Integrated reality-entrepreneurship project-based learning model to increase the skills of students

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ABSTRACT: An objective of this study was to determine the application of the integrated reality-entrepreneurship project-based learning model (PjBL-RE) to increase students' ability in skill creation. The focus of the study was on creating skills, which is one of the strong variable components of project-based learning. In this study, quantitative and qualitative methods were combined (mixed methods research). The quantitative method chosen was descriptive. The qualitative method chosen was a multi-site study and action research. The results of this study showed an increase in students creating skills after applying a project-based integrated *reality-entrepreneurship* learning model. Results of the qualitative method of descriptions of social situations support the goal of improvement in students' skill creation.

INTRODUCTION

The main problem for higher education in Indonesia is developing competencies in learning for life [1]. Higher education produces new generations of graduates, but still relies on rote-based learning. Learning in higher education is still dominated by traditional learning systems [2].

Higher education strives to develop learning that is suitable for students, starting with the curriculum, learning management and learning resources. However, the activity as such of students learning is not followed. Students are not able to form mindsets according to problems they face. The learning process in higher education is narrow, so that students are not able to address higher-level problems [3].

Teaching and learning activities are not merely the provision of unidirectional information without developing mental, physical and personal abilities [4]. There are problems that occur when students try to recall that which they previously studied. In addition, students have difficulty in performing tasks or concentrating [5]. Therefore, an improvement in teaching and learning is needed [6]; namely, implementing a project-based learning (PjBL) system. This is in accordance with the concept of digital transformation.

Digital transformation is the use of digital technology for the sharing of information in learning and society in general. Digital transformation uses technology for innovation and creativity in learning; and not only to improve and support traditional methods [7]. Project-based learning (PjBL) is a model that involves problem-solving activities and provides opportunities for students to work autonomously in constructing their learning, culminating in producing products of real value [8].

LITERATURE VIEW

Project-based learning (PjBL) is an approach or model for class activity involving long-term, interdisciplinary project-based learning activities that are student-centred and reflect real-world problems [9]. Project-based learning can be integrated with reality-entrepreneurship (PjBL-RE). Entrepreneurship can be interpreted as:

1) innovative through capturing and creating new opportunities;
2) operating with uncertainty, while introducing products to markets, determining locations and resources;
3) managing the business and competing to win market share [1].

This definition can be linked to classic definitions of entrepreneurship, although in this definition invention is not explicitly mentioned, but nor is it omitted. Reality-entrepreneurship can improve skill creation in students.

Creating skill is defined as an individual's ability to create something by combining various fields of science. Skill creating focuses on the results (products) generated. This capability is an ability needed for the digital transformation of technology and the development of the digital world. The PjBL learning model is a focus on the concepts and principles of a scientific discipline. Students play an active role in problem-solving activities and project task completion [10].

Opportunities are provided by PjBL for students to work in groups and develop their own learning. Eventually students are able to generate products that are valuable, innovative and realistic. By contrast, traditional learning approaches have learning that is structured and of short duration; students are passive and the learning activity is lecturer-centred. The PjBL process is an emphasis on learning activities that are in line with professional practice, interdisciplinary, student-centred, active and reflect the skills and problems of the real world [11].

The PjBL process is different from problem-based learning (PBL) [12], although there are similarities. They are both learning techniques based on inclusive learning, which emphasises a learning environment that is active, involves creative and innovative group work, and with a self-learning approach that is based on self-evaluation. The difference lies in the learning objects. Problem-based learning emphasises students in activities that require problem formulation, formulating learning objectives, collecting data, analysing data and learning diagnoses. Whereas, in PjBL students are encouraged in learning design activities, formulating job descriptions, designing, estimating time, carrying out work with project design arranged in a time chart, and evaluating learning outcomes [12]. With the opportunity to convey ideas, give opinions, listen to peers' ideas, as well as reflecting and actualising their own ideas about other people's ideas, it is a form of creative individual empowerment. The interactive process with colleagues helps to construct global knowledge.

Social transactions play an important role in the formation of mind cognition maps [1]. The process of strengthening individual cognitive negotiations involves submitting ideas, debating works and accepting or rejecting ideas during the process of interaction with colleagues. This enables the expansion and smoothing of knowledge and skills in learning. From this theoretical perspective, PjBL provides an alternative climate and authentic learning environment, where learning can help students to improve their skills at work [13].

Collaborative and effective problem-solving as a learning approach is relatively new. The PjBL process continues to develop forms and methods to improve learning practices in national technology education. The PjBL process is a creative and innovative model or approach to learning, which emphasises contextual learning through centralised, comprehensive activities [14].

The learning focuses on the concepts and core principles of a study discipline. This involves students in investigating problems, problem-solving and learning activities, as well as other meaningful tasks, to give them the opportunity to autonomously and creatively construct innovative knowledge. The result is to allow students to produce products that are highly competitive and worthy of being used by the community [15].

METHOD

Combined in this research are quantitative and qualitative approaches, i.e. mixed methods research, in one research package. Johnson and Christensen have suggested the use of mixed methods research for educational researchers [10]. The quantitative method chosen for this study was a descriptive and quasi-experimental survey. The qualitative method chosen was a multi-site study and action research.

The use of mixed methods research is appropriate because of the following:

1) look for/choose the most appropriate method for a multi-perspective educational context;
2) complement the shortcomings of other methods commonly chosen by previous researchers;
3) develop product models that will become implemented public policies;
4) problem solving for things that are paradoxical and contradictory in society.

The use of mixed methods will affect the research data, which are from questionnaires or observations. The questionnaires include several sub-variables to reveal PjBL-RE as a whole. The observations emphasise qualitative items with scoring guidelines to see how skill creation increases.

Six hundred students from the Electrical Engineering Department at the State University of Malang, Malang, Indonesia, were selected for this study. The selection criterion was that students had carried out fieldwork involving practice teaching in vocational schools.

The design of the study used a concurrent design method in which quantitative and qualitative are combined into a single measure [16] to produce conclusions. The concurrent design method had five main steps; namely:

1) validation of sampling through a *t*-test;
2) implementation of the questionnaire;
3) observations and interviews;

4) merging quantitative and qualitative data;
5) results and conclusions through the analysis of the collected data.

The design of the concurrent design mixing method is displayed in Figure 1. Variable indicators are defined in Table 1.

Table 1: Variable indicators.

	Student's creating skill	PjBL-RE
1	Constructing the learning through competence and expertise	Describing identity through a structured lecture
2	Using learning media as a learning tool	Provide an innovative perspective of the business world outside of learning
3	Actualising skills through practical work and project assignments	Analyse aspects of business through a series of symptoms or implications
4	Provide assumptions or opinions regarding effective learning	Communicate fluently in front of other students
5	Connecting learning through a series of processes reflecting the real world	Provide solutions to problems

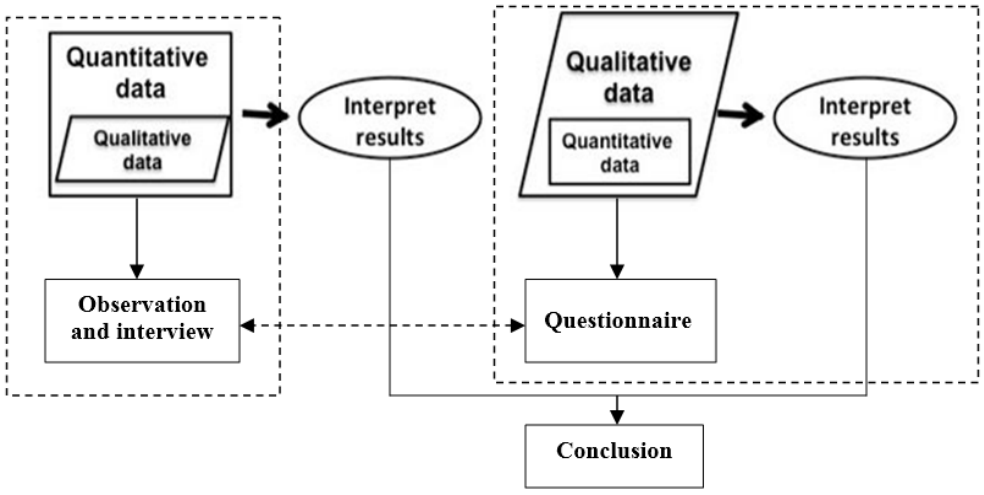

Figure 1: Concurrent design method.

A non-test technique was used to collect skill creating data. A non-test technique is an assessment technique to obtain an overview, especially regarding student characteristics, attitudes or personalities that cannot be assessed quantitatively [3]. In other words, the non-test assessment relates to observable appearance compared to other knowledge and mental processes. The Likert scale-based questionnaire instrument has randomised questions with positive and negative values from strongly agree (SA), agree (A), quite agree (QA), disagree (D), strongly disagree (SD).

In this study, the authors used several research variables to capture the results for PjBL-RE. This involves retrieving variable data related to modelling objects to be able to measure student skill creation and qualitative observation data.

RESULTS AND DISCUSSION

The mixing method study was used to determine the effect of PjBL-RE on student skill creation. The quantitative data are the results of the PjBL-RE influence questionnaire, which contained 587 answers from the student respondents (13 respondents' results were discarded because they did not fill out the questionnaire). The frequency for Likert scale point 5 was 324, point 4 was 171, point 3 was 67, point 2 was 12 and point 1 was 13. The results of the quantitative questionnaire are shown in Table 2.

Table 2: Quantitative questionnaire results.

Value range	Frequency	Percentage %
5	324	55
4	171	29
3	67	11
2	12	2
1	13	2
Total	587	100

The questionnaire data reveal that most of the responses (55%) say that PjBL-RE strongly positively influences creation skills. A sampling *t*-test significance level of 0.226 means that the sampling was not homogeneous and was free from average sampling correlation. The homogeneity test results can be seen in Table 3.

Table 3: Homogeneity test results.

T-test for equality of means				
t	df*	Sig. (2-tailed)	Mean difference	Std error difference
1.151	56	0.226	2.780	2.286

* Degrees of freedom

The value of the multiple correlation coefficient for the PjBL-RE variable was 0.010 (medium) and the skill creation variable was 0.02 (moderate). By comparing the value of *p*-count < *p*-standard in the two multiple correlation coefficient values, it can be interpreted that the correlation value between the variables was significant. A summary of the results of multiple correlation analyses and their simple interpretations are shown in Table 4.

Table 4: Results of correlation testing.

Variable name	Coefficient correlation	Probability		Interpretation
		P_{hitung}	$P_{standard}$	$P_{hitung} < P_{standard}$
PjBL-RE (X)	0.010	0.000	0.05	(+) &Significant
Skill creation (Y)	0.032	0.000	0.05	(+) &Significant

From these results, it can be stated that the use of PjBL-RE provides a significant increase in skill creation with the regression equation Y = 32,663 + 0.763 X which reveals the correlation of variable X to Y. Then, qualitative data were used to reinforce the quantitative data through a series of observations. The observations of 71 observer items revealed an average value of *B* (*good)* with a range value from 142 to 72. The results show that PjBL-RE can improve student skill creation. The qualitative data results are displayed in Table 5.

Table 5: Results of qualitative observation data.

Interval (%)	Letter criterion	Item	Criterion	Lowest observation score	Highest observation score
85-100	A	7	Very good	72	142
75-84	B	35	Well		
60-74	C	21	Enough		
40-59	D	3	Less		
0-39	E	5	Very less		

CONCLUSIONS

Based on the results, the authors concluded that PjBL-RE can have a significant positive influence on the creation of skills. This is evidenced by testing the null hypothesis which produced a $p = 0.010 < 0.05$. Hence, H_0 was rejected, and Ha was accepted, while *t*-test testing showed sampling free from correlation and homogeneity.

Qualitative data were used through field observations, which produced qualitative data showing that the use of PjBL-RE greatly helped increase creation skills in subjects related to entrepreneurship. The use of PjBL-RE also identified other variables that could complement skill creation; namely, student modelling design through lecturers providing examples in the real world.

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