

Research-Based Learning to Improve Students' Critical Thinking Skills in Studying Business Ethics

Umi Nuraini^{1,*}, Nurika Restuningdiah¹, Eka Ananta Sidharta¹, Helianti Utami¹

¹ Universitas Negeri Malang

*Corresponding author. Email: umi.nuraini.fe@um.ac.id

ABSTRACT

Research-Based Learning as a form of educational technology innovation can be applied to facilitate the teaching of 21st-century skills such as critical thinking, communication, creativity, and collaboration. This study applies research-based learning to business ethics subjects. The focus of research integration in learning is to prioritize content and research results. Learning is enriched with the results of the latest research related to ethical decision making. This study found that Research-Based Learning can improve students' critical thinking skills in studying business ethics. The results of statistical tests show that there is a significant difference in the average final test results of students as measured by indicators of critical thinking between research-based learning and learning with the group presentation method. In addition to having benefits in improving students' critical thinking skills, research-based learning also shows that students are not only important to have strong knowledge but also have the skills needed in the 21st-century. The application of research-based learning is in line with the efforts of the State University of Malang as "The Learning University" which focuses on the excellence of learning innovation and competition. Having excellence in learning innovation can produce graduates who have high competitiveness in the realm of knowledge, attitudes, skills, and character (soft competence).

Keywords: *Critical Thinking, Research-Based Learning, 21st-Century Skills*

1. INTRODUCTION

Today's higher-education environment has become increasingly competitive. This is not only competition on inputs but also output among universities. Output or college graduates will be more competitive in the labor market, whether in developed countries and developing countries. According to [1] higher education has an important role in forming a quality workforce that can bring high competitiveness to improve company performance and productivity. Research conducted by the World Economic Forum (WEF) of nearly 100 countries shows a large gap in human resource skills indicators between developed and developing countries. This gap indicates that too many students are not educated to prosper in the 21st century. It is because countries are not finding enough skilled workers they need to compete.

The WEF has examined issues of skill gaps and sought ways to address this gap through technology. One effort to address this problem is to improve the quality of education in universities, by continuing to innovate in the field of educational technology that can facilitate the teaching skills of the 21st century. An innovation that teachers provide in the learning process can train students to develop creativity,

critical thinking, problem-solving skills, communication skills, and collaborative skills [2]. In the rapidly growing world of 21st-century education, students must not only have strong academic skills, but they must also have skills such as persistence, curiosity, problem-solving, critical thinking, and collaboration. However, many students in many countries have not achieved this skill yet.

According to [3] critical thinking development must be inherent in education as societies need citizens who facilitate their progress. The results of the study of [4] found that the act of collecting information significantly influences the critical thinking skills of students of Junior High School (SMP) class VIII. In this activity, each student is trained to construct their knowledge and is required to have the courage and communication skills well with outsiders. Critical thinking that is needed now is of course higher-order thinking skills following the Bloom taxonomy. According to [5] critical thinking skill indicators include interpreting activities, the ability to study or analyze, identify relevant and irrelevant sources, identify and evaluate assumptions, implement various strategies to make appropriate decisions, conclude, and self-regulation.

Research by [6] found that educational technological innovation can be done through learning using project-based, experiential, and investigative-based learning methods. All of which can be integrated with Research-Based Learning (RBL). Educational technology can be applied to facilitate the teaching of the 21st-century. If students are required to be ready to compete in the 21st-century, then the teacher must also be ready. This is where the role of a teacher to be able to prepare, implement, and evaluate learning activities that meet the needs of students in the 21st century. As stated by [7] it is necessary to prepare teachers to deal with a diverse student population from the 21st-century class.

RBL is a learning model that integrates research in the learning process to build student knowledge. The goal of RBL for students is to assist them in building strong intellectual and practical connections between research boundaries and student learning on their own. While according to [8] RBL is based on the philosophy of constructivism that leads to contextual teaching and learning approaches, discovery learning, project-based learning. RBL includes four aspects, namely learning that builds students' understanding, learning by developing prior knowledge, learning which is the process of social interaction, and meaningful learning achieved through real experience [9].

The four-focus cartesian quadrant of research integration in learning [10]. There are (1) research-tutored (discussion, debate, or brainstorming to irritate research); (2) research-leads (Learn current research in lectures); (3) research-based (learning involves students to do research), and (4) research-oriented (learning techniques or research methods in each course). RBL is applied in learning business ethics for students in the Accounting Department, Faculty of Economics, Universitas Negeri Malang. The consideration in choosing this business ethics course begins with concerns over the rampant cases of violations of business ethics in Indonesia lately, especially in State-Owned Enterprises (BUMN). The situation will become chaotic and will create confusion in the community which will lead to fatal chaos in the business, industrial and economic activities of a country, especially if these violations of business ethics are allowed to occur.

This is in line with the global condition that concern in introducing specialized courses on business ethics in higher education curricula is increasing worldwide [11]. In curriculum and teaching, young people need to be taught business ethics education to prepare them to be able to make decision-making processes in handling business in the marketplace well [12]. Good decision-making is decision-making that characterizes the quality of ethical behavior, namely that reflects integrity and

social responsibility. Besides transferring knowledge, lecturers also have an important role in helping develop the attitudes and skills needed by students in today's job competition. At work, they not only need to master knowledge, but also need to have good attitudes and skills by the professional code of ethics.

Therefore, lecturers must use the right learning model to achieve learning objectives and RBL as a choice. The application of research-based learning in this research is an alternative choice of learning innovations to improve the skills needed in the 21st century, especially critical thinking skills.

2. METHODS

The approach in this research is a quantitative approach that uses the quasi-experiment method. This method is widely applied in educational research. There is an increasing emphasis on using quasi-experimental to evaluate educational programs [13]. The researcher sets the experimental and control groups intact, administers the pretest for both groups, carries out experimental treatment activities with the experimental group only [14]. As stated by [15] quasi-experimental design can be used to provide valid answers to fundamental questions such as what is the status of a particular group after they have received a particular treatment. The pre-test is done to know the characteristics of the group before they get treatment, while the post-test is done to find out the results achieved by the group after they get treatment.

This study uses a non-equivalent control group design, which involves a full group random assignment for treatment, rather than an individual random assignment. The assignment to one group or the other is controlled because the control group and the experimental group do not have pre-experimental sampling equivalence. A control group is one that does not receive any kind of formal treatment at all. While refers to an alternative person receiving some sort of alternative treatment.

The sample in this study is two of four classes S1 Accounting Education 2018 which takes the introductory course of business ethics. The study sample was taken not randomly, consisting of two classes, one control class, and one experimental class. The sample selection is based on the characteristic equation between the two classes. Before taking data, the researchers conducted a trial of the question instruments that will be used as the pre-test and post-test questions. The pretest is a preliminary test before the students start learning and the posttest is the final test. Data analysis includes descriptive analysis, normality test, homogeneity test, and independent-sample t-test. The design of this research can be seen in the following figure 1:

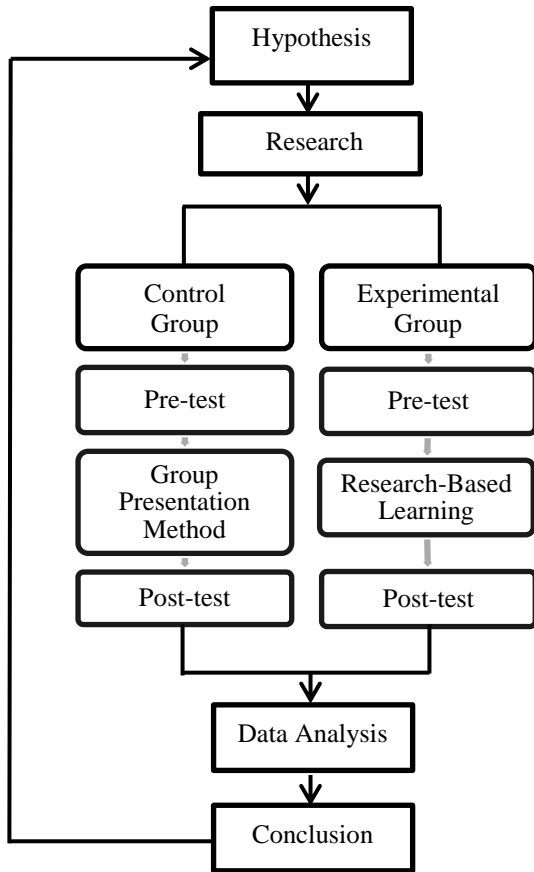


Figure 1. Research Design

The control class in this study used the group presentation method. At one meeting there was a group that presented the material that had been shared at the beginning of the meeting and then discussed it with classmates. While in the experimental class, the lecturer applies RBL by providing examples of business ethics journals, and then each student analyzes it. After the two classes were given a pretest and posttest, the researcher analyzed the data and then concluded it.

3. RESULTS AND DISCUSSION

Research-lead is the focus of research integration taken in this study. The consideration of using this focus because the sample is students who have not got a course on research methods yet. Students are introduced first through the results of recent research in a business ethics course. Furthermore, this study focuses on improving students' critical thinking skills. The first stage in this study is to hold discussions with lecturers on other introductory business ethics courses. This aims to determine whether the material is feasible to apply and to determine the suitability between the questions and the material that has been determined. The results of the discussion agreed that the chapter used as an experiment is ethical decision making.

The second stage is designing research-based learning scenarios. The third stage is determining the

critical thinking indicator and then developing it in the form of student learning activities. Determination of indicators based on competency standards important for the development of intellectual skills. As stated by [16] the determination of indicators and activities refers to the concept of critical thinking competency standards.

Competency Standards for the development of intellectual skills include targeting analysis of thinking, assessing thinking, and cultivating intellectual virtues focused on subject-specific critical thinking competencies. This study refers to the standard of ethical reasoning skills because it is in line with the business ethics course. While [17] explained that one outline of the ability to measure critical thinking skills can provide questions related to hypotheses, explanations, and conclusions. This is in line with the RBL scenario.

Then we determined five indicators adapted to the RBL scenario, namely (1) students can distinguish between simple and complex ethical questions; (2) students can demonstrate an understanding that ethical principles are based on human rights; (3) students can understand by placing themselves imaginatively in the place of others and recognizing how they will think and feel when someone acts against them; (4) students can demonstrate an understanding of ethical reasoning, by accurately describing and providing examples of that reasoning; and (5) students can realize that there is a logic to ethical reasoning, just as there is scientific logic and can accurately articulate that logic.

The fourth step is to make pretest and posttest questions. After being tested for validity and reliability, the pretest and posttest were given to the experimental class and the control class. Learning in the control class uses the group presentation method followed by discussion. The application of RBL in the experimental class through the focus of research integration in learning is research-lead. Business ethics studies discuss research journals on ethical decision making.

The lecturer provides research journals to students to study first, then students review the journals according to the guidelines set by the lecturer. Journal reviews focus on discussing content so that students can relate theory to facts. This is different from the treatment in the control class, where students only discuss material according to the literature used. If using RBL, students can understand how problems arise and how to solve these problems.

Testing the validity and reliability of six questions to twenty respondents was carried out using the SPSS. The analysis results are based on the value of r-count (Corrected Item-Total

Correlation) > r-table of 0.438, for $df = 20 - 2 = 18$; $\alpha = 0.05$ then the item/question is valid. The summary data can be seen in the following table 1:

Table 1. Question Validity Test Results

Items	Correlation Value	r-table	Criteria
1	0.603	0.438	Valid
2	0.601	0.438	Valid
3	0.703	0.438	Valid
4	0.603	0.438	Valid
5	0.816	0.438	Valid
6	0.766	0.438	Valid

Source: Primary data processed

It can be seen that all questions have a valid status, because the value r-count (Corrected Item-Total Correlation) > r-table is 0.438. The reliability test results are presented in table 2 below:

Table 2. Question Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
0.698	6

Source: Primary data processed

Based on figure 2, the reliability test was carried out on six question items that were declared valid and the results had a value of "Alpha Cronbach" greater than 0.600 ($0.698 > 0.600$), which means that the three instruments were declared reliable or met the requirements, so that is feasible to be tested on students. After being tested for validity and reliability, the pretest and posttest questions were given to the experimental class and the control class.

The pretest and posttest data were analyzed using the normality test first. The normality test is used as a condition or assumption of the parametric test in this study which uses the independent t-test.

Table 3. Tests of Normality

Test Results	Test of Normality			
	Class	df	Kolmogorov-Smirnov ^a (Sig.)	Shapiro-Wilk (Sig.)
Pretest-Control Class		22	0.200	0.560
Posttest-Control Class		22	0.200	0.715
Pretest-Experiment Class		22	0.200	0.458

Test of Normality			
Posttest-Experiment Class	22	0.081	0.115

Source: Primary data processed

The results of the normality test, it is known that the significance value (Sig.) for all data, both the Kolmogorov-Smirnov test data and the Shapiro-Wilk test is greater than 0.05. So, the research data is normally distributed. The assumption of normality is fulfilled or the data is normally distributed so that the treatment can be used by the hypothesis analysis.

The next analysis is using the homogeneity test. The homogeneity test is used to test the difference between the control class and the experimental class, so that homogeneity is required as an assumption of the independent t-test. The results of the homogeneity test are as follows:

Table 4. Test of Homogeneity of Variance

Test of Homogeneity of Variance		
Post-test		Sig.
	Based on Mean	0.542
	Based on Media	0.664
	Based on Median and with adjusted df	0.664
	Based on trimmed mean	0.563

Source: Primary data processed

Homogeneity test results obtained a significance value (Sig.) based on the mean of $0.543 > 0.05$ so that the variance of the posttest data for the experimental class and control class is the same or homogeneous.

After the homogeneity test is fulfilled, the final data analysis step is the independent t-test. An independent t-test was conducted to compare the means of the two groups (control class and experimental class), whether significantly the two samples had the same mean or not.

Table 5. Independent Sample Test

Independent Samples Test			
Posttest	Equal variances assumed	df	Sig. (2-tailed)
		42	0.000
Posttest	Equal variances not assumed	41.782	0.000

Source: Primary data processed

In the independent test sample t-test, the Sig value is obtained. (2-tailed) of $0.000 < 0.05$, then there is a significant difference in the average final test results of students between research-based learning and learning using group presentation. The

results of the statistical analysis also show an increase in students' critical thinking skills in learning business ethics. The benefits of RBL are to develop students' scientific attitudes, critical inquiry skills, and the ability to come up with creative solutions [18]. RBL also has benefits that students can develop a solid and varied theoretical foundation, applying classroom knowledge to real problems, connecting and linking theory with applications, learning through doing and developing problem-solving skills and improving communication skills and team-building skills [19].

Critical thinking skills can improve analytical skills, creativity, utilize ideas or information, and seek additional relevant information and self-reflection [20]. Teachers can help students become critical thinkers by posing challenges and engaging them in active learning [21]. It aims to uncover their misconceptions and help them reconfigure their cognitive models. A study by [22] operationalized critical thinking into a practical indicator in which critical thinking is required for problem-solving.

RBL is not only beneficial for improving the academic and research writing skills of a teacher, but also students able to conduct research, write scientific papers, and publish them. In this case, students collect all portfolios of the research process and provide them with research and questionnaires of academic writing skills as one of the evaluation processes in the learning activities [23]. Besides, the application of RBL is also appropriate if it is used in learning business ethics at the higher education level. The mixed learning approach can be used in business ethics by building the constructivist learning theory and the case teaching method [24]. Studying business ethics appropriately can be a provision for students when they graduate and can be applied when they become employees. The applied modules of Business Ethics taught in the undergraduate program apply to working adults. The study results show that after individuals understand the useful value of ethics education, the behavior is more likely to be driven by this knowledge [25].

4. CONCLUSION

This study found that RBL can improve students' critical thinking skills in learning business ethics. The critical thinking skill is one of the skills needed in the 21st-century so that the measurement of student learning success today is not only seen from the breadth of knowledge but also how much 21st-century skills students have. RBL as a form of educational technology innovation can be applied to facilitate the teaching of 21st-century skills such as critical thinking, communication, creativity, and collaboration (4C). RBL is very likely to be implemented in many courses that demand theories, best practices (good practices), and practicum. It will ultimately require effective collaboration

among a group of policymakers, educators, educational technology providers, and funders who are complex and interconnected. This collaboration can bring the most effective educational technology to more students across the world to address the 21st-century skills gap. Further research is suggested that RBL is applied in other courses and focuses not only on research-lead. Besides, further researchers can also develop other indicators in determining the attainment of 21st-century skills.

The implementation of RBL is consistent with the effort of the State University of Malang as "The Learning University" which is focused on the advantages of learning innovation and competition. Learning innovation includes innovation in learning management, provision of learning resources, management of the learning environment, and innovation in the organization and management of learning. Having excellence in learning innovation can produce graduates who have high competitiveness in the realm of knowledge, attitude, skill, and character (soft competence).

AUTHOR'S CONTRIBUTIONS

The first author determines the research framework and writes articles, the second author determines the research topic and reviews the article. Data collection and data processing were carried out by the third and fourth authors.

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REFERENCES

- [1] H. Y. Keser, "Effects of Higher Education on Global Competitiveness: Reviews in Relation With European Countries and the Middle East Countries," *Ann. - Econ. Ser.*, vol. 11, no. January 2015, pp. 58–68, 2015.
- [2] S. Ristanto and N. Khoiri, "Pembelajaran Real Laboratory Dan Tugas Mandiri Fisika Pada Siswa Smk Sesuai Dengan Keterampilan Abad 21," *J. Pendidik. Fis. Indones.*, vol. 11, no. 1, pp. 73–83, 2015, doi: 10.15294/jpfi.v11i1.4005.
- [3] O. L. Uribe-Enciso, D. S. Uribe-Enciso, and M. D. P. Vargas-Daza, "Pensamiento crítico y su importancia en la educación: algunas reflexiones," *Rastros Rostros*, vol. 19, no. 34, pp. 78–88, 2017, doi: 10.16925/ra.v19i34.2144.
- [4] E. Jayadiputra, "Model Project Citizen dalam Meningkatkan Keterampilan Berpikir Kritis Siswa," *J. Ilm. Cisoc*, vol. 2, no. 1, pp. 11–20, 2015, [Online]. Available: <http://jurnal.fkip-uninus.ac.id/index.php/cisoc/article/view/18>.

- [5] W. Boonjeam, K. Tesaputa, and A. Sri-ampai, "Program Development for Primary School Teachers' Critical Thinking," *Int. Educ. Stud.*, vol. 10, no. 2, p. 131, 2017, doi: 10.5539/ies.v10n2p131.
- [6] W. E. Forum, "New Vision for Education: Unlocking the Potential of Technology," *AIP Conf. Proc.*, pp. 1–32, 2015, doi: 10.1063/1.4938795.
- [7] L. B. Liu, L. L. Baker, and N. B. Milman, "Technological innovation in twenty-first century multicultural teacher preparation," *J. Multicult. Educ.*, vol. 8, no. 1, pp. 54–67, 2014, doi: 10.1108/JME-02-2013-0005.
- [8] P. Blackmore and M. Fraser, "Research Based Learning Strategies for Successfully Linking Teaching and Research," *J. Educ.*, vol. 13, no. 2, pp. 1–13, 2007.
- [9] D. T. Widayati *et al.*, "Pedoman Umum Pembelajaran Berbasis Riset (PUPBR)," pp. 1–15, 2010.
- [10] Dafik, "Pengembangan PBR (Pembelajaran Berbasis Riset)," *Hand Out PBR UNEJ. Univ. Negeri Jember*, pp. 1–16, 2016.
- [11] G. Tormo-Carbó, V. Oltra, E. Seguí-Mas, and K. Klimkiewicz, "How Effective are Business Ethics/CSR Courses in Higher Education?," *Procedia - Soc. Behav. Sci.*, vol. 228, no. June, pp. 567–574, 2016, doi: 10.1016/j.sbspro.2016.07.087.
- [12] A. Seran and Y. Suhartoko, "Challenges and Trends in Business Ethics Education: Mindmapping University Curriculum for the Promotion of Justice and Sustainability for the Whole Society," *Int. J. Contemp. Res. Rev.*, vol. 9, no. 03, pp. 20681–20698, 2018, doi: 10.15520/ijcrr/2018/9/03/485.
- [13] T. M. Walser, "Quasi-experiments in schools: The case for historical cohort control groups," *Pract. Assessment, Res. Eval.*, vol. 19, no. 6, pp. 1–8, 2014.
- [14] J. W. Creswell, *Research and Design Qualitative, Quantitative and Mixed Methods Approaches*. California: Thousand Oaks California., 2018.
- [15] B. A. and Thyer, *Quasi-Experimental Research Designs*, vol. 15, no. 1. 2013.
- [16] R. Paul and L. Elder, "Critical Thinking: Competency Standards Essential for the Cultivation of Intellectual Skills, Part 2," *J. Dev. Educ.*, vol. 36, no. 1, p. 31, 2012.
- [17] R. Ennis, "Critical Thinking Across the Curriculum: The Wisdom CTAC Program." pp. 25–45, 2013.
- [18] M. Salimi, T. S. Susiani, and R. Hidayah, "Research-Based Learning Sebagai Alternatif Model Pembelajaran Di Lembaga Pendidikan Tenaga Kependidikan," *J. Pendidik. Sekol. Dasar*, vol. 3, no. 1, p. 1, 2017, doi: 10.30870/jpsd.v3i1.1284.
- [19] Z. Hunaiti, S. Grimaldi, D. Goven, R. Mootanah, and L. Martin, "Principles of assessment for project and research based learning," *Int. J. Educ. Manag.*, vol. 24, no. 3, pp. 189–203, 2010, doi: 10.1108/09513541011031574.
- [20] T. S. S. Ratna Hidayah, Moh. Salimi, "Critical Thinking Skill: Konsep dan Indikator Penilaian," *J. Taman Cendekia*, vol. 1, no. 1, pp. 127–133, 2017.
- [21] N. Keith and J. G. Kurfiss, "Critical Thinking: Theory, Research, Practice, and Possibilities," *Teach. Sociol.*, vol. 18, no. 4, p. 581, 1990, doi: 10.2307/1317666.
- [22] S. Y. Chao, H. Y. Liu, M. C. Wu, M. J. Clark, and J. Y. Tan, "Identifying critical thinking indicators and critical thinker attributes in nursing practice," *J. Nurs. Res.*, vol. 21, no. 3, pp. 204–211, 2013, doi: 10.1097/jnr.0b013e3182a0aee9.
- [23] R. C. I. Prahmana and Y. S. Kusumah, "The Hypothetical Learning Trajectory on Research in Mathematics Education Using Research-Based Learning," *Pedagogika*, vol. 123, no. 3, pp. 42–54, 2016, doi: 10.15823/p.2016.32.
- [24] A. M. Lämsä, R. Pučetaite, J. Kujala, A. Heikkinen, E. Riivari, and R. A. Medeišiene, "Teaching and learning business ethics in a multicultural group," *Int. J. Knowl. Manag. Stud.*, vol. 8, no. 1–2, pp. 83–98, 2017, doi: 10.1504/IJKMS.2017.084403.
- [25] S. Varma, "Why learn business ethics?—Students' conceptions of the use and exchange value of applied business ethics," *Asian J. Bus. Ethics*, vol. 8, no. 1, pp. 107–125, 2019, doi: 10.1007/s13520-019-00090-7.