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Student need analysis of problem-based learning model with blended learning in EFL academic reading

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ABSTRACT

This research aimed to provide a detailed description and identify the students' need to develop an English as Foreign Language (EFL) academic reading learning model using the problem-based learning (PBL) approach and blended learning (BL). The study employed a survey research method and was conducted at the English education study program of Universitas Muhammadaiyah Mataram and Universitas Pendidikan Mandalika. The participants comprised 116 students, who responded to a questionnaire of 77 items representing 11 variables of the study. The results show that participants required reasonable learning goals and topics in EFL academic reading and exercises, from comprehension to evaluation. An individual or group assessment was performed at the end of each topic. Syntaxes of the model started with a review of the previous topic and ended with reflection and evaluation. Blended Learning (BL) was applied for the reinforcement of learning, while the learning system was undertaken by making students a learning subject, not a learning object. This system was rejected by the service process disregard to the background. The support system was however suitable to student needs. This study implies that student learning was influenced by their problem-solving skills, and the companion was influenced by communication, collaboration, creativity, leadership, and team management skills as well as attitude to accept others' opinions.

Contribution/Originality: This study discovered that students required appropriate learning purposes for EFL academic reading using various topics. A new step in the syntax of PBL model was also found which requires a BL approach wherein teacher prepare reading text to find problems.

1. INTRODUCTION

Reading is a process of constructing meaning from a text that entangles several strategies to effectively comprehend, synthesize, and communicate information (Maher & Shehata, 2017). Reading is also defined as a process that involves a set of complicated and interrelated activities (Baker, Bangeni, Burke, & Hunma, 2019) to comprehend a linguistic text that significantly helps students achieve successful higher education (Yapp, de Graaff, & van den Bergh, 2021) or academic goals (Baker et al., 2019). Sharma et al., (2019) point out that reading is an essential component of a learning process, especially before class, because it increases students' performance, develops their class participation, and improves their compression of the presented information. One type of reading is academic reading.

Academic reading is undoubtedly an imperative ability in higher education (Kimberley & Thursby, 2020; Liu & Read, 2020), considered a scholarly activity for students to participate in a university (Yapp et al., 2021), and concerns a text assigned as a part of the academic lesson (Desa, Howard, Gorzycki, & Allen, 2020). Academic Reading has become a subject of a small but growing area of interest (Baker, 2018), is characterized by the utilization of a more formal tone, content intricacy, and a degree of impersonality in the position of the author (Muñoz & Valenzuela, 2020), and takes place in academic settings (Taghizadeh & Khalili, 2019). In the academic reading course, the students practice reading and vocabulary acquisition strategies, identify distinct text types, elicit and save literary source texts, and analyze the structure of journal articles, consisting of introduction, methods, results, and discussion (IMRD) (Yang & Spitzer, 2020).

Academic reading is distinct from other forms of reading (Maguire et al., 2020; Maher & Shehata, 2017; Sohail, 2015) because it is complicated and discipline-specific. It encompasses a measured, challenging, and multifaceted process in which students are dynamically engaged with various reading strategies (Sohail, 2015). Another reason for the distinction of reading is that readers must be critical, could understand the author's intention, and could evaluate the text's worthiness (Maher & Shehata, 2017). Academic reading is also focused, complex, challenging, and discipline-specific, and each reading text is dissimilar (Maguire et al., 2020). Desa et al. (2020) put forwards that academic reading and the advancement of college reading abilities from beginners to experts are not gained automatically but through continuous processes carried out by readers. Therefore, practices to understand academic reading is believed to assist students and researchers to effectively utilize available research papers and books and succeed in academic reading (Maher & Shehata, 2017). The reading success is influenced by three factors: readers' characteristics, properties of texts, and demands for the reading tasks bound within sociocultural contexts (Rahman, 2020).

In academic reading, general comprehension is influenced by four factors (Liu & Read, 2020). The first is reading efficiencies, such as terrible reading experiences, ineffective reading habits or methods, and complex reading material. The second is the comprehension of unfamiliar words, complicated language, challenging material, writing styles of an author, complicated sentence structures, lack of background knowledge, strange text structures, cultural differences in text structures, failure to integrate information within the text, psychological disorders, limited general reading experiences, time constraints, insufficient exposure to English, little experience with academic texts, and dense information. The third is the information evaluation and intertextual model building, such as comprehension problems and uncritical reading. The fourth is the length or number of texts.

A previous study by Afdal et al. (2022) investigated how academic reading, as a social practice, can increase various aspects of the academic literacy of undergraduate students. Moreover, Afdal et al. (2022) explored the role of vocabulary mastery in the performance of second language learners when taking an International English Language Testing System (IELTS). Additionally, Chen and Liu (2020) as well as Liu and Read (2020) surveyed general academic reading in a university in China and utilized questionnaires and in-depth analysis to explore students' skill requirements and difficulties. Before the 2000s, most researchers on academic reading focused on investigating students' learning via text and describing the relationship of approaches, conceptions, and outcomes (Afdal et al., 2022).

Furthermore, Liu and Read (2020) focused on examining the needs and challenges of general skills for academic reading at a university level. They discovered five crucial academic reading skills for students. The first was comprehension skills, such as comprehending the text's aims, main ideas, the author's intentions, implied meaning, general comprehension, and integrating information within the text. The second was linguistics and discourse knowledge, including word recognition, grammar, discourse structures, vocabulary, language knowledge, and spelling. The third was reading strategies and efficiency, including skimming, scanning, extracting necessary, helpful, or relevant information efficiently, reading closely, tolerating specific comprehension failures, inferring the meaning of words or sentences from contexts, reading with a purpose, reading strategically, and making

predictions. The fourth was affective factors, consisting of attention, motivation, and concentration. Finally, the fifth was critical reading, information reconstruction skills, and intertextual model building, such as paraphrasing a sentence, critically evaluating or criticizing information, integrating information from multiple texts, and discussing, expressing, and constructing ideas or meanings. Therefore, the researchers consider that a gap still exists because reading academics using the problem-based learning (PBL) model has not been widely investigated.

PBL is a student-centered learning model and is initiated by presenting an ill-structured problem to solve. PBL has potentially multiple solutions possibly applied to educators who guide learners with metacognitive questions and encourage them to actively construct knowledge by defining learning goals, seeking information to build prior knowledge, reflecting on the learning process, and participating in active group collaboration (Moallem, Hung, & Dabbagh, 2019). PBL is a learning model that potentially links many problems in everyday life (Faqiroh, 2020). In PBL, students are expected to spend more time studying alone or with their classmates than studying under the instruction of an educator; therefore, lecturing should be limited, and access to quality learning resources should be guaranteed (Moallem et al., 2019).

The core characteristics of PBL are student-centered learning through small group discussions and collaborative learning. As a facilitator, an educator presents real problems to establish education. The problem is also utilized to achieve the required knowledge and problem-solving skills, and new information is acquired through self-directed learning (Zwaal, 2019). Meanwhile, Vleuten and Schuwirth (2019) point out four characteristics of PBL; they are the use of engaging tasks or problems as a starting point for learning, conducting self-directed and self-regulated learning, working in groups of learners to tackle tasks, and performing the role of teachers who facilitate this process.

Learning through PBL consists of five stages: integrating students into the problem, organizing students to learn, guiding the investigation, developing and presenting the work, as well as analyzing and evaluating the problem-solving process (Arends, 2004; Khoiriyah & Husamah, 2018; Strobel & Van Barneveld, 2009). Another stage for implementing the PBL model is presenting the problem to students by an educator. The students identify the problem, search for information from various sources to solve the problem, and choose the most appropriate solution to solve the problem; meanwhile, the educator evaluates the work of the students (Saputra et al., 2019).

The PBL model has many advantages, such as significantly impacting social science and learning outcomes (Permatasari, 2019), increasing learning achievement and understanding (Doymus, 2008), developing critical thinking skills (Saputra et al., 2019), and improving learning quality (Nurtanto, Fawaid, & Sofyan, 2020). This current study focuses on investigating the PBL model with blended learning (BL).

BL is a learning model that mixes synchronous and asynchronous activities (Heilporn et al., 2021). BL is also described as integrating face-to-face instruction with online learning (Castro-Gil & Correa, 2021). BL is considered a new information technology-assisted teaching model in the twenty-first century, which generally combines traditional face-to-face with online learning (Liu, 2021). BL is fascinating because it potentially optimizes students' learning engagement (Halverson & Graham, 2019; Manwaring, Larsen, Graham, Henrie, & Halverson, 2017), improves their learning performance, and significantly changes their writing (López-Pellisa et al., 2021). This study focuses on investigating the need analysis of the PBL model with BL in EFL academic reading.

Need analysis refers to a technique for gathering and assessing appropriate information for a learning design (Hyland, 2006). Needs analysis is also defined as identifying what learners should do when learning a foreign language in the target situation and how they could master the target language during the learning period (Kim, 2013). Need analysis is conducted to establish what and how a course is learned (Flowerdew, 2012). Need analysis is the first stage to design a PBL model with BL in EFL academic reading. The following stages are learning model design, material selection, methodology, assessment, and evaluation.

This study aims to comprehensively describe and identify the need for a PBL model along with BL in EFL academic reading. This model was utilized as a reference to design a learning model suitable for students' needs, not the researchers' wishes.

2. METHOD

This study was conducted at the English Education study programs of Universitas Muhammadiyah Mataram and Universitas Pendidikan Mandalika. The respondents were 116 students who were studying or had completed EFL reading academic courses in the English education program. These respondents consisted of 53 males and 63 females. The instrument to collect the data comprised eleven variables and 77 statements in a questionnaire. The data were analyzed using a quantitative research approach.

3. RESULTS AND DISCUSSION

The results of this study can be classified into eleven variables of need: learning objectives, topics, exercises, assessment, the syntax of problem-based learning models, blended learning, social system, reaction system, support system, learning impact, and companion impact.

3.1. Learning Objectives

The variable of learning objectives consisted of four statements, as presented in Figure 1.

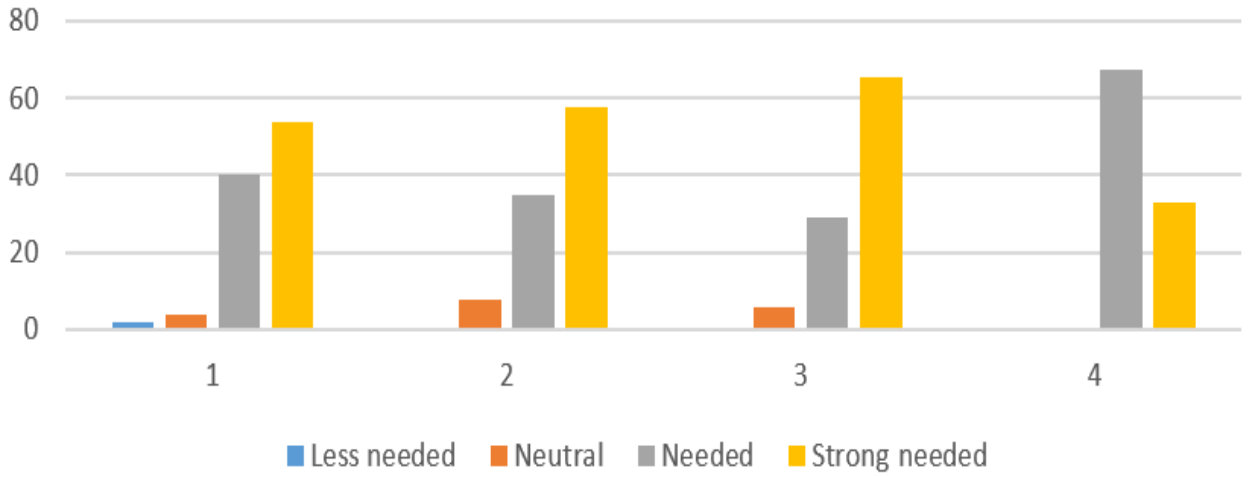

Figure 1. Learning objectives.

Figure 1 shows that respondents answered Statement 1 about the need for understanding academic reading concepts. A total of 53.8% of respondents answered that understanding the concept of academic reading was strongly needed, 40.3% stated that this understanding was needed, 3.9% showed a neutral opinion, and 1.9% stated that this understanding was less needed. The Statement 2 was about the need for critical thinking skills to find problem-solving skills. 57.7% of the respondents responded that this skill was strongly needed, 34.6% responded that this skill was needed, and 7.7% showed a neutral opinion. The statement 3 was about the need for understanding English reading texts. 65.4% of the respondents responded that this understanding was strongly needed, 28.9% responded that this understanding was needed, and 5.8% showed a neutral opinion. Finally, the statement 4 was about the need for strategies to enrich students' mastery of English vocabulary topics. 32.7% of the respondents believed that this mastery was strongly needed, and 67.3% responded that this mastery was needed.

3.2. Topics

The second variable of topics comprised ten statements, as presented in Figure 2.

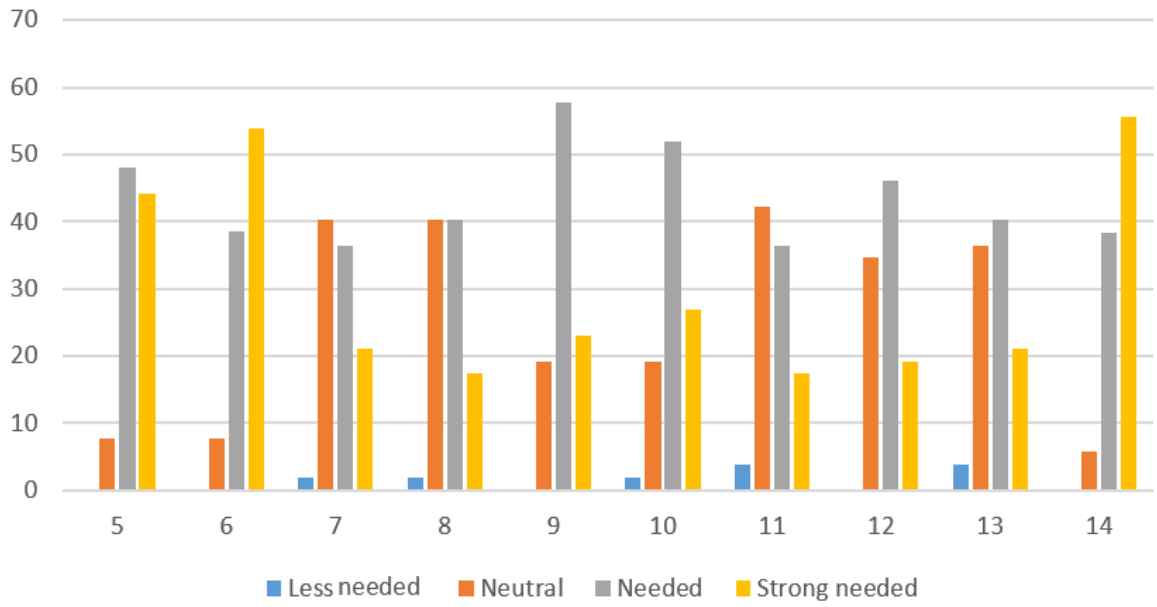

Figure 2. Topics.

Figure 2 presents that statement 5 received 44.2% of the respondents strongly needing learning topics about language skills, 48.1% needing learning, and 7.7 % showing a neutral opinion. Meanwhile, the data on Statement 6 denotes that 53.8% of the respondents strongly need learning education topics, 38.5% need learning, and 7.7% show a neutral opinion. The data on Statement 7 shows that 21.1% of the respondents strongly need a learning political topics, 36.6% need learning, 40.4% show a neutral opinion, and 1.9% need less learning. The data on statement shows that 17.3% of the respondents strongly need to learn economics topics, 40.4% need learning, 40.4% show a neutral opinion, and 1.9% less need the learning.

Data on statement 9 shows that 23.1% of the respondents strongly need to learn social topics, 57.7% need learning, and 19.2% show a neutral opinion. Data on statement 10 show that 26.9% of the respondents strongly need to learn cultural topics, 51.9% need learning, 19.2% show a neutral opinion, and 1.9% less need the learning. Data on number 11 show that 17.3% of the respondents strongly need to learn sport topics, 36.6% need the learning, 42.3% show a neutral opinion, and 3.8% less need the learning. Data on number 12 show that 19.2% of the respondents strongly need learning environmental topics, 46.2% need the learning, and 34.6% show a neutral opinion. Data on number 13 show that 21.2% of the respondents strongly need to learn health topics, 40.4% need the learning, 36.6% show a neutral opinion, and 3.8% less need the learning. Meanwhile, data on number 14 show that 55.8% of the respondents strongly need to learn technological topics, 38.8% need the learning, and 5.4% show a neutral opinion.

3.3. Exercises

The variable of exercises consists of eight statements, as presented in Figure 3.

Figure 3 summarizes the statements of types of academic reading exercises. Data on number 15 shows that 30.8% of the respondents strongly need to understand academic reading exercises, 44.2% need the understanding, 23.1% show a neutral opinion, and 1.9 % less need the understanding. Data on number 16 shows that 34.6% of the respondents strongly need comprehension of academic reading texts, 51.9% need the comprehension, and 13.5% show a neutral opinion. Meanwhile, data on number 17 shows that 21.2% of the respondents strongly need the application of reading texts, 59.6% need the application, and 19.2% show a neutral opinion. Data on number 18

shows that 28.9% of the respondents strongly need reading text analysis, 59.7% need the skill, and 11.5% show a neutral opinion. Data on number 19 shows that 27% of the respondents strongly need synthesizing reading texts, 36.5% need the synthesizing, and 36.5% show a neutral opinion. data on number 20 show that 32.7% of the respondents strongly need the evaluation of reading texts, 50% need the evaluation, and 17.3% show a neutral opinion. Data on number 21 shows that 42.3% of the respondents strongly need individual and collective exercises, 44.2% need such exercises, and 13.5% show a neutral opinion. meanwhile, data on number 22 show that 32.7% of the respondents strongly need exercises in each topic, 46.2% need such exercises, 19.2% show a neutral opinion, and 1.9% less need exercises.

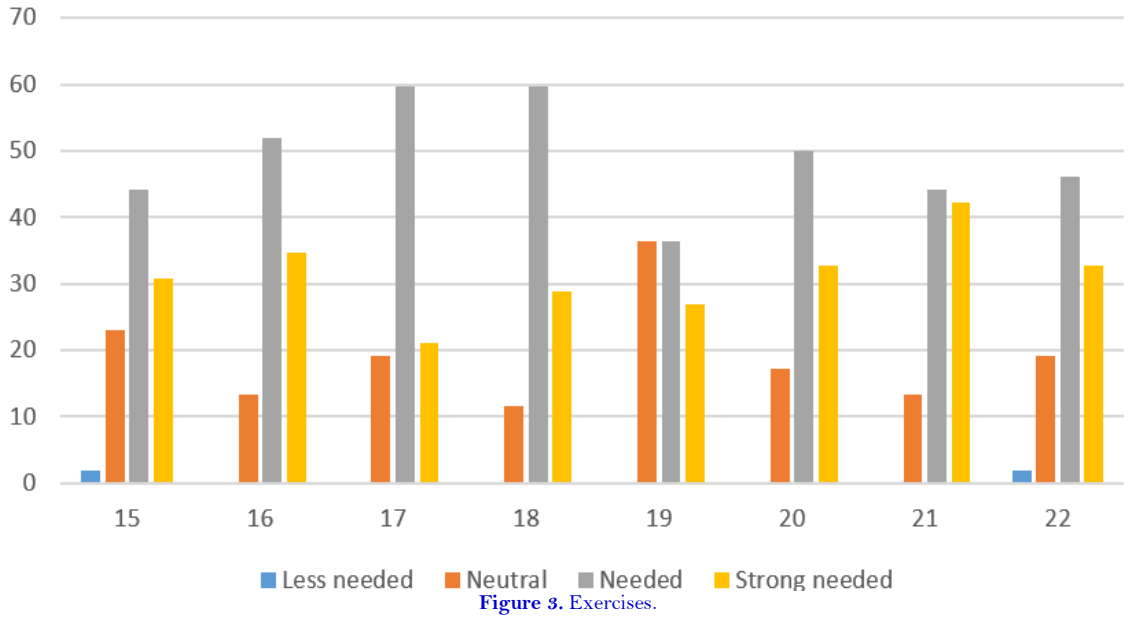

Figure 3. Exercises.

3.4. Leaning Assessment

The variable of learning assessment consisted of eight statements, as presented in Figure 4.

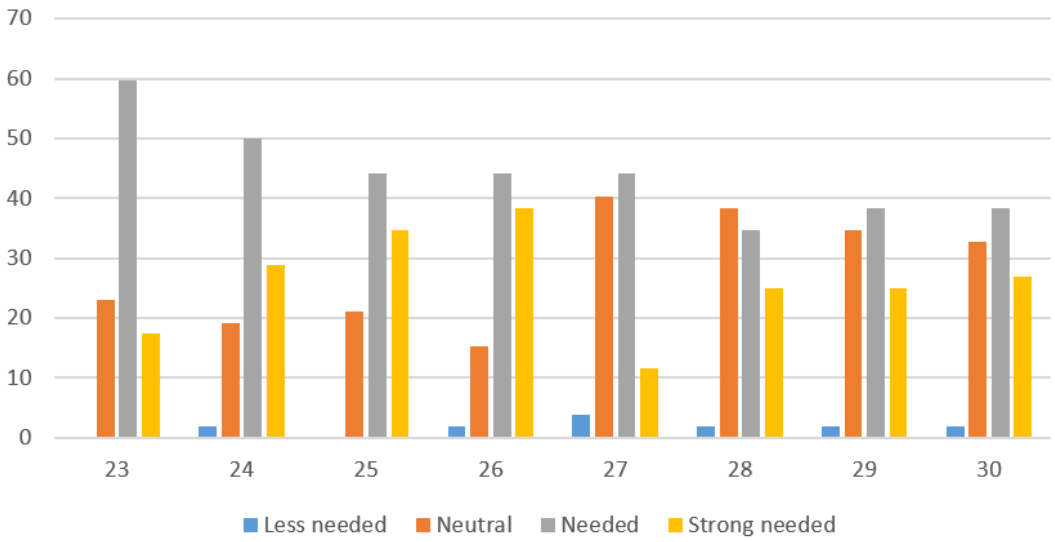

Figure 4. Learning assessment.

Figure 4 summarizes the types of assessment carried out at the end of each topic. Data on number 23 shows that 17.3% of the respondents strongly need an assessment carried out at the end of each topic, 59.6% need the assessment, and 23.1% show a neutral opinion. Data on number 24 shows that 28.9% strongly need an assessment

based on theoretical materials and reading texts of each topic, 50% need the assessment, 19.2% show a neutral opinion, and 1.9% less need the assessment. Data on number 25 is about an individual or collective assessment process. Data on number 26 shows that 38.5% of the respondents strongly need a learning assessment in academic reading, 44.2% need the learning assessment, 15.4% show a neutral opinion, and 1.9% less need the learning assessment. Data on number 27 shows that 11.6% of the respondents strongly need an assessment by summarizing the material, 44.2% need such an assessment, 40.4% show a neutral opinion, and 3.8% less need such an assessment. Data on number 28 shows that 25% of the respondents strongly need an assessment by retelling the material, 34.6% need such an assessment, 38.5% show a neutral opinion, and 1.9% less need such an assessment. Data on number 29 shows that 25% of the students strongly need an assessment using a subjective test, 38.5% need such an assessment, 34.6% show a neutral opinion, and 1.9% less need such an assessment. meanwhile, data on number 30 show that 26.9% of the respondents strongly need assessment using an objective test, 38.5% need such an assessment, 32.7 % show a neutral opinion, and 1.9% less need such an assessment.

3.5. Syntax of Problem-Based Learning Model

The variable of the syntax of the problem-based learning model consisted of 20 statements, as presented in Figure 5.

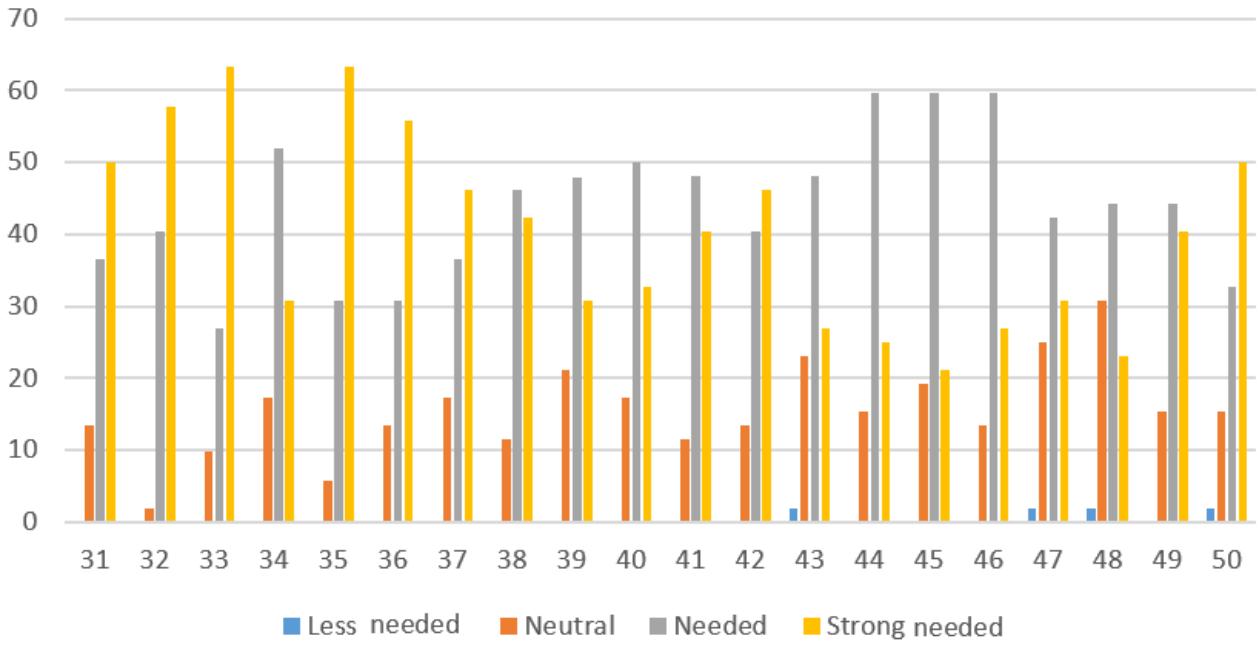

Figure 5. Syntax of problem-based learning models.

Figure 5 shows the statement of a lecturer's technique to start a lesson by reviewing the previously learned topic. Data on number 31 shows that 50% of the respondents strongly need a review of the previous lesson by the teacher, 36.5% need such a review, and 13.5% show a neutral opinion. Data on number 32 shows that 57.7% strongly need that the lecturer delivers the topic, 40.4% need such an activity, and 1.9% show a neutral opinion. Data on number 33 shows that 63.5% of the respondents strongly need that the lecturer about the lecturer delivers the learning objectives at the beginning of each lecture, 26.9% need such an activity, and 9.6% show a neutral opinion. Data on number 34 shows that 30.8% of the respondents strongly need that the lecturer assigns a reading text to raise problems, 51.9% need such an assignment, and 17.3% show a neutral opinion. Data on number 35 shows that 63.4% of the respondents strongly need that the lecturer motivates them to be involved in problem-solving, 30.8% need such motivation, and 5.8% show a neutral opinion. Data on number 36 shows that 55.8% of the respondents strongly need that a lecturer and students design learning groups based on learning needs, 30.8% need

such a design, and 13.4% show a neutral opinion. Data on number 37 shows that 46.2% of the participants strongly need that the lecturer explains the steps for completing the task while the students divide each group member's roles in the learning process. Meanwhile, 36.5% of the participants need such techniques, and 17.3% show a neutral opinion.

Whereas, data on number 38 shows that 42.3% of the participants strongly need that the lecturer formulates and explains a formative assessment method to measure the achievement of learning goals, 46.2% need such a technique, and 11.5% show a neutral opinion. Data number 39 shows that 30.8% of the participants strongly need that the lecturer assists the students to organize an assignment about selected problems, 48% need such a technique, and 21.2% show a neutral opinion. Data on number 40 states that 32.7% of the participants strongly need that lecturers encourage students to collect information, 50% need such encouragement, and 17.3% show a neutral opinion. Data on number 41 show that 40.4% of the participants strongly need that the lecturer helps the students design their experiments, 48.1% need such help, and 11.5% show a neutral opinion. Data on number 42 shows that 46.2% of the participants strongly need that the lecturer encourages students to conduct experiments to find problem-solving, 40.4% need such encouragement, and 13.5% show a neutral opinion. Data on number 43 shows that 26.9% of the participants strongly need that the lecturer assists the students to compose an experimental report and share the reports with other students. Meanwhile, 48.1% of the participants needed such an assistance, 23.1% show a neutral opinion, and 1.9% less need such assistance. Data on number 44 shows that 25% of the students strongly need that each group member present his investigation results, 59.6% need such a presentation, and 15.4% show a neutral opinion.

Data on number 45 shows that 21.1% of the respondents strongly need that the lecturer and the students comment on the presented investigation results, 59.6% need such a comment, and 19.2% show a neutral opinion. Data on number 46 shows that 26.9% of the participants strongly need that the lecturer reviews and summarizes the students' ideas as input for the next meeting, 59.6% needed such actions, and 13.5% show a neutral opinion. Data on number 47 shows that 30.7% of the participants strongly need that the lecturer assesses group activities during the learning process, 42.3% needed such an assessment, 25% show a neutral opinion, and 1.9% less need such an assessment. Data on number 48 shows that 23.1% of the participants strongly need group evaluation by each group member, 44.2% need such an evaluation, 30.8% show a neutral opinion, and 1.9% less need such an evaluation. Data on number 49 shows that 40.4% of the students strongly need that the lecturer positively affirms student achievement, 44.2% need such an affirmation, and 15.4% show a neutral opinion. Meanwhile, data on number 50 shows that 50% of the participants strongly need the lecturer's assistance to reflect and evaluate their experiments or investigations, 32.7% need such an assistance, 15.4% show a neutral opinion, and 1.9% less need such an assistance.

3.6. Blended Learning

The variable of blended learning consisted of six statements, as presented in Figure 6.

Figure 6 summarizes the statements of blended learning. Data on number 51 shows that 32.7% of the participants strongly need a blended learning process, 44.2% need a blended learning process, and 23.1% show a neutral opinion. Data on number 52 shows that 30.8% of the participants strongly need the implementation of blended learning as a reinforcement, 46.2% need such an implementation, and 23.1% show a neutral opinion. Data on number 53 shows that 21.2% of the participants strongly need the implementation of flipped-blended learning (instruction and investigation via online media while the presentation of the results via offline media), 53.8% need such an implementation, and 25% show a neutral opinion. Data on number 54 shows that 28.8% of the participants strongly need blended learning with students' engagement, 48.1% need such blended learning, and 23.1% show a neutral opinion. Data on number 55 shows that 40.4% of the participants strongly need the implementation of inside-out blended learning (offline to online), 36.5% need such an implementation, and 28.8% show a neutral

opinion. Data on number 56 show that 25% of the participants strongly need the implementation of outside-in blended learning (online to offline), 44.2% need such an implementation, and 30.8% show a neutral opinion.

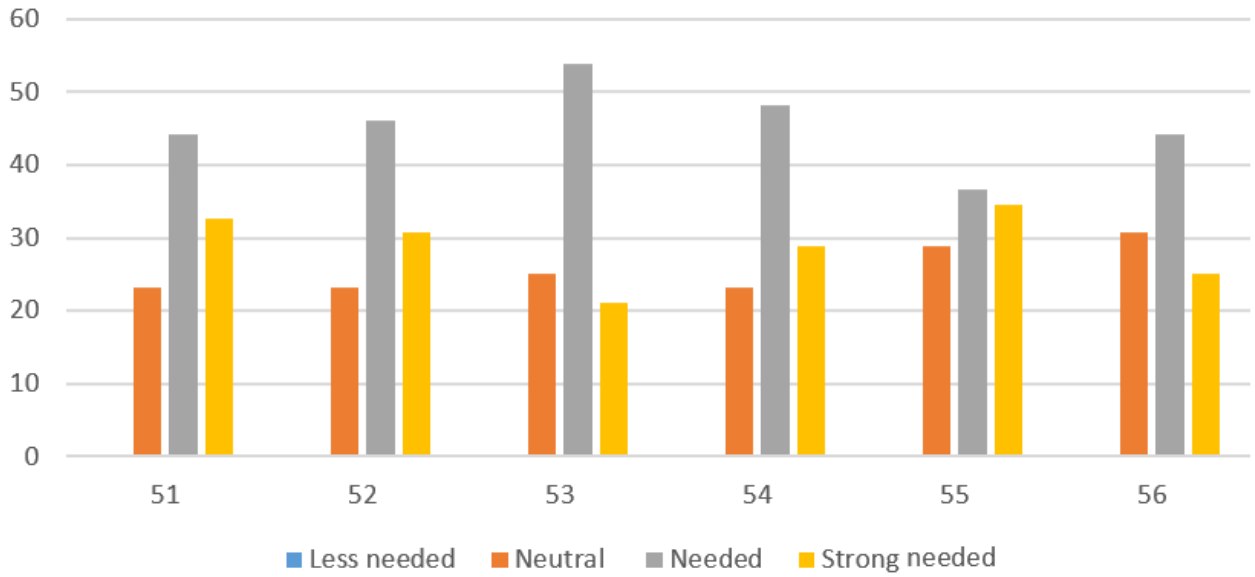

Figure 6. Blended learning.

3.7. Social System

The variable of social systems consists of five statements, as presented in Figure 7.

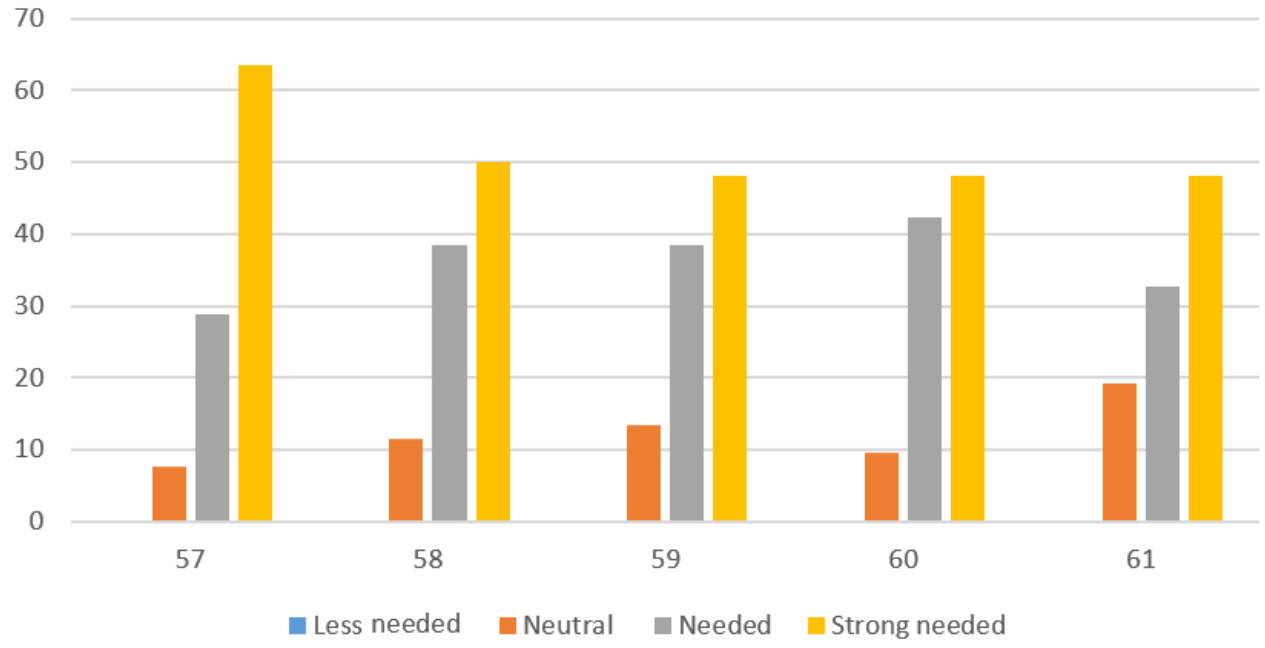

Figure 7. Social systems.

Figure 7 summarizes the results of statements about social systems. Data on number 57 shows that 63.5% of the students strongly need that the lecturer's motivation, 28.8% need such motivation, and 7.7% show a neutral opinion. Data on number 58 shows that 50% of the participants strongly need that the lecturer facilitate the learning, 38.5% need such a facility, and 11.5% show a neutral opinion. Data on number 59 show that 48% of the participants strongly need that the lecturer builds instruction with students during the learning process, 38.5% need such an action, and 13.5% show a neutral opinion. Data on number 60 shows that 48.1% of the students

strongly need consultation, 42.3% need the consultation, and 9.6% show a neutral opinion. Finally, data on number 61 shows that 48.1% of the respondents strongly need that the lecturer considers the students as learning subjects not learning objects. Meanwhile, 32.6% of the participants need such a consideration, and 19.2% show a neutral opinion.

3.8. Reaction Systems

The variable of reaction systems consists of three statements, as presented in Figure 8.

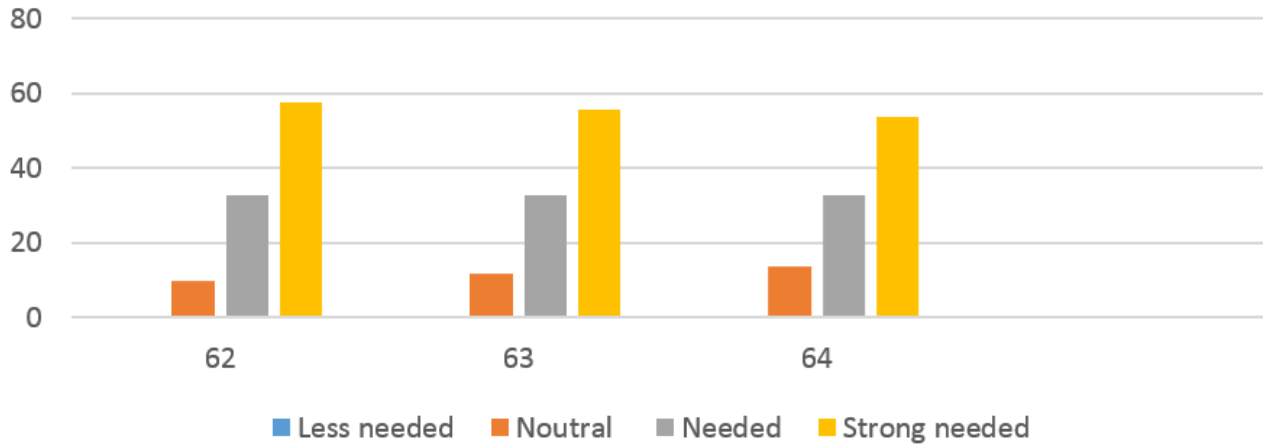

Figure 8. Reaction systems.

Figure 8 shows the respondents' responses to the statements about reaction systems. Data on number 62 show that 57.7% of the respondents strongly need direct responses from the lecturer, 32.7% need such a direct response, and 9.6% show a neutral opinion. Data on number 63 show that 55.8% of the participants strongly need positive appreciation from the lecturer after completing an assignment, 32.7% need such an appreciation, and 11.5% show a neutral opinion. Finally, data on number 64 show that 53.8% of the students strongly need service provisions regardless of students' backgrounds, 32.7% need the service provisions, and 13.5% show a neutral opinion.

3.9. Support Systems

The variable of support systems consists of three statements, as presented in Figure 9.

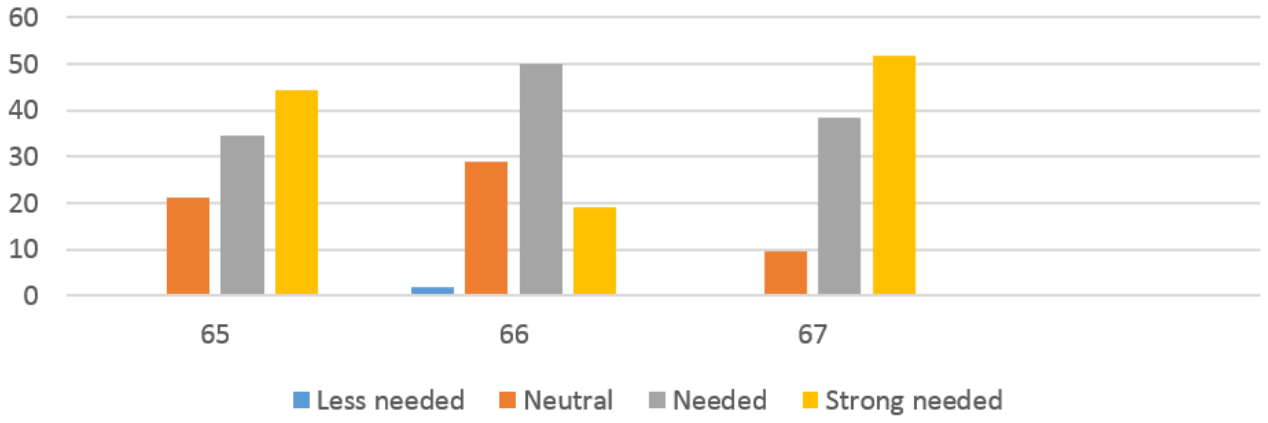

Figure 9. Support systems.

Figure 9 asserts the statement of support systems. Data on number 65 shows that 44.2% of the respondents strongly need the use of LCD for learning, 34.6% need this use, and 21.3% show a neutral opinion. Data on number

66 shows that 19.3% of the respondents strongly need the preparation of materials in the form of power points, 50% need such a preparation, 28.8% shows a neutral opinion, and 1.9% less needs such a preparation. Data on number 67 shows that 51.9% strongly need that lecturers provide teaching materials based on students' needs, 38.5% need, and 9.6% show a neutral opinion.

3.10. Learning Impacts

The variable of learning impact consisted of four statements, as presented in Figure 10.

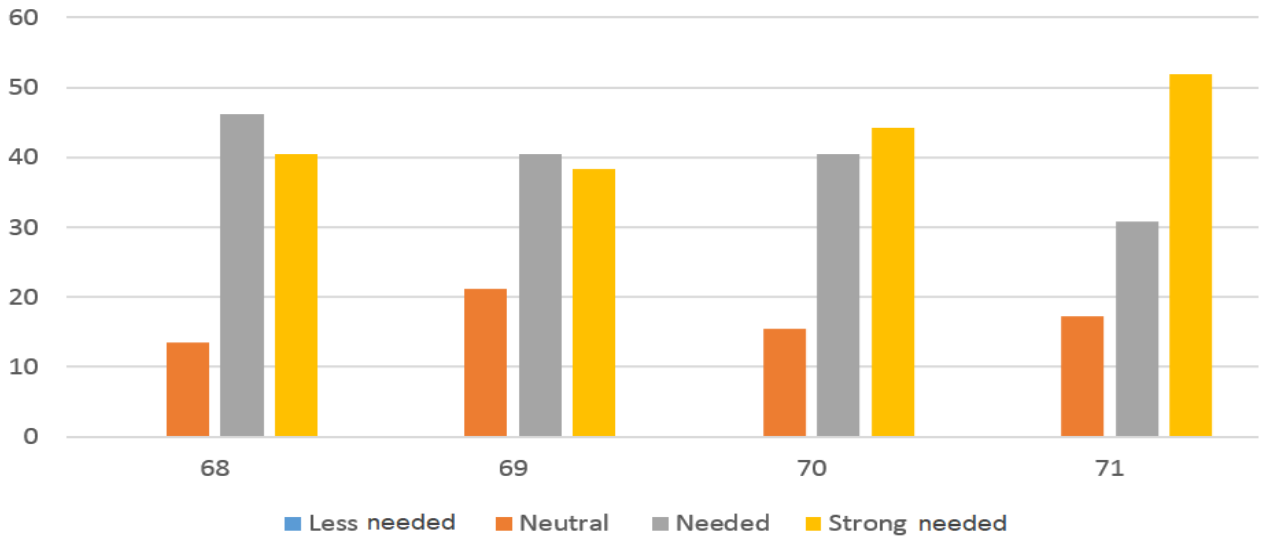

Figure 10. Learning impacts.

Figure 10 summarizes the statements of the learning impacts. Data on number 68 shows that 40.4% strongly need to understand the concept of academic reading at the end of the class, 46.2% need the understanding, and 13.5% show a neutral opinion. Data on number 69 shows that 38.5% strongly need problem-solving skills, 40.4% need the skills, and 21.1% show a neutral opinion. Data on number 70 shows that 44.2% strongly need academic reading skills, 40.4% need the skills, and 15.4% show a neutral opinion. Data on number 71 shows that 51.9% strongly need critical thinking ability to solve problems, 30.8% need the ability, and 1.9% show a neutral opinion.

3.11. Companion Impacts

The variable of companion impacts consists of six questionnaire statements, as presented in Figure 11.

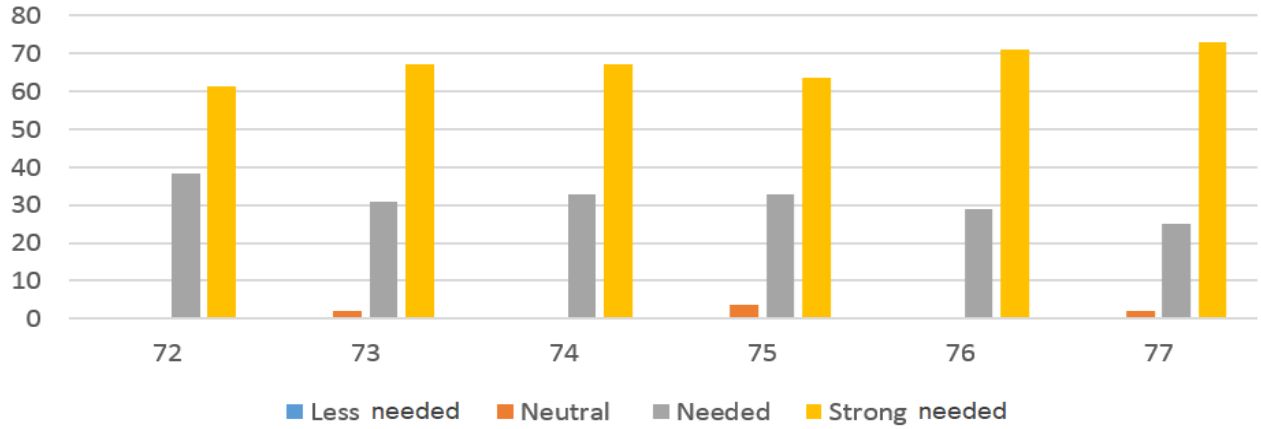

Figure 11. Companion impacts.

Figure 11 summarizes the statement of companion impacts. Data on number 72 shows that 61.5% of the respondents strongly need communication skills, and 38.5% need communication skills. Data on number 73 shows that 67.3% of the respondents strongly need collaboration skills, 30.8% need collaboration skills, and 1.9% show a neutral opinion. Data on number 74 shows that 67.3% of the respondents strongly need creative abilities, and 32.7% need creative abilities. Data on number 75 shows that 63.5% of the respondents strongly need leadership skills in team management, 32.7% need these skills, and 3.8% show a neutral opinion. Data on number 76 shows that 71.2% strongly need an attitude to accept others' opinions, and 28.8% need the attitude. Finally, data on number 77 shows that 73.1% strongly need open suggestions and critics, 25% need open suggestions and critics, and 1.9% show a neutral opinion.

4. DISCUSSION

This study identified students' needs for the problem-based learning model with blended learning in EFL academic reading. The authors revealed that students required 11 variables for this purpose: learning objectives, topics, exercises, assessment, the syntax of problem-based learning models, blended learning, social systems, reaction systems, support systems, learning impacts, and companion impacts.

The variable of learning objective focused on four statements needed by students. For example, understanding the concept of reading can assist students to apply approaches, methods, strategies, and techniques effectively and appropriately to their reading needs (Maher & Shehata, 2017), develop critical thinking skills, improve their ability to comprehend English reading text, and enrich their English vocabulary mastery (Nurtanto et al., 2020; Saputra et al., 2019). Meanwhile, the variable of topics consisted of ten topics required by students when learning academic reading. These topics included language, education, politic, economy, society, culture, sport, environment, healthy, and technology. The variable of exercises consisted of eight exercises needed by the students, such as academic reading exercises in the form of understanding, comprehension, application, analysis, synthesis, evaluation of reading texts, and assignment in each topic.

The variable of learning assessments consisted of eight statements needed by the students. They are assessments at the end of each topic, assessments based on the material of each topic, theoretical and textual assessments, individual and collective assessment processes, assessments on students' understanding of the process of academic reading learning, assessments by summarizing materials, assessments by retelling, assessments by subjective tests, and assessment by objective tests.

The variable of the syntax of problem-based learning models consisted of 20 statements needed by the students. These statements are as follows:

(1) Reviewing the previous lesson by the lecturer to start the class.
(2) Informing the topic to learn.
(3) Conveying the learning objectives at the beginning of each lecture.
(4) Preparing reading texts to raise problems, motivating students to be involved in solving selected problems.
(5) Designing needs-based learning by the lecturer and students.
(6) Dividing the roles of each group member in the learning process by the lecturer and students.
(7) Explaining the steps for completing the task by the lecturer.
(8) Formulating and explaining formative assessment methods to measure the achievement of learning goals.
(9) Assisting students to organize assignments about selected problems.
(10) Encouraging the students to collect information.
(11) Helping them to design experiments.
(12) Encouraging them to experiment to get problem-solving.
(12) Assisting them to compose experimental reports that will be shared with others.
(13) Asking each group member to present their investigation results.

(14) Providing inputs on the results of the presented investigations by the lecturer and students.
(15) Reviewing and summarizing the student's mindset as input for the next meeting by the lecturer.
(16) Assessing group activities during the learning process by the lecturer.
(17) Evaluating each group member.
(18) Positively affirming the students' achievement by the lecturer.
(19) Assisting the students to reflect and evaluate their experiments or investigations.

The syntax of PBL needed in this research agrees with the stages of PBL proposed by other researchers (Arends, 2004; Khoiriyah & Husamah, 2018; Strobel & Van Barneveld, 2009). However, this study found a new step in the syntax of the PBL model, which requires a lecturer to prepare reading text to find problems.

The variable of blended learning focuses on six statements required by students. The implementation of the blended learning process is supported by many researchers (Castro-Gil & Correa, 2021; Halverson & Graham, 2019; Heilporn et al., 2021; Liu, 2021; Manwaring et al., 2017); they argue that this process can reinforce students to secure information stored in the short-term memory and proceed in the long-term memory (López-Pellisa et al., 2021). Flipped blended learning (instruction and investigation using online media and presentation of results using offline media) is implemented in learning. Moreover, blended learning increases student engagement. Blended learning inside-out (offline to online) and blended learning outside-in (online to offline) are applied in the learning process.

The variable of social systems focuses on five statements needed by students. First, a lecturer motivates students. Moreover, a lecturer facilitates the learning, builds instruction with students during the learning, prepares consultation time for students, and considers students as subjects and not objects of learning. Meanwhile, the variable of reaction systems focuses on three statements needed by students. For example, a lecturer responds directly, gives positive appreciation to students who complete assignments on time, and provides service processes for all students regardless their background (Faqiroh, 2020; Moallem et al., 2019). Finally, the variable of support systems focuses on three statements. For example, the learning process utilizes LCD, materials are always prepared in the form of power points, and a lecturer provides teaching materials by considering the student needs.

The variable of learning impact emphasizes four statements. For example, the students understand the concept of academic reading at the end of the lesson and have problem-solving skills, academic reading skills, and critical thinking skills to solve problems (Maher & Shehata, 2017; Sohail, 2015). Finally, the variable of companion impacts focuses on six statements: students have communication skills, collaboration skills, creative abilities, leadership skills in team management, the attitude to accept others' opinions, and openness to suggestions and critics.

5. CONCLUSION

This study revealed that designing the PBL model with blended learning in EFL academic reading requires 11 variables namely, first, appropriate learning objectives; second, various learning topics; third, exercises to understand, comprehend, apply, analyze, synthesize, and evaluate reading texts; fourth, individual or collective assessments at the end of each theoretical and practical topic by summarizing and retelling reading text materials; fifth, syntax of problem-based learning models by reviewing previous topics, informing a topic, conveying a topic to discuss, assigning a reading text to raise problems, motivating students, making many small groups, dividing the roles of each group, formulating and explaining formative assessment method, giving assistance, encouraging students to collect information, designing an investigation, driving the students to research and overcome problems, assisting them to compose research reports, asking the students to present their investigation results, giving input of their presentation, give reflection and evaluation.

The sixth variable found appropriate was blended learning implemented as reinforcement, wherein flipped blended learning, inside-out, and inside-in can be applied for learning. The seventh variable was social systems by motivating, facilitating, building instructions, preparing consultation time, and considering students as subject and

not objects of learning. The eighth variable was reaction systems through direct responses, positive appreciation, and service provision regardless of students' background. The ninth variable was support systems by utilizing LCD, PowerPoint slides, and teaching material as needed. The tenth was learning impact by comprehending the concept of academic reading, problem-solving, reading academic skills, and critical thinking. The eleventh variable was companions' impact by having communication, collaboration, creativity, leadership, and team management skills, an attitude to accept others' opinions, and openness to suggestions and critics.

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