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# Competence and Perceived Benefits in Project-Based Learning for Postgraduate Students in History Education

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**Abstract**

The paradigm developed at the State University of Jakarta (UNJ) in recent years has focused on competence to achieve workability. This paradigm shift requires a more flexible and active teaching-learning context. This paper presents empirical research into the application of a case-based project-based learning model (Case-Project Based Learning, CPjBL) in the learning of Evaluation, Process, and Learning Outcomes courses at the History Education Postgraduate Program of UNJ. Considering the important role of motivation and performance, we pursue three main goals. First, this study aims to analyze students' perceptions of the effectiveness of the CPjBL learning model to improve key competencies for employability. Second, we explored whether the perceived benefits of these competencies changed after the PBL trial. Finally, we aim to explore students' opinions about the usefulness, advantages, and disadvantages of this model. Our findings support the perceived effectiveness of PBL for improving teamwork, communication, creativity, organization, and information management competencies.

**Keywords:** History Education; Postgraduate Program; Project-Based Learning;

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## INTRODUCTION

The European Higher Education Area (EHEA) proposes the application of a new educational paradigm that focuses on competency development that allows students to learn new knowledge and acquire problem-solving skills. In the new paradigm, the concept of employability is the main pillar in the professional world. To achieve employability, the development of skills and competencies such as communication skills, problem-solving, teamwork, and social leadership is necessary ( Anazifa & Djukri, 2017; Coleman, 1992; de la Puente Pacheco et al., 2019; Hosman & Jacobs, 2018; Kokotsaki et al., 2016). Training to acquire these competencies is linked to action and experience in a professional context. The learning model in higher education in Europe is oriented towards redefining learning based on the usefulness of applying knowledge from a socio-economic perspective. This paradigm shift in education in Europe affects curriculum models around the world, including at UNJ. Following the paradigm shift that occurred in Europe, UNJ followed suit by implementing an outcome-based education (OBE) curriculum by applying case-based and project-based learning models. Both models are included in the active learning model (Boss & Krauss, 2007)

Active learning plays a new concept to support the OBE curriculum. Active learning is an educational approach that shifts learning responsibilities from

lecturers to students (Hosman & Jacobs, 2018; Kokotsaki et al., 2016; Krajcik et al., 2016). In this context, students are placed at the center of the learning process while lecturers act as mentors (Blumenfeld et al., 1991; Krajcik et al., 2016; Musa et al., 2011). The effectiveness of this model arises from the fact that individual activities motivate the learning process that occurs in students' minds and responsibilities. In this regard, project-based learning (PBL) is a well-known method for competency development and the creation of a flexible learning environment (Blumenfeld et al., 1991). PBL encourages students to explore new fields and integrate knowledge from different subjects into professional practice (Aerts et al., 2017; Blumenfeld et al., 1991; Musa et al., 2011). The implementation of this CPjBL model may have benefits for the new generation. Unfortunately, research on the impact of CPJBL is still scant and further research is still needed (Anazifa & Djukri, 2017).

This paper presents empirical research on the application of the CPjBL model in postgraduates. Specifically, we use this CPjBL during Process, Evaluation and Learning Outcomes of History Learning (2020/2021 academic year). In this sense, the course of evaluation is a branch of education that studies how to determine instruments, develop instruments, collect, and analyse data for decision-making in learning design. The close relationship between professional practice and this course is very useful for employability as a practitioner in the future. With the awareness of the important role of students' perspectives in their motivation and performance, this research is focused on two main objectives. First, this study aims to analyse students' perceptions of the effectiveness of the CPjBL (case-project-based learning model) model to improve several key competencies for student employability, such as teamwork, communication, creativity, organization, or information management. Second, we explore changes in the perceived usefulness of these competencies after the experiment.

## METHOD

This experiment was applied to the Evaluation, Process and Results of History Learning course from the master's Program in History Education, State University of Jakarta by 2020/2021 academic year or February to July 2021. This course is the right context to apply the active learning methodology due to the small group size which must have a maximum of 20 students per year.

The content of this course is organized into three main blocks: (i) types of assessment instruments; (ii) instrument development; (iii) item analysis and decision making. Traditionally, this content is taught through classical lectures, where the lecturer is at the centre of the teaching-learning process while students take on a passive role and their knowledge is assessed through a final written exam. By using the CPjBL model, we aim to introduce a more practical learning model that encourages active student participation, independent learning, and contact with reality. With the introduction of these innovations, students are expected to be able to improve several competencies: (i) planning and organizing skills, (ii) teamwork and cooperation competencies, (iii) information management skills, (iv) verbal communicative competence and (v) creativity competencies. and innovation These

competencies are in high demand by the labour market (European Commission, 2018) and therefore educational programs that include developing these skills can increase job opportunities.

This research was conducted in several stages:

1) At the initial meeting, we explained the CPjBL methodology in detail to students.
2) We form three groups of 4 or 5 students. To take advantage of the diversity of student profiles, groups include people of different degrees (e.g., teachers, employees, and others). It is important to develop social competencies such as teamwork and, at the same time, this fact can enrich their experiences and thoughts.
3) After several theoretical lessons explaining the basic concepts of the first block assessment instrument, the lecturer presented the project that each group had to work on. Given the course structure, the CPjBL methodology was applied to the second block and projects related to instrument development. Each group must analyse the basic competencies, develop an instrument grid and develop an instrument based on the instrument grid.
4) Students must obtain direct information about the school where they work. There are no strict rules about the content of the work except the need for originality and creativity.
5) To evaluate the work at the end of the course, each group must make an oral presentation of the results along with the resulting product.

***Experiment design***

This study examines whether PjBL enables students to enhance their competency development, focusing on their perceptions. In particular, the main objective of this study was to identify whether there were differences between the self-reported competencies of the students and the benefits they felt, before and after the CPjBL trial. In addition, we aim to explore student satisfaction with this learning model and its main benefits and drawbacks. We focus on student perspectives because students' perceptions of their learning are critical to the quality of that learning.

Changes in the learning context from the first block to the second block can cause changes in students' awareness and perceptions, which in turn can lead to changes in learning approaches. Thus, to motivate and involve students in the learning process, educators need a broad understanding of students' conceptions in certain contexts (Gibbings et al., 2014). Therefore, only after certain ways in which students perceive the act of learning through CPjBL have been established, can curricula be designed to introduce students to more active and in-depth ways of learning (Gibbings et al., 2014; Kek & Huijser, 2011).

***Research hypothesis***

According to the previous objective, we propose the following hypotheses to be tested:

- H1: Students felt that their planning and organizing skills improved with the use of the CPjBL model.

- H2: Students feel that their cooperation and cooperation competence increase with the use of the CPjBL model.
- H3: Students feel that their information management skills improve with the use of the CPjBL model.
- H4: Students feel that their verbal communicative competence increases with the use of the CPjBL model.
- H5: Students feel that their creativity and innovation competence increase with the use of the CPjBL model.
- The perceived usefulness of competence increased after the trial use of the CPjBL model.

***Instrument***

The instrument developed to test the hypothesis is a questionnaire with a self-assessment of each competency and the student's perceived usefulness for each competency. The steps for developing the instrument are as follows:

1) We divide each competency into 5 or 6 indicators to facilitate student self-assessment.
2) For each item, students must make multiple assignments; they must self-assess their level of achievement and perceived benefits. All items are presented on a Likert scale of 1-5 (1 = low, 5 = high) following previous literature (Manaf et al., 2011).
3) Each student must fill out the questionnaire twice (before and after the CPjBL trial). We assign a numeric code to each student to maintain anonymity, thus ensuring the correctness of the answers.

***Data analysis***

The experiment was conducted in the 2019/2020 academic year with a total of 10 students. We collected data from the questionnaire in a spreadsheet and, after a data filtering process, we analysed the data with SPSS version 25 software.

We used the non-parametric Wilcoxon Signed Rank statistical hypothesis test to examine the differences in the level of competence of students before and after the CPjBL experiment. The same test is used to detect differences in the perceived usefulness of the competencies.

The Wilcoxon Signed-Rank is a pairwise difference test to compare related samples or repeated measurements of a single sample. This non-parametric test is used to assess whether the population mean ratings differ. It can be used as an alternative to the t-test in the case of a discrepancy with the assumption of normality (Shapiro-Wilk test), which is the case we encountered (Cohen et al., 2007). The null hypothesis of this test is that the median difference between the “pre” and “post” values is equal to 0. If the null hypothesis (H0) is rejected, there is a statistically significant difference between the values before and after the experiment at a significance level of 0.05 (* *).

## RESULTS AND DISCUSSION

The profile of the students came from various characteristics and interests of students in the experiment. The heterogeneity of the sample in terms of age and

previous degree should be noted. In the 2019−2020 school year, the age of students varied between 21 and 43 years, although the majority of students (67.9%) in the sample were under 28 years of age (see Table 1).

Regarding previous student degrees, although the most common degrees were related to previous education (education and non-education, history education, and non-historical education) (see Figure 1).

*Table 1*

Age of Student

| ***Age*** | ***Frequency*** | **Percentage** | ***Accumulated percentage*** |
|---|---|---|---|
| 21 | 1 | 10% | 10% |
| 22 | 1 | 10% | 20% |
| 23 | 2 | 20% | 40% |
| 25 | 2 | 20% | 60% |
| 27 | 2 | 20% | 80% |
| 41 | 1 | 10% | 90% |
| 43 | 1 | 10% | 100% |
| Total | 10 | 100% | |

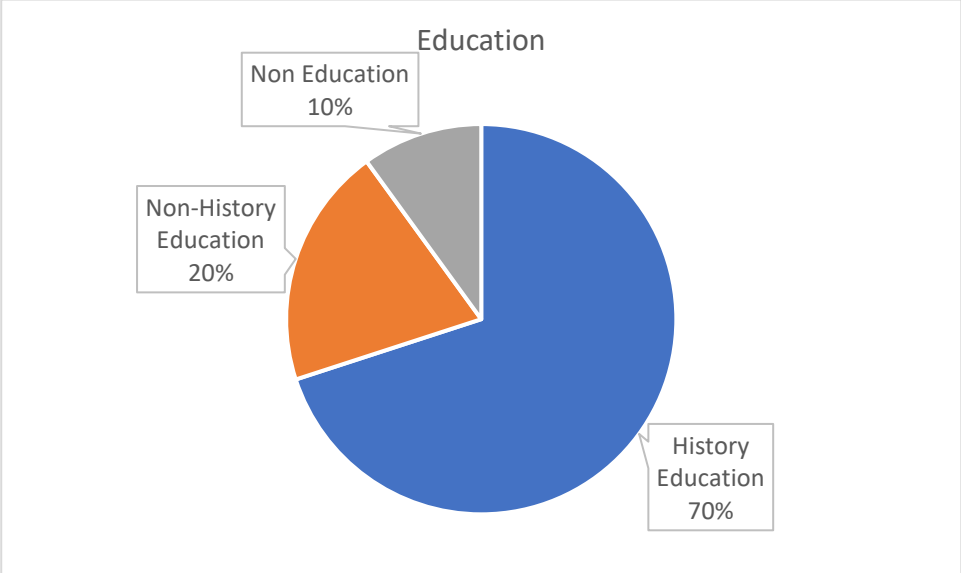


Figure 1. Previous Education Level (%)

***Perceived competency development***

Next, we present the main findings of the students' perceived competency development after the implementation of the CPjBL model. The analysis is carried out for each indicator that defines the respective competencies. The results of the Wilcoxon signed test obtained for each competency are shown in Table 2. The null hypothesis of this test is that the median difference between the "pre" and "post" values is equal to 0. If the null hypothesis (H0) can be rejected, there is a significant difference. statistically between the values before and after the experiment at a significance level of 0.05 (**).

*Table 2. Pretest dan Post-test for each competence*

| | Indicator | N | Mean | | SD | | Wilcoxon Test |
|---|---|---|---|---|---|---|---|
| | | | Pre | Post | Pre | Post | |
| Planning and Management | I1 | 10 | 2,80 | 4,1 | 1,03 | 0,74 | 0,000** |
| | I2 | 10 | 3,10 | 3,8 | 0,99 | 0,92 | 0,000** |
| | I3 | 10 | 3,10 | 3,9 | 0,88 | 0,88 | 0,162 |
| | I4 | 10 | 2,70 | 3,9 | 0,67 | 0,88 | 0,011** |
| | I5 | 10 | 3,00 | 4,1 | 0,94 | 0,88 | 0,027** |
| Teamwork and cooperation | I6 | 10 | 3,00 | 4 | 0,94 | 0,67 | 0,617 |
| | I7 | 10 | 3,20 | 4,3 | 0,79 | 0,82 | 0,001** |
| | I8 | 10 | 3,20 | 4,3 | 0,79 | 0,82 | 0,070 |
| | I9 | 10 | 3,40 | 4,1 | 0,70 | 0,88 | 0,004** |
| | I10 | 10 | 2,90 | 3,9 | 0,99 | 0,88 | 0,002** |
| | I11 | 10 | 3,10 | 4,3 | 0,88 | 0,82 | 0,058 |
| Information Management Ability | I12 | 10 | 3,30 | 4,2 | 0,82 | 0,79 | 0,000** |
| | I13 | 10 | 3,60 | 4,4 | 0,52 | 0,70 | 0,000** |
| | I14 | 10 | 2,60 | 3,7 | 0,70 | 0,82 | 0,002** |
| | I15 | 10 | 3,00 | 3,9 | 0,82 | 0,99 | 0,003** |
| | I16 | 10 | 3,50 | 4 | 0,71 | 0,67 | 0,044** |
| Oral communication Competence | I17 | 10 | 3,00 | 4,2 | 0,94 | 0,63 | 0,000** |
| | I18 | 10 | 3,50 | 4 | 0,85 | 0,82 | 0,001** |
| | I19 | 10 | 3,10 | 4,5 | 0,88 | 0,71 | 0,000** |
| | I20 | 10 | 3,20 | 4 | 0,92 | 0,82 | 0,000** |
| | I21 | 10 | 2,80 | 4,2 | 0,79 | 0,79 | 0,003** |
| Innovation and ability | I22 | 10 | 3,10 | 4 | 0,57 | 0,94 | 0,010** |
| | I23 | 10 | 3,20 | 3,9 | 0,63 | 0,99 | 0,002** |
| | I24 | 10 | 2,40 | 3,6 | 0,70 | 0,84 | 0,238 |
| | I25 | 10 | 2,90 | 3,9 | 0,88 | 0,88 | 0,157 |
| | I26 | 10 | 3,00 | 3,8 | 0,82 | 0,92 | 0,048 |

As can be seen, the results show a significant improvement in the self-reported competencies of all the competencies analysed after the implementation of the PjBL methodology. 17 of the total 26 indicators showed statistically significant differences between the self-reported values before and after the experiment. Thus, the research hypothesis is accepted: students feel that the use of PjBL methodology has improved their planning and organizing skills (H1), teamwork and cooperation competence (H2), information management ability (H3), oral communicative competence (H4), and creativity and creativity competence. innovation (H5).

***Benefits of perceived competence***

Regarding the usefulness of perceived competence (Hypothesis H6), the results showed no statistically significant difference before and after the PBL experiment (see Table 4), except for indicators related to information management ability which showed significant differences in the two academic years. Specifically, the indicator 13: “being able to develop previous guidance notes for

interviewing people to obtain information on history education". In the 2017−18 school year, the results showed that students considered this aspect to be less important after the PjBL experiment (Table 4). This surprising finding may be because students have a good mastery of competencies, they do not appreciate them.

*Table 3. benefit of perceived competence*

| | Indicator | N | Mean | | SD | | Wilcoxon test |
|---|---|---|---|---|---|---|---|
| | | | Pre | Post | Pre | Post | |
| Planning and Management | I1 | 10 | 4,20 | 4,6 | 0,92 | 0,52 | 0,564 |
| | I2 | 10 | 4,30 | 4,4 | 0,82 | 0,52 | 0,593 |
| | I3 | 10 | 4,10 | 4,3 | 0,88 | 0,48 | 0,617 |
| | I4 | 10 | 4,40 | 4,4 | 0,70 | 0,52 | 0,589 |
| | I5 | 10 | 4,40 | 4,7 | 0,70 | 0,48 | 0,491 |
| Teamwork and cooperation | I6 | 10 | 4,10 | 4,6 | 0,99 | 0,52 | 0,782 |
| | I7 | 10 | 4,10 | 4,6 | 0,88 | 0,52 | 1,000 |
| | I8 | 10 | 3,80 | 4,5 | 0,79 | 0,53 | 1,000 |
| | I9 | 10 | 4,00 | 4,5 | 0,82 | 0,53 | 0,617 |
| | I10 | 10 | 4,00 | 4,4 | 0,82 | 0,52 | 0,273 |
| | I11 | 10 | 4,20 | 4,4 | 0,79 | 0,52 | 0,951 |
| Information Management Ability | I12 | 10 | 3,70 | 4,3 | 0,67 | 0,48 | 0,210 |
| | I13 | 10 | 4,20 | 4,3 | 0,79 | 0,48 | 0,019** |
| | I14 | 10 | 4,00 | 4,2 | 0,94 | 0,42 | 0,631 |
| | I15 | 10 | 4,40 | 4,4 | 0,70 | 0,52 | 0,763 |
| | I16 | 10 | 3,70 | 4,4 | 0,95 | 0,52 | 0,033** |
| Oral communication Competence | I17 | 10 | 3,80 | 4,6 | 0,79 | 0,52 | 0,059 |
| | I18 | 10 | 3,90 | 4,7 | 0,99 | 0,48 | 0,527 |
| | I19 | 10 | 3,90 | 4,8 | 0,99 | 0,42 | 0,405 |
| | I20 | 10 | 4,10 | 4,6 | 0,99 | 0,52 | 0,248 |
| | I21 | 10 | 3,80 | 4,4 | 0,79 | 0,52 | 0,644 |
| Innovation and Creativity | I22 | 10 | 3,70 | 4,3 | 0,82 | 0,48 | 1,000 |
| | I23 | 10 | 3,80 | 4,7 | 0,92 | 0,48 | 0,518 |
| | I24 | 10 | 3,50 | 4,5 | 0,71 | 0,53 | 0,222 |
| | I25 | 10 | 3,70 | 4,5 | 0,82 | 0,53 | 0,020** |
| | I26 | 10 | 4,20 | 4,4 | 0,79 | 0,52 | 0,929 |

The results of this study indicate that students who are treated with the Online Project-Based learning (OPJBL) approach can learn better in studying the History Learning Process and Outcomes Evaluation course. Researchers are not surprised by these results because successful OPJBL learning in many disciplines has been widely reported (Belenky, D. M., & Nokes-Malach, 2013)

The results of the study provide support for the idea that the integration of cooperative learning in OPJBL learning contributes to academic achievement and academic performance. It became a limitation in this study, it cannot be ascertained whether the student's academic performance is due to the influence of Online Project-Based learning or because of peer tutoring, considering that in the trial, the researcher asked friends who were already proficient in teaching their friends who

could not. It is undeniable that peer tutors have a positive influence on academic performance. Xu, et.al (Xu et al., 2001) showed that peer tutoring can facilitate learning by helping students to understand and apply the knowledge they are learning.

## CONCLUSION

Active learning plays an important role in the new conception of the teaching-learning process that is based on applied knowledge and students' own experiences. In this case, project-based learning is a model that has been widely applied for competency development in elementary, middle, middle, and high schools. In college, the application of this model is commonly associated with engineering, educational, medical, or psychology degrees, but is rarely applied in history education.

The main benefits of PBL that were felt by the experimental participants were related to more real and practical learning, as well as motivation, independence in learning, and the application of a constructive point of view in the learning process. However, some limitations of this experiment should be noted as well. First, due to the course structure, we only had three months to implement this learning method. In this sense, the application of PBL requires sufficient time for students to seek information and embrace knowledge. Second, the development of the right project relies heavily on the collaboration of several institutions, which is sometimes difficult to achieve.

Coinciding results from two trials in different academic years and with different groups of students support the robustness of our conclusions and the validity of our study. In this way, we can check that the results are stable and not influenced by any group of students.

This research was conducted to improve student learning outcomes and given the satisfactory results of this experiment, the PBL method could be applied in the future in other postgraduate studies. An interesting future work could be the implementation of integrated PBL experiments in which the entire master's program is organized as a large project. In this experience, the students must use the skills from all master's programs to successfully develop their projects.

In conclusion, it is worth focusing on the behaviour of a new generation of students, along with the way they acquire knowledge and make sense of the world (or real life). Given the unpredictable nature of our modern society, it is generally accepted by employers and teachers that we need to adapt to students if we want them to become high-performing professionals. As traditional learning methods report low results, lecturers in higher education should be aware of the need and urgency to implement new teaching methodologies and to share more experiences in this area.

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