❒ 221

The effect of ex-add learning techniques on critical thinking skills and pedagogic competence of Islamic education students

Mahfudz Mahfudz[1], Sukarno Sukarno[2]

[1]Islamic Education Department, Tarbiyah and Teacher Training Faculty, Universitas Islam Raden Fatah-Palembang, Palembang, Indonesia

[2]Science Education Department, Tarbiyah and Teacher Training Faculty, UIN Sulthan Thaha Saifuddin Jambi, Jambi Indonesia

Article Info

ABSTRACT

This study aimed to determine the effect of explain-analysis-doing-discussion or known as ex-add learning techniques on critical thinking skills and pedagogic competence of Islamic religious education students at State Islamic University (UIN) Sulthan Thaha Saifuddin Jambi and at UIN Raden Fatah Palembang, Indonesia. The approach used quantitative with quasi-experimental techniques. The number seen in this study was 31 students from UIN Sulthan Thaha Saifuddin Jambi. The data were obtained using tests, namely pretest, and posttest. The test instrument was in the form of multiple-choice questions, each consisting of 40 questions. Data analysis was carried out using percentage techniques, N-gain analysis, and a T-test. Based on the data and discussion that has been done, it can be concluded that the ex-add technique in 'learning methods and strategies' can increase critical thinking skill (CTS) and pedagogic competence (PC) respectively by 78 .23% in the 'high' category and 59.81% in the 'medium' category. This is reinforced by the results of the T-test that both variables obtain a value (2-tailed) of $0.000 < 0.05$. This means that there is an average difference between the pretest and posttest scores for each variable. In other words, it can be said that the increase in student CTS and PC after participating in learning with the ex-add technique is significant.

Corresponding Author:

Sukarno Sukarno
Science Education Department, Tarbiyah and Teacher Training Faculty
UIN Sulthan Thaha Saifuddin Jambi
Arif Rahman Hakim Street No.111, Simpang IV Sipin, Telanaipura, Jambi, Indonesia
Email: sukarno@uinjambi.ac.id

1. INTRODUCTION

One of the skills that are very important to guarantee success in the era of society 5.0 is the ability to think critically. This is in line with the explanation of Changwong *et al*. [1], Borodina *et al*. [2], Facione [3], and Alsaleh [4] that the ability to think critically is a very important high-level thinking ability to face the era of the industrial revolution 4.0 and the era of society 5.0. Cakici [5] stated that in facing the era of society 5.0 every student must have good critical thinking skills. Heard *et al*. [6] also explained that the ability to think critically is a very important skill in the 21st-century era. Even Karakoc [7] wrote that implementing the concept of independent learning is an effort to improve critical thinking skills. In general, students critical thinking skills in Indonesia still need to be developed [8].

Critical thinking skills can be taught, trained, and developed by teachers and lecturers through planned and systematic learning. Therefore, efforts to improve critical thinking skills are always associated with the real abilities and efforts of teachers in the learning process. Each teacher has an important role in

developing students' critical thinking skills. Laar *et al.* [9] state that the role of the teacher in preparing students' critical thinking skills in the learning process is by the characteristics of constructivism itself, where the teacher has various roles that can be used in helping students during the learning process. Research Alsaleh *et al.* [4], Nor and Sihes [10], and Rogti [11] also describe the important role of teachers in training and developing students' critical thinking skills. The important role of the teacher can be carried out by carrying out action research [12]. Therefore, it can be understood that efforts to improve critical thinking skills are closely related to the teacher's ability to plan and implement learning.

Talking about the teacher's ability to plan and implement learning also means talking about teacher competence, especially pedagogic competence. According to Ningtiyas and Jailani [13], Sulaiman and Ismail [14] and Sahana [15] pedagogical competence is the ability of teachers/lecturers who are combined and coordinate terms to plan, implement, and assess the learning process. According to Bayram [16], there are six aspects of pedagogical competence, namely: i) Mastering the characteristics of students; ii) Mastering learning theory and principles of educational learning; iii) Developing curriculum; iv) Learning activities that educate; v) Developing the potential of participants students; and vi) Communication with students. Competent teachers will ensure the continuity of a quality educational process [17]. This happens because competent teachers will have an impact on work performance and motivation [18]. Thus, it can be understood that pedagogical competence is very important for teachers and has a broad impact on the quality of education.

The influence and the important role of teacher pedagogic competence on the quality of education can be seen from the results of research by experts. Several studies, among others, were conducted by Prihono *et al.* [19] who in his research concluded that pedagogic competence has a positive effect on lecturers' academic performance. Channa and Sahito [20] in a study found that teacher pedagogic competence had a positive effect on student learning motivation. Several other studies also prove that teacher pedagogic competence has a positive effect on learning quality [21], teacher performance, and students' intellectual quality [22]. Based on the results of these studies, proves that teacher pedagogical competence influences the quality and outcomes of education. Therefore, efforts to improve teacher pedagogic competence must continue to be carried out to ensure an increase in the quality of education in general.

One important factor in improving the quality of education and the success of the educational process is related to the approach, model, method, strategy, or technique used by the teacher in the learning process. This is as mentioned by Namusoke and Rukundo [23], Nind and Lewthwaite [24], Syahrial *et al.* [25] and Mallillin *et al.* [26] that to achieve a standard educational process, it is best to start by analyzing how it applies effective learning methods and strategies in each lesson. Wen and Peng [27] explained that methods and approaches in Islamic education have a very important role in achieving educational goals. In addition, Feng [28] also stated that learning methods have a very important role in the learning process. Thus, it can be understood that the diversity of ways or techniques in teaching has the potential to improve the quality of education in general.

Various kinds of approaches, models, methods, strategies, or learning techniques that already exist are often not to the situation and conditions of students. Therefore, in using approaches, models, methods, strategies, or techniques, teachers or lecturers must consider certain factors. According to Hergan and Pečar [29] and Tomak [30], several factors must be considered in choosing a learning method, namely learning objectives, student conditions, learning resources, and characteristics of the technique or method used. Alnufaie [31] and Khalil *et al.* [32] states that the selection of learning methods or techniques used in learning must be adapted to the teaching materials and media to be used. Considerations in selecting learning methods or techniques must be made by the teacher or lecturer because each method or technique always has its advantages and disadvantages.

In the learning process in tertiary institutions, the selection of methods or techniques in learning is intended to optimize the process and results of student learning. The intended student learning outcomes include critical thinking skills and pedagogic competence. Efforts to improve critical thinking skills and pedagogic competence have been carried out by many experts before using existing learning methods or techniques. For example, Zhang [33] conducted research on improving critical thinking skills using the engage, explore, explain, elaborate and evaluate (5E) approach. Bashir [34] make efforts to improve students' critical thinking skills through discovery learning. As for pedagogical competence, Alhaj and Albahiri [35] makes efforts to increase student pedagogic competence through microteaching techniques, and Çelik *et al.* [36] made efforts to increase student pedagogic competence through apprenticeship techniques.

Efforts to improve student's critical thinking skills and pedagogic competence by using existing models, approaches, or techniques are often not by the existing situations and conditions. In addition, often existing models, approaches, or techniques are not to the characteristics of students and their learning environment. Therefore, it is necessary to develop new models, approaches, or techniques so that efforts to improve these two capabilities can continue to be carried out optimally. The development of learning

methods or techniques also means efforts to improve the quality of education. In developing learning methods or techniques, various criteria for quality methods or techniques must be considered. According to Dolapçıoğlu and Koşar [37] there are four criteria for a good learning method or technique, namely: i) It can arouse students' curiosity; ii) It can generate positive optimism in students; iii) It can foster student creativity; and iv) It can be applied effectively. However, each model, approach, or technique developed must be tested for its effectiveness and efficiency in developing students' critical thinking skills and pedagogic competence.

Referring to the description above, this study focuses on examining the effectiveness and efficiency of the explain-analysis-doing-discussion or known as ex-add learning technique for improving students' critical thinking skills and pedagogic competence. Although theoretically, the ex-add learning technique which consists of explain-analysis-doing-discussion activities has proven to have a positive impact on learning outcomes. For example, research by Öztürk *et al.* [38] states that lecture and discussion methods can increase student learning activities. Mekonnen [39] found that finding that the application of the concept of learning by doing can improve the quality of student learning. Vrabec and Bôtošová [40] also stated that the application of the concept of learning by doing can improve the quality of education in schools. However, the implementation of the ex-add technique is still partial and not systematic and has not linked students' critical thinking skills and pedagogic competence. Therefore, there is a need for more systematic ex-add learning implementation research to improve students' critical thinking skills and pedagogic competence. Thus, the question that will be answered in this study is whether there is an influence of the ex-add learning technique on the critical thinking skills and pedagogic competence of Islamic religious education students.

2. RESEARCH METHOD

As previously mentioned, this research focuses on examining the effect of ex-add learning techniques on students' critical thinking skills and pedagogic competence. Therefore, the approach used in this research is quantitative with a quasi-experimental design through the implementation of learning. The research was carried out at the Islamic Religious Education Study Program at UIN Sulthan Thaha Saifuddin Jambi, Indonesia involving 31 students in the learning methods and strategies course. Data for each variable in the study was obtained by using a test technique that was carried out twice, namely the pre-test and post-test. Therefore the design used in this research is a one-group pretest and posttest design [41].

The variable measurement of critical thinking skills adapts the indicators developed by Ambar [42] which include indicators: i) Providing simple explanations; ii) Building basic skills; iii) Summarizing, and iv) Providing further explanations. The pedagogical competence indicators include: i) Mastery of student characteristics; ii) Mastery of learning theory; iii) Mastery of the curriculum; iv) Development of student potential and v) communication with students. The instruments used in this study have been validated by previous research, both expert validation and empirical validation. Each variable is measured using a test in the form of multiple-choice questions totaling 40 questions. Data analysis was carried out by giving a score for student loyalty, which was carried out using the (1):

$$N = \frac{\text{Acquired score}}{\text{Maximum score}} s \ 100\%$$ (1)

After all, students have obtained pretest and post-test scores, then to find out the increase in student ability in both variables is analyzed using N-gain. This analysis is carried out using the (2):

$$N - Gain = \frac{Npost - Npre}{Nmax - Npre} x 100\%$$ (2)

N-gain: The increase achieved by students
N post: The value of the post
N pre: Pretest value
N max: Maximum value

Decision-making is based on the results of the N-gain analysis with the classification as shown in Table 1.

Table 1. Classification of N-gain

N-gain	Upgrade classification
g>0.70	High
0.30 <g≤0.70	Moderate
g≤0.30	Low

Furthermore, data analysis was continued with the T-test (mean average difference test). That was to see how far the level of confidence or significance of the results of the N-gain test had been carried out. The F-test was carried out with the help of SPSS 16 software.

3.   RESULTS AND DISCUSSION

Based on the measurement results for each variable at the end of the lecture with the ex-add technique, namely in the middle of the semester. Each variable is analyzed to determine the increase in each indicator observed. Through this analysis, the percentage of categories in each indicator for each variable will be known. Presentation of data in Table 2.

Table 2. Percentage of improved critical thinking skills

Indicators	Upgrade classification	Range score	Number of students	Percentage
Give a simple explanation	High	76-100	18	58.06
	Moderate	41-75	8	25.81
	Low	0-40	5	16.13
	Total		31	100
Build basic skills	High	76-100	15	48.39
	Moderate	41-75	9	29.03
	Low	0-40	7	22.58
	Total		31	100
Conclude	High	76-100	21	67.74
	Moderate	41-75	7	22.58
	Low	0-40	3	9.68
	Total		31	100
Provide further explanation	High	76-100	12	38.71
	Moderate	41-75	11	35.48
	Low	0-40	8	25.80
	Total		31	100

Based on Table 2, it can be seen that in general, each indicator measured on the critical thinking variable is in the 'high' category with a score range of 76-100. The four indicators scored in the 'high' category, respectively: i) Providing simple explanations 58.06%; ii) Building basic skills 48.39%; iii) Concluding 67.74%; and iv) Providing further explanations 38 .71%. Thus, it can be said that in general students' critical thinking skills in the post-test are relatively good.

Furthermore, in the pedagogical competency variable, the measurement results for each indicator are shown in Table 3. Based on the table, it can be seen that in general each indicator has been well achieved. All indicators measured are dominated by a score range of 76-100 or the 'high' category. Each achievement indicators are: i) Mastery of the characteristics of students is achieved by 20 people or around 64.52%; ii) Mastery of learning theory was achieved by 19 people or about 61.30%; iii) Mastery of the curriculum was achieved by 17 people or about 54.83%; iv) Developing the potential of students was achieved by 14 people or about 45.16%; and v) Communication with students was achieved by 17 people or around 54.83%. Thus, it can be said that in general, the pedagogic competence of Islamic religious education (PAI) students is relatively good.

Furthermore, based on the analysis of test results carried out using the N-gain formula, it is known that each variable has a different increase. Variable critical thinking skills (CTS) increase in the 'high' category was achieved by 17 students or around 54.83%. The increase in the 'medium' category was nine people or around 28.03%, while the increase in the 'low' category was six people or around 19.34%. In general, or on average, the CTS variance increased by 78.23% in the 'high' category. This means that the ex-add learning technique has an effect of 78.23% on increasing student CTS.

Table 3. Percentage of pedagogic competency improvement

Indicators	Upgrade classification	Range score	Number of students	Percentage
Mastery of student characteristics	High	76-100	20	64,52
	Moderate	41-75	6	19,35
	Low	0-40	5	16,13
	Total		31	100
Mastery of learning theory	High	76-100	19	61,30
	Moderate	41-75	8	25,80
	Low	0-40	4	12,90
	Total		31	100
Curriculum mastery	High	76-100	17	54,83
	Moderate	41-75	9	29,03
	Low	0-40	5	16,13
	Total		31	100
Development of potential learners	High	76-100	14	45,16
	Moderate	41-75	13	41,94
	Low	0-40	4	12,90
	Total		31	100
Communication with students	High	76-100	17	54,83
	Moderate	41-75	8	25,82
	Low	0-40	6	19,35
	Total		31	100

For the variable pedagogical competence (PC) the increase in the 'high' category was achieved by 16 people or around 51.61%. The increase in the 'moderate' category was 12 people or around 38.71% and the increase in the 'low' category was three people or around 9.68%. Based on the calculation of the average N-gain at 59.81% in the 'medium' category. This means that the ex-add learning technique has an effect of 59.81% on increasing student pedagogical competence. Complete data for both variables can be seen in Table 4.

Table 4. Classification and percentage increase in CTS and PC

Variables	Number of students	Number of percentages	Development percentage	Development category
CTS	17	54.83	>71	High
	9	29.03	30-70	Moderate
	6	19.34	<30	Low
Total	31	100	78.23	High
PC	16	51.61	>71	High
	12	38.71	30-70	Moderate
	3	9.68	<30	Low
Total	31	100	59.81	Moderate

Furthermore, to find out how significant the influence of the ex-add technique is, the existing data is subjected to a T-test. The test results for both variables can be seen in Table 5. Based on the table, it can be seen that viable CTS and PC obtained sig. (2-tailed) of 0.000<0.05. This means that there is an average difference between the pretest and posttest scores for each variable. In other words, it can be said that the increase in student CTS and PC after participating in learning with the ex-add technique is significant.

Table 5. One-sample test

	t	df	Sig. (2-tailed)	Mean difference	95% Confidence interval of the difference	
					Lower	Upper
CTS Pretest	11.062	30	.000	41.452	33.80	49.10
CTS Post-test	16.981	30	.000	57.581	50.66	64.51
PC Pretest	11.311	30	.000	41.935	34.36	49.51
PC Post-test	17.341	30	.000	63.903	56.38	71.43

The results of this study, namely that there is an influence of the ex-add learning technique on CTS and PC prove that this technique can be used as an alternative in developing student CTS and PC. In addition, the research results also prove that the ex-add technique with activities in the form of explain-analysis-doing-discussion effectively plays a role in increasing student CTS and PC. Each of these activities is strongly suspected of contributing to the development or improvement of student CTS and PC.

The role of each element in the ex-add learning technique is in line with previous research. Experts have conducted previous research that the elements of the activities contained in these techniques have a positive impact on learning outcomes. Harris *et al.* [43] and Sudarmika *et al.* [44] states that the element of explaining or lecturing has a positive effect on student learning outcomes. In the context of this study, it is reasonable to suspect that elements of lecture activities also have an impact on student CTS and PC. Although empirically no research specifically mentions that lecture activities have a positive effect on CTS and PC. Therefore, there is a need for further research in this regard.

The second element in the ex-add technique is analysis. Empirically, analytical activities have been shown to have a positive impact on learning outcomes. Blegur [45] in his research stated that analytical skills have a positive effect on learning achievement. Although no research explicitly states that analytical activities affect CTS and PC, reference to Phurikultong and Kantathanawat's [46] that the ability to analyze refers to cognitive or thinking activities and opinions Fiolida and Rohaeti [47] that analysis is an activity that involves the power of thought to examine something. Therefore, this is the basis for why analysis activities on the ex-add techniques are thought to play a role in increasing student CTS and PC.

The third element, namely doing activities, is also thought to play a role in increasing student CTS and PC. Some research proves that learning by doing or learning by doing effectively improves student learning outcomes. For example, Zafar and Hafeez [48] research states that the learning-by-doing approach can improve the quality of learning. Halimah *et al.* [49] also stated that learning with a learning-by-doing approach is very good learning. Therefore, it is reasonable to suspect that doing activities in the ex-add technique plays a role in increasing student CTS and PC. However, further research is needed on how the learning-by-doing approach influences student CTS and PC.

The last element in the ex-add learning technique is discussion activities. This activity is believed to play a major role in increasing student CTS and PC in this study. This refers to the results of previous research that discussion activities have a positive impact on student learning outcomes. Several studies related to this, for example, conducted by Farooq [50], found that lecture and discussion methods can effectively increase student learning activities. Other researcher also states that the discussion method has a positive correlation with student learning outcomes. Even though there has not been much research related to the direct effect of the discussion method on student CTS and PC, the results of the research above can be used as a basis for thinking.

Based on the description above, at the end of this research, it is necessary to convey several things, including the need for further research related to the positive impact of ex-add learning techniques on learning outcomes in other forms, for example, the ability to think creatively, scientific attitude, professional competence, and others. In addition, there is also a need for research related to the elements contained in the ex-add technique separately and their influence on student CTS and PC. This is meant in addition to strengthen arguments in research as well as add to the repertoire of insights regarding learning techniques and their impact on the educational process.

4. CONCLUSION

Referring to the data and discussion that has been done, it can be concluded that the ex-add technique in learning 'learning methods and strategies' course can increase CTS and PC respectively by 78.23% in the 'high' category and 59.81% in the 'high' category. This is reinforced by the results of the T-test that both variables obtain a value (2-tailed) of 0.000<0.05. This means that there is an average difference between the pretest and posttest scores for each variable. In other words, it can be said that the increase in student CTS and PC after participating in learning with the ex-add technique is significant. Therefore, as an implication of the research is that the ex-add learning technique can be used as an alternative in developing student abilities, especially in terms of critical thinking skills and pedagogical competence.

REFERENCES

[1] K. Changwong, A. Sukkamart, and B. Sisan, "Critical thinking skill development: Analysis of a new learning management model for Thai high schools," *Journal of International Studies*, vol. 11, no. 2, pp. 37–48, Jun. 2018, doi: 10.14254/2071-8330.2018/11-2/3.

[2] T. Borodina, A. Sibgatullina, and A. Gizatullina, "Developing creative thinking in future teachers as a topical issue of higher education," *Journal of Social Studies Education Research*, vol. 10, no. 4, pp. 226–245, 2019.

[3] P. A. Facione, "Critical Thinking: What It Is and Why It Counts 2020 Update," *Insight assessment*, vol. XXVIII, no. 1, p. 33, 2020.

[4] N. J. Alsaleh, "Teaching Critical Thinking Skills : Literature Review," *The Turkish Online Journal of Educational Technology*, vol. 19, no. 1, pp. 21–39, 2020, [Online]. Available: https://eric.ed.gov/?id=EJ1239945.

[5] D. Cakici, "Metacognitive Awareness and Critical Thinking Abilities of Pre-service EFL Teachers," *Journal of Education and*

Learning, vol. 7, no. 5, p. 116, 2018, doi: 10.5539/jel.v7n5p116.

[6]   J. Heard, C. Scoular, D. Duckworth, D. Ramalingam, and I. Teo, "Critical Thinking : Skill Development Framework.," *Australian Council for Educational Research*, pp. 1–23, 2020.

[7]   M. KARAKOÇ, "The Significance of Critical Thinking Ability in terms of Education," *nternational Journal of Humanities and Social Science*, vol. 6, no. 7, pp. 81–84, May 2016, doi: 10.23971/mdr.v4i1.3140.

[8]   S. - and A. Musyafa, "AM Analysis of Metacognition Ability and Critical Thinking Skills of Students in Integrated Islamic Education Institutions," *INNOVATIO: Journal for Religious Innovation Studies*, vol. 21, no. 1, pp. 1–17, May 2021, doi: 10.30631/innovatio.v21i1.124.

[9]   E. van Laar, A. J. A. M. van Deursen, J. A. G. M. van Dijk, and J. de Haan, "Determinants of 21st-Century Skills and 21st-Century Digital Skills for Workers: A Systematic Literature Review," *SAGE Open*, vol. 10, no. 1, p. 215824401990017, Jan. 2020, doi: 10.1177/2158244019900176.

[10]   H. Mohamed Nor and A. J. Sihes, "Critical Thinking Skills in Education: A Systematic Literature Review," *International Journal of Academic Research in Business and Social Sciences*, vol. 11, no. 11, p. 2020, 2021, doi: 10.6007/ijarbss/v11-i11/11529.

[11]   Maroua Rogti, "Prospects for Raising Critical Thinking Competency through Project-Based Learning in EFL Classroom," *International Journal of Studies in Education and Science*, vol. 2, no. 1, Nov. 2021, doi: 10.46328/ijses.21.

[12]   L. P, S. Sapriya, and K. Komalasari, "Development of Critical Thinking Ability Through Sets Based Learning Approach: An Action Research on Grade XI IPA 1 SMAN 5 Dumai," *Journal of International Conference Proceedings*, vol. 3, no. 1, pp. 136–149, May 2020, doi: 10.32535/jicp.v2i4.788.

[13]   F. A. Ningtiyas and Jailani, "Does Teacher's Training Affect the Pedagogical Competence of Mathematics Teachers?," *Journal of Physics: Conference Series*, vol. 1097, p. 012106, Sep. 2018, doi: 10.1088/1742-6596/1097/1/012106.

[14]   J. Sulaiman and S. N. Ismail, "Teacher Competence and 21st Century Skills in Transformation Schools 2025 (TS25)," *Universal Journal of Educational Research*, vol. 8, no. 8, pp. 3536–3544, Aug. 2020, doi: 10.13189/ujer.2020.080829.

[15]   C. K. Sahana, "Pedagogical Competence: Quality Education For Future Introduction," *International Journal of Research in Social Sciences*, vol. 8, no. 9, Mar. 2018.

[16]   S. Bayram, "World journal on educational technology: Current issues," *World Journal on Educational Technology: Current Issues*, vol. 13, no. 4, pp. 1418–1427, Jun. 2021.

[17]   J. Lohmann, J. Breithecker, U. Ohl, P. Gieß-Stüber, and H. Brandl-Bredenbeck, "Teachers' Professional Action Competence in Education for Sustainable Development: A Systematic Review from the Perspective of Physical Education," *Sustainability*, vol. 13, no. 23, p. 13343, Dec. 2021, doi: 10.3390/su132313343.

[18]   A. Madjid, F. M. Suud, and S. Bahiroh, "Teacher Competence, Commitment and Work Motivation: What Influences Performance in Yogyakarta," *International Journal of Innovation, Creativity and Change*, vol. 13, no. 11, pp. 135–147, 2020.

[19]   E. W. Prihono, F. Lapele, S. Jumaeda, S. Sukadari, and S. Nurjanah, "EFA of Pedagogic Competence Instrument to Measure Teacher Performance," in *Proceedings of the 5th International Conference on Current Issues in Education (ICCIE 2021)*, 2022, vol. 640, no. 4, doi: 10.2991/assehr.k.220129.059.

[20]   W. M. Channa and Z. Sahito, "Pedagogical Competencies Of Teachers And The Achievement Of Students: Explorations Of Best Practices Through A Literature Review," vol. 19, no. 3, p. 2022, Jan. 2022, [Online]. Available: http://www.webology.org.

[21]   X. Ji, Y. Cao, and W. Wei, "Pre-service teachers' pedagogical decisions on integrated-skills instruction in a sojourn Chinese teaching programme: The context matters," *Cogent Education*, vol. 9, no. 1, pp. 31–42, 2022, doi: 10.1080/2331186X.2022.2064602.

[22]   M. Abraham, Z. Arficho, T. Habtemariam, and A. Demissie, "Effects of information communication technology-assisted teaching training on English language teachers' pedagogical knowledge and English language proficiency," *Cogent Education*, vol. 9, no. 1, pp. 635–648, 2022, doi: 10.1080/2331186X.2022.2028336.

[23]   E. Namusoke and A. Rukundo, "Group work: effect of cooperative learning method on academic performance in English language among pupils in Universal Primary Education schools in Kashari, Uganda," *Cogent Education*, vol. 9, no. 1, pp. 234–244, Dec. 2022, doi: 10.1080/2331186X.2022.2147774.

[24]   M. Nind and S. Lewthwaite, "Methods that teach: developing pedagogic research methods, developing pedagogy," *International Journal of Research & Method in Education*, vol. 41, no. 4, pp. 398–410, Aug. 2018, doi: 10.1080/1743727X.2018.1427057.

[25]   Syahrial, Asrial, D. A. Kurniawan, and M. Subandiyo, "Pedagogic competence and Indonesian language competence pre-service teacher of elementary program," *International Journal of Scientific and Technology Research*, vol. 8, no. 10, pp. 851–856, 2019.

[26]   L. L. Mallillin *et al.*, "Strategies, Trends, Methods and Techniques of Teaching in the New Normal Learning Perspective of Students," no. July, 2021, doi: 10.36349/easjehl.2021.v04i07.001.

[27]   Y. Wen and S. Peng, "Cultivation of Students' Independent Learning Ability in Teaching Chinese as a Foreign Language Based on the CDIO Model of Guiding Data Structures and Hidden Markov Algorithms," *Security and Communication Networks*, vol. 2022, no. 2, pp. 125–132, 2022, doi: 10.1155/2022/7114217.

[28]   Q. Feng, "Research on Teaching Management Methods and Approaches of Chinese-Foreign Cooperation in Running Schools in Colleges and Universities under the Background of Big Data," *Wireless Communications and Mobile Computing*, vol. 2022, no. 14, pp. 334–346, 2022, doi: 10.1155/2022/8577550.

[29]   I. Hergan and M. Pečar, "Teaching practicum for primary teacher education students during the COVID-19 pandemic," *Tuning Journal for Higher Education*, vol. 10, no. 1, pp. 373–402, 2022, doi: 10.18543/tjhe.2278.

[30]   B. Tomak, "Evaluation of the 'Speaking' Component of a Curriculum Applied in a School of Foreign Languages: An Action Research in a State University in Turkey," *International Journal of Educational Methodology*, vol. 7, no. 1, pp. 33–51, Feb. 2021, doi: 10.12973/ijem.7.1.33.

[31]   M. R. Alnufaie, "Language Learning Strategy Instruction in Saudi Arabia: A Systematic Review," *Arab World English Journal*, vol. 13, no. 2, pp. 192–204, Mar. 2022, doi: 10.24093/awej/vol13no2.13.

[32]   L. Khalil and B. Kholofelo Semono-Eke, "Appropriate Teaching Methods for General English and English for Specific Purposes from Teachers' Perspectives," *Arab World English Journal*, vol. 11, no. 1, pp. 253–269, Mar. 2020, doi: 10.24093/awej/vol11no1.19.

[33]   Y. Zhang, "The Research on Critical Thinking Teaching Strategies in College English Classroom," *Creative Education*, vol. 13, no. 04, pp. 1469–1485, Nov. 2022, doi: 10.4236/ce.2022.134090.

[34]   S. Bashir, "Critical Thinking and Creative Thinking: Students' Reading Comprehension," *Webology*, vol. 18, no. 6, pp. 57–64, Jan. 2022, [Online]. Available: http://www.webology.org.

[35]   A. A. Mohammed Alhaj and M. H. Albahiri, "Using Pedagogic Video to Enhance English for Specific Purposes Teaching Program (ESP) for Saudi University Students: A New Prospective Approach," *Arab World English Journal*, vol. 6, no. 02, pp. 302–317, 2020, doi: 10.24093/awej/call6.20.

[36]   E. Çelik, M. Süler, A. Söylemez, and L. Koçak, "The mediating role of time attitude in the relationship between self-esteem and

resilience in high school students," *Journal of Pedagogical Research*, vol. 2, no. 1, pp. 124–132, Feb. 2023, doi: 10.33902/jpr.202317971.

[37] S. Doğan Dolapçıoğlu and G. Koşar, "An inquiry into EFL teachers beliefs concerning effective teaching, student learning and development," *Journal of Pedagogical Research*, vol. 5, no. 3, pp. 221–234, 2021, doi: 10.33902/jpr.2021371747.

[38] B. Öztürk, M. Kaya, and M. Demir, "Does inquiry-based learning model improve learning outcomes? A second-order meta-analysis," *Journal of Pedagogical Research*, vol. 6, no. 4, pp. 201–216, Nov. 2022, doi: 10.33902/JPR.202217481.

[39] M. Debebe Fikru, "Evaluating the effectiveness of 'learning by doing' teaching strategy in a research methodology course, Hargeisa, Somaliland," *African Educational Research*, vol. 8, no. 1, pp. 13–19, Jan. 2020.

[40] N. Vrabec and Ľ. Bôtošová, "The concept of learning by doing in the context of media education and school quality assessment," *Communication Today*, vol. 11, no. 1, pp. 140–14, 2020.

[41] D. W. L. Lai, X. Ou, and J. Jin, "A Quasi-Experimental Study on the Effect of an Outdoor Physical Activity Program on the Well-Being of Older Chinese People in Hong Kong," *International Journal of Environmental Research and Public Health*, vol. 19, no. 15, pp. 187–203, 2022, doi: 10.3390/ijerph19158950.

[42] Ambar Pangaribowosakti, "Implementation of Shared Type Integrated Learning to Improve Critical Thinking Skills and Learning Motivation of Vocational High School Students on the Topic of Waste in the Work Environment of the Indonesian University of Education | repository.upi.edu |," 2014.

[43] R. Harris, B. Pam Blundell–, S. Ed, and P. Madeleine, "Students' perceptions of online lecture delivery: An empirical mixed-methods investigation," *Psychology Teaching Review*, vol. 27, no. 1, pp. 69–78, 2021, doi: 10.53841/bpsptr.2021.27.1.69.

[44] P. Sudarmika, I. W. Santyasa, and D. G. H. Divayana, "Comparison between group discussion flipped classroom and lecture on student achievement and student characters," *International Journal of Instruction*, vol. 13, no. 3, pp. 171–186, 2020, doi: 10.29333/iji.2020.13312a.

[45] J. Blegur, C. P. M. Rajagukguk, A. E. Sjioen, and M. Souisa, "Innovation of Analytical Thinking Skills Instrument for Throwing and Catching Game Activities for Elementary School Students," *International Journal of Instruction*, vol. 16, no. 1, pp. 723–740, 2023, doi: 10.29333/iji.2023.16140a.

[46] N. Phurikultong and T. Kantathanawat, "Flipping the Undergraduate Classroom to Develop Student Analytical Thinking Skills," *Emerging Science Journal*, vol. 6, no. 4, pp. 739–757, Jan. 2022, doi: 10.28991/ESJ-2022-06-04-06.

[47] I. A. S. Fiolida and E. Rohaeti, "Research-oriented collaborative inquiry learning (REORCILEA): Improving analytical thinking ability of high school students in reaction rate learning," *Journal of Physics: Conference Series*, vol. 1806, no. 1, p. 202, Nov. 2021, doi: 10.1088/1742-6596/1806/1/012189.

[48] S. Nishat Zafar , Muhammad Hafeez, "A Critical Review on Discussion and Traditional Teaching Methods," *Psychology and Education Journal*, vol. 58, no. 1, pp. 1871–1886, Oct. 2021, doi: 10.17762/pae.v58i1.1042.

[49] S. Halimah *et al.*, "Effectiveness of Learning Using Online Discussion Methods Pandemic Period," *Proceedings of the 5th Progressive and Fun Education International Conference (PFEIC 2020)*, vol. 479, 2021, doi: 10.2991/assehr.k.201015.022.

[50] M. Farooq, A. Iqbal, and S. Ahmed, "Impact of Teaching Methods on Achievement Score of Students at University L...: Discovery Service," *Elementary Education Online*, vol. 20, no. 2, pp. 1090–1097, 2021, [Online]. Available: https://eds.b.ebscohost.com/eds/pdfviewer/pdfviewer?vid=1&sid=065c980c-95c9-4bce-8fe7-cb49fe414616%40pdc-v-sessmgr01.

BIOGRAPHIES OF AUTHORS

Mahfudz is a lecturer at the Teacher Training Faculty at the State Islamic University of Raden Fatah Palembang with expertise in Education. He obtained bachelor's, master's and doctor's degrees from the same campus, namely Raden Fatah Palembang-Sumatera Selatan. He has held several important research in education field, including curriculum, leadership in education, management education and other. He can be contacted at email: mahfudz_uin@radenfatah.ac.id.

Sukarno is a lecturer in Physics Education and at the postgraduate program at Suthan Thaha Saifuddin State Islamic University (UIN STS) Jambi. He is a bachelor of Physics Education from Jambi University, then continued his education in the master of Islamic Education program at UIN STS Jambi and then followed the Doctoral program in Science-Physics Education at the Indonesian Education University, Bandung, Indonesia. Several training/short courses that have been attended include: Curriculum Development 2013, Jakarta in 2015, 2016, and in 2017. Furthermore, he has also participated in the Education Leadership Training program, at Messey University, New Zealand. He has also participated in the development of the Classroom Action Research Course at the Universiti Sains Malaysia and the 21th Century Education Management Training, Brunei Darussalam. Sukarno is also the chairman of the Editorial Board of several journals in Jambi City as well as an expert at the Jambi City Education Office that is to assist in the development of the quality of teachers and experts at the Jambi Province Early Childhood Education Development Center (BP-PAUD). He can be contacted at email: sukarno@uinjambi.ac.id.