

## Social science education students' preparedness for problem-based hybrid learning

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### ABSTRACT

This research aims to investigate social science education students' preparedness before they attend problem-based hybrid learning (PBHL). This research is quantitative research with an explorative survey method conducted on college students taking Social Science Education Program in Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia. The participant of this study were 118 students, subsisting of 32 male and 86 female students. This research used a questionnaire with a 1-4 Likert scale as an instrument to measure students' readiness, weighted from their motivation, prospective behavior, and information and communication technolog (ICT) skills. The data collection process was carried out through Google Form in April 2020. This research used descriptive quantitative analysis to discover students' preparedness and one-way ANOVA to identify the effect of gender type to the students' preparation in PBHL. The results of this research show that social science education students' preparedness (motivation, prospective behavior, and ICT skills) in PBHL is classified high, namely in the B+ category. Furthermore, the gender type has no significant effect on students' preparedness for PBHL ( $p > 0.05$ ). Recommendation based on the research result is the university has to facilitate easy internet access, such as by accelerating the bandwidth, internet connection, and promote other policies that support PBHL.

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## 1. INTRODUCTION

Problem based learning (PBL) is one of the innovative learning models in authentic problem-solving. This model was first introduced by Howard Barrows and implemented to medical students of McMaster University School of Medicine [1], [2]. This problem-based learning model emphasizes the interaction between students and the environment [3], [4]. PBL model has superiority in improving competencies, such as analytical thinking skills [5], problem-solving ability [6], [7], spatial thinking skills [8], and disasters education skills [9]. Further, PBL also accelerates students' ability to collaborate [10], [11], communicate [12], think creatively [13], [14], and think critically [15]. Therefore, the implementation of PBL fits 21st-century learning.

Information and communication technology (ICT) brings a challenge for this 21st-century learning. This learning demands students to have mastery in technology, media, and information, as well as learning, innovation, life, and career skills [16]. Thus, a change in the education field that combines learning models and 21st century information technology is required.

Currently, the e-learning system is mostly used by many universities. E-learning advances learning effectiveness, and flexibility also enhances the quality of interactive learning between lecturers and students [17]. Additionally, e-learning and blended learning also boost learning results [18], [19]. This reasonable effort is performed to accommodate the students' skills demanded in the 21st century, including social science education students as prospective teachers in the digital era [20]. Even if e-learning is appropriate for the current information and technology era, yet it possesses weaknesses in the learning process. One of that weaknesses is it limits the interaction between students, as well as the interaction between students and lecturers [21]–[23].

This narrow interaction hinders the formulation of values in learning. Thus, this brings up the need for a model that incorporates face to face and online learning, known as hybrid learning (HL). Hybrid learning is the expansion of blended learning concepts, with 30-79% online learning, and the rest becomes face-to-face learning [24]. This face-to-face and online learning combination resolve the shortcoming of online learning [25]–[29]. One of the learning implementation that associates face-to-face and online learning is problem-based hybrid learning (PBHL) model. PBHL learning is conducted through the PBL platform that regards its design, presentation, support, and evaluation [30]. During the PBHL learning, students find problems, collect data, present the investigation results, and analyze the solution. These steps were completed in a small group that creates online and face-to-face synchronous or asynchronous discussions. Consequently, to smoothen the implementation of PBHL, information on students preparedness before PBHL learning is required [31].

The demand for 21st-century information and communication technology becomes an essential rationale for PBL model-assisted hybrid learning implementation. This combination is expected to strengthen its constructive effect on learning. This PBL model was implemented in the PBHL model to minimize its weaknesses. The first weakness is students face difficulties due to they have not been accustomed to group discussion to solve a problem [32]. Thus, they need an adaptation period to PBL [33]. Second, students face challenges in the final assessment since the PBL learning traps students to only focus on the problem-solving process, resulting in limited theory mastery [34], [35]. Third, PBL requires more time, both in the preparation and implementation, primarily in the discussion and presentation stage [35], [36]. Lastly, teachers and lecturers encounter difficulties in planning PBL [35].

Empirically, PBHL carries a positive impact on the learning results that resolve the weaknesses of PBL. Results of a study conducted by McCall [37] conclude that problem-based blended learning is sufficient to be implemented to accelerate students' learning results. It is also supported by research carried out by Zamroni *et al.* [38] that proves PBL and blended learning bring better learning results in cognitive, affective, and psychomotor aspects. Further, a study from Yennita and Zukmadini [39] explains that the implementation of problem-based learning with blended learning affects students' critical thinking skills. Carrió *et al.* [40] also state that hybrid-problem based learning gives a more challenging, motivating, and fun approach for education. The application of blended and problem-based learning, primarily the ones using a website, is feasible to be used in tutorial learning for college students [41]. In the other hand, Salari *et al.* [42] conducted a comparison between pure PBL (PPBL) and hybrid PBL (HPBL). The results of that research discover that HPBL is more effective than PPBL in learning. The elements that construct PBHL, such as PBL and HL, are expected to deliver their advantages and resolve the existed weaknesses. Thus, PBHL is expected to carry more benefits. Students' preparedness to attend PBHL is critical to be comprehended to develop a proper strategy in implementing the model.

Students' preparedness in the PBHL class should be considered before the course is started. The readiness of prospective social science educator students becomes the determinant of PBHL model success. Theoretically, students are habituated to work in a group, solve issues in the courses, use internet facilities; thus, their preparedness for the PBHL model is higher [43]. However, the relation between students' habits and their preparation for PBHL needs to be empirically proven. Readiness can be measured from the level of awareness, culture, technology, pedagogy, and material [44]. Besides, internet access skills, motivation in online learning, online literacy, along with online discussion and conversation, should also be examined [45]. Therefore, to support the implementation of PBHL, a comprehension of students preparedness is demanded [46].

This research aims to investigate social science education students' readiness before attending PBHL learning. This is essential to ensure a stable implementation of PBHL, with no hindrances. The success of PBHL is decided by motivation, prospective behavior, and ICT skills in online learning.

## 2. RESEARCH METHOD

This research is a quantitative research using explorative survey method, conducted in an even semester of 2019-2020. The research subjects were 118 students, consisting of 32 male and 86 female students, from Social Science Education Program, Faculty of Tarbiyah and Teacher Training, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia. These respondents were randomly chosen from 154 fourth semester students taking social geography course.

A questionnaire was used as an instrument in this research to measure students' readiness. The questionnaire was adapted from Xiong *et al.* [47]. The questionnaire subsists of statements adjusted to indicators of students' preparedness in PBHL. The first indicator is the motivation aspect, with 16 items that cover interest, perception, self-efficacy, and reinforcement. The second indicator is prospective behavior with 12 items that comprise of communication, problem-solving, and self-management. The third indicator is ICT skills, with eight items that encompass comfort and skills in ICT usage. Further, the students were asked to choose the 1-4 Likert scale for each statement in that questionnaire. Score 1 represents extreme disagreement; score 2 means argument; score 3 means agreement, and score 4 means extreme agreement. The validity of this instrument has been tested through a product-moment correlation, while its reliability has been tested using Cronbach's Alpha. The results of the instrument test show that its items are valid and reliable as presented in Table 1.

Table 1. Results of instrument validity and reliability test

Indicator	Sub-indicator	Pearson Correlation	Cronbach's Alpha	r Table	Classification
Motivation	Interest	.654	.945	.339	Valid and reliable
	Perception	.562	.945	.339	Valid and reliable
	Self-efficacy	.508	.946	.339	Valid and reliable
	Reinforcement	.617	.945	.339	Valid and reliable
Prospective behaviour	Communication	.548	.945	.339	Valid and reliable
	Problem solving	.558	.945	.339	Valid and reliable
	Self-management	.538	.946	.339	Valid and reliable
ICT skills	Skills in ICT usage	.681	.944	.339	Valid and reliable
	Comfort on ICT usage	.674	.945	.339	Valid and reliable

The data collection process was carried out using Google Form application in April 2020. This method was chosen since it is more efficient to collect data during the implementation of learning from a home policy from the Indonesia Ministry of Education due to the rapid spread of the Corona 19 virus in Indonesia. This research used a descriptive analysis method to reveal the score, average, standard deviation, the maximum and minimum score for each indicator. Further, the level of students' motivation, prospective behavior, and ICT skills are categorized based on score, as presented in Table 2.

Table 2. Category of motivation, prospective behaviour, and ICT skills level

Score interval	Alphabetical score	Numerical score (Scale 4)	Category
85 ≤ Score ≤ 100	A	4.0	Very high
75 ≤ Score < 85	B+	3.5	High
70 ≤ Score < 75	B	3.0	Moderate
65 ≤ Score < 70	C+	2.5	Low
60 ≤ Score < 65	C	2.0	Very low
50 ≤ Score < 60	D	1.0	Very low
0 ≤ Score < 50	E	0.0	Very low

Source: UIN Maulana Malik Ibrahim Malang [48]

In addition, one-way ANOVA analysis was used to see the effect of different gender toward the score in each indicator. Before the one-way ANOVA analysis, a normality test using the One-Sample Kolmogorov-Smirnov Test and homogeneity test using Levene's Test had been conducted. The statistic analysis test was assisted SPSS Statistics 22 program.

The hypothesis tests for indicator motivation, prospective behavior, and ICT skills are: i) H0: no difference in students' motivation, prospective behavior, and ICT skills in PBHL, seen from the gender type; and ii) H1: there is a difference in students' motivation, prospective behavior, and ICT skills in PBHL, seen from the gender type. Meanwhile, the criteria for decision making are if the significance value  $\geq 0.05$ , then H0 is accepted. If the significance value  $< 0.05$ , then H0 is rejected.

### 3. RESULTS AND DISCUSSION

#### 3.1. Students' preparedness in PBHL

The motivation, prospective behavior, and ICT skill score of social science education students in PBHL are shown in Table 3. The table shows that the highest and lowest average score of social science students on motivation indicators in PBHL is obtained by perception and self-efficacy, respectively. Generally, social science education students' motivation is categorized high, in all sub-indicators. In addition, the highest and lowest average score of social science students' on prospective behavior indicators in PBHL is gained by communication and self-management, respectively. The level of prospective behavior of social science education students in PBHL is classified as high on sub-indicator communication and problem-solving; meanwhile, sub-indicator self-management is categorized as moderate.

Table 3. Results of descriptive analysis on motivation, prospective behaviour, and ICT skills score

Indicator	Sub indicator	N	Minimum	Maximum	Mean	Std. Deviation	Category
Motivation	Interest	118	38	100	80.14	12.110	High
	Perception	118	38	100	84.90	11.709	High
	Self-efficacy	118	38	100	75.32	12.144	High
	Reinforcement	118	44	100	82.10	11.021	High
Prospective behaviour	Communication	118	31	100	84.27	12.810	High
	Problem solving	118	44	100	76.54	11.438	High
	Self-management	118	44	100	74.63	12.481	Moderate
ICT skills	Skills on ICT usage	118	50	100	85.91	13.156	Very high
	Comfort on ICT usage	118	31	100	69.60	15.438	Low

Besides, the highest and lowest average score of social science students' on ICT skills indicator in PBHL is attained by skills on using ICT and comfort in using ICT, respectively. The ICT skills level of social science education students in PBHL is grouped as very high in sub-indicator skill and low in sub-indicator comfort in using ICT. According to results on the analysis of each indicator, the social science education students' preparedness scores in PBHL are presented in Table 4.

Table 4. Results of descriptive analysis of students' preparedness score

Indicator	N	Minimum	Maximum	Mean	Std. Deviation	Category
Motivation	118	45	100	80.62	9.398	High
Prospective behaviour	118	52	100	78.48	9.580	High
ICT skills	118	44	100	77.76	11.154	High

Table 4 reveals that the preparedness of social science education students in PBHL is classified as high on all indicators. The comparison of the average score on each indicator is illustrated in Figure 1. The figure presents that the highest average score on social science education students' preparedness in PBHL is in motivation (80.62), while the lowest average score is in ICT skills (77.76).

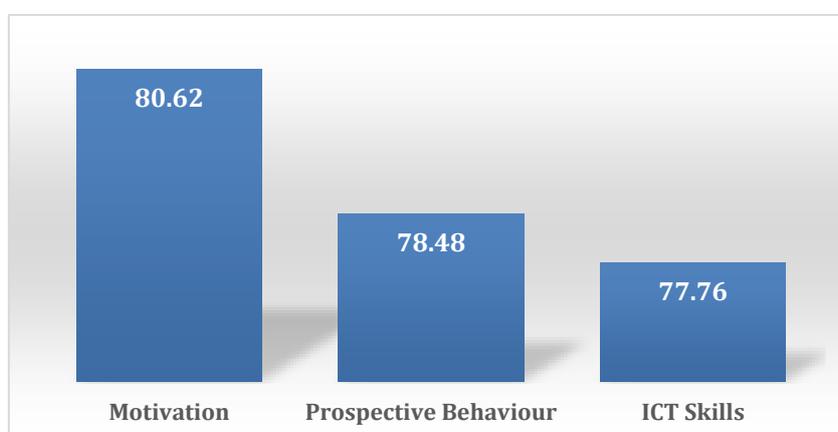


Figure 1. Average score of students' preparedness

The level of social science education students' preparedness in PBHL is classified as high. This is concluded from the category of each readiness indicator based on assessment criteria used in UIN Maulana Malik Ibrahim Malang are categorized as B+ category. Thus, the PBHL model is expected to be implemented in social science education classes with no obstructions.

Two essential elements support the success of PBHL implementation, which is students' classroom learning experience and their ICT usage [31]. Classroom learning experience comes from various models applied by lecturers in the learning process. Besides, students' involvement in using ICT is one of the manifestations of the millennial generation who generally has been familiar with computers and the internet. Therefore, social science students, as the millennial generation, have commonly adapted to ICT usage. All of these factors simultaneously improve their mental function, so students' preparedness is established.

The results of the study conducted by Horzum *et al.* [49] discover that ICT skills effectively predict academic motivation in accelerating online learning. Recently, students frequently look for online references to finish their task, then send it through email [50]. This activity involves ICT skills, including necessary skills in operating technology, access easiness, as well as interacting using technology [46]. Students possess excellent skills in technology-based learning and have great technical skills required in technology operation [51]. Additionally, Xiong *et al.* [47] state that the online learning ability subsists of two aspects, ICT skills and the comfort in attending online learning. These two aspects can be sharpened through frequent usage of the internet to gain a positive impact on the performance [43].

In addition, students' readiness in PBHL is one of the critical aspects to be considered. The students are in the high mental function when they are ready to follow the classroom learning and obtain new concepts [52]. Later, students' preparedness also generate bravery to do and create something new, especially when they get support from the institution and cultural changes [53], [54]. Institutional supports and cultural differences are significant in deciding students' readiness in the learning process. Further, to support the exceptional PBHL implementation, the pedagogy students' preparedness and accessibility should be a balance [55].

### 3.2. Effect of different gender on students' motivation, prospective behaviour, and ICT skills in PBHL

The results of the normality test on motivation, prospective behavior, and ICT skills are shown in Table 5. Based on the table, the results of data normality test are: i) The score of indicator motivation is  $\text{sig.}=0.434 > \alpha=0.05$ , meaning that the motivation data has a normal distribution; ii) The score of the prospective behavior indicator is  $\text{sig.}=0.272 > \alpha=0.05$ , signifying that the prospective behavior data has a normal distribution; iii) The score of the ICT skills indicator is  $\text{sig.}=0.092 > \alpha=0.05$ , implying that the ICT skills data has a normal distribution.

Table 5. Results of normality test

Indicator	N	Mean	Std. Deviation	One-Sample Kolmogorov-Smirnov Test	
				Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
Motivation	118	80.62	9.398	.871	.434
Prospective behaviour	118	78.48	9.580	.998	.272
ICT skills	118	77.76	11.154	1.241	.092

Results of the data homogeneity test on motivation, prospective behavior, and ICT skill are presented in Table 6. According to the data, the results of homogeneity test are: i) The score of motivation indicator is  $\text{sig.}=0.041 < \alpha=0.05$ , suggesting that the motivation data has no homogenous variation; ii) The score of the prospective behavior indicator is  $\text{sig.}=0.708 > \alpha=0.05$ , implying that prospective behavior has homogenous variation; iii) The score of the ICT skills indicator is  $\text{sig.}=0.776 > \alpha=0.05$ , signifying that the ICT skills data has homogenous variation.

Table 6. Results of homogeneity test

Indicator	Levene statistic	df1	df2	Sig.
Motivation	4.284	1	116	.041
Prospective behaviour	.141	1	116	.708
ICT skills	.081	1	116	.776

The data on motivation, prospective behavior, and ICT skills were analyzed using one-way ANOVA. The summary of the results of one-way ANOVA is presented in Table 7. Based on the table, the

results of the one-way ANOVA test are: i) The score of motivation indicator is  $\text{sig.}=0.608 > \alpha=0.05$ , meaning that there is no difference in students' motivation in PBHL, seen from the gender type; ii) The score of the prospective behavior indicator is  $\text{sig.}=0.769 > \alpha=0.05$ , indicating that there is no difference in students' prospective behavior in PBHL, seen from the gender type; iii) The score of ICT skills indicator  $\text{sig.}=0.808 > \alpha=0.05$ , representing no difference of students' ICT skills in PBHL, seen from the gender type.

Table 7. Results of one-way ANOVA analysis

Indicator	Sum of Squares	Between groups		F	Sig.
		df	Mean Square		
Motivation	23.577	1	23.577	.265	.608
Prospective behaviour	8.048	1	8.048	.087	.769
ICT skills	7.407	1	7.407	.059	.808

According to the analysis, the conclusion that can be made is gender difference brings no significant effect on social science education students' motivation, prospective behavior, and ICT skills in PBHL. Both male and female students demonstrate high preparedness in PBHL. There is no students' different preparedness level in PBHL, reviewed from gender type. According to the results of one-way ANOVA analysis, different gender type carries no significant effect on social science education students' readiness to attend PBHL. The preparedness of female and male students relies on their motivation, prospective behavior, and ICT skills.

Students' motivation on blended face-to-face and online learning is not affected by gender type, but they are affected by their behavior on technology usage, beliefs in technology usage, and decreased technology anxiety [56]. Motivation contributes to students' knowledge management and self-management in an online learning context [57]. Besides, motivation is also presumed to affect students' performance, primarily on the small-group discussion in PBL [58]. Motivation becomes the factor that predicts students' preparedness in learning [59]. Other than that, motivation also contributes to online learning success and satisfaction in universities [60]. It also turns into a factor that determines students' persistence and improves students' behavior in the classroom [61].

The results of this research reveal that gender type brings no significant effect on prospective behavior. The prospective behavior that supports students' preparedness in PBHL covers the habits in using ICT and collaboration. The practices of using ICT is closely related to the internet-based learning process. This practices that transform into students' pattern in the information era has the potential to support readiness in PBHL [50]. Besides, the habits of using the internet contribute to the development of online communication and collaboration outside the class [62]. Further, the collaboration practices are also associated with the social skill to attain collected purposes in group discussion. The collaboration culture gained from classroom discussion learning also contributes to students' preparedness in PBHL class [63]. PBL trains students to solve problems in a group, be responsible for it, as well as communication and collaboration during the process of solving the problem.

#### 4. CONCLUSION

The results of this research show that students' ICT skills in PBHL learning carry no differences, seen from the gender type. The expertise in using ICT is a significant factor of preparedness in online learning, as proven by the results of this research that classified as very high. Generally, social science education students' preparedness in PBHL is classified as high. At the same time, the gender difference brings no significant effect on social science students' readiness in PBHL. Based on the results of this research, some recommendations are concluded. First, the implementation of PBHL does not require a consideration of different gender types since it has been proven to bring no significant effect on students' readiness. Second, the university has to facilitate easy internet access, such as by accelerating the bandwidth, internet connection, and promote other policies that support PBHL.

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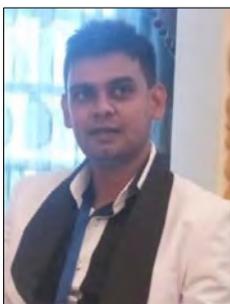
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