Perceptions of Faculty of Education Students in Using Problem Based Learning to Increase Human Literacy

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Abstract
Problem Based Learning is one of the learning models based on student activities. This model can deliver the achievement of learning outcomes not only in the cognitive aspects but also in the aspects of attitude and skills. The integration of these three aspects is an ability that must be possessed by students in human literacy. As prospective teachers in the faculty of education, students must have the knowledge that growing human literacy can be done by applying student activity-based learning models such as PBL. The purpose of this study was to analyze the perceptions of students of the faculty of education in using PBL to improve human literacy. Participants in this study were 77 elementary school education program, students. Methods of data collection using online questionnaires and FGDs. Data were analyzed using descriptive analysis method. The survey instrument was developed from the PBL theory developed by Arends (2008). Whereas the human literacy instrument was developed from The Center of Human Literacy. The findings in this study include; 1) almost all education faculty students consider that PBL is a student center-based learning model; 2) most students assume that PBL can also increase classroom interaction; 3) most of them have the perception that using PBL can automatically increase human literacy.

Introduction
Human literacy is knowledge about being human and educating how to interact between fellow humans. In the context of education, human literacy seeks to use knowledge to change learning activities so that they are oriented towards continuous improvement (Home - Human Literacy by Edumazing, n.d.). This aspect of human literacy really needs to be instilled in students, because students are facing more complex challenges than the previous generation; the challenges of the 21st century, the industrial revolution with its technology, and then media that integrates with the internet are a series of complex challenges that affect students in dealing with others as human beings (Human Literacy - Maramba Primary School, n.d.). The rapid development of technology, internet, and social media can make it easier for students to connect with anything and anyone; in the context of education, this is certainly very helpful, but on the other hand, students also really need to interact humanely, interact directly with teachers or fellow friends, respect each other while in discussion forums,
express opinions directly with audiences who are also real. Human literacy is a knowledge to guide students in real social and emotional aspects.

Human literacy consists of five key elements which include social, physical, intellectual, cultural and emotional (Human Literacy - Maramba Primary School, n.d.). Socially, students need to know how to develop mutually reinforcing relationships with each other, become leaders, teamwork, and be active as members of a community whether online or offline. Physically, students can make healthy choices that support the body and neurological development, are aware of the environment and can make changes in that environment. Intellectually, students are able to become innovative and reflective problem solvers, able to respond to new challenges, set value-based goals and achieve success. Culturally, students realize that they are important and have a role, so students can develop mindsets to support attitudes, identities, and positive views. Emotionally, students are expected to understand their own emotions, can rise from adversity and develop emotional intelligence to develop.

One learning model that is capable of supporting human literacy is Problem Based Learning (PBL). Actually, this learning model is very promising and most often used in learning, even this strategy has been used successfully in a variety of learning contexts (Sulaiman, 2010), for example, learning activities in basic education (Tsybulsky, 2019), distance learning by accommodating technology (Brien, Hamburg & Southern, 2019), higher education (Ahlfeldt, Mehta & Sellnow, 2005), medical school (Stentoft, 2019), teacher training (Bridges, 2019), nursing (Hajibabaee & Ashrafizadeh, 2019), engineering (Perrenet, Bouhuijs & Smits, 2000) until doctoral (Yang et al., 2019). Therefore, experts in learning and teaching themselves recognize that PBL which has the characteristics of problem-solving is the main goal of education itself (Dochy et al., 2005).

At present, the world has entered the 4th industrial revolution, where education has become the foundation for bringing about fundamental changes in everyday human life. In this circumstance, critical thinking, creativity, problem-solving, communication, and collaboration skills are valued as core competencies for students and are needed in society in the future (Ha, 2018). Thus students need learning patterns that practice the development of creativity and constructivist thoughts through learning programs in schools that involve the community. If students experience such learning patterns then they will get used to returning to the community to build their community (Mincheol Kim, 2019). This is the reason why PBL is suitable in all kinds of forms of learning that equip students in living with society.

Some universities in the world also have used PBL in their curriculum. Danish Aalborg University applies PBL as a pedagogical foundation (Camacho & Christiansen, 2018). The University of Delaware has a PBL program with annual training for those who wish to become tutors; Samford University in Birmingham-Alabama includes PBL in various undergraduate programs in arts and science schools, business, education, nursing, and pharmacy; The Illinois Academy of Mathematics and Science has provided intermediate students with the PBL curriculum since 1985 (Savery, 2006). It illustrates that PBL provides certainty for the quality of learning in various fields of learning. PBL can form human resources who are able to think critically and carry out critical reflection, provide effective learning pedagogical experiences that inherently engage students in active and meaningful learning, resulting in deeper understanding with longer retention (Hung, 2006). PBL
facilitates understanding of problems where it will make students learn something new, facilitates group learning where students must analyze problems and set clear goals about what they have to do to overcome these problems, each individual must find the knowledge needed to meet group goals. Then, in group learning, PBL facilitates students to compare their knowledge with those of their peers, validate personal understanding of the concepts they learn, criticize and correct personal and other understanding, then build a synthesis of what they have learned and consolidate it (Vickery, 2013). PBL develops skills in the form of communication skills, problem-solving, critical thinking, then motivates students to learn, and fosters lifelong learning attitudes (Li, 2013).

In addition to the industrial revolution, education also faces 21st-century competency challenges, where one must be able to collaborate, communicate, be creative and think critically (Leask & Younie, 2013). In this century, one must be able to bring oneself to collaborate with other individuals, with groups and even with technology (Boholano, 2017). In addition to these competencies, meta-cognition, digital literacy, and technology, individual and group responsibilities, and problem-solving are also competencies that one needs to master (Kim, Raza & Seidman, 2019).

For this reason, PBL in this context is an appropriate learning strategy to equip students to face the industrial revolution and challenges of the 21st century while still being human with good social and emotional competence. PBL presents learning which; (1) student-centered, where students develop actively and cooperatively their own knowledge and they formulate independently; (2) collaborative and group learning; (3) the teacher becomes a facilitator of learning activities; (4) problem solving (Dochy et al., 2005). Thus, PBL as a learning strategy tries to instill competence in collaboration, communication, creative and critical thinking, as well as problem-solving, and instill good social interaction competencies.

In addition, education in Indonesia has also mandated PBL as an approach to learning in the classroom. The learning has also led to the production of problem-based work which is adjusted to the characteristics of competencies and levels of education (Permendikbud, 2016). At this point, it can be concluded that PBL is a learning strategy that is suitable for equipping students in facing challenges in the future.

PBL can also develop student interaction in the classroom. Through PBL, students can strengthen their interaction and communication between students themselves and with their environment, in addition, students’ skills to express themselves also develop (Akinoğlu & Tandoğan, 2007). In addition, PBL which presents problems intrinsically can trigger dialogue and negotiation (elements of collaboration) between students and therefore each student is responsible for framing the problem, deciding on the main learning problem, selecting, collecting, and assessing information (Simone, 2014). Finally, PBL is also very capable of promoting meaningful interactions in the classroom, because PBL itself does emphasize learning activities on the students themselves so that students become autonomous learners (Binnendijk, 2014).

Therefore, the Faculty of Education students who are prospective educators who will carry out learning must have the correct perception of PBL. Because, on the other hand, it needs to be recognized that not everyone has the right perception about PBL, there is an assumption that PBL still needs support from academics and for some senior teaching staff,
PBL is an unattractive strategy (Usmani et al., 2011), because PBL is more burdensome and more time-consuming (Hwang & Jang, 2005), then there are those who assume that there is no significant difference between PBL and other strategies (Haghparast, Ghorbani & Rohlin, 2017). Based on this explanation, the purpose of this study was to analyze the perceptions of students of the Faculty of Education in using PBL to improve human literacy. The flow of this research follows the research questions; (1) What are the characteristics of PBL in learning? (2) What is the perception of the Faculty of Education students in using PBL to improve classroom interaction? (3) What is the perception of the Faculty of Education students in using PBL to improve human literacy?

**Method**

**Research Design**

The purpose of this study was to analyze the perceptions of students of the Faculty of Education in using PBL to improve human literacy. Thus, this study is a qualitative study with a survey approach to analyze the responses of participants about their perception of the use of PBL to improve human literacy.

**Participants**

This study was conducted at Sunan Ampel State Islamic University in Surabaya, at the Faculty of Education that concentrates on preparing and training prospective teachers to become professional and quality teachers in educating students.

The Faculty of Education consists of several majors including (1) Madrasah Ibtidaiyah Teacher Education, (2) Arabic Language Education, (3) Islamic Religious Education, (4) Mathematics Education, (5) Early Childhood Islamic Education, and (6) Science Education. However, participants in this study were the Madrasah Ibtidaiyah Teacher Education students.

Details about these participants are listed in Table 1.

**Table 1.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Demographic characteristic</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>65</td>
<td>84.4</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>12</td>
<td>15.6</td>
</tr>
<tr>
<td>Job of parent</td>
<td>Teacher</td>
<td>15</td>
<td>19.5</td>
</tr>
<tr>
<td></td>
<td>Non-Teacher</td>
<td>62</td>
<td>80.5</td>
</tr>
</tbody>
</table>

Based on table 1, this study presents the 'job of parent' variable to analyze whether family background can influence perceptions of students of the Faculty of Education on the use of PBL in improving the human literacy referred to in this study.

**Data Collection**

Participants in this study were presented online questionnaires through the Google form adopted from Arends to find out their perceptions about Problem Based Learning in
improving human literacy. In the online questionnaire, participants could assess their own perceptions about PBL and its relationship with human literacy through each point using a four-point Likert scale ranging from 'Disagree' to 'Strongly agree'.

Not only that, to strengthen the data from respondents, interviews were conducted to explore further information from respondents, complete the information needed in research, and explore the possibility of new perspectives from respondents.

Data Analysis

Data analysis in this study used descriptive statistics, the results of responses from Google Form were analyzed and interpreted according to qualitative research.

Result

The results of the research instrument are intended to answer research questions namely 1) to determine the characteristics of PBL, 2) to determine perceptions of the Faculty of Education students in using PBL to enhance classroom interaction, and 3) to analyze perceptions of the Faculty of Education students in using PBL to improve human literacy.

This instrument was distributed from 19 November 2019 to 12 January 2020, approximately 2 months. Here are the perceptions of PBL to improve classroom interaction and human literacy.

Table 2.
Perception of education students on using PBL

<table>
<thead>
<tr>
<th>No</th>
<th>Statements</th>
<th>Disagree</th>
<th>Fairly agree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Learning that begins with a problem</td>
<td>2</td>
<td>2.6</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>2</td>
<td>Learning that suitable for children</td>
<td>-</td>
<td>-</td>
<td>11</td>
<td>14.3</td>
</tr>
<tr>
<td>3</td>
<td>Learning that requires collaboration</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>4</td>
<td>Learning that organizes students to study in groups or independently</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>5</td>
<td>Learning that has learning outcomes in the form of creative products</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>5.2</td>
</tr>
<tr>
<td>6</td>
<td>Learning that requires the exhibition of learning outcomes</td>
<td>-</td>
<td>-</td>
<td>9</td>
<td>11.7</td>
</tr>
<tr>
<td>7</td>
<td>Learning that has a process evaluation and problem-solving</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1.3</td>
</tr>
</tbody>
</table>
Based on table 2 above, the results of this study are as follows;

**Characteristics of PBL in Learning Activities**

PBL is learning that has several characteristics namely; (1) student-centered, where students can develop actively and cooperatively their own knowledge and formulate it independently; (2) collaborative and group learning; (3) the teacher becomes a facilitator of learning activities to support the active students; and (4) synonymous with problem-solving (Dochy et al., 2005).

(Dochy et al., 2005).

Characteristics of PBL in Learning Activities refer to table 2 in numbers 1, 2 and 7. The table shows that the characteristics of PBL in learning activities are learning that begins with a problem, where 54.5% of respondents agreed and 39% strongly agreed. Then, PBL is also very identical with children, which means PBL is very suitable to equip the mindset of children to solve and hone aspects of their skills; this is indicated by 59.7% of respondents agreed and 26% strongly agreed.

Finally, the characteristics of PBL in learning activities refer to the existence of a program evaluation process and problem-solving. The results of the respondents as shown in table 2 above shows 63.6% strongly agreed and 35.1% agreed.

Based on this explanation, the PBL character is very identical to the activities of students themselves, students are given the freedom to solve problems to practice their thinking patterns, facilitated through collaborative and group activities, then there is ongoing evaluation. This means that PBL is a learning strategy that upholds student-centered, and almost all respondents agreed.

The characteristics of PBL in learning activities are also strengthened by the statements of respondents 9 who stated;

"In PBL, students are given a variety of problems from an early age, and those problems are actually illustrations of problems that students will face in the future. Thus, when children (students) will grow up, they will no longer feel confused to find a solution, because they have become accustomed to the presence of problems and are trained to solve them since they are children, either independently or in groups."

The same thing was also expressed by respondent 8, who stated;

"PBL is learning that begins with a problem. So, students are accustomed to dealing with these problems and are trained to solve them. So that when students reach adulthood, they are accustomed to thinking critically about a problem, then they will easily understand what the problem is and find a solution. Therefore, PBL is very suitable for children, PBL will equip students to face problems in the future and train them to solve these problems."

**Perceptions in using PBL to enhance classroom interaction**

PBL emphasizes student-centered learning activities, and this point is very capable of promoting meaningful interactions in the classroom and leading students to become autonomous learners (Binnendijk, 2014). In addition, PBL which facilitates group learning
can strengthen interaction and communication between students and each other and their skills to express themselves will develop (Akinoğlu & Tandoğan, 2007). Then, PBL which also facilitates students to collaborate will intrinsically encourage students to dialogue and negotiate with other students (Simone, 2014). Thus, PBL can trigger positive and meaningful class interactions.

In this study, the points about perceptions of using PBL to enhance classroom interaction refer to statements number 3, 4, 5 and 6. Based on table 2 above, it can be concluded that respondents assume that PBL is learning that requires collaboration, indicated by 45.5 % of respondents agreed and 50.6% strongly agreed. Then, PBL is also learning that organizes students to study in groups or independently, 45.5% agreed and 53.2% strongly agreed.

It is very clear that PBL which emphasizes collaboration can increase classroom interaction because collaboration stimulates students to compare their knowledge with those of their peers, validate their own understanding, criticize and correct their personal understanding with others, to the activity of building synthesis of what they have learned and consolidating it (Vickery, 2013).

Furthermore, PBL is learning that produces creative products, this is indicated by 45.5% of respondents who agreed and 49.4% strongly agreed. It shows that learning with the orientation of product results at the end of learning will stimulate students to actively transfer their knowledge and skills autonomously into tangible products.

In addition, respondents also agreed that PBL is learning that requires exhibition activities as a result of learning, indicated by 50.6% of respondents agreed and 37.7% strongly agreed. Exhibitions can vary according to learning objectives, as well as diverse settings; they can only be held per class or exhibition activities involving the school. It can be concluded that through the exhibition activities facilitated by PBL, it will support the ability of students to interact, communicate, negotiate in expressing themselves in the form of work to then be exhibited in the class or school exhibition event earlier.

**Perceptions in using PBL to increase Human Literacy**

Human literacy is knowledge about being human and educating how to interact between fellow humans. In the context of education, human literacy seeks to use knowledge to change learning activities so that they are oriented towards continuous improvement (Human Literacy - Maramba Primary School, n.d.). Human literacy has actually been facilitated by PBL itself as shown in table 2 in statement 3 where PBL facilitates students to collaborate with other students, and 45.5% of the respondents agreed and 50.6% strongly agreed. That is, PBL encourages students to interact, work together, respect each other to achieve common goals.

This is in line with what was stated by respondents 4 who stated;

"The use of PBL in learning activities facilitates communication between one student and another student. Thus, in learning activities, there is positive contact between students, which leads students to understand each other, tolerance, and respect for opinions to achieve common goals."

Then, human literacy has five key elements where one of them is social, students need to know how to develop mutually reinforcing relationships with each other, become leaders,
teamwork, and be aware of their role in a community (Human Literacy - Maramba Primary School, n.d.). Based on table 2 above (statement number 4), PBL certainly has supported this element where PBL is learning that seeks to organize students to learn in groups or independently, and 45.5% of respondents agreed and 53.2% strongly agreed.

Respondent 6 stated;

"PBL tries to organize students to learn in groups that will encourage students to get used to working with friends, express their opinions, learn to respect themselves and others, and learn how to express their disagreements in accordance with applicable norms and rules."

In line with that, respondent 7 also stated that;

"PBL can foster social values in students. Through PBL, students can learn to communicate using language that is good, true and does not hurt feelings. This will certainly make it easier for students in the future to join and be accepted by any social group."

Another element of human literacy is intellectual, that students must be able to become innovative and reflective problem solvers, be able to respond to new challenges, and set value-based goals and achieve success (Human Literacy - Maramba Primary School, n.d.). This is of course very identical to PBL itself which seeks to prepare human resources who are able to think critically and do critical reflection (Hung, 2006), challenges students to learn something new (Vickery, 2013), and equips problem-solving abilities (Li, 2013). The results in table 2 (statement number 7) above also indicate that PBL is learning that has a process evaluation and problem-solving program, where 35.1% of participants agreed and 63.6% strongly agreed.

About this respondent 10 stated;

"In PBL, students are guided to find their own concepts to solve problems. Thus, students are encouraged to think creatively and innovatively; students are accustomed to developing things, discovering new things to solve existing problems."

The survey results on several of the respondents above were strengthened by the results of the interview as follows:

Q: Are you interested in implementing PBL in your class?
A: Yes, obviously I'm very interested
Q: Why do you think PBL can develop the potential for positive social interaction?
A: Problems in the PBL method can stimulate students to always think critically and play an active role in conveying their ideas to solve problems, train students to exchange opinions with their teams to produce problem-solving in the results of discussions that are carried out.
Q: By implementing PBL, students can increase awareness of environmental problems and foster attitudes to participate in problem-solving. Do you agree?
A: Yes totally agree, because the PBL method requires students to be sensitive to the environment, to analyze problems or the environment, it helps them to solve contextual problems in their environment.
Q: Why is PBL believed to stimulate students to be creative and innovative in solving certain problems?
A: Because with the problems presented and discussed, students will practice the hidden ideas that are in their minds, which cannot be conveyed without the
stimulus of the problem being presented.

Q: Can PBL facilitate students to develop their thinking patterns and realize their role in the community? Why?

A: Yes, because with the PBL method, students will often play an active role in expressing their opinions and discussing in groups which is very important to have a habit of discussion. I will have a role in my capacity, so my friend will have a role. In PBL there are no students who are not actively involved.

Q: PBL is believed to be able to develop students' emotions, how do you apply that to learning?

A: By way of stimulating the students to argue with each other with his teacher or with other friends. To practice the openness of the student's mind too. Students are required to respect the opinions of other students when providing other student solutions. Therefore students will learn to control their emotions when their opinions are not the same or not approved by other students.

Q: In your opinion, is PBL a suitable learning strategy to equip students to face their future? Why is that?

A: It is suitable because, in its application in the real world, everyone will be confronted with the life problems of various elements. By the presence of PBL, students are trained to think through problem-solving intelligently and creatively.

Human Literacy Instruments

The human literacy instrument in learning practices was adopted from the Human Literacy by Edumazing website (Home - Human Literacy by Edumazing, n.d.), where the indicators are as follows; (1) excellence in teaching and learning, learning that is entirely student-centered, presenting different learning practices, visible learning and thinking, which means learning aims to develop students' thinking independently, continuous assessment, presenting periodic feedback, and based on development and progress; (2) positive climate for learning, students can develop their thinking patterns and become activists of change and can control themselves, then learning can develop a positive learning culture, pay attention to student involvement, foster behavior that leads to success; (3) professional leadership, students can be agents of change, foster students to be able to work together in groups/teams, identify every need to be actively involved in the learning process; (4) community engagement in learning, creates meaningful relationships with parents, students, and parents, fosters the parents, and fosters an understanding that parents are leaders.

Interconnection between PBL and Human Literacy

Based on the human literacy instrument described earlier, the following will be displayed an illustration of the interconnection between PBL and human literacy;
Based on the illustration above, human literacy is very closely related to PBL, each indicator of PBL can lead students to master each competency of human literacy, to the improvement of student achievement.

**Orient students to the problem**

The industrial revolution and 21st-century competency challenges require education to equip students to master competencies in the form of collaboration, communication, creativity and critical thinking (Leask & Younie, 2013). Therefore, education is very necessary to present learning that makes students as lifelong learners, good problem solvers, can choose, organize, and use information appropriately in a variety of conditions (Wright, 2011). Thus, problem-based learning is the right learning model to equip students to face their own future.

PBL through giving problems to students to find a solution will create student-centered learning itself. Students will learn how to ask important questions, design and conduct investigations, collect, analyze, and interpret data, and are responsible for applying what students have learned to new problems or situations (English & Kitsantas, 2013). Chung & Chow (2004) aligned PBL with student-centered learning to increase student learning potential and interest. Gordon et al (2001) stated that PBL is very identical to student-centered learning because when students respond to problems they will try to be responsible for determining their own learning needs and conducting investigations according to their own personal learning preferences. Overby (2011) mentioned that student-centered learning does refer to PBL.

In addition, in PBL when they want to direct students to problems, students will - either independently or in groups - try to identify what they already know, then what they need to learn to solve the problem (Kenney, 2008), students formulate and analyze the problem by
identifying relevant facts, then try to identify their lack of knowledge to solve the problem (Hmelo-Silver, 2004).

Massa (2008) provided steps in PBL where one of them is "analyze and frame the problem", in this process, students identify what they know, what doesn't, recognize situational constraints and clear understanding of the desired results at the end of problem-solving. Carder, Willingham & Bibb (2001) revealed that PBL is an approach whose focus is on helping students to be able to identify their own information needs. Kassab et al (2005) conducted a study using the PBL approach where each session ended with activity in identifying specific learning needs.

**Organize students for study**

Organizing students to learn means the instructor helps students to define and organize learning tasks related to problems. Students are guided by good learning, organizing work assignments to solve problems individually or in groups.

PBL tries to equip students with good learning methods that can be used on an ongoing basis and even so on. Therefore, PBL can also be referred to as learning that equips students to become lifelong learners, providing continuous education for students (Yasin & Rahman, 2011).

Preetha, Ram & Sprague (2005) tried to use PBL online to train lifelong learning in order to realize student learners to professional learners; Bhattacharya (2006) used technology to strengthen the PBL learning environment to equip students in acquiring cognitive, affective and interpersonal skills to become lifelong learners; Bidokht & Assareh (2011) revealed that students are no longer required to be good encyclopedias, but they should have the critical and creative thinking skills so that they can solve problems and learn independently, then students will never lose enthusiasm for learning and will become lifelong learners; and Dunlap (2008) also revealed that the PBL approach has the potential to meet the goals of lifelong learning.

Based on this, in equipping students on how to learn well and solve problems appropriately and efficiently then PBL can use diverse learning practices. The success of PBL implementation itself actually depends on the accuracy of a teacher when mapping learning styles and students' knowledge. For example, teachers can plan short class or class discussions to help students find the right way out, explore specific topics in-depth; or the teacher can have a team discussion to listen and ask questions; Likewise, teachers can use students as facilitators or assistants to expand the range of learning (E. Allen, S. Donham & A. Bernhardt, 2011).

Klein (1999) revealed in the research on problem-based essays, where teachers try to develop students' thinking and writing skills through writing reports with various genres; Kolmos, de Graaff & Du (2020, bk. Research on PBL Practice in Engineering Education) quoted Barrows who stated that PBL does not refer to certain learning methods; Savin-Baden in Graaff & Kolmos (2007) developed five PBL models namely (1) epistemological competence, (2) professional action, (3) interdisciplinary understanding, (4) trans-disciplinary learning, and (5) critical contestability; and Graaff & Kolmos (2007) concluded three main approaches, namely (1) learning approach where learning is organized based on problems, (2)
contents approach which is concerned with interdisciplinary learning, (3) social approach based on team/group-based learning.

Assist independent and group investigation

PBL, in this case, seeks to encourage students to be able to gather information in accordance with the problem, then carry out experiments, and look for explanations and solutions, so that at this stage there is a solution to the problem. PBL learning in this context can be in the form of independent or group learning.

At independent learning or groups, students get the opportunity to practice their leadership abilities and feel how to play a role in group work activities (Bridges & Hallinger, 1997). Then, if it is independent learning, through PBL, students can compare their opinions or work results with peers and assess themselves, can validate their personal understanding of the concepts they learn, criticize it, correct it to build a synthesis of what students have learned (Vickery, 2013), so that students can become leaders for themselves.

Knight & Murphey (2017) used the PBL approach to enhance student team project leadership activities and group work. O’Sullivan et al (2018) used PBL for teaching and learning leadership. O’Shea et al (2013) conducted an observation into how students' teams in PBL learning develop leadership when implementing projects. Cain & Cocco (2013) tried to deepen how to use PBL as a method for developing student leadership that is focused on experience and the environment. Yeo (2007) revealed that PBL can provoke thoughts to then investigate, develop again into critical thinking activities, and that is all an aspect of leadership.

In line with this leadership aspect, PBL is certainly also related to aspects of teamwork. PBL presents learning, one of which is collaborative and group learning (Dochy et al., 2005), and this certainly requires students to be able to analyze problems and set goals and then synergize them with group goals (Vickery, 2013), as a form of teamwork.

Regarding this teamwork, Butun, Erkin & Altintas (2008) revealed that PBL is an effective method for instilling teamwork skills as well as the ability to promote new ideas; Alves et al (2012) tried to explore the importance of teamwork using the PBL method, and as a result, students' motivation in learning increased, students are active in teams and enjoyed the division of work assignments, students also learned how to manage conflict and have a positive attitude towards problems; then also Jun (2010) tried to integrate PBL into the curriculum and the results showed that the PBL method could effectively improve students' teamwork abilities while increasing their self-confidence.

Then, PBL also tries to encourage students to independently arrange a series of activities to achieve their learning goals, including how students collect information in accordance with the problems they face and find the solutions. This will certainly have an impact on student self-regulation, where students can proceed to activate and maintain their thoughts, behaviors, and emotions to achieve goals. Through this self-regulation, students set goals effectively, plan and use strategies to achieve goals, manage resources, and monitor their own progress (Zimmerman, 2002).

Sungur & Tekkaya (2006) revealed that PBL students have higher levels of intrinsic goal orientation, assignment values, use of elaboration learning strategies, critical thinking,
metacognitive self-regulation, effort regulation, and peer learning. In addition, PBL must be designed to support self-regulated learning (English & Kitsantas, 2013; Thomas, Bennett & Lockyer, 2016). Dannefer & Prayson (2013) revealed that through PBL students can get feedback to then regulate their own behavior.

PBL can improve aspects of leadership, teamwork, and self-regulation in students, so this certainly refers to the conclusion that PBL itself is a learning model that involves students to fully participate in building learning itself. Student engagement can be interpreted as the relationship of students with the context of learning, discipline, peers, and teachers that allow for the transition; this also includes students' willingness to learn, their level of interest and student attention to learning (Savin-Baden, 2016).

Abu-aishheh et al (2016) tried to adopt a portfolio in PBL and the results can increase student involvement in each learning, and PBL is also an effective method for increasing student involvement in the classroom, specifically on responsible learning, strategic learning, collaborative learning and energized by learning (Ahlfeldt, Mehta & Sellnow, 2005; Abdul Khalek & Lee, 2012).

**Develop and present artifact and exhibits**

PBL facilitates problem-solving for later processing in the form of reports and the instructor assists students in planning and preparing appropriate work such as reports, videos, models, and helps students to share their assignments with others. Thus learning has clear objectives, teachers and students try to engage together in the action of learning, teachers see the learning process through the eyes of students, and students see learning as a continuous learning (Hogan et al., 2013). PBL also corresponds to the progressive challenges of pedagogy where the challenges namely learning to create visible knowledge content for students, teacher thoughts that are visible to students and students' thoughts themselves also need to be visible to themselves, their colleagues and to teachers (Tan, 2007).

PBL, as explained earlier, is identical with timely feedback, teacher-student relationship, and clear learning goals, it is very possible to form visible learning and teaching. Hattie (2013) as the initiator of visible learning provided points that can influence this visible learning which include feedback with 0.75 level of influence, teacher-student relationship (0.72), then goals (0.50), and even problems-solving teaching itself specifically has a level of influence of 0.61. Kumar & Kogut (2006) revealed in their research conclusions that PBL which presents problems to be solved by students will encourage students themselves to think reflective and reflexive, and in turn, these things can make their thinking more visible to themselves.

**Analyze and evaluate the problem-solving process**

PBL makes it easy to help students conduct evaluations of the investigations and learning processes they use. Then, PBL itself has the principle that involves timely feedback (Chen et al., 2006), which is thus very appropriate if PBL is indeed very focused in the progress of student achievement in learning itself.

Parikh, McReelis & Hodges (2001) concluded that through PBL students can receive frequent feedback; Yip (2000) stated that timely feedback in PBL can be performed via the
Web; Gülbahar & Tinmaz (2006) recommended PBL to use e-portfolio in presenting timely feedback for students; Ching & Hsu (2013) revealed their findings that online peer feedback can effectively support PBL learning.

Then, in this process, a teacher can also design PBL learning activities more effectively as a continuation of evaluation. Halvorsen et al (2018) provided an interesting review about PBL, that PBL is a learning design that can connect students with their community, that the condition of the surrounding community is something that is indeed fit with this PBL learning design.

To make learning more effective in solving a particular problem, for example, students are invited to visit a place that is related to the theme of learning, if it is economic learning then students can visit local businesses and learn how the business produces goods or services, how the problem is and how to roughly solve it (Halvorsen et al., 2018). Through this learning students certainly can build meaningful relationships with their own communities, can feel that they and the community are one entity and grow together, and feel a vision that in the future they will jump into the community and build it.

Keegan, Losardo & McCullough (2017) in their research tried to partner PBL with another approach called CE (Civic Engagement), so students could observe the provision of community-centered services and emphasize tolerance, compassion, and consideration for themselves where in the future will work with the community and their families; Hou (2014) combined PBL with CEL (Community-engaged Learning) and as a result, students feel more confident and have more awareness of the community, then the community also gives a positive appreciation of the quality work provided by students; Kim (2018) tried to invite students to participate with local communities (geographers) to produce products that can be used, and as a result, students can evaluate their own learning experiences and their work products receive direct reviews from community members and geographers.; Langhout, Rappaport & Simmons (2002) tried to bridge the gap between school and community through the use of gardens, through this program the school has invited the community and vice versa the community has also invited teachers to the garden on weekends to create learning opportunities for students in the community, trying to legitimize public knowledge and then be adopted and taught in schools; Movahedzadeh, Linzemann & Quintero (2015) tried to preserve the Chicago River by inviting students with the PBL approach and inviting the public to participate with the aim of educating them about pollution on the Chicago River.

**Conclusion**

This research shows that almost all students of the faculty of education assume that PBL is student centered based learning, beginning with the provision of problems with emphasis on children in basic education. The reason is that since children are accustomed to dealing with problems from an age of age and they are accustomed to solving them, this will automatically lead them to think critically and develop their thinking patterns. Furthermore, respondents assume that PBL can increase classroom interaction because PBL presents aspects of collaboration in learning activities. Collaboration can stimulate students to compare their knowledge with that of their peers, validate that knowledge, criticize, synthesize and ultimately consolidate it.
In addition, respondents also strongly agree that PBL can increase classroom interaction because PBL accommodates group learning with one of the learning objectives being to produce a product / work and then exhibit it in an exhibition. With this of course the class becomes more active, interaction in the classroom more positive and meaningful.

Finally, the most important thing is that respondents also assume that PBL will automatically be able to improve aspects of human literacy in students. PBL which facilitates collaborative activities, group learning activities and problem solving to later solve them will eventually generate human literacy elements including excellence in teaching and learning, positive climate for learning, professional leadership, and community engagement in learning, all of which are all can improve student achievement.

References


[64]. Shea, N. O., Verzat, C., Raucent, B., Ducarme, D., Bouvy, T., & Herman, B. (2013). Coaching tutors to observe and regulate leadership in PBL student teams or you can lead a horse to water but you can’t make it drink…. Journal of Problem Based Learning in Higher Education, 1(1), 94–113. https://doi.org/10.5278/ojs.jpblhe.v111.277


