

Implementation and Challenges of Problem Based Learning in Critical Thinking Skills in Elementary Schools: A Review of Pedagogic Competencies

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Abstract

This study describes the role of teachers in terms of teachers' pedagogical abilities in implementation and the obstacles experienced in applying problem-based learning models to critical thinking skills. Research focus: 1) identify teacher planning and implementation in the application of problem-based learning models on critical thinking skills in terms of pedagogic competence. 2) Describe the challenges faced by teachers and students in the application of critical thinking skills. 3) Solutions that can be done by teachers in implementing problem-based learning models on critical thinking skills. The research method used is descriptive qualitative with data collection techniques of interviews, observations, and documentation studies. The result of this study is that teachers in planning learning objectives in RPP have not contained critical skill indicators. Teachers can empower students' critical thinking skills, as facilitators teachers can improve classroom management skills to achieve learning goals. Group discussion forums can be an alternative solution to the challenges faced by teachers and students in optimize critical thinking skills. The conclusion of this study is that pedagogic competence has an effect on optimizing the application of problem-based learning models and critical thinking skills.

Keywords: *Problem Based Learning, critical thinking skills, pedagogic competencies.*

Abstrak

Penelitian ini mendeskripsikan peran guru ditinjau dari kemampuan pedagogi guru dalam implementasi dan kendala yang dialami dalam penerapan model pembelajaran berbasis masalah terhadap kemampuan berpikir kritis. Fokus penelitian: 1) mengidentifikasi perencanaan dan pelaksanaan guru dalam penerapan model pembelajaran berbasis masalah pada keterampilan berpikir kritis ditinjau dari kompetensi pedagogik. 2) Mendeskripsikan tantangan-tantangan yang dihadapi guru dan siswa dalam penerapan keterampilan berpikir kritis. 3) Solusi yang dapat dilakukan guru dalam menerapkan model pembelajaran berbasis masalah pada keterampilan berpikir kritis. Metode penelitian yang digunakan adalah deskriptif kualitatif dengan teknik pengumpulan data wawancara, observasi, dan studi dokumentasi. Hasil penelitian ini adalah guru dalam merencanakan tujuan pembelajaran di RPP belum memuat indikator keterampilan kritis. Guru dapat memberdayakan kemampuan berpikir kritis siswa, sebagai guru fasilitator dapat meningkatkan keterampilan pengelolaan kelas untuk mencapai tujuan pembelajaran. Forum diskusi kelompok dapat menjadi alternatif solusi atas tantangan yang dihadapi guru dan siswa dalam mengoptimalkan kemampuan berpikir kritis. Kesimpulan penelitian ini adalah kompetensi pedagogik berpengaruh terhadap optimalisasi penerapan model pembelajaran berbasis masalah dan keterampilan berpikir kritis.

Kata kunci: *Pembelajaran Berbasis Masalah, kemampuan berpikir kritis, kompetensi pedagogik*



INTRODUCTION

The 21st century is marked by the application of technology and the development of science that affects life (Nuryani, Abidin, and Herlambang 2019). The advancement of 21st-century education has an effect on the quality of learning. Education is important to educate the next generation who are able to think critically, and creatively, and have character so that they can survive in global competition (Subekt et al., 2017; Zakaria et al., 2021). Quality education can develop students' critical thinking skills in learning (Ariani, 2020; Ellerton, 2022; Mislal & Mawardi, 2020).

The ability to think critically must be possessed by every student. Critical thinking is the process of analyzing statements with a focus on making conclusions about information that should be believed and done (Rachmadtullah 2018; Razak 2017; Syofyan et al. 2019). The ability to think critically is an effort to train students' cognitive abilities in solving problems that require skills to produce accurate information (Ardiyanti and Winarti, 2013; Liska et al., 2021). In fact, schools still focus on teacher-centered learning to provide information and provide students with thinking activities to solve problems during learning because teachers only provide book guidelines (L.E., 2018; Liu et al., 2016; Prime et al., 2017). Teachers choosing learning models are not in accordance with the material to be delivered so students do not understand the material well (Budiyanti et al., 2013; Jannah & Atmojo, 2022; Pratiwi & Setyaningtyas, 2020). Teachers should innovate in choosing learning models that are in accordance with the material to be taught (Nuzulaeni, I & Susansto R, 2022). A problem-solving-oriented learning model can improve students' critical thinking skills.

The problem-based learning model is a learning model that applies a scientific approach and is oriented toward problem-solving. The problem-based learning model is an effective learning model that improves communication, group work, investigating, innovation, collaboration, and individual skills (Saepuloh et al., 2021). Problem-based learning is not training students just to memorize but actively solving existing problems and gaining new knowledge (Emily E. Virtue, 2019; Mincheol Kim, 2022). The problem-based learning model makes it easier for students to understand concepts, improve critical thinking skills, and cultivate information- and knowledge-based creative talents (Sinaga et al., 2023; Hasibuan et al., 2023; Hasegawa., 2019; Minamide & Takemata, 2019; Peramunugamage et al., 2019).

One of the recommended learning models to help teachers in learning is the problem-based learning model because it makes the learning experience more real by relating learning material to students' daily life situations (Sari, 2020). Problem-based learning is a learning model in which learners attempt to solve problems using several steps of scientific methods, which allows learners to use the knowledge they gain to develop problem-solving and critical thinking skills (Syamsidah & Suryani, 2018). According to Duch (Widayanti & Nur'aini, 2020), the problem based learning learning model has special characteristics where this model uses real problems for students so as to encourage them to learn to think critically, solve problems, and gain more real knowledge from the mistakes they experience. In line with this, (Wahyuningsih, 2019) using the problem-based learning model will provide space for students to solve problems in learning that they will face. The problem-based learning model is one of the learning approaches that emphasizes scientific learning, (Fauziah et al., 2017) where students are required to actively acquire concepts by solving problems. Through the problems presented by the teacher, students use their scientific reasoning skills to develop an experiment which includes the ability to formulate problems, make hypotheses, determine variables, design experiments, analyze data, and make conclusions based on data. In the final stage of the problem-based learning model, students are expected to communicate the results of their work in front of friends and teachers, so that students are trained to argue and use their reasoning to argue scientifically.

In the implementation of the problem-based learning model, teachers must have good competency standards. Professional teachers require strong understanding and skills, willpower, and an exceptional personality. Professional teachers are also defined as teachers who are trained in taking action by rethinking every action (Putra, 2021). Efforts can be made to improve the quality of education by developing teacher competencies, namely pedagogic, professional, personality, and social (Dahlan, 2018); (Gani et al., 2018); (Jatiningsih, O et al., 2018). Regulation of the Minister of National Education of the Republic of Indonesia Number 16 of 2007 that pedagogic competence is competence in managing learning activities.

Pedagogic competence is the competence possessed by teachers in improving students' abilities. According to (Rijal, 2020); (Sumiarsih, 2015); (Syarifuddin, 2020); (Jannah 2020). Pedagogic competence relates to the teacher's ability to manage learning. According to (Hakim, 2015); and Ambarita et al. (2020) teacher pedagogic competence is the ability to apply attitudes, knowledge, and skills to the implementation and evaluation of learning and can develop student potential. The learning process and learning outcomes will be influenced by the pedagogic abilities of the teacher. Basinun et al. (2020) stated that teachers who have pedagogic competence can manage learning effectively so that the teaching and learning process takes place well and goals are achieved.

Teacher competence is essential for the quality, and development of learning. Teachers have the potential to be more creative, and innovative, and develop pedagogic abilities in the learning process. To ensure that all teachers can maximize their potential, ongoing and ongoing mentoring and guidance are needed. In learning that supports the understanding of child psychology, pedagogic competence is needed (Kartikasari et al., 2021; Susilawati, 2021). Pedagogic competence must be considered in the learning process and must be improved as part of teacher competence (Anam, 2020; Syarifuddin, 2020; Syofyan et al., 2019). Teachers must have interpersonal intelligence developed from pedagogic competence (Susanto & Anti, 2017). Pedagogical knowledge, emotional intelligence, reflective abilities, and instructional communication patterns can be used to apply pedagogic competencies both partially and simultaneously (Susanto et al., 2020). Pedagogic competence affects student achievement and student learning motivation (Wahyuningsih, 2021). According to Rosyid (2018), teacher pedagogic competence includes educational foundations, understanding of student's insights and characters, making teaching materials, making learning activities, utilizing technology, and developing students' talents, interests, and potentials.

The role of teachers is very important in developing students' critical thinking skills. In the research conducted (Yulianti & Gunawan, 2019; Uliyandari, et.al., 2021; Monalisa et.al., 2018; Kardoyo et.al., 2020), it can be concluded that there is an influence of the application of problem-based learning models on understanding concepts and critical thinking of students. In the research conducted (Nuzulaeni, I & Susansto R, 2022), there is a positive relationship between the pedagogic competence possessed by teachers and the ability to think critically. This study emphasizes the pedagogical competence of teachers in planning and implementation in facing the challenges of applying the problem-based learning model to students' critical thinking skills. Teachers can provide a positive influence on students, so they can compete competitively (Suardipa, 2020). The results of research (Duchovičová & Tomšik, 2018) teacher management in choosing strategies can influence the development of students' critical thinking. (Bezanilla et.al., 2019) teachers can use reflection and argumentation methodologies; reading, analysis and synthesis of resources; and case studies, on students' critical thinking. The existence of pedagogic competence in teachers can guide students in facing problems in the learning process. The objectives of the study: 1) identify teacher planning and implementation in the application of problem-based

learning models in critical thinking skills in terms of pedagogic competence. 2) Describe the challenges faced by teachers and students in the application of critical thinking skills. 3) Solutions that can be done by teachers in implementing problem-based learning models on critical thinking skills.

METHOD

Bagian ini disajikan jika artikel merupakan hasil penelitian (hasil kajian tidak perlu). This research uses a qualitative approach descriptive. This research was conducted at SD Negeri in Sukoharjo Regency, Central Java Province. The study was conducted for 3 months from September to November. The subjects in this study were selected by purposive random sampling, Data collection techniques can be done by observation, interviews, questionnaires and documentation (Sugiyono, 2019). According to Creswell & Guetterman (2018, hlm. 46) Qualitative research is a type of research in which the researcher relies heavily on information from the subject or participants in a broad field, the questions are general in nature, and collects data mainly from the text literature or the words of participants and subjectively interprets and analyzes the research. Observations are made in the ongoing learning process. Interviews were conducted with teachers and students related to problem-based learning models, critical thinking skills, and pedagogic competence. Questionnaires were given to teachers and students regarding responses related to the problem-based learning model, students' critical thinking skills, and pedagogic competence. Documentation can be in the form of learning implementation designs, learning process activities, and student learning outcomes. The analysis technique used is data triangulation. Data triangulation is in the form of data collection, data reduction, data presentation, and conclusion drawing (Sutama, 2019).

RESULTS AND DISCUSSION

This research was conducted on ten teachers and thirty-two in SD Negeri Sukoharjo Regency on learning by applying a problem-based learning model to critical thinking skills using the following assessment indicators and results :

Table 1. Pedagogic Competence

No	Indicator	Very lacking	Less	Usual	Good	Very good
1	Learners' comprehension ability			20%	50%	30%
2	Ability to plan learning		10%	60%	30%	
3	Learning implementation capabilities		10%	40%	50%	
4	Learning evaluation			30%	40%	10%
5	Student development		10%	40%	30%	10%

Table 2. Critical Thinking

No	Indicator	Very lacking	Less	Usual	Good	Very good
1	<i>Focus</i> (attention to one goal)			21,875%	46,875%	31,25%
2	<i>Reason</i> (able to argue)			25%	31,25%	43,75%
3	<i>Inference</i> (logical/scientific/sequential thinking)		18,75%	43,75%	37,5%	
4	<i>Situation</i> (able to use the subject matter for problem-solving)		28,125%	34,375%	25%	12,5%
5	<i>Clarity</i> (able to explain correctly)			28,125%	43,75%	28,125%
6	<i>Overtime</i> (rechecking work tasks)			21,875%	53,125%	25%

Based on conservation and interviews, research results were obtained: 1) Teachers in planning learning have not been able to develop critical thinking skills. 2) The role of the teacher as a facilitator in managing the classroom affects critical thinking skills. 3) The pedagogical ability of teachers in mastering the learning model is not optimal.

At the learning planning stage, teachers in all education units are required to prepare a complete and systematic Learning Implementation Plan (RPP) so that learning can take place interactively, inspirationally, fun, challenging, and motivate all students to participate actively, as well as provide adequate opportunities for initiative, creativity, and independence of students in accordance with their respective talents, interests, and physical and psychological development (Rukayah, 2018). In the learning implementation plan, there are no learning objectives that can develop critical thinking skills. There is still the use of indicators that focus on the ability to understand and apply. To train students' critical thinking skills, learning indicators are needed to analyze, evaluate, and create. These indicators can stimulate students' critical thinking skills in a particular subject matter. The absence of problem-solving-oriented learning also has an impact on students' critical thinking skills. Learning that coordinates problem-solving can train students to think critically in finding expected problem-solving alternatives.

As facilitators, teachers can create classroom environments that support open and reflective discussion. A classroom environment that supports the learning process can have a positive effect on the quality of learning. Teachers as facilitators can use encouraging questions to encourage critical thinking. Questions that stimulate reflection, analysis, and evaluation help students develop critical thinking skills. Lighter questions can foster critical thinking in students. Motivating students to express opinions, share ideas, and exchange views improves critical thinking skills. Teachers can also design and facilitate problem-based learning activities that are challenging and require critical thinking. Invite students to collaborate together in solving problems or projects to improve analytical and problem-solving skills.

Teachers' understanding of the problem-based learning model affects students' critical thinking skills. All teachers must have pedagogic skills because these skills include understanding students, helping students maximize their potential, and assessing student learning outcomes (Widyaningrum et al., 2019). In the problem orientation step, the teacher must provide problems that are challenging and relevant to the learning objectives that are oriented to problem-solving. On these problems,

students can be motivated to find solutions and encourage critical thinking. In the step of the problem-based learning model guiding individual or group investigations, the role of the teacher is very important, namely the teacher as a facilitator directs students to solve the problem faced with critical thinking skills. In the last step of analyzing and evaluating problem-solving, students are required to think critically about the problems faced. Pedagogical involvement is very important to expand the range of students' abilities (Supriyono, 2017; Syarifuddin, 2020; Yulyani et al., 2020). To ensure that learners can use their critical thinking skills in everyday life, teachers must continue to develop and apply the pedagogical competencies they have learned in innovative ways.

CONCLUSION

This research can conclude that: 1) In the preparation of the learning implementation design, there are no learning objectives that stimulate critical thinking skills using the problem-based learning model. 2) The pedagogic competence of teachers has not been optimal in mastering the problem-based learning model. 3) The role of teachers in classroom management in the learning process has not had a significant impact.

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