CHANGES IN ABILITY OF SELF-DIRECTED LEARNING OF THE THIRD-YEAR STUDENTS ON PROBLEM-BASED LEARNING

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ABSTRACT
Learning method applied in Faculty of Dentistry of Brawijaya University is Problem-based Learning (PBL). One of the purposes of PBL is to develop students’ ability of self-directed learning (SDL). SDL is students’ ability to learn independently. This ability is necessary to determine the need and objective of students’ learning. This research aims to compare the ability of SDL of the first-year students and the third-year students of undergraduate program in Faculty of Dentistry of Brawijaya University. This is pre-experimental research using one-group pretest-posttest design. Samples are divided into two groups. The first group is pre-test group consisting of students of 2014 that have ever joined PBL in their first year. Meanwhile, post-test group consists of students of 2014 that have ever joined PBL on their third year. Instrument used in this research is adapted questionnaires. Data is analyzed using Independent Samples T-test, resulting in significant difference of students’ SDL scores between the first year and the third year (p<0.05). The average SDL score of the first year is 228.85 while the third year is 218.20. It can be concluded from this research that students’ SDL score in the first year is higher than that in the third year, and both of them are significantly different.

KEY WORDS
Problem-Based Learning, Self-Directed Learning, SRSSDL

INTRODUCTION
Student Centered Learning (SCL) is one of learning methods using approach that lecturer gives bigger autonomy and control to the students in order to determine the learning purpose. This method has positive impacts to the dental students because they will be motivated to learn, resulting in the expected learning outcomes and the ability to apply the knowledge on clinical cases (Murad et al., 2008).

The method is used to support the dental students in finishing their study, and one of the methods applying SCL system is Problem-Based Learning (PBL). PBL has been introduced in Indonesia since 1990 as well as in dental education because there are many dental students that are not able to see the relationship of the materials of the first year (e.g. biochemistry, anatomy or histology) and their profession as dentist (Wood, 2003).

The aim of PBL is to develop problem solving skill. This is in line with the characteristics of PBL model, namely learning about broader life, skill to interpret information, collaborative skill, reflective and evaluative thinking skill, and ability to develop Self Directed learning (SDL) skill. Students are able to use problem solving skill to discuss problem, to formulate the right solution, and to determine learning outcomes, and their learning needs (Williamson, 2007).

SDL skill is an ability on how to get knowledge based on self-initiative and to determine the learning goals, plan learning process, to use selected learning resources, to make academic decisions, and run activities to reach the learning goals (Williamson, 2003).

Dentists are required to have competencies according to those presented in Standard Competence of Indonesian Dentist (SCID). SCID of dentist states that dentist graduate is required to become lifelong learner (KKI, 2015).

SCL is a potential method to create lifelong learning in medical education. The Accreditation Council for Graduate Medical Education (ACGME) recommends that medical
graduate should become self-directed learner, evaluate their own learning process, and to facilitate other's learning process. Faculty of Dentistry of Brawijaya University has used PBL method in its curriculum since 2008. PBL discussion is conducted twice a week known as group discussion (GD1 and GD2). In GD1, students are required to activate prior knowledge or basic knowledge to identify learning needs to be learning issues. In between GD1 and GD2, students collect reference or library resources (self-learning) in order to answer the learning issue. In GD2, students discuss the result of SDL. Students of 2014 in the Faculty of Dentistry of Brawijaya University have been followed PBL process since their first year until their third year. PBL process in the first year has run well, as it shows factors that become consideration for SDL, namely awareness, learning strategies, learning activities, evaluation, and even interpersonal skills. Based on the previous research on the comparison of SDL ability of students of 2014 (the first year of PBL) and students of 2012 (the third year of PBL), it is seen that the first-year students have higher average SDL score that those in the third year (A’raaf, 2011). Besides from awareness, learning strategies, learning activities, evaluation, and interpersonal skills, SDL ability can be obtained from motivation that has two factors, namely score and hope. For the first-year students, they have big hope to study in the Faculty of Dentistry of Brawijaya University. SDL ability of the third-year students should be higher than the first-year students of the same academic year. Thus, the researcher wants to analyze the influence of PBL towards SDL by comparing students’ SDL ability during their learning process using PBL in their first and third year of study.

LITERATURE REVIEW

PBL is a learning method where students are trained to develop learning strategies that are based on problems and PBL involves thinking activities to find the right problem solving (Wood, 2003). One of the main objectives of PBL is to develop self-directed, to prepare students to think critically and analytically in finding and using appropriate learning resources (Murad, 2008).

Another goal of PBL is to build a broad and flexible knowledge base, the ability to develop effective problem solving, intrinsically motivated to learn and develop SDL capabilities (Loyen et al., 2008).

According to Gibbons (2002), self directed learning is an increase in knowledge, expertise, achievement, and developing oneself where individuals use many methods in many situations at all times. Self directed learning is needed because it can give students the ability to do assignments, to combine the development of abilities with character development and prepare students to study their entire lives. Self directed learning includes how students learn every day, how students can adapt to a rapidly changing situation, and how students can take their own initiative when an opportunity does not occur or does not appear.

Independence (self direction) is an organizational concept for higher education. Self direction is the basis of all learning, both formal and informal, the effectiveness of learning relative to one's motivation. All individuals can do independent learning but the degree of development varies and differs in each individual. It is important for educators and students to have a clear understanding of the concepts and nature of learning independently for further development (Williamson, 2007).

Some things that are known about SDL are: a student can increase his sense of responsibility for several decisions relating to student efforts, self-direction is seen as a characteristic that exists at several levels of a person and learning situation, self-direction does not mean all learning processes are isolated from others, self-directed learners can transfer knowledge, both knowledge and skills, from one situation to another, learning self-reliance requires several activities and resources, such as self-guidance, participation in study groups, an effective part of teaching in SDL is very possible, such as dialogue with students, designating resources, evaluating results, and forming critical thinking skills (Murad, 2008).
METHOD

This research uses one-group pretest-posttest method. Samples are divided into two groups, namely pre-test group and post-test group. Samples of this research are all students of 2014, as many as 97 students. The independent variable in this research is PBL discussion process. Scores from the questionnaire are obtained by summing the scores of all fields or aspects listed in questionnaires and categorizing them into low, medium, and high. Data is analyzed using normality test and homogeneity test. If the data has been distributed normally and homogenously, there will be conducted Independent T-Test to find out the difference of self-directed learning ability of students of 2014 in their first year and third year.

Table 1. Interpretation of SDL ability

<table>
<thead>
<tr>
<th>Score</th>
<th>SDL Ability Level</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 - 140</td>
<td>Low</td>
<td>Really needs supervision from the instructor/teacher. Some specific changes for the development must be identified and, if possible, structure as well as learning method should be changed.</td>
</tr>
<tr>
<td>141 - 220</td>
<td>Medium</td>
<td>This phase has been in a halfway to become self-directed learner. Useful area for developing ability should be identified. Evaluation and strategy are carried out under the supervision of instructor/teacher in needed.</td>
</tr>
<tr>
<td>221 - 300</td>
<td>High</td>
<td>This phase indicates a process for effective self-directed learning. The purpose is to maintain the progress by identifying the strength and method for effective self-directed learning.</td>
</tr>
</tbody>
</table>

RESULTS AND DISCUSSION

The result of comparison of SDL ability of students of Faculty of Dentistry of Brawijaya University can be seen in table below:

Table 2. Result of Independent Samples Test

<table>
<thead>
<tr>
<th>Period</th>
<th>Average</th>
<th>T Statistics</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>The First Year</td>
<td>228.85</td>
<td>3.582</td>
<td>0.000</td>
</tr>
<tr>
<td>The Third Year</td>
<td>218.21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From Table 2, it is shown that significance value is <0.05. The conclusion of statistic test using Independent T-Test is there is significant difference of SDL ability between students in the first year and the third year. Students in the first year has higher average score than those in the third year.
PBL learning method in Faculty of Dentistry of Brawijaya University is a learning step that must be passed by undergraduate students. PBL trains students to develop their ability in problem solving and SDL ability in discussing problem as well as determining learning goals and learning needs.

The previous research is conducted on the difference between SDL ability of students of 2014 (the first year) and students of 2012 (the third year). The result of the research shows that there is significant difference of SDL score of students of the first year and the third year. The score of students in the first year is higher than those of the third year (A’raaf, 2011). This research will re-test changes in SDL ability on PBL method of students of 2014 in the third year compared to the first year. The number of samples changes; the number in the first year is 101 while in the third year is 97. The decrease in the number of samples is because there are students that move to another place. Data collection in this research uses questionnaires adapted from Williamson (2007).

The result of this research states that students in the first year of PBL learning have higher SDL ability than students in the third year.

To reach the research purpose, which is to compare SDL ability of students of Faculty of Dentistry in the first year and the third year, statistic test is conducted using Independent t-test. The result shows that significant level is 0.00 (p<0.05). It shows that there is significant difference between SDL ability of students in the first year and students in the third year of PBL learning.

PBL learning method is applied to create adults’ character, especially their SDL ability. Some researches on this matter have been conducted in Indonesia, but the results are different. A research conducted by Lestari and Widjajakusumah (2009) on students of Faculty of Medicine of Sutan Agung University finds that 50% of students in the third year and the fourth year have a range of SDL score from low to medium (Lestari et al., 2009). Some of the researches describes that characters of SDL through PBL learning in Indonesia have not been implemented well. The main problem in the implementation of Competency-Based Curriculum is the lack of student’s intrinsic motivation (Dibyasakti et al., 2012). The first-year students of Faculty of Dentistry of Brawijaya University have the average score of 228.85, which is included in high category, while the third-year students have the average score of 218.21, which is included in medium category. It can be concluded that the first-year students have higher average of SDL score than the third-year students. This condition is influenced by some factors. One of them is students’ motivation.

Some factors determined the implementation of SDL is planning, monitoring and evaluating; time management; and boredom. In planning step, it is necessary to have the two things called prior knowledge and complete learning resources. Prior knowledge in PBL process is to find out the learning needs (Dibyasakti, 2012). Faculty of Dentistry of Brawijaya University conducts two meetings in PBL discussion process, commonly called GD1 and GD2. In the first meeting (GD1), students are given scenario to be discussed. In this step, prior knowledge of students will be activated to help discussing problem and determining learning needs. Besides, in this meeting, students will determine the learning objective that will be searched during self-learning process between GD1 and GD2. Before GD1, students are given topic that will then be discussed on the scenario. This is expected to make students be able to search for information relevant to the topic and used as prior knowledge.

Complete learning resources such as lecturers and literature should also be provided. Library of Faculty of Dentistry of Brawijaya University has owned resources that are relevant to the topic learned by students. However, the number of resources has not been met the criteria since the library is accessed at the same time, so students who cannot find the resources there should find in another library. In term of instructor or lecturers, Faculty of Dentistry of Brawijaya University has owned lecturers that are able to facilitate the students learning process. It is expected that the students can use the opportunity to do consultation. However, some of students do not use it, so they only use literary texts from resources like book or journals only (Wood, 2002; Dibyasakti, 2012; Gibbons, 2002).
Monitoring process is reflected in learning process when students conduct self-learning in between GD1 and GD2. This is conducted by reading several references. References are not only from book but also internet, journals, and etc. Evaluating process can be carried out by consultant to ask about learning material that have not been obtained or understood during group discussion (Wood, 2002; Dibyasakti, 2012; Gibbons, 2002).

In PBL method in Faculty of Dentistry of Brawijaya University, deeper lecture on learning material that is still confusing is conducted after GD2 (Pedoman Akademik FKG UB, 2012). This is really useful to clarify unclear things. However, some students still do not use the lecture. In fact, one of the weaknesses of PBL method according to (Wood, 2003) is information overload or students are confused on how far they should do self-directed study and what information that is relevant and useful to study.

Skill of students’ time management is necessary in this phase. Good academic achievement can be obtained by balancing time management and effective learning method. One of the weaknesses of PBL methods is time consumption, meaning that the duration of finding literature, collecting new information, self-preparing for discussion, in which students need more time to study (Fitriah, 2014). Some scenarios have many learning issues so that students need to write many logbooks as well. Logbook is a self-learning process of students which is written in handwriting in a notebook according to the understanding and learning style of each student and must answer all learning issues (Fitriah, 2014). Students who have many activities outside campus are lack of time, so they only use any resources or even just copy what have been written by some else.

Many logbooks and activities can reduce their time to understand what they write. This condition can make their SDL ability stuck. In psychology, it is called boredom of study. It may happen because the learning process of students has reached the limits of their physical abilities due to boredom and fatigue (Gibbons, 2002; Loyens et al., 2008; Syah, 2005). Mental fatigue is often considered as the main factor of boredom of study. It can be caused by students’ anxiety toward the standard of success in certain subject considered to be too high, especially when students have been bored to the subject (Djaali, 2013). This condition may happen in the third-year students that have studied in Faculty of Dentistry of Brawijaya University for less than three years and have joined PBL process for several times, so they have felt bored. The boredom can reduce students’ learning motivation so they do not meet their learning needs.

One of the factors influencing learning process is motivation. Motivation is determined by two factors, namely score and hope. The higher the hope on a subject and the higher the score of the object, the bigger the motivation will be (Djaali, 2013). In the first year, students have big hope to study in Faculty of Dentistry of Brawijaya University, so they are motivated to achieve their goals to be self-directed learner (Premkumar et al., 2014).

Five fields in SDL level are awareness, learning strategy, learning activity, evaluation, and interpersonal skill. Some elements in individual learning strategy are motivation, attitude, time management, note-taking, reading technique, concentration, and learning style (Harsono, 2008). Learning strategy can be determined by the individual based on his/her condition. Content of the material in learning strategy has been obtained by students in the first year through conventional lecture in their beginning of school. The result is the first-year students have known how to determine their own learning strategy and have the highest average of learning strategy. It is seen that they have been prepared their better to do self-directed learner (Malik, 2012; Nadi, 2012).

Some researches that have been conducted show that PBL learning model can increase students’ learning activities (Premkumar et al., 2014). In the first and the third year, learning activity of students has the lowest average score.

This condition can be caused by students lacking of ability to formulate their idea or to implement their learning strategy. Interpersonal skill is the ability in interpersonal relationship needed to be self-directed learner. During PBL process, interpersonal skill can be trained or increased because it requires skills to work together in a group, to lead group, to listen and to respect others, and to deliver presentation. The result of PBL process in the third year
shows high average score of interpersonal skill because their skill has been trained for three years by joining PBL process in Faculty of Dentistry of Brawijaya University (Malik, 2012; Nadi, 2012).

CONCLUSION

The research conclude the following points:
1. The average SDL score of the 2014 students of the Faculty of Dentistry of Brawijaya University in the third year is 218.21, which is included in medium category.
2. The average SDL score of the 2014 students of the Faculty of Dentistry of Brawijaya University in the first year is 228.85, which is included in high category.
3. The average SDL score of the 2014 students of the Faculty of Dentistry of Brawijaya University in the first year is higher than the third year, and has significant difference.
   Moreover, the researchers suggest the following points.
1. In the next research, it is expected to do a survey to the students of Faculty of Dentistry of Universitas Brawijaya to evaluate the implementation process of PBL.
2. A longitudinally (all time) observation is required so the development of the students' SDL skills can be viewed clearly.
3. The research can be continued by interviewing or role playing to the student.
4. The next research is done by different instrument so the clear connection about the PBL towards the SDL skill to the students of the Faculty of Dentistry of Brawijaya University can be obtained.
REFERENCES


