Assignment of the Ethnoscience Project "Art of Jidor" in Learning the Concept of Sound for PGSD Students as an Effort to Cultivate 4C

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Abstract
The aim of this research is to determine the results of the project assignment for making a simple jidor musical instrument and the relationship between the project assignment and the ability to develop 4C skills in PGSD students. The subjects of this research were PGSD students at PGRI Adi Buana University, Surabaya. The data collection technique uses product assignments for simple jidor art imitation tools. The data analysis technique used in this research is descriptive by describing the results of assignments which are supported by the results of literature studies to find connections between project assignments and developing 4C skills. Based on the results obtained, it can be concluded that the jidor art ethno science project assignment in learning sound concepts for PGSD students is able to develop 4C skills well.

Keywords: *Ethnoscience, Project Learning, Concept of Sound.*

Abstrak
Tujuan dari penelitian ini untuk mengetahui hasil tugas proyek pembuatan alat musik seni jidor sederhana dan kaitan antara tugas proyek dengan kemampuan menumbuhkan keterampilan 4C pada mahasiswa PGSD. Subjek penelitian ini yaitu mahasiswa PGSD Universitas PGRI Adi Buana Surabaya. Teknik pengumpulan data menggunakan penugasan produk alat tiruan seni jidor sederhana. Teknik analisis data yang digunakan pada penelitian ini adalah deskriptif dengan cara mendeskripsikan hasil tugas yang ditunjang dengan hasil studi literatur untuk mencari keterkaitan antara penugasan proyek dengan menumbuhkan keterampilan 4C. Berdasarkan hasil yang didapat, maka dapat disimpulkan bahwa tugas proyek ethnosains seni jidor dalam pembelajaran konsep bunyi mahasiswa PGSD mampu untuk menumbuhkan keterampilan 4C dengan baik.

Kata Kunci: Ethnosains, Tugas Proyek, Konsep Bunyi.

INTRODUCTION

Natural Science is basically a science that teaches about natural phenomena that occur in everyday life. Science is the science of natural phenomena consisting of facts, concepts, principles and laws that have been proven correct through various scientific activities.(Hisbullah & Nurhayati, 2018). Science and ethno science are a unity which, when combined, will make it easier for us to learn. Ethno science itself is unique because it combines culture and science. Ethno science learning is the integration of local culture into the learning process. The goal is to create a learning environment for students. Teachers not only play a role in delivering material but also internalize values that can foster a sense of empathy for the environment(Aisyah & Khotimah, 2023).

Ethno science is a form of natural knowledge in the form of customs and culture, morals, language and technology created with natural knowledge(Sudarmin in Rahayu et al., 2023). The cultural diversity in Indonesia in relation to science learning is an attractive value for the learning process. The educational process about everyday life developed by culture, both processes, methods, methods and content, will make it easier to identify forms of ethno science(Revelation in Rikizaputra et al., 2021). In science learning, ethno science is expected to make it easier for students to understand the science concepts being studied. Learning physics is quite complex, making ethno science suitable for use in the learning process.

Learning the concept of sound in physics courses requires an understanding of the factors that can cause a sound. The process of understanding the concept of sound requires an appropriate strategy because the material is quite complex. Through this ethno science project-based learning, it is hoped that it can grow students' understanding of sound concept

material in physics courses. Connecting science learning with local culture or ethno science can add to the quality of learning(Suardana in Wibowo & Ariyatun, 2020). Nieto & Ling state that cultural relationships in various sectors determine the quality of professional services, including education, so teachers must be able to incorporate cultural elements into learning(Wibowo & Ariyatun, 2020).

Jidor art project task-based physics learning is considered suitable for use in learning, this is supported by the statement of Rati et al (2017)that in project-based learning, project work is viewed from the perspective of creativity and activities carried out by students during the learning process. This will have the potential to improve student learning outcomes. The jidor instrument itself has a function and role that is similar to the gong musical instrument in Javanese musical instruments. The Jidor instrument is played by beating it using a wooden bat with a rubber circle at the end(Prasetyo & Winarko, 2012). Through this jidor art ethno science project-based learning, it is hoped that students can foster the 4C process (Communication, Creativity, Collaboration, and Critical Thinking). Therefore, this research was carried out to determine whether the ethno science project task was able to foster the 4C process in PGSD students at PGRI Adi Buana University, Surabaya. The formulation of the research problem is 1) what are the results of the project assignment for making a simple jidor musical instrument? 2) How can project assignments foster 4C skills? Thus, the aim of this research is to find out the results of the project task of making a simple jidor musical instrument and the relationship between project tasks and developing 4C skills.

METHOD

This research is included in the descriptive quantitative research category by applying project assignments as a strategy for learning sound concepts in physics concepts courses. The target subjects of this research are PGSD students Class of 2022 E, PGRI Adi Buana University, Surabaya. The data collection technique uses product assignments for simple jidor art imitation tools. The data analysis technique used in this research is descriptive by describing the results of assignments which are supported by the results of literature studies to find the relationship between project assignments and developing 4C skills.

RESULTS AND DISCUSSION

In this jidor art ethno science project, students were divided into seven groups with each group making a different simple musical instrument project, jidor art. Each group made a video tutorial on how to make a simple musical instrument, the art of jidor, made a written report and presented the product results to other groups. The musical instruments made by each group were Tin Tambourine, Percussion, Bamboo Bongo, Paper Whip, Inverted Bucket Drum, Maracas, and Plastic Gentong Jidor.

The results of the Rebana Tin group products require several tools and materials, including 3 used cigarette cans, 1 can lid, 10 rubber bands, 1 balloon, and 1 pair of chopsticks. The steps for making this tin Tambourine start by putting together used cigarette tins and then gluing them together with a rubber band so they don't come apart from each other. After that, the ends of a pair of chopsticks are tied with a rubber band to beat the used cigarette can. This canned tambourine is used by hitting it with chopsticks that have been given rubber, the sound produced will be loud because of the effect of the used cigarette can. The results of Tambourine cans can be seen in figure 1.1

Figure 1.1 Tin Tambourine

The results of the second group are Percussion. To make this percussion you need tools and materials, namely used Yakult bottles, scissors, double tips, pipe glue, folded paper and

rice. The first step in making this percussion is to adjust the folded paper to the Yakult bottle then attach it to the Yakult bottle according to the specified size, then add decoration with colorful folded paper to make it attractive, after that the decorated bottle is filled with enough rice so that it can produce sound which is loud when shaken. After being filled with rice, the ends of the bottles are filled with pipe glue so that they stick together and the rice doesn't spill.

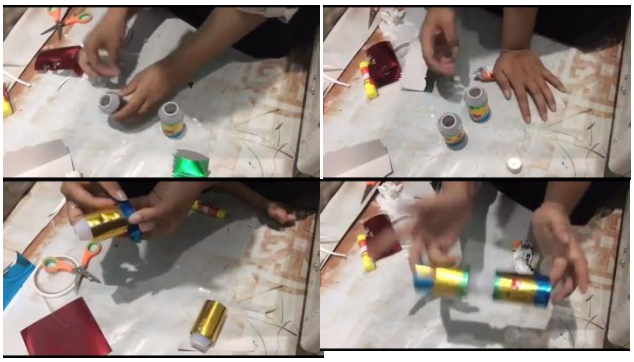

Figure 1.2 Steps to Make Percussion and Final Results

The third group is Bamboo Bongos. In the process of making Bamboo Bongos you need several tools such as a saw, 15 cm long bamboo, sandpaper, balloons, rubber bands and a ruler. The first step is to cut the bamboo with a saw to a size of 15 cm, then sand the bamboo so that the sides are smooth and not sharp. After that, attach the balloon to the end of the bamboo that has been cut and secure it with a rubber band until the surface of the balloon is tight. The steps for making Bamboo Bongos can be seen in figure 1.3.

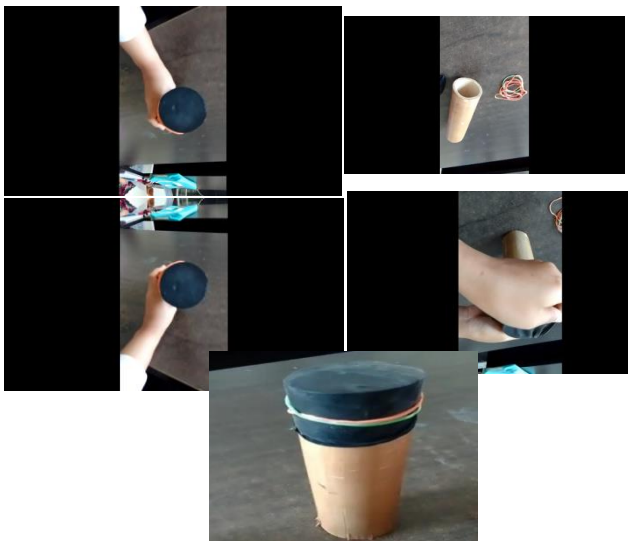

Figure 1.4 Steps for Making Bongo Bamboo and Final Product Results

In the fourth group, namely making paper whips. All that is needed for this tool is paper, then fold it into several parts so that when it is whipped it will produce a loud sound. The final result of the paper whip can be seen in figure 1.5.

Figure 1.6 Steps and Final Results of Paper Whip

The fifth group is the Reverse Bucket Jidor, with the tools and materials needed, namely a bucket, duct tape, scissors. Next, the surface of the bucket is taped, taking into account the type of material of the bucket and also the thickness of the tape used and the desired resonance properties. The results of the Reverse Ember Jidor can be seen in figure 1.7.

Figure 1.7 Inverted Bucket Jidor Final Result

The sixth project is the Marakas group. In making these marakaas require tools such as used bottles and green beans. Then the used bottle is filled with enough green beans so that when shaken it makes a sound. These maracas can be seen in figure 1.8.

Figure 1.8 Maracas Final Results

And finally, the seventh group is Jidor Gentong Plastik. To make this, you need a plastic drum or barrel used for holding water, rubber car inner tires, and a stick as a hitting tool. The step that must be taken is to install the rubber inner tire of the car on top of the plastic barrel and then tie it with a rope. The plastic barrel jidor can be seen in figure 1.9.

Figure 1.9 Final Result of Plastic Barrel Jidor

In this project, students not only make a simple imitation jidor art musical instrument product but also analyze the instrument critically, creatively, collaboratively and communicatively in relation to the concept of sound. The creative aspect is fostered through the efforts made in the process of making various simple musical instruments, the art of imitation jidor. The results of research conducted by Kumalasari et al (2017)namely that project-based learning influences students' creative thinking abilities because project learning has stages that are able to develop creative thinking abilities such as flexibility, originality and judgment. In the collaborative aspect, they are required to provide reasons and reviews why the musical instrument produces sounds that differ from one instrument to another and with different sizes and materials.

Project-based learning requires students to be able to collaborate in creating projects based on what they know and provides space for them to learn independently(Umam & Jiddiyyah, 2020). So in this case it requires critical thinking skills in providing reasons and reviews by paying attention to factors including size, materials and how to use the simple imitation jidor musical instrument they produce. This is in line with what Facione said(in Ramadayanti et al., 2017)that one of the components of critical thinking is analysis, namely identifying concepts, questions, and describing reasons as well as information and opinions.

In this project assignment, students work in groups and between groups. Students are also required to present the results of their simple musical instrument product project, imitation jidor art, to other groups. Thus, this activity clearly fosters collaboration skills. Students are encouraged by the project to gain a learning experience that includes more than just knowledge but also reaches the stage of creating. Students will experience and learn concepts through project-based learning(Izzati, 2014).Project-based learning requires skills such as collaboration and reflection. Project-based learning will reduce absenteeism and discipline problems in the classroom because it helps students improve their social skills(Wariani & Hayon, 2023).

On the other hand, at the end of the project students are required to make a report which must be done in writing and presented. So this activity makes it possible to develop written and oral communication skills because after the presentation there is a question and answer discussion session, regarding why and how related to the tools produced and their relationship to the sound produced. Bell(in Luthvitasari et al., 2012)states that the ability to communicate and solve problems can be improved through project-based learning. Thus,

the jidor art ethno science project assignment in learning sound concepts for PGSD students can enable the growth of critical, creative, collaborative and communicative (4C) thinking skills.

CONCLUSION

Based on the results of the research that has been carried out, it can be concluded that there are seven types of results from project assignments carried out by students in making simple imitation musical instruments of the jidor art, namely Tambourines, Percussion, Bono Bamboo, Paper Whip, Inverted Bucket Jidor, Maracas, and Gentong Jidor Plastic.

As for the results of the literature review and analysis of the jidor art ethno science project assignment in learning the concept of sound, it can foster 4C abilities because from this project assignment students are required to think creatively, collaboratively, communicatively and critically to produce good simple jidor art imitation musical instrument products.

SUGGESTION

Through this research, it is hoped that we can utilize ethno science as an approach to achieve 4C achievements. Prospective teachers can use ethno science to grow the 4Cs. For other researchers, it is necessary to carry out further qualitative research to explore ethno science in cultivating 4C.

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