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TOP 10 21ST CENTURY SKILLS THAT CAN BE DEVELOPED THROUGH THE IMPLEMENTATION OF PROBLEM BASED LEARNING METHOD

Wahyuningsih Santosa^{1*}, Murtanto², Yuana Jatu Nilawati³, Jati Kasuma Ali⁴

^{1,2,3}Fakultas Ekonomi dan Bisnis, Universitas Trisakti

⁴Fakulti Pengurusan dan Perniagaan, Universiti Teknologi MARA Malaysia

* Corresponding Author. E-mail: wahyuningsih@trisakti.ac.id

Abstract This study aims to analyze the role of the Problem Based Learning (PBL) learning method in facilitating the development of skills that are very much needed in today's era. In this study, Problem-Based Learning (PBL) was implemented by assigning students ill-structured problems for each course topic, facilitating small-group discussions using the 7-step PBL approach, and presenting the proposed solutions in class. The study was conducted quantitatively descriptively by distributing questionnaires to 151 students and alumni of the Faculty of Economics and Business, Universitas Trisakti who carried out the learning process with the PBL method. The data collected were processed using SPSS. The results of the study indicate that PBL is an active learning method that is able to facilitate the development of student skills that are very much needed to achieve success in the 21st century. The results of the ranking of skills developed through PBL show the top 10 skills, namely cooperation skills, communication skills, negotiation and conflict management skills, analytical skills, results-oriented skills, leadership skills, decision-making skills, innovation/creativity skills, critical thinking skills, and maturity skills. With these results, it can be recommended to expand the implementation of PBL in other study programs and to provide adequate training for lecturers.

Keywords: Learning Methods, Problem Based Learning, Effectiveness, Skills.

INTRODUCTION

Higher education institutions are tasked with producing graduates capable of making meaningful contributions to business and industry, either as entrepreneurs or as professionals within their fields of expertise. This contribution can be maximized if graduates possess not only technical (hard) skills but also the soft skills increasingly demanded by the industrial sector. According to the World Economic Forum (WEF, 2020), essential soft skills such as complex problem-solving, critical thinking, creativity, and collaboration are crucial for success in today's era. Similarly, Stanley and Fallaw (2019) highlight that attributes like discipline, resilience, honesty, sociability, and leadership are key factors determining individual success. Therefore, higher education must focus on developing soft skills alongside hard skills, particularly in response to the challenges posed by the Industrial Revolution 4.0, which demands technological proficiency and adaptability.

Learning strategies significantly influence students' ability to achieve these outcomes. Choosing effective methods plays a critical role in determining how well learning objectives are met. Active learning approaches, where lecturers act as facilitators rather than traditional instructors (Santosa, 2018), are recognized as effective for fostering both hard and soft skills.

On a learning continuum, outcomes may range from simple knowledge acquisition to complex skill development required to tackle global challenges. To be competitive in the workforce or succeed as entrepreneurs, graduates must master diverse skills such as problem-solving, leadership, communication, analytical thinking, teamwork, creativity, and strategic planning (Raza et al., 2020).

Moreover, education today must shift its focus from merely achieving high grades to emphasizing holistic

development across cognitive, affective, and psychomotor domains (Santosa, 2018). Effective assessment practices and continuous feedback are critical to supporting this development, encouraging students to prioritize meaningful learning over performance alone.

In line with global trends, the Indonesian Ministry of Education and Culture (Kemendikbud, 2020) advocates for the cultivation of not just the 4Cs (collaboration, communication, critical thinking, and creativity), but also compassion and computational thinking, forming the expanded 6Cs competencies necessary for 21st-century success.

Active learning methods, including Problem-Based Learning (PBL), have become vital in nurturing these competencies. PBL requires students to collaboratively solve real-world problems, enhancing their ability to seek information, engage in meaningful discussion, and demonstrate leadership and collaboration skills (Duch et al., 2001). In this learning model, students are empowered to take responsibility for their own learning, supported by an environment that encourages participation, feedback, and critical thinking.

The objective of this study is to evaluate the effectiveness of the PBL method in developing 21st-century skills among students at the Faculty of Economics and Business, Universitas Trisakti. By analyzing the impact of PBL within the context of the Outcome-Based Education (OBE) curriculum and the Kampus Merdeka initiative, this research seeks to provide insights that can strengthen the practice of active learning. The findings are expected to contribute both to a deeper understanding of PBL's role in skill development and to practical improvements in curriculum implementation, supporting students' readiness for the Industry 4.0 era and beyond.

RESEARCH METHODOLOGY

This study adopts a quantitative research design with a descriptive approach to provide an overview of the effectiveness of PBL implementation in developing contemporary skills among students. *In this study, Problem-Based Learning (PBL) was implemented by assigning students ill-structured problems for each course topic, facilitating small-group discussions using the 7-step PBL approach, and presenting the proposed solutions in class.* The population of this study consists of current students and alumni of the Faculty of Economics and Business, Universitas Trisakti, who have experienced learning through the PBL method.

In terms of sampling, Roscoe recommends that the appropriate sample size for most behavioural research studies ranges between 30 and 500 participants (Sekaran & Bougie, 2016). Based on this guideline, the targeted sample size in this study is 175 respondents. The measurement of variables is conducted using instruments adapted from Raza (2020) and Lubis et al. (2019). Data collection was carried out through a structured questionnaire, and the collected data were analysed using SPSS software.

RESULTS AND DISCUSSION

The data collected through the distribution of questionnaires to respondents were analyzed descriptively using SPSS software to address the research objectives. From the targeted 175 student respondents, a total of 152 responses were received. However, one response was incomplete, resulting in a final dataset of 151 valid responses—representing approximately 86% of the targeted sample size. The collected data were then processed descriptively using SPSS.

Table 1 below provides a detailed profile of the respondents, including gender, respondent status (student or alumni), and year of enrollment. For alumni respondents, additional demographic questions were included, such as highest educational attainment, monthly income, and length of employment.

Tabel 1. Respondents' Characteristics

Variable	Category	Frequency	Percentage
Gender	Male	34	22.5%
	Female	117	77.5%
Status	Active Student (KU Program)	112	74.2%
	Alumni (KU Program)	39	25.8%
Year of Enrollment (Student)	2002–2016	25	16.5%
	2017	4	2.7%
	2018	12	8.1%
	2019	61	40.9%

	2020	41	26.8%
	2021	8	5.0%
Alumni: Last Education	Bachelor's Degree (S1)	29	85.29%
	Master's Degree (S2)	3	8.82%
	Doctoral Degree (S3)	1	2.94%
Alumni: Monthly Income	< 5 million IDR	9	26.5%
	5 – 9.9 million IDR	10	29.7%
	10 – 14.9 million IDR	9	23.4%
	15 – 20 million IDR	2	5.4%
	> 20 million IDR	8	21.6%
Alumni: Length of Work	< 5 years	32	82.1%
	5–9.9 years	6	15.4%
	10–15 years	1	2.6%

Based on the data presented in Table 1, the majority of respondents in this study were female, accounting for 77.4%, with the remaining 22.5% being male. This may indicate a higher level of participation among female respondents in the research. In terms of student status, most respondents were active students (74.2%), while the remaining 25.8% were alumni. Engaging alumni in research tends to be more challenging compared to involving active students. Regarding the year of enrolment, the majority of participants were from the 2019 cohort, followed by those from 2020 and 2018.

The alumni data show that most respondents held a bachelor's degree (S1) as their highest level of education, accounting for 85.29%. Alumni income data reveal that the largest percentage earned between IDR 5–9.9 million per month (29.7%). However, a comparable portion (24.3%) earned IDR 10–14.9 million, and a notable 21.6% reported monthly earnings exceeding IDR 20 million. This generally suggests that alumni from programs applying the PBL method are able to attain promising career paths and competitive income levels. Additionally, the majority of alumni had less than five years of work experience (82.1%).

Descriptive statistical analysis indicated that the average response across most items was above 4. This implies that, on average, respondents agreed with the statements regarding the role of PBL in developing their personal skills and competencies. Only one item received an average score below 4—specifically, 3.715—which indicates that respondents were moderately in agreement that PBL helps improve stress management skills. The highest-rated roles of PBL, based on mean scores, were in developing collaboration skills, analytical abilities, communication, and negotiation skills.

The findings of this study, which aimed to identify 21st-century skills fostered through PBL, show that collaboration—one of the most essential skills in today's context—was perceived as being highly developed through the PBL approach. This was followed by communication skills, which are also vital in the current era of disruption, then negotiation and conflict management, analytical skills, results-oriented thinking, leadership, decision-making, innovation, critical thinking, and maturity. These ten skills emerged as the top-ranked competencies developed through the implementation of PBL. The complete ranking is presented in Table 2 below.

Tabel 2. Ranking of Skills Developed Through PBL

No	Skill	Ranking Score	
1	Collaboration skills	91	60.3%
2	Communication skills	88	58.3%
3	Negotiation and conflict management (accepting differing opinions to reach consensus)	79	52.3%

No	Skill	Ranking Score	
		Score	Percentage
4	Analytical skills (drawing conclusions and making predictions based on information from various sources)	77	51%
5	Result-oriented skills (goal/performance achievement)	73	48.3%
6	Leadership skills	70	46.4%
7	Decision-making skills	69	45.7%
8	Innovation/creativity skills	68	45%
9	Critical thinking (identifying and analyzing credible information/knowledge to draw appropriate conclusions)	68	45%
10	Maturity (ability to behave in a mature manner)	64	42.4%
11	Self-awareness (understanding personal strengths and weaknesses)	63	41.7%
12	Attention to detail	63	41.7%
13	Management skills (planning and strategizing to achieve goals)	61	40.4%
14	Learning ability (ability to acquire and utilize knowledge/information to help complete tasks/jobs)	59	39.1%
15	Commitment to tasks/work	58	38.4%
16	Interpersonal skills	58	38.4%
17	Networking skills	56	37.1%
18	Continuous improvement skills (performing high-quality and excellent tasks/responsibilities consistently)	56	37.1%
19	Professional ethics in daily activities	55	36.4%
20	Emotional intelligence	53	35.1%
21	Cultural adaptability (working in multicultural environments)	53	35.1%
22	Stakeholder-oriented skills (focusing on stakeholders' interests)	52	34.4%
23	Life balance skill	50	33.1%

This finding indicates that the PBL method is reliable in facilitating the development of skills required for success in the workforce, as identified by credible educational institutions such as WEC (2020) and Kemendikbud (2020).

CONCLUSION

The conclusion drawn from this study is as follows: First, Problem Based Learning (PBL) is an active learning method that effectively facilitates the development of skills essential for the 21st century. Second, based on the ranking of skills developed through PBL, the top 10 skills that can be cultivated through PBL are: first, teamwork skills; second, communication skills; third, negotiation and conflict management skills (accepting differing opinions to reach a consensus); fourth, analytical skills (making conclusions and

predictions using information from various sources); fifth, result-oriented skills (goal/performance achievement); sixth, leadership skills; seventh, decision-making skills; eighth, innovation/creativity skills; ninth, critical thinking skills (the ability to identify and analyze credible information/knowledge to draw conclusions that align with objectives); and tenth, maturity skills.

Furthermore, the recommendation is to expand the application of PBL to other study programs within the university. This also requires effective training to ensure that the implementation of PBL is of high quality and maximizes the achievement of its learning objectives.

Recommendations for further research:

1. The number of respondents and the scope of the study can be expanded to achieve more comprehensive results.
2. Future research could be conducted to examine the effectiveness of other teaching methods.
3. Research variables and analytical methods can be broadened by incorporating hypothesis testing to examine the relationships between variables

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