterns. The tools and materials should be included in the planning list

Figure 2 Kegiatan perencanaan proyek

2) Arranging schedule (asking and processing information)

   Schedule is aimed to set targets in completing their batik projects.

3) Monitoring the project progress (asking questions, processing information, and associating information)

   During the production process, students are expected to consult to the teacher. The batik making process is done through the following steps:

   a) Creating the design

Figure 3 a)   Creating batik design

b) Copying the design on the fabric

Figure 4 Copying the design on the fabric

Figure 5 Copying the design on the fabric

c) Drawing patterns with wax using *canthing*

Figure 6 Drawing patterns using *canthing*

Figure 7 Drawing patterns using *canthing*

d) Dyeing the clothes with *colet* technique

Figure 8 Dyeing the clothes with colet technique

Figure 9 Dyeing the clothes with *colet* technique

e) *Nemboki*

Figure 10 *Nemboki* process

f) Dyeing the clothes with *celup* (dipping) technique

Figure 11 Dyeing by dipping

Figure 12 Dyeing by dipping

g) *Pelorodan*

In every activity, the teacher is present to guide the students in completing their project.

4) Assessing the project (asking, associating, and communicating)

Students present their projects through classroom presentation followed by a school exhibition

Figure 13 Students presentation

5) Evaluating Experiences (communicating and evaluating)

Students conduct discussions with peers to evaluate the projects.

In addition to conducting the batik project well, Students are also expected to write down all the experiences gained during the project in the form of reports. Through the report, the teacher can provide input and evaluation on student performances.

Figure 14 Report presentation

The project-based learning method facilitates the teacher in managing time and organizing material and learning activities optimally within 2 periods per week.

The field observation results suggest that by using PjBL, students become more creative and competitive in various competitions, one of which is the FLSSN Batik Competition both at the UPT, City, and Provincial level.

Figure 15 The winner (1) and runner up (2) of FLSSN batik competition in Yogyakarta

Figure 16 The winner, (1), runner up (2), and the fifth runner up (6) of FLSSN Batik Competition in Yogyakarta

3. CONCLUSION

Education should continuously adapt and adjust to the ever-changing era, especially Industry 4.0. Batik Local Content Subject at elementary schools can be used as media to develop skills. To answer these challenges, an innovative learning method is needed. The technique used is a project based learning method. In this method, students are actively participate in planning, arranging schedule, creating batik tulis (handmade batik), and evaluating the project.

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