



The Results of Project-based Learning Models Implementation for Beauty Students in the Design of Digital-based Make-up and Fashion Models Using the CLO 3D Application

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ABSTRACT

In the era of the industrial revolution 4.0, digitalization is developing rapidly. It impacts industries in the field of make-up and fashion models. The emergence of various information technology devices in the form of software applications causes beauty study program students in tertiary institutions to be required to have skills in using them. Application software can make it easier to make digital-based make-up design products and fashion models. Therefore, by implementing the Project Based Learning (PjBL) Learning Model and CLO 3D application software, students can have the skills to make these products. This study uses a qualitative experimental research method by explaining how the experimental process implements the learning model and uses the application in a sample. The study results by applying the PjBL learning model for beauty students can make three types of digital-based make-up and clothing models. The level of effectiveness in using the CLO 3D application software is 77%.

Keywords: *PjBL Learning Model, Facial Make-up, Fashion Model, 3D CLO Application.*

1. INTRODUCTION

The era of the industrial revolution 4.0 has impacted the digitalization process, which is developing rapidly. So, it has an impact on industrial activities, especially in the field of digital-based make-up and fashion models. Indonesia has tremendous and dynamic potential in both fields [1] [2]. The development of Information Technology (IT) in software and hardware is a supporting factor in making digital-based make-up products and fashion models. Conditions in the garment and textile industry already use software and hardware-based machine tools [3]. All industrial activities are based on automation and digitalization, so it is essential to have skills in using IT tools.

Various application software can make digital-based make-up products and fashion models. The Marvelous Designer 5 application software can effectively simplify

designing three-dimensional clothes [4]. Three-dimensional hexagon application software can also be used as a medium in making shirt designs [5]. In addition, there is CLO 3 software which can also make digital-based make-up products and fashion models. Its manufacture has been used extensively in industrial environments [6].

The impact of IT developments in make-up and digital fashion models gave rise to Virtual Reality (VR). VR is useful as a learning medium for understanding the concept of three-dimensional make-up and fashion models [7]. The use of VR technology can also explore skills in aspects of creativity and innovation in making digital-based design products [8]. So skills in making VR products in make-up and fashion models are needed now.

Creativity and innovation skills are supporting factors in designing make-up and fashion models in educational settings [9]. Creativity and innovation are the ability to

create a new product based on an idea obtained. Besides these factors, digital skills are also a supporting factor in making products using IT tools [10]. Therefore, digital skills are also needed in making make-up products and fashion models.

Based on this description, skills such as: (1) creativity; (2) innovation; and (3) digital must be owned by beauty students. The development of IT has become a demand and necessity for beauty students to have these skills through learning activities on campus. Training skills in learning required a learning model as support. The PjBL learning model can provide student learning experiences in producing work through solving work problems, organizing work, applying technology, and managing work time [11].

The PjBL learning model can increase student learning activity and productive competence to get real learning experiences according to problems and needs [12]. The PjBL learning model can positively affect knowledge aspects for project design and production topics [13]. The PjBL model can help improve teamwork skills, responsibilities, understand the conditions of group members, communicate ideas, and manage time [14]. Therefore, this study will discuss the results of implementing the PjBL learning model for beauty students in designing digital-based make-up and fashion models using the CLO 3D application software.

2. RESEARCH METHOD

The type of research used is qualitative research with data collection techniques using observation during lecture process activities in making digital-based make-up products and fashion models [15]. In addition, data collection is also carried out by analyzing the final results of the lecture process in the form of products made for each student [16]. The research method used is the experimental method. According to [17], by means of experiments, the researcher deliberately raises the emergence of an event or situation, then examines the consequences. An experiment is a way to look for a causal relationship between two factors deliberately generated by researchers by eliminating, reducing, or setting aside other disturbing factors. In the experimental research activities, researchers tested using the CLO 3D application software as a medium for making digital-based make-up products and fashion models.

The research was conducted at the Cosmetology Study Program, Faculty of Engineering, Universitas Negeri Semarang. The choice of this location is because researchers can carry out experimental research with the maximum in terms of the supply of equipment such as computer equipment that has the qualifications to be able to be installed by the CLO 3D application software and in sufficient quantity. The subjects in this study were make-up products and fashion models using the CLO 3D

application software. Meanwhile, the object of this study were students of the Beauty Study Program, Faculty of Engineering, Universitas Negeri Semarang, with a total of fifty-five.

3. RESULTS AND DISCUSSION

3.1 Results

The results of this study are from experiments on applying the PjBL learning model to make digital-based make-up and fashion products using the CLO 3D application software. The stages of the lecture process in the experimental class included:

(1) Preparing Project Assignments

In this part of the phase, the lecturer makes a project assignment kit for making digital-based make-up products and fashion models using the CLO 3D application software. In the assignment device, there is a project work procedure that each student must do. Students use this device as a guide in working on projects the lecturer has determined.

(2) Make a Project Planning Design

At this stage, the lecturer determines the design in planning the project. Project planning design helps determine how the technique is used in completing projects to make digital-based make-up products and fashion models using the CLO 3D application software carried out by students.

(3) Compile the Project Work Implementation Schedule

In this part of the stage, the lecturer makes a project work schedule according to the assignment given. In making the lecturer's schedule, consider aspects of the average student's ability to work on a project to make digital-based make-up products and fashion models using the CLO 3D application software.

(4) Monitoring Project Activities and Development

In this part of the stage, the lecturer conducts observation monitoring activities on students regarding the results of developments in the manufacture of digital-based make-up products and fashion models using the CLO 3D application software. During the lecture, monitoring activities are carried out in working on projects according to predetermined schedules and procedures.

(5) Make Project Activity Reporting Results

In this part of the stage, each student will present the final results of working on a digital-based make-up and fashion product project using the CLO 3D application software. Students explain the process of making it from the first to the last. Furthermore, the lecturer will give

some questions to assess student understanding in completing the project.

The results of implementing the PjBL learning model allowed each student to complete three digital-based make-up and fashion modeling products using the CLO 3D application software. The product form is as follows:



Figure 1 First Product Model of Digital-Based Make-up and Clothing Models



Figure 2 Second Product Model of Digital-Based Make-up and Clothing Models



Figure 3 Third Product Model of Digital-Based Make-up and Clothing Models

Based on the results of three digital-based make-up and fashion models, all 55 students of the Cosmetology Education Study Program, Faculty of Engineering, Semarang State University, can create using the CLO 3D application software on their laptops/computers. However, the assessment results vary according to the assessment indicators in Table 1.

Table 1. Results of Assessment of Digital-Based Make-up and Clothing Model Products

Types of Product	Assessment Category			
	Very Good	Good	Above Average	Average
First	25	10	5	15
Second	18	15	2	20
Third	27	20	5	3

Based on Table 1, it can be analyzed the three digital-based make-up products and clothing models. On average, all students can work on and complete projects in very good and good categories. Based on the level of effectiveness test, it was stated that the effectiveness of using the CLO 3D application software in learning using the PjBL learning model in making digital-based make-up products and fashion models was 81.09%. The statement is based on the following calculations:

$$PK(x) = \frac{\text{Number of Completed students}}{\text{Number of Students}} \times 100\%$$

$$PK(\text{product one}) = \frac{40}{55} \times 100\% = 72,73\%$$

$$PK(\text{product two}) = \frac{35}{55} \times 100\% = 63,63\%$$

$$PK(\text{product three}) = \frac{52}{55} \times 100\% = 94,54\%$$

$$PK(\text{average}) = \frac{72,73 + 63,63 + 94,54}{3} = 77\%$$

3.2 Discussion

Implementing the PjBL learning model influences the manufacture of digital-based make-up products and fashion models. Students can make products based on work steps according to the PjBL model learning syntax. Practicum learning activities will be successful using the PjBL learning model [18]. The implementation of the practicum-integrated PjBL model has a positive influence on learning outcomes [19]. Implementing the PjBL learning model also positively affects cognitive and psychomotor learning outcomes [20] [21]. In addition, the PjBL learning model also positively impacts student independence in working on a project [22]. The PjBL learning model is effectively applied to practicum courses to increase motivation and interest in learning and make it easier to understand the material [23].

Based on table 1 it can be explained that the average student of the Cosmetology Education Study Program, Faculty of Engineering, Universitas Negeri Semarang can make make-up products and digital-based fashion models using the CLO 3D application software. Some students are familiar with the application, so they can easily make digital-based make-up products and fashion models. However, students who are new to or using the CLO 3D application software experience difficulties making products because they have to learn the basic menus in the application software first.

The use of CLO 3D application software can assist students in designing and designing digital-based make-up products and fashion models [24]. The CLO 3D application software is appropriate for use as a learning medium in making three-dimensional based fashion model designs [25]. CLO 3D is a design application software that can produce realistic 3D avatars/models from 2D clothing patterns [26].

The existence of modules/job sheets that lecturers have provided makes it easier for students to understand the procedures for working on digital-based make-up products and fashion model projects. In addition, the module/job sheet provides basic materials for using the CLO 3D application software. The effectiveness level of using the CLO 3D application software is based on an average effectiveness of 77%. It means the CLO 3D application software is quite effective in assisting students in making digital-based make-up products and fashion models.

The use of job sheets in practicum courses has a significant effect on student learning outcomes [27]. Job sheets can help students understand practicum instructions that lecturers have planned. Students can also use job sheets as a guide in completing practicum assignments. Job sheets are very appropriate to be used in practicum-based courses [28]. The use of job sheets also supports the implementation of project-based learning models [29]. Therefore, job sheets can help students to make a product/project [30].

4. CONCLUSION

Implementing the PjBL learning model influences the manufacture of digital-based make-up products and fashion models. Students can make these products based on work steps according to the PjBL model learning syntax. The CLO 3D application software can assist students in making these products with an average effectiveness of 77%. It means the CLO 3D application software is quite effective in assisting students in making digital-based make-up products and fashion models.

AUTHORS' CONTRIBUTIONS

Anik Maghfiroh as the first author, contributed in conducting research experiments. Okta Purnawirawan as

the second author contributed to making scientific research articles and assisting in using the CLO 3D application software. As the third and fourth authors, Ade Novi Nurul Ihsani and Maria Krisnawati contributed in preparing learning tools using the PjBL model.

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REFERENCES

- [1] F. N. and D. F. Hervianti, Potensi penerapan konsep zero waste pada busana tradisionaal studi kasus: kimono, *J. Rupa*, 9(8), 2017, pp. 52–58, DOI: <https://doi.org/10.25124/rupa.v2i1.754>
- [2] N. A. Putri, Desain strategi pemasaran online pada fullus fashion melalui evaluasi benchmarking, *J. Manaj. dan Start-Up Bisnis*, 1(1), 2016, pp. 119–128.
- [3] N. K. & L. C. Tekila Harley Nobile, Alice Noris, A review of digital fashion research: before and beyond communication and marketing, *Int. J. Fash. Des. Technol. Educ.*, 14(3), 2021, pp. 293. DOI:<https://doi.org/10.1080/17543266.2021.1931476>
- [4] H. dan A. F. Sofyan, Perancangan simulasi 3D desain fashion dan membuat letak jatuh pakaian pada badan, *Naskah Publ. Sekol. Tinggi Manaj. Inform. Dan Komput. Amikom Yogyakarta*, 1(1), 2016, pp. 1–6.
- [5] A. S. L. dan E. M. Kharnolis, Penerapan aplikasi hexagon tiga dimensi pada busana pesta malam,” *J. Fash. Text. Des. Unesa*, 1(1), 2020.
- [6] I. Chan, J. Au, C. Ho and J. Lam, Creation of 3D printed fashion prototype with multi-coloured texture: a practice-based approach, *Int. J. Fash. Des. Technol. Educ.*, 149(1), 2021, pp. 78–90. DOI: <https://doi.org/10.1080/17543266.2020.1861342>
- [7] S. Starkey, S. Alotaibi, H. Striebel, K. Francisco and N. Rudolp, Fashion inspiration and technology: virtual reality in an experimental apparel design classroom, *Int. J. Fash. Des. Technol. Educ.*, 14(1), 2021, pp. 1–9, DOI: <https://doi.org/10.1080/17543266.2020.1844807>
- [8] J. H. Lee, E. K. Yang, E. J. Lee, S. Y. Min, Z. Y. Sun and B. J. Xue, The use of VR for collaborative exploration and enhancing creativity in fashion design education, *Int. J. Fash. Des. Technol. Educ.*, 14(1), 2021, pp. 48–57. DOI:

- <https://doi.org/10.1080/17543266.2020.1858350>
- [9] M. N. Melinda Astuti, Z. Arifin, F. Mutohhari, Competency of digital technology: the maturity levels of teachers and students in vocational education in Indonesia, *J. Educ. Technol.*, 5(2), 2021, pp. 254–262. DOI: <https://doi.org/10.23887/jet.v5i3.35108>.
- [10] E. van. Laar, Alexander J. A. M. van Deursen, Jan A. G. M. van Dijk, J. de Han, Determinants of 21st-century skills and 21st-century digital skills for workers: a systematic literature review, *Sage Journals*, 1(1), 2020, pp. 1–14. DOI: <https://doi.org/10.1177/2158244019900176>
- [11] P. Sudira, *Metodologi Pembelajaran Vokasional Abad XXI Inovasi, Teori, dan Praksis*, UNY Press, Yogyakarta, 2018.
- [12] A. M. Nizwardi Jalinus, R. A. Nabawi, The seven steps of project based learning model to enhance productive competences of vocational students, in *Proceedings of the International Conference on Technology and Vocational Teachers (ICTVT)*, 2017, pp. 251–256. DOI: <https://doi.org/10.2991/ictvt-17.2017.43>.
- [13] A. R. B. Yang Guat See, Abdullah Mat Rashid, The effect of project based learning on level of content knowledge of pre-vocational subject, *Mediterr. J. Soc. Sci.*, 6(6), 2015, pp. 369–375.
- [14] F. Dewi, Proyek buku digital: upaya peningkatan keterampilan abad 21 calon guru sekolah dasar melalui model pembelajaran berbasis proyek, *J. Pendidik. ke-SD-an*, 9(2), 2015, pp. 1–15.
- [15] Sugiyono, *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*, Alfabeta, Bandung, 2014.
- [16] Sukmadinata, *Metode Penenelitian Pendidikan*, PT Remaja Rosdakarya, Bandung, 2010.
- [17] S. Arikunto, *Prosedur Penelitian, Rineka Cipta*, Jakarta, 2010.
- [18] I. M. A. Winangun, Project based learning: strategi pelaksanaan praktikum IPA SD dimasa pandemi covid-19, *Edukasi J. Pendidik. Dasar*, 2(1), 2021, pp. 11–20. DOI: <https://doi.org/10.55115/edukasi.v2i1.1388>.
- [19] A. M. A. Nur Istiqomah, Noor Hujjatusnaini, Nurul Septiana, Implementasi model pembelajaran project based learning terintegrasi praktikum studi antagonisme escherichia coli dan candida albicans terhadap keterampilan berpikir kritis mahasiswa, *J. Pendidik. Sains Indones.*, 10(4), 2022, pp. 892–904, DOI: <https://doi.org/10.24815/jpsi.v10i4.26264>.
- [20] S. M. Lani Meita Indah Furi and S. Handayani, Eksperimen model pembelajaran project based learning dan project based learning terintegrasi stem untuk meningkatkan hasil belajar dan kreativitas siswa pada kompetensi dasar teknologi pengolahan susu, *J. Penelit. Pendidik.*, 35(1), 2018, pp. 49–60. DOI: <https://doi.org/10.15294/jpp.v35i1.13886>.
- [21] S. S. Fivia Eliza, Peningkatan kompetensi psikomotor siswa melalui model pembelajaran project based learning (PjBL) di SMKN 5 Padang, *INVOTEK J. Inov. Vokasional dan Teknol.*, 19(2), 2019, pp. 57–66. DOI: <https://doi.org/10.24036/invotek.v19i2.427>.
- [22] M. M. Hafizd Rizky Kurniawan, Hakkun Elmunsyah, Perbandingan penerapan model pembelajaran Project Based Learning (PJBL) dan Think Pair Share (TPS) berbantuan modul ajar terhadap kemandirian dan hasil belajar rancang bangun jaringan, *J. Pendidik. (Teori dan Prakt.)*, 3(2), 2018, pp. 80–85. DOI: <https://doi.org/10.26740/jp.v3n2.p80-85>.
- [23] A. I. F. F. Made Gayatri Anggarkasih, Penerapan project based learning dalam praktikum teknologi fermentasi di sekolah Vokasi Institut Pertanian Bogor, *Biosci. J. Ilm. Biol.*, 10(2), 2022, pp. 891–900. DOI: <https://doi.org/10.33394/bioscientist.v10i2.6241>
- [24] O. Purnawirawan, H. Elmunsyah, and D. Kustono, Pengembangan video pembelajaran pembuatan virtual reality fashion pada siswa Sekolah Menengah Kejuruan, *Edu Komputika J.*, 9(1), 2022, pp. 18–27. DOI: <https://doi.org/10.15294/edukomputika.v9i1.56414>.
- [25] N. Fitrihana, Penerapan teknologi virtual 3D untuk pengembangan produk fesyen di era digital, *Prosiding Pendidikan Teknik Boga Busana FT UNY*, 2022, pp. 1–5.
- [26] S. Hartanto, CLO 3D sebagai alat bantu R&D produk fesyen setelah pandemi, *International Conference Art, Design, Education, and Cultural Studies*, 2022, pp. 128–135.
- [27] H. Vivi Oktavia, Pengaruh Penggunaan Jobsheet Terhadap Hasil Belajar Praktikum Kerja Bengkel Dan Gambar Teknik, *VOTEKNIKA (Jurnal Vokasional Tek. Elektron. dan Inform.)*, 7(2), 2019, pp. 33–39. doi: <https://doi.org/10.24036/voteteknika.v7i2.104070>.
- [28] W. Tri Dinda Sahira, Pengaruh penggunaan media jobsheet dan kreativitas terhadap terhadap hasil belajar siswa dalam pembelajaran seni rupa di SMPN 4 Bukittinggi, *Serupa J. Art Educ.*, 8(2), 2019, pp. 1–12. DOI: <https://doi.org/10.24036/sr.v8i2.106816>.
- [29] B. A. H. Syaifullah, Pengaruh model project based learning berbantuan jobsheet terhadap

peningkatan penguasaan kompetensi pengelasan pelat berbagai posisi menggunakan las busur manual, *J. Pendidik. Tek. Mesin*, 18(2), 2018, pp. 56–60. DOI: <https://doi.org/10.15294/jptm.v18i2.18654>.

- [30] A. Nurhasanah, S. Subekti, Analisis penggunaan jobsheet pada praktikum dasar boga Di SMKN 9 Bandung, *J. Media, Pendidikan, Gizi dan Kuliner*, 6(2), 2017, pp. 1–8. DOI: <https://doi.org/10.17509/boga.v6i2.9021>.

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