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Project-based Collaborative Learning for Making Tie-dye to Improve the Skills of Vocational High School Students

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Abstract. Developing the world of creative industries requires humane and creative human resources (HR). Educational institutions have a strategic role in developing creative human resources through learning that facilitates students to be active, wise, and collaborative. Therefore, it is necessary to implement project-based collaborative learning in learning activities, especially learning competencies related to the creative industry; one is about dyeing cloth with the popular tie-dye technique. This study was conducted at SMK N 1 Pengasih in the Fashion Design expertise program, using a project-based collaborative learning direct learning approach. The steps are; need assessment, learning preparation, tool and material preparation, learning implementation, and evaluation. The learning activity was declared successful because the number of targets present reached 100% with an activity level of > 90%. The level of participation or activity in the learning process is grouped in the high category, namely > 80%. This activity has a good impact and benefits students if the score is > 80%. The evaluation design for increasing knowledge and skills was determined by the service team, as seen from the results of the tie-dye shirt product, with a score of > 80% in the "good" category.

Keywords: Collaborative learning, tie-dye, learning, creative industries.

INTRODUCTION

In 2020, the Ministry of Education and Culture of the Republic of Indonesia established eight Main Performance Indicators (IKU) for State Universities (PTN). This policy is contained in the Decree of the Minister of Education and Culture of the Republic of Indonesia Number 754/P/020 concerning the Main Performance Indicators of State Universities. Through these indicators, the state universities are demanded to be able to present solutions to the midst of the problems faced by the government, society, and the world of work/industry so that the life of the nation and state moves into the future (Ministry of Education and Culture of the Republic of Indonesia, 2020). Based on the indicators, Universitas Negeri Yogyakarta (UNY) provides opportunities for academics to carry out community service programs through lecturer programs with activities outside campus.

In line with efforts to implement the state universities indicators and UNY's Merdeka Belajar Kampus Merdeka (MBKM) program through lecturer's outside campus activities, the UNY lecturer team works with relevant partners to be able to provide solutions to problems experienced by certain community groups. On this occasion, the team of lecturers from the Fashion Design Education study program chose SMK Negeri 1 Pengasih as the target for the activity. The reason is that the school needs to be based on the results of orientation and observation and requests from the school. This is also intended to help realize the goals of SMK N 1 Pengasih, especially in achieving the goal of

equipping students for careers, being independent, having an entrepreneurial spirit, being creative, being able to adapt in the work environment according to their fields and being able to deal with changes that occur in society. Through the synergy of these activities, the goals of universities and schools can be adequately achieved. Moreover, SMK graduates are potential input for tertiary institutions (Wild & Schulze, 2020).

The synergy with UNY and SMK N 1 Pengasih in this activity at school in the form of teaching is one of the eight state university indicators. It is an effort to establish a partnership between UNY and the school, in this case, SMK N 1 Pengasih Kulon Progo, which will lead to increased intellectual capital, development of lecturer competencies, and sharing of knowledge as partnership development. This activity is also an effort to implement the MBKM policy launched by the Ministry of Education, Culture, Research, and Technology. This MBKM policy is a policy that guarantees students in determining their choice of learning patterns so that they can be more agile in dealing with various changes that occur. The form of activity that students at school can carry out is teaching/training. The competency that is taught or trained is tie-dye making.

This tie-dye-making training was chosen because it is adapted to the needs of the industrial world and the world of work today, as well as having great opportunities to empower the micro-economy (Aryani et al., 2020). In addition, the rapid development of the world of creative industries must be supported by creative human resources. Creativity can be honed and developed, one of which is at school, where it is strongly supported by the role of the teacher (Selasih, 2019). SMK N 1 Pengasih is a place for students to have authentic learning experiences relevant to the industrial world. In the industrial world, a person must also have various abilities that are used at one time, for example, the ability to complete tasks and social skills. In addition, the old paradigm in the learning process that is teacher-centered becomes student-centered. Therefore, students must be active, creative, and able to socialize in learning activities. Based on this, there is a need for project-based collaborative learning in learning activities (Nerona, 2019), one of which is about dyeing cloth with the tie-dye technique.

Based on the situation analysis described above, the identification of the problem can be conveyed as follows: (a) Students at SMK N 1 Pengasih, especially the fashion design program, still need to be provided with additional knowledge and skills so that they can later have independent and creative careers, (b) students of SMK N 1 Pengasih still need to increase their self-confidence so that they have an entrepreneurial spirit, (c) student-centered learning still needs to be improved and implemented in schools as an effort to develop students' self-confidence, activeness, independence, and responsibility, (d) it seems that project-based collaborative learning still needs to be improved at SMK N 1 Pengasih, (e) the knowledge and skills of cloth dyeing using the tie-dye technique for students of the fashion skills program at SMK N 1 Pengasih still need to be improved.

Developing the world of creative industries requires humane and creative human resources. Based on the background and existing problems, it is necessary to have collaborative learning in learning to train students to socialize in completing a project. Collaboration between lecturers and students is a solution for schools so that students gain knowledge and experience from UNY lecturers and students. In addition, collaborative learning makes students more active, creative, and capable of socializing in learning activities. Based on this, there is a need for project-based collaborative learning in learning activities, one of which is the tie dye coloring technique. Project-based Learning (PjBL) is a teaching approach that builds on learning activities and authentic assignments that provide challenges for students related to everyday life to be solved in groups (Goodman et al., 2020). Project-based learning is an active learning methodology where students develop projects in teams as a means of building practical professional skills and knowledge (Colim et al., 2022). Project-based learning is a student-centered learning model to conduct an in-depth investigation of a topic (Grant, 2002). Students constructively deepen learning with a research-based approach to problems and questions that are weighty, real, and relevant. By the 21st-century learning model, this PjBL model can cultivate high-order thinking skills (HOTS) in implementing scientific learning (Observing, Associating, Trying, Discussing, and Communicating) as well as improving 4C skills (Critical thinking, Collaboration, Creative, Communication).

Based on the description above, project-based collaborative learning is used, namely, the manufacture of t-shirt products using the tie-dye technique. The tie-dye technique is focused on the overall design pattern, which prioritizes pattern control by preventing other parts from being dyed. The activities that will be taught are using the simple tie dye method for coloring plain t-shirts and the dyeing process, which is simple, cheap, and easy to do. The plain T-shirt is cotton, so it quickly absorbs dyes and can be locked properly. In addition, t-shirts made of cotton are more comfortable, cooler, and absorb sweat easily.

Relevant research can be a reference entitled “Eco-tech fashion project: collaborative design process using problem-based learning” (Choi, 2019). The results of this study are Project-Based Collaborative Learning (PjBL) consisting of three teams of 24 students in one class adapted to learning because this model is very suitable for students

to solve real-world problems that arise naturally when students complete a given project. In this project, there will be various kinds of skills used in completing the project. Project-based learning can help integrate knowledge and improve skills, including the main competencies (Gomez-del Rio & Rodriguez, 2022). PjBL enables the students to share knowledge with others in the group; they are motivated to seek solutions to problems, train to collect data, acquire knowledge independently, practice multiple thinking, and practice creating ideas (Supadol et al., 2014).

The other article concerns Training in Productive Skills for Making Shibori to Increase Family Income for PKK Mothers in Sumbersari Moyudan Sleman Village, Yogyakarta (Widihastuti et al., 2021). This shibori technique is almost the same as tie-dye. It uses easy coloring and uses flocking techniques. The dyes used are the same, and the results of the community service products vary even though they use one technique. Therefore, this technique increases the skills of community service participants and can increase income from productive skills training that has been attended.

METHODS

The method of implementing the program is through a learning approach for class X students of the Fashion Expertise Program at SMK N 1 Pengasih. The number of participants was 36 students divided into two classes. The community service team provides tie-dye knowledge and skills to students for one semester starting in March-August 2022. This activity is packaged in the activities of lecturers and students teaching at school using the training method. Some of the steps include analyzing needs, teaching and assisting in implementing tie-dye making, monitoring and evaluating results, and publication.

RESULTS AND DISCUSSION

The implementation of the tie dye-making project-based collaborative learning program to improve the skills of Fashion Design students at SMK N 1 Pengasih Kulon Progo Yogyakarta begins with a need assessment, preparation for learning, preparation of tools and materials, implementation of learning, outcomes, and program evaluation.

Need Assessment

Need assessment is the first step that must be implemented. It is essential to identify priority needs that urgently need to be met to improve tie dye skills for students. The initial stages of this needs analysis have been identified during initial observations and discussions with SMK N 1 Pengasih Kulon Progo. Various information identified included information about tie dye's knowledge and skills, as well as information about learning strategies and methods commonly applied in schools. This information on learning strategies and methods is essential as a starting material for implementing project-based collaborative learning.

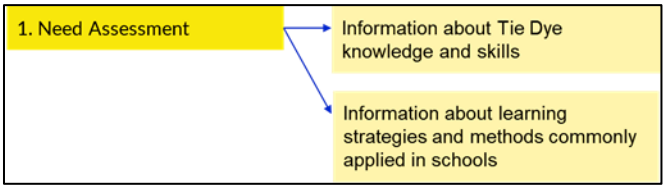

FIGURE 1. Analysis of the needs for tie-dye t-shirts.

Learning Preparation

The preparation stage for project-based collaborative learning for tie-dye skills includes designing learning tools, namely learning implementation plans and jobsheets for practical learning. In learning implementation plans, the learning method will focus on project-based collaborative learning, where activities direct students to learn actively, namely by giving assignments/projects that are completed in small groups.

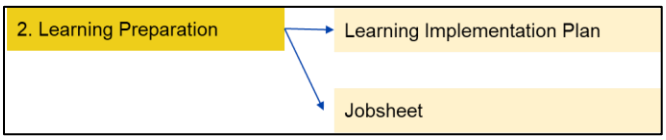

FIGURE 2. Learning preparation.

Preparation of Tools and Materials

The tools and materials for the tie-dye skill training include cotton combed 30s t-shirts, dyes, large polyester threads, rubber bands, and brushes (Behera & Khandual, 2017). The various tools/materials were prepared in several packages according to the number of participants from SMK N 1 Pengasih Kulon Progo.

FIGURE 3. Preparation of tie-dye stain.

(a) (b)

FIGURE 4. Tie-dye staining experiment with cloud motif (a) and circle (b).

Implementation of Learning

Tie-dye skills learning or training is carried out at SMK N 1 Pengasih by implementing project-based collaborative learning. The team of service program lecturers will teach/train tie-dye skills to partner SMK students, starting from knowledge about tie-dye, tools and materials, pattern/design, and various tie-dye techniques. The term tie-dye is the process of making motifs on cloth using a tie technique to block colors, while the term dye is defined as a coloring process (Wardoyo & Widodo, 2018). Dyeing is an attempt to decorate the fabric's surface by covering the unwanted parts of the color with pressure media caused by stitching or bonding. In the manufacturing process, a barrier material used is threads or straps that do not absorb dyes. Tie-dye can also be interpreted as giving clothing motifs by pressing with ties and dyeing (Zulaikhah, 2010).

FIGURE 5. Explanation of tie-dye material.

FIGURE 6. Students form groups to design tie-dye motif designs.

FIGURE 7. Students do the tie-dye process using various techniques.

FIGURE 8. Students mix dyes in plastic containers and pour dyes on t-shirts.

FIGURE 9. Students washing and drying tie-dye t-shirts.

FIGURE 10. Finished tie-dye products by students of SMK N 1 Pengasih.

Tie-dye used to be a traditional cloth used in traditional Javanese ceremonies, but in its development, this cloth has become the daily life consumption of Indonesian people. Tie-dye products are in great demand by consumers both domestically and abroad. Tie dyes that can be found in various regions in Indonesia are Java (Jumputan cloth), Palembang (Rainbow cloth), Lampung (Cinde cloth), Kalimantan (Sasirangan cloth), Bali (Rainbow cloth), Lombok (Rainbow cloth), South Sumatra (Roto cloth) and Sulawesi (Rainbow cloth) (Harmoko, 1996). The tie-dye technique is applied to fashion products such as t-shirts, hijabs, skirts, blouses, pants, and shirts and can also be used for bags, hats, and other household accessories.

The learning outcomes of tie-dye skills in this community service activity consist of two aspects, namely the product of the tie-dye project and the evaluation of the learning process based on collaborative learning. Evaluating student products is essential for measuring the achievement of success indicators in making tie-dye clothes. While the evaluation of this process is vital to determine whether the project-based collaborative learning has been carried out properly, which includes indicators of activity and collaboration between students, have been achieved. Even though the results of the lecturer's activities outside campus have been well implemented, to achieve a unique and creative design using the tie-dye method, a lot of training and creativity development is still needed (Barasa & Olal, 2020).

Successful implementation of activities

The success of implementing activities can be seen from the presence and participation or activeness of students. Learning activities are declared successful if the number of targets present reaches at least 90% with an activity level of > 80%. The level of participation or activity in the learning process is grouped into > 80% = High; 60-80% = Moderate; < 60% = Low.

TABLE 1. Successful implementation of activities.

Number of Students	Attendance Students	Attendance Percentage
18	18	100%

Based on implementing lecturer programs with activities outside campus, student attendance was 100%; namely, 18 students were present. Viewed from the aspect of student activity, all students are active in training activities, totaling 18 active students or 100%. This shows that the learning activities were successful because the number of attendees was more than 90%, i.e., 100% of students were present. The level of student activity was 100% of active students, so the success rate of implementing activities was in the High category.

Student attitudes in learning activities are measured using attitude assessment sheets to know responses to project-based collaborative learning. Activities will look good and provide benefits for students if the score obtained is > 80. The evaluation plan for increasing knowledge and skills is determined by the service team with the criteria of knowledge value > 80% = Good; 60- 80% = Moderate; < 60% = Less.

TABLE 2. Student attitudes in learning activities.

Score	Frequency of Student Attitude	Percentage	Category
>80%	18	100%	Good
60- 80%	0	0%	Moderate
< 60%	0	0%	Less

Based on student attitudes, the process, and results of learning how to make tie dye shirts, all students (100%) scored > 80, so the increase in students' abilities in activities was included in the good category. Activities provide knowledge and skills to students and teachers and provide new knowledge that students and teachers can apply. Students can take advantage of the skills provided as inspiration to open a business or use it for personal use, for example, to improve the appearance of clothes that are not good enough to look like new clothes.

CONCLUSION

The success of implementing activities can be seen from the presence and participation or activeness. The learning activity was declared successful because the number of targets present reached at least 100% with an activity level of > 90%. The level of participation or activity in the learning process is grouped in the high category, namely > 80%. Student attitudes in learning activities are measured using attitude assessment sheets to know responses to project-based collaborative learning learning. Activities will look good and provide benefits for students if the score obtained is > 80%. The evaluation design for increasing knowledge and skills was determined by the service team as seen from the results of tie dye t-shirt products with a score of > 80% in the good category.

REFERENCES

1. Aryani, D. I., AP, A. W., & Tan, I. J. (2020). Pemberdayaan ekonomi kreatif rumah tangga melalui kreativitas pemanfaatan kaus bekas dengan teknik tie dye. *Abdimas Unwahas*, *5*(1).
2. Barasa, N., & Olal, F. O. (2020). Creative designing of fabric patterns by tie-dyeing with synthetic dyes.
3. Behera, S., & Khandual, A. (2017). Tie & Dye Textiles in Fashion Domain. *Int Engineer Res & Technol*, *6*(5), 650-655.
4. Choi, K. H. (2019). Eco-tech fashion project: collaborative design process using problem-based learning. *International Journal of Fashion Design, Technology and Education*, *12*(1), 105-117.
5. Colim, A., Carneiro, P., Carvalho, J. D., & Teixeira, S. (2022). Occupational safety & ergonomics training of future industrial engineers: A project-based learning approach. *Procedia Computer Science*, *204*, 505-512.
6. Gomez-del Rio, T., & Rodriguez, J. (2022). Design and assessment of a project-based learning in a laboratory for integrating knowledge and improving engineering design skills. *Education for Chemical Engineers*, *40*, 17-28.
7. Goodman, Brandon, and Stivers J. (2020). Project-Based Learning. *Educ Psychol*, 505.

8. Grant, M. M. (2002). Getting a grip on project-based learning: Theory, cases and recommendations. *Meridian: A middle school computer technologies journal*, *5*(1), 83.
9. Harmoko. (1996). *Indonesia Indah: Kain Non Tenun* (4 ed.). Jakarta: Yayasan Harapan Kita BP3 – TMII.
10. Ministry of Education and Culture of the Republic of Indonesia. (2020). *Buku Panduan Indikator Kinerja Utama Perguruan Tinggi Negeri.* Jakarta: Kementerian Pendidikan dan Kebudayaan Republik Indonesia.
11. Nerona, G. G. (2019). Effect of collaborative learning strategies on student achivemement in various engineering courses. *International journal of engineering education*, *1*(2), 114-121.
12. Selasih, N. N. (2017). Upaya Guru dalam Meningkatkan Kreativitas Peserta Didik Di Era Globalisasi. *Guna Widya: Jurnal Pendidikan Hindu*, *4*(2), 13-22.
13. Supadol, P., Sukreeyapong, W., Intarakumhaeng, P., Siripan, K., Chantanapim, W., & Nesusin, N. (2014). Results of learning activities of grade 1 thai language subjects using the project-based approach. *Procedia-Social and Behavioral Sciences*, *116*, 1444-1448.
14. Wardoyo, S., & Widodo, S. T. (2018). *Kreasi motif pada produk tie-dye (ikat celup) di Kota Yogyakarta*. BP ISI Yogyakarta.
15. Widihastuti, W., Istanti, H. N., Handayani, S., & Putri, G. E. (2021). Pelatihan keterampilan produktif pembuatan shibori untuk meningkatkan pendapatan keluarga bagi ibu-ibu PKK Desa Sumbersari Moyudan Sleman Yogyakarta. *Prosiding Pendidikan Teknik Boga Busana*, *16*(1).
16. Wild, S., & Schulze, H, L. (2020). How do the digital competences of students in vocational schools differ from those of students in cooperative higher education institutions in Germany?. *Empirical Research in Vocational Education and Training*, *12*(1), 1-18.
17. Zulaikhah, S. (2010). Perancangan motif tekstil dengan teknik tie dye untuk scarf.