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ការរៀនដោយប្រើចំណោទបញ្ហា: គំនិតរបស់សាស្ត្រាចារ្យ និងនិស្សិតវិទ្យាសាស្ត្រសុខាភិបាលនៅក្នុងសាកលវិទ្យាល័យពុទ្ធិសាស្ត្រ

Problem-based Learning: The Experience of Health Science Lecturers and Students at University of Puthisastra

A Thesis

Submitted In Partial Fulfillment of the Requirement for the Degree of

Master of Education

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Abstract

This research paper aims to mainly look at the experience of the health science lecturers, year-three and year-fourth pharmacy and dentistry students as well as their challenges toward problem-based learning. The study was composed of 280 health sciences year-three and year-fourth students from pharmacy major and four full-time lecturers from University of Puthisastra. It was conducted by using a mixed method, so a mixed use of questionnaire and semi-structured interviewed were employed as tools to collect data from respondents. The questionnaires consisted of three mains sections- the introduction, the personal information and the subject matter part talking about the perception of students; semi-structured interviewed was conducted to obtain detail information from the lecturers who directly taught PBL classes. The data was analyzed in two ways. First, the data collected from the 280 participants were computed and analyzed using the SPSS 18. The statistical procedures used in this study were frequencies and percentage. Second, manual analysis of the interview was used to analyze qualitative data. The results show that most of the students and lecturers were not feeling satisfied with the current PBL implementation and needed to have further improvement for the future success.

Acknowledgements

I would like to profoundly thank **Dr. Keuk Chan Narith**, my supervisor, whose encouragement, supervision, assistance, feedback, patience and kindness always push me to move forward and are unforgettable. It is my great honor to have him as my research supervisor. I do really appreciate all of the feedback, collaboration, and support that I received from him.

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CHAPTER I: INTRODUCTION

1.1. Background of the Study

In the past, it was believed that theoretical teaching was very practical to pass on the knowledge to the students; however, due to the modernization and evolvement of teaching and learning, it seems that nothing is theoretically interesting as good practice (Gaffney & Anderson, 1991). To better equip students to be more competent and challenged in problem-solving and analytical skill, problem-based learning (PBL) is designed and implemented. Ironically, the root of PBL may derive from the belief of John Dewey that teaching should be conducted based on the student's natural instincts to investigate and create but not to memorize, and traditionally most teaching in the past, especially in the field of medical science required students to memorize great deal of information and theories and then to apply in the clinical situation. Actually, the clinical result was not satisfied since the theories they learn were not all applied during the clinical periods; as a result, PBL was firstly originated for the medical doctor students (Delisle, 1997).

Generally, PBL is an instructional approach that has been used successfully for over 30 years in health sciences subjects and continuously remains its impact and gains its acceptance on the other educational majors. According to Hal White (1995), educator must reconsider what students really need to learn and the environment in which they learn. Motivation and enthusiasm for the problem-based learning approach to learning from students heavily rely on the instructors who are active and energetic. Significantly, problem-based learning generally looks the same to student-centered approach but precisely, it is more than this because in PBL courses, instructional model is applied that assign students to work with classmates to solve complex and authentic problems that help develop content knowledge as well as problem-solving, reasoning, communication, and self-assessment skills. These problems also help maintain students' interest and joy in the program because students realize that they are learning the skills needed to be successful in their profession and life.

Remarkably, in Cambodia the term of problem-based learning is not familiar to most educator and students but only student-centered approach that was first introduced via Child Friendly School program set up by the collaboration between MoEYS and international partners; however, the scope of it at that time was narrow and human resources were inadequate (UK

Essay, 2015). To jointly develop the educational sector in Cambodia, University of Puthisastra whose main goals are to provide excellence of education, research, and institutional diversification and sustainability decided to include problem-based learning approach in the teaching and learning activities of the pharmacy students in 2017 aiming to increase their potentiality in their professions. In addition, before applying this approach, there was a serious discussion among technical team whose experience in teaching PBL; importantly, lecturers were also provided PBL training to increase the level of effectiveness of PBL teaching.

1.2. Research Problem

Even though Royal Government of Cambodia has put an effort to improve the educational sector, the satisfactory level of improvement is low; especially the applying process of student-centered approach that is a part of problem-based learning since most teachers are still adopting traditional teaching method that gradually transforms the students to the spoon-fed ones (Wilson, 2013; Phearon, 2013). The ineffectiveness or the absence of problem-based learning approach in the class will have a negative impact on the ability to perform in workplace of the students, especially graduate ones that may cause them to fail in job hunting process or probation period; it is not because they are not qualified but it is because they are not taught how to flexibly and independently solve the problem in the realistic way. Moreover, although UP has already included PBL into teaching and learning of health sciences students; it is only in a pilot stage and yet, no investigation and report about the perception of students or the instructors who were directly involved in this approach has been done. Consequently, this research paper will mainly look at the perception of the lecturers and students as well as their challenges toward PBL practice.

1.3. Research Objectives

Objectives:

To address the problem, researcher will:

1. Explore the experience of PBL encountered by health sciences lecturers and students at UP
2. Discover the challenges of the students and lecturers facing during practicing PBL in the class
3. Seek for sound recommendations to make the practice of PBL more effective at UP

1.4. Research Questions

To fulfill the objectives, this current research sought to answer the following questions.

1. What are the experiences of lecturers and students toward PBL practice in the class?
2. What challenges do the students and lecturer face in the implementation of PBL?

1.5. Significance of the Study

The mixed-method research study will produce a scientific finding telling whether the students have positive or negative experience toward the PBL practice, their challenges, as well as their suggestions to improve the situation in the class. Considerably, this research study will also glance at the perception and difficulties of the instructors as well as their proposed idea to have a better progress of existing approach; overall recommendation will be provided to increase the effectiveness of the teaching and learning environment through PBL approach and to expand it to all disciplines at UP .

1.6. Scope

Since PBL is applied to only dentistry and pharmacy students at UP, the result of this research study cannot be generalized to all health sciences students in Cambodia; furthermore, this study only focuses on the experience but not the impact or the level of effectiveness of PBL approach to the students. The future study should figure out the influence of PBL by comparing the PBL students with non-PBL ones who are in the same level to see the effective impact of this approach to the students.

CHAPTER II: LITERATURE REVIEW

This chapter consist of two main parts- the definition of problem-based learning and the review of previous research studies that can be considered as the leading point to the formulation of conceptual framework.

2.1. The Definition of Problem-based Learning

According to Schmidt (1983), problem-based learning (PBL) is an instructional method delivered to the students aiming at providing suitable knowledge to improve problem-solving skill. It consists of carefully designed problems that challenge students to use problem solving techniques, self-directed learning strategies, team participation skills, and disciplinary knowledge. In addition, fundamentally, it is an instructional method specified using patient problems as a lesson for students to generate problem-solving skill and acquire knowledge about basic and clinical science (Barrows, 1985). However, according to Barrow and Gijsealers (1996), the assumption of PBL is that learning is active, integrated, and constructive process impacted by social and contextual issues. They then claim that it is characterized by student-centered approach in which teacher takes role as facilitator rather than disseminator. Problem-Based Learning (PBL) is a non-traditional teaching technique where "the problem drives the learning" (Tse & Chan, 2003). First, a problem is presented. Students must then search for the information needed to help them solve it (Salas, Segundo, Álvarez, Arellano & Pérez, 2014). In PBL, "learning is student-centered" (Tse & Chan, 2003) and the instructor's role is not lecturing, as in the traditional style of teaching that has dominated engineering and science education but coaching the students to acquire knowledge and to become "self-directed learners" (Forcael et al., 2015, Stanford University Center for Teaching and Learning, 2001).

2.2. Review of Previous Researches

Precisely, the academic conflict about the influence of instructional guidance during teaching happened for at least about the past half-century (Ausubel, 1964; Craig, 1956; Mayer, 2004). On one hand of this dispute were a group of people who firmly thought that people could learn best in the uncontrolled or unguided environment. It meant rather than presenting clues or important information, students had to discover and investigate the root of problem by themselves to construct the information (Bruner, 1961; Papert, 1980). On the other hand, it was

said that young learner should have not left to discover things alone; they had to be directly guided by particular principles and concepts (Cronbach & Snow, 1977; Sweller, 2003). Direct guidance referred to the process of explaining concepts and strategies that were required for students to improve their leaning capacity and fundamentally support their investigation and observation spirit.

The minimally guided approach was known and called problem-based learning and this approach included science instruction that students were assigned to explore the fundamental principles through investigatory activities (Van Joolingen, de Jong, Lazonder, Savelsbergh, & Manlove, 2005). However, it seemed that two main assumptions were underlying instructional approach using minimal guidance or problem-based learning. Firstly, students were challenged to solve authentic tasks or problems that required complex understanding to construct their own solutions contributing to the most effective learning experience. Secondly, it was believed that knowledge could be best acquired through experience on the procedures of discipline (Kirschner, 1992). Normally, minimal guidance was retrieved in the form of process or task-relevant information that was available for learners in case they use it.

According to Savery and Duffy (2001), instructional methods that were used in problem-based learning were divided into 8 principles to foster and accelerate cognitive process of the learners- expanding all learning activities into larger task or problem, supporting learners to develop ownership of problem or task, designing an realistic task, creating task and learning environment to reflect the complexity of the society, giving learners ownership to develop a process of solving-problem skill, designing learning environment to challenge learner's thinking, encouraging idea testing against substitute views and contexts, and providing support and opportunity to reflect on both the content learned and learning process. Similarly, Papas (2014) also argued that problem-based learning can be best introduced to the learners throughout 4 main principles- active learning, integrated learning, cumulative learning, and learning for understanding.

However, two main aspects were introduced in the PBL class to help teachers generate and develop the comprehensive problems for the students. Primarily, problems had to be created with the inclusion of concepts and principles in relation to the content taught in the class or in the existing curriculum. In this sense, students would be able to expose and identify the problem and solution better and quicker. Finally, the proposed problems had to be authentic; for example,

for health science students, problems could be a real patient or disease; by doing so, students would be able to apply the theories and lesson learnt in the class to the genuine context of the problems (Savery & Duffy, 2001).

Problem-based learning promotes a better understanding of course concepts and improves the problem-solving skills of the students as well as their communication, presentation and teamwork skills. Research has shown that students find PBL to be a very "motivating and effective means for learning" (McLoone, Lawlor & Meehan, 2016; Forcael et al., 2015). Students are more engaged in class because they recognize that they are acquiring important skills which will help them succeed in their future careers (Stanford University Center for Teaching and Learning, 2001). The combination of problem-based learning with traditional teaching in engineering and science "strengthens the teaching-learning process" (Salas, Segundo, Álvarez, Arellano & Pérez, 2014).

Previous research suggests PBL improves long-term knowledge retention (e.g., Strobel & van Barneveld, 2009), problem-solving skills (e.g., Kanet & Barut, 2009), analytical and reasoning skills (e.g., Michel, Bischoff, & Jakobs, 2002), interpersonal skills (e.g., Kumar & Natarajan, 2007), self-directed learning skills (e.g., Thomas & Chan, 2002), and attitudes towards the course subject (e.g., Ferreira & Trudel, 2012). In a comprehensive review of research, Hmelo-Silver (2004) argues that there is considerable evidence in the literature supporting claims that PBL helps students develop flexible knowledge, effective problem-solving skills, and self-directed learning skills, yet little research has been done to understand the influence PBL has on effective collaboration skills and instinctive motivation. Hmelo-Silver (2004) also cautions that too little research has been conducted outside of medical and gifted education and, therefore, understanding how goals are achieved with less skilled learners is important for future research.

The positive impacts of PBL have been well documented. First, PBL allows the learner to take an active role in the education, encourages concept application, and provides intellectual growth through strategic decision making (Yeo, 2008). Specifically, PBL holds students accountable for their own learning and the learning of the classmates (Chagas et al., 2012), allows students to explore more than one right answer (Karantzas et al., 2013), and encourages students to use learned knowledge to arrive at a solution (Mykytyn et al., 2008). Second, PBL can enrich students' learning outcomes, which will better prepare them for the work

environment (Deeter-Schmelz, Kennedy, & Ramsey, 2002). When knowledge is deficient, PBL encourages students to identify the missing information that must be utilized to complete their task (Mykytyn et al., 2008). As such, PBL requires active engagement of material rather than regurgitation of lectured concepts (Yeo, 2010). Third, PBL provides tools necessary to handle future challenges (Yeo, 2008). In contrast to traditional lecture-based learning, which requires students to demonstrate understanding by replicating materials provided by the faculty member on exams (Kuruganti, Needham, & Zundel, 2012), PBL has been found to be a better instructional pedagogy to "bridge the gap between theory and practice" (Hsieh & Knight, 2008, p. 29). Due to its well-known benefits, PBL has been successfully employed in a wide variety of disciplines including business education (e.g., Buff, 2011; Kanet & Barut, 2009; Mykytyn et al., 2008), medical education (e.g., Prince, van Eijs, Boshuizen, van der Vleuten, & Scherpbier, 2005), social work education (e.g., Pearson, Wong, Ho, & Wong, 2007), health education (e.g. Chagas et al., 2012), and engineering education (e.g., Hsieh & Knight, 2008; Woods, 2012)

Conceptual Framework

The conceptual framework was created and deliberated according to the instructional principles deriving from constructivism. The eight delivering methods helped support each approach to be delivered effectively during PBL implementation.

Delivering Method		**Approaches**		
Problem's Ownership Training Critical Thought	⇨	Active Learning	⇨	
Realistic Task Relevancy of Social Complexity	⇨	Integrated Learning	⇨	**Effective PBL Implementation**
Problem Possession Progressive Challenge	⇨	Cumulative Learning	⇨	
In-depth personal Reflection Knowledge Testing	⇨	Learning for Understanding	⇨	

Source: Savery & Duffy (2001)

CHAPTER III: Methodology

3.1. Research Design

The main purpose of this research study is to explore the perception of lecturers and students toward the four approaches applied in problem-based learning; therefore, a mixed method of both qualitative and quantitative data will be used to explore in-depth and specific information that will give a comprehensive result to analyze and describe.

3.2. Tool for data gathering

Since this research study was conducted by using a mixed-method approach, so a mixed use of questionnaire and semi-structured interview were employed as tools to collect data from the respondents. Questionnaire, which was considered as an efficient tool to measure behaviors of a large population, was used to collect the information regarding the experience of 280 pharmacy year-three and year-fourth students toward PBL at UP; it consisted of three mains sections- the introduction, the personal information and the subject matter to investigate the experience of the students who had been involved in the PBL practice. This research tool did not require students to spend much time since it was only two pages long with two-sided paper which take students around 10 minutes to completely run through it. Besides, semi-structured interviewed was another tool to be used to seek for the information, concerns, and suggestions from the full-time instructors taught in the pharmacy department. To ensure the effectiveness and the exhaustion of retrieving information, more questions were also asked to the participants during the interview.

3.3. Site, population, sample size and sampling method

Since the University of Puthisastra has been implementing PBL into its teaching and learning activities for the pharmacy students, it was considered as the best place for the researcher to collect information. Essentially, UP consists of more than 300 year-three and year-fourth pharmacy students; moreover, there are only four full-time and six part-time lecturers in the Department of Pharmacy (DOP). In this research study, 280 year-three and year-fourth students from the DOP were selected and all the four lecturers who were teaching in year 3 and year 4 during the data collection period. Noticeably, 140 of third-year students and the other 140 of fourth-year students of pharmacy were chosen and there were two main reasons staying behind

the decision of choosing this kind of selection process. The first one was that only year three and year four students were involved in the practice of PBL and they were regarded as senior in their major, so comprehensive and specific information were obtained from them. Secondly, the accessibility to get data collection from the participants was relatively easy and convenient for researcher. In addition, there were also two main reasons that only full-time lecturers were chosen for the interview to conduct this research. Firstly, no part-time lecturers were available for this research; since they were too busy with their full-time job and teaching, they rejected the researcher's request for interview. Secondly and the most important one was that only full-time lecturers were trained to teach PBL, and this was considered as the best respondents to obtained the data from.

Research study was not reliable and valid if the process of selecting participants is not clearly planed and operated; in this sense, research findings were undoubtedly biased. To avoid having this problem, simple random sampling (SRS) and purposive methods were employed to choose the most suitable participants for the research study. SRS was used to choose the students and researcher used the systematic way that was the table random sampling in excels to maximize the fair chance of being selected; meanwhile, he used purposive technique for the lectures. There were two logical reasons that researcher decides to employ these two techniques. Primarily, SRS gave equal chance to each member of the population to be selected as subject to the study; this somehow ensured the fair and equal process of selection. Lastly, since researcher was not quite clear about the lecturers teaching in the dentistry and pharmacy departments, a recommended name of lecturers from head departments of dean was the most effective way to reach the subject of the research.

3.4. Data Collecting Procedures

Related to data collection, a letter of permission to the field were given to the Vice-president of Academic Affairs (VPAA) for approval. With the permission from VPAA, researcher, then, showed it to distinguished related head departments and dean of Faculty of Health and Sciences asking for their cooperation in the recruitment process. Head departments of pharmacy helped give out the name list of two classes of year three and the other twos of year-fourth students respectively to the researcher. He then used a sample random sampling technique to choose participants. In this sense, table random sampling in excel was used; each name of the

students was typed in the Excel table with chronological number based on the given name list. Next, he used random formula to create random numbers and then random custom sort to select the preferred number of students out of the total population. Remarkably, this systematic process was done according to the year, class, and major of the students; It means he picked 70 numbers of students each time and he did these 4 times to ensure that he equally chooses 70 students out of each class from that major. After this, he delivered the questionnaire to his subject and waiting to collect it. Besides, researcher went to the head departments to ask for the lecturers who were currently teaching PBL in year 3 and year 4 to be the subject for interview. After getting participants, he then interviewed his subjects by using semi-structured interview that consists of approximately 10 questions; the interview was held at any convenient place and time depending on the subject. Before interviewing, respondents were carefully explained about the purpose of the research.

3.5. Data analysis

Since questionnaire was used as a tool to gather information, then Statistical Package for Social Science was also employed to analyze and interpret the collected data from the students; this software was very convenient and reliable with the large amount of respondent's data. Researcher analyzed by using descriptive statistic that mostly looks at the frequencies and percentage transferring from SPSS. However, the information obtained from the teacher by semi-structure interview was noting down in categories to easily figure out the problem. Next, he interpreted the data by reviewing the relation between the major findings and the research questions and gave some personal reflections related to the subject matter.

3.6. Ethical Consideration

Researcher brought a clarified letter about his background and personal information to the Vice-president of Academic Affairs, head departments, and dean at faculty of health sciences, UP. Then, he carefully and clearly explained the selected participants about his research purposes and procedures to make them more familiar with what he conducted during data collation process; questionnaire and interview in this research were voluntary and they could reject or gave up at any time they wanted. Researcher assured the confidentiality of any provided information from the participants to be in secret and could not be revealed to public without any consensus from them.

CHAPTER IV: Findings

The findings obtained from the two data collection methods were interpreted according to the research questions. It meant that they were divided into two parts based on the two research questions and then further divided into student section and teacher section. For research question one in student section, the result was interpreted based on the information from the questionnaire and used graph to explain the perception of the students to PBL in class. However, in teacher session the interpretation was done according to the categories that the researcher was divided. And he also applied the same method-category explanation- in research question two to make the finding interpretation more organized and understandable.

4.1. Research question 1: What are the perceptions of lecturers and students toward PBL practice in the class?

Student Section

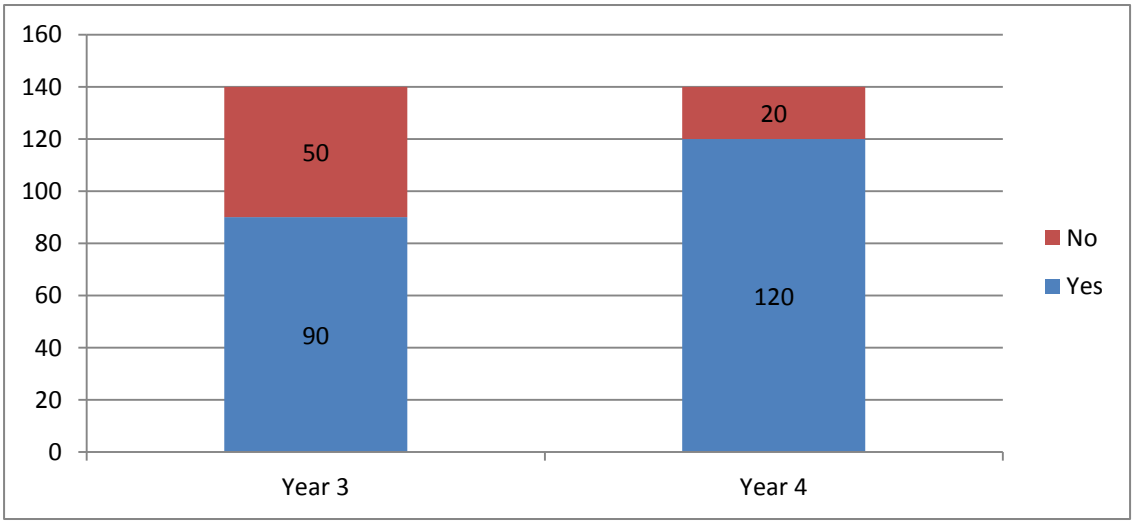

Figure1: The understanding of year-three and year-fourth pharmacy students toward the definition of PBL.

When the students were asked to tick whether they used to hear the word ***Problem-based Learning,*** they replied differently according to the year.

According to figure 1, it showed that the majority of the pharmacy year-fourth students were aware of the term "**PBL**" while only minority was not. This may meant that they used to join the PBL conference or were well introduced by their lecturers before becoming a subject to PBL implementation. Conversely, it was slightly difference in numbers of students of pharmacy

year-three regarding this term. Not so many of them realized PBL and it was probably because they were not well informed by the lecturers before.

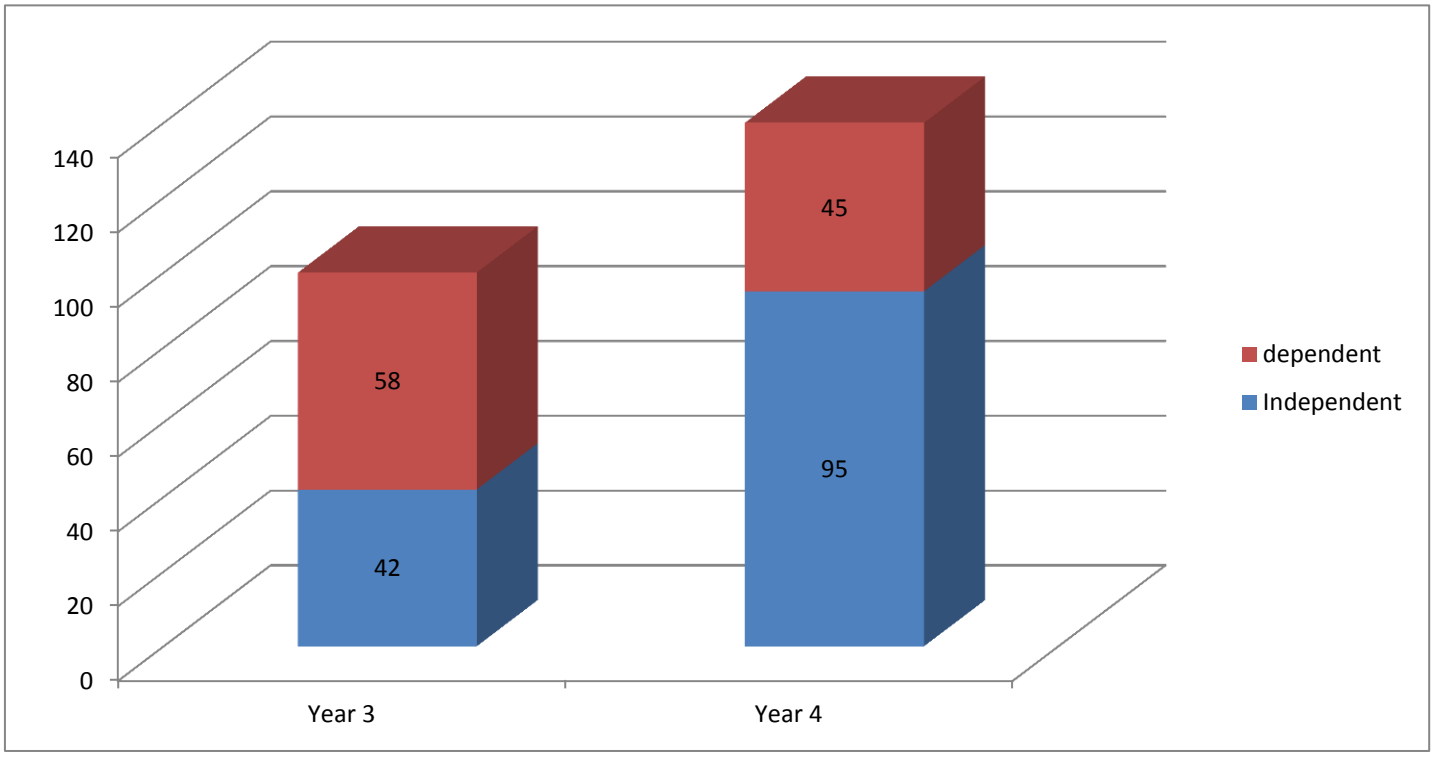

Figure2: The preferred ways of studying of year-three and year-fourth pharmacy students.

The year-three and year-fourth students seemed to make big gap difference when they moved to the question whether they preferred to study dependently or independently. The concept was that PBL could be delivered by making students more independent and this result meant different.

Depending on the bar graph displayed above, we could see that among total number of year-three students, only 42 students preferred studying independently or received less instruction and clues from their instructor while the most of them chose dependence as their preference. It meant they needed more instruction, clues, answers, and handout from their lecturers; it could cause a major barrier to the process of PBL implementation. However, the result was different to year-fourth pharmacy students. Most of them preferred studying independently with less instruction and explanation while only slight numbers of them depended on their lecturers to help

them solve the assigned task or problems; this result could be very positive to the implementation process.

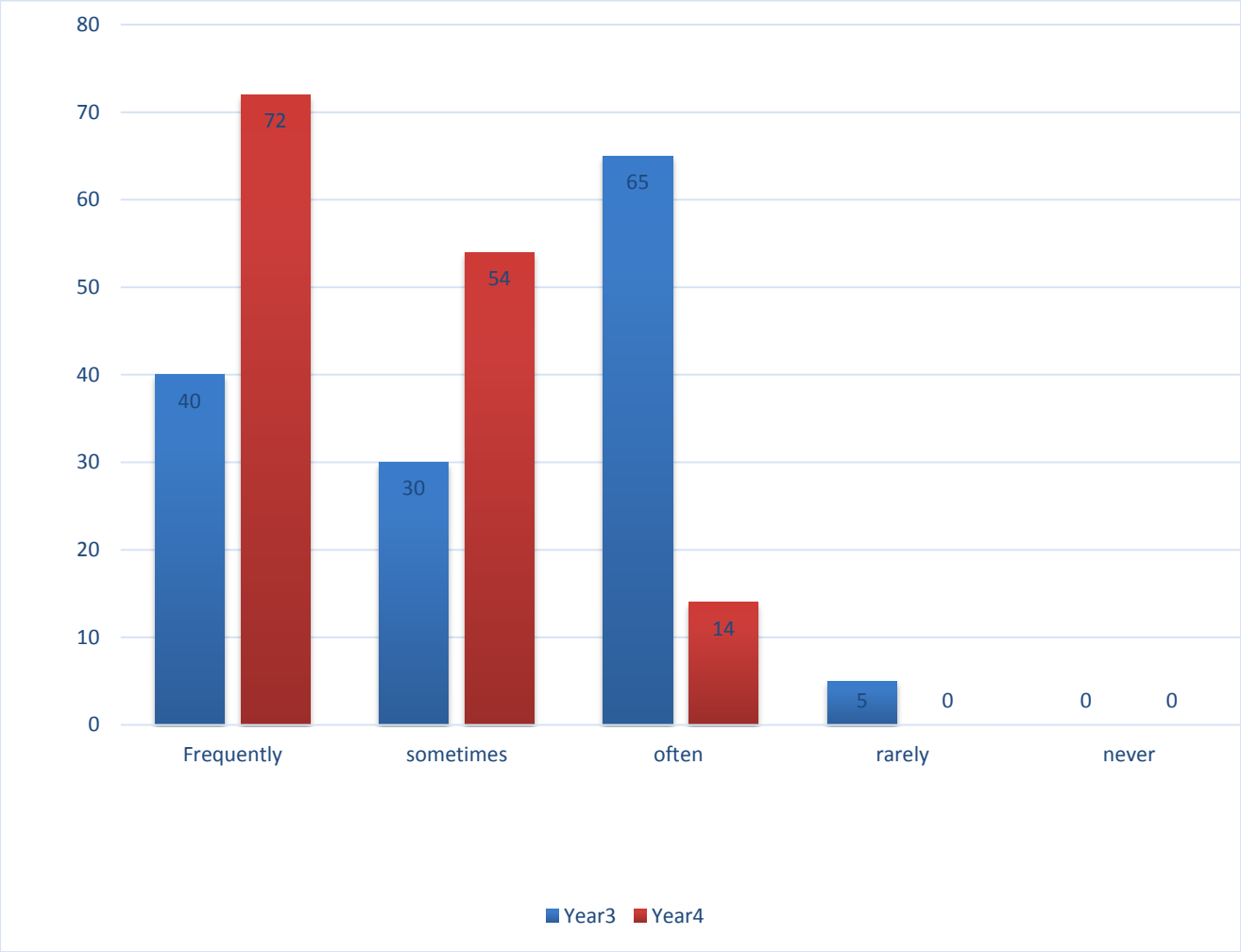

Figure3: The frequencies students are assigned to do problem solving in the class.

Actually, pharmacy students in both years have to get through clinical test during their academic year. And when they were asked about the frequencies of assignment from their lecturers to solve problems related to disease or clinical problem, the research got different noticeable response.

Figure 3 represents the tasks that the students were assigned to solve certain problem related to disease or clinical cases. Most of year-three pharmacy students chose “often” as their most preferable answers but not frequently as their first choice. When they received less clinical test or exam, their knowledge matter was limited and would be difficult to pass the ultimate

national test. Conversely, the result was more positive when we looked at the answer of year-fourth pharmacy students. Most of them chose frequently and this meant that they were well connected and frequently exposed to solve problems related to current disease. Although the frequency chosen by year-three students was not good, none of them choose never as their answer.

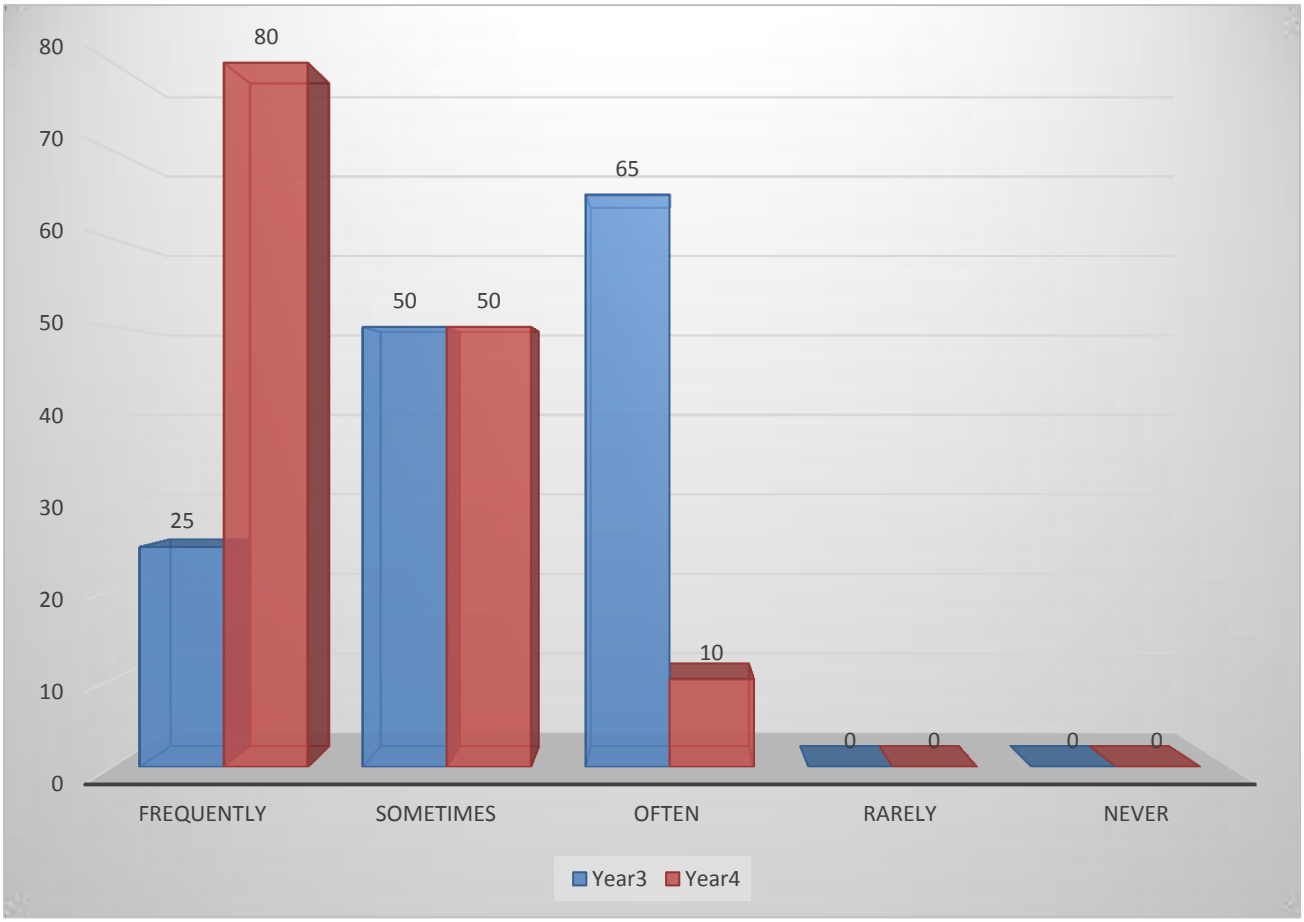

Figure4: The frequencies students are assigned to do presentation

In this part, the respondents were asked about the frequency of doing presentation inside class and the response was also obtained differently based on the year.

Based on the bar graphs above, the majority of year-fourth pharmacy students chose frequently as the answer, so it meant they were exposed to do research and work in group. This would gradually help them increase their confidence and independency. However, year-three

participants chose often as their preferred answer, and this meant that they received less tasks to present comparing to year-fourth students; it could be a slight problem when injecting PBL. However, since none of them chose never as the answer, we could assume that they have experience in doing presentation.

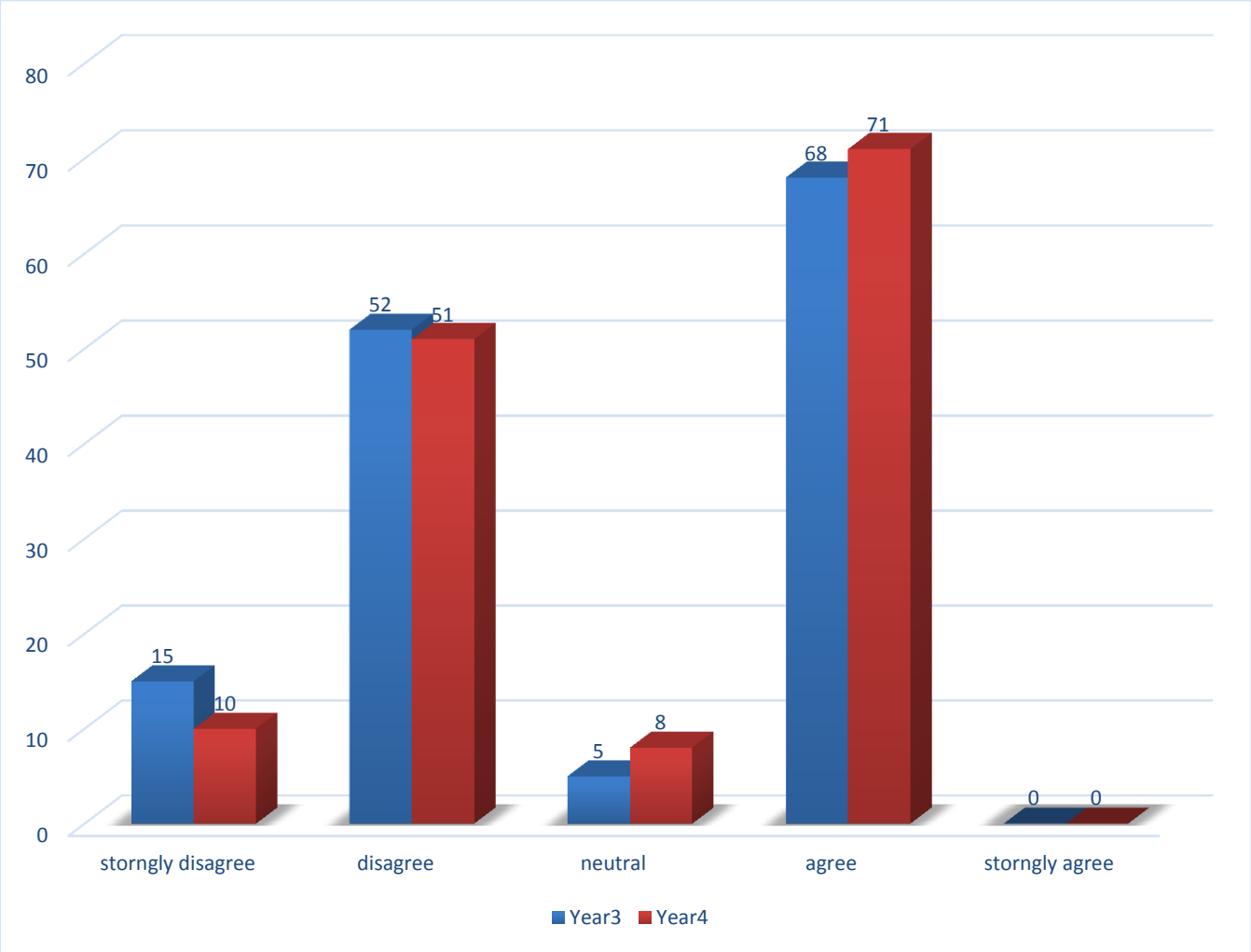

Figure5: The rating of students whether they are given enough time to do research

When distinguish respondents were asked to rate how much they agreed with the time they were given to do research in class, year-three and year-fourth pharmacy students gave almost the same response.

According to the graph, almost half of year-three and year-fourth students respectively agreed that they received adequate time to do research on their assignments while nearly half of them correspondingly disagreed with this idea; conceptually speaking, once the students were not given enough on the problem matter, then they seemed not to develop their critical and research skill, and this may lead to the fragility of PBL implementation.

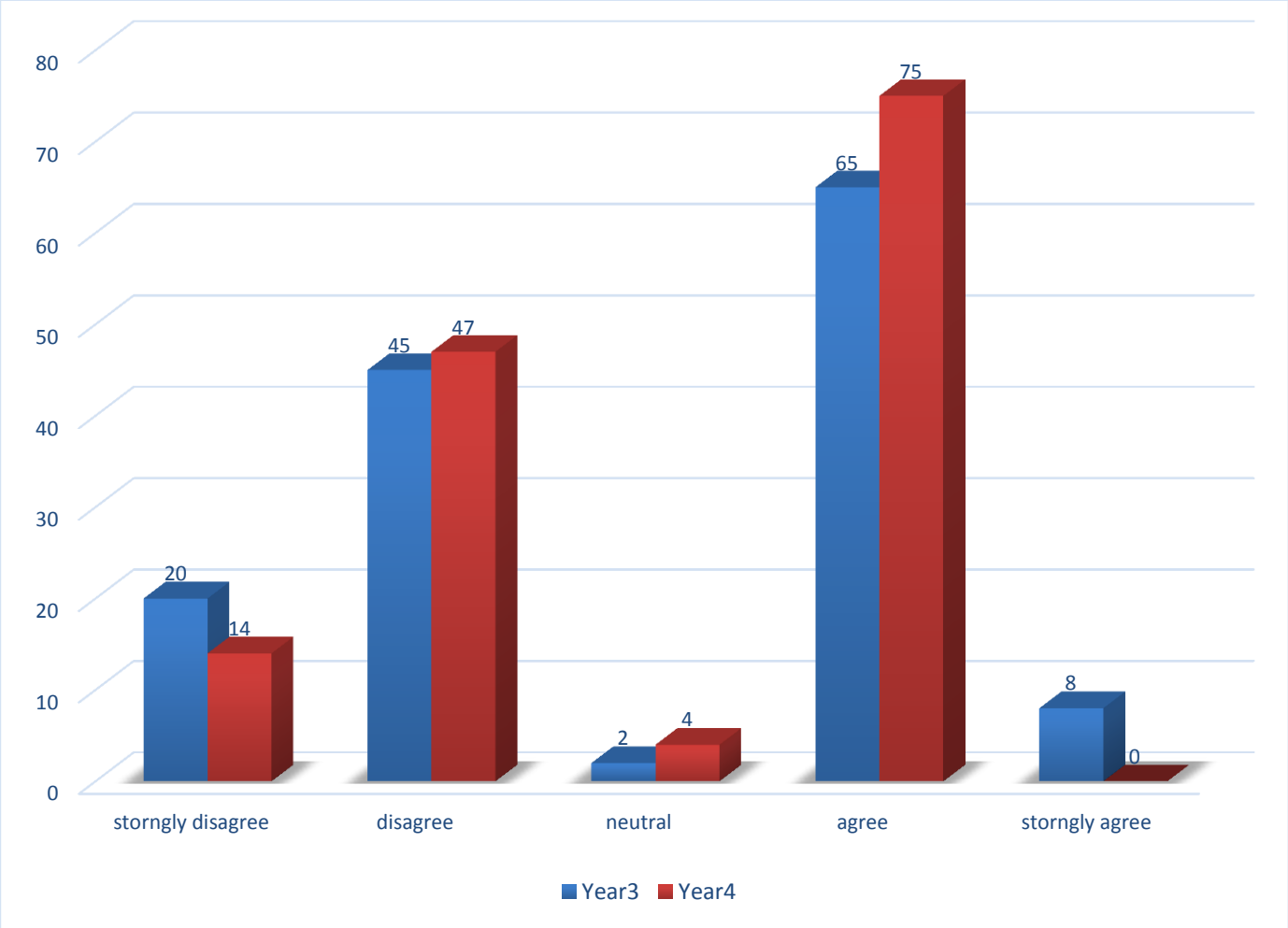

Figure6: The rating of students' confidence during class presentation

In this part, the students were measured the experience on their confidence during class presentation and the result was not pretty much different.

According to figure 6 above, only half of year-fourth students chose agree while nearly half disagreed; it was remarkable that they were exposed to more presentation and class discussion comparing to year-three students but still not most of them felt confident during class

presentation. In addition, this result was not different when applying to year-three students; only half of the student's total number chose agree while nearly half of them picked up disagree to show that they did not feel confidence when they did presentation in the class.

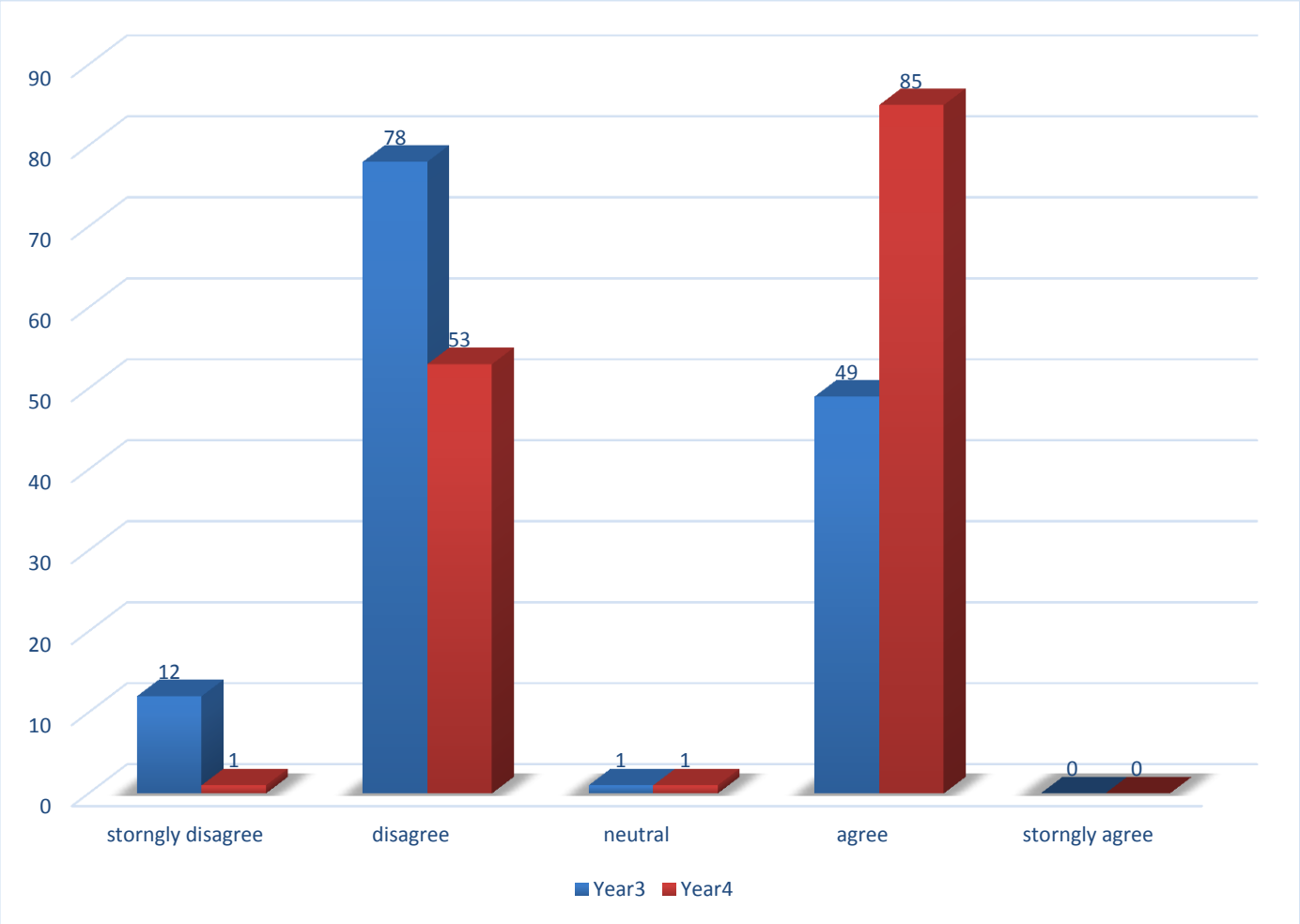

Figure7: The rating of students whether they are motivated to raise the problems and solutions in the class.

The outstanding result appeared when students rated their experience on the motivation and encouragement received from their lecturer to use logical and reasonable way to present the problems and solutions in the class.

Depending on the bar chat above, we can see that the majority of year-fourth pharmacy students agreed that they are motivated inside the class while the minority chose disagreed; it showed the positive sign for PBL implementation since students were gradually developed

logical and critical thinking skill. Conversely, it applied very different when we looked at year-three students' response. The majority of them seemed to deny that they were not received any encouragement from their lecturers to produce logical and reasonable skill to present the case inside the class; this result would be severely influenced the effectiveness of PBL injection process.

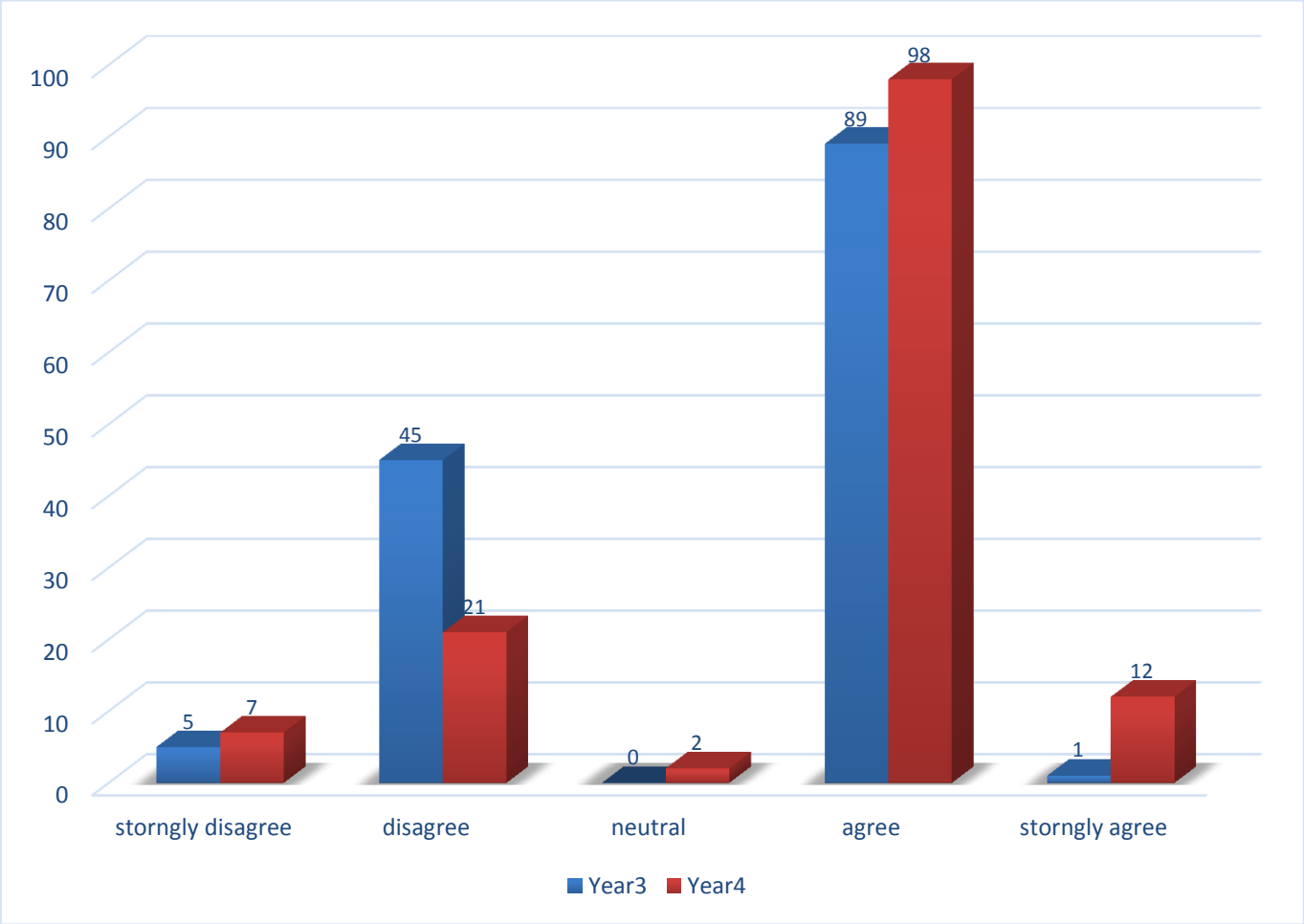

Figure8: The rating of task relevancy to what students have learnt in the class

Actually, it has a slightly different response when students were asked to rate about the relevancy between the assigned tasks and what they learnt inside the class.

Based on graph, it seemed that most of the students from year-three and fourth agreed that the assignment and the lesson learnt inside the class were related to one another while only minority of them disagreed respectively.

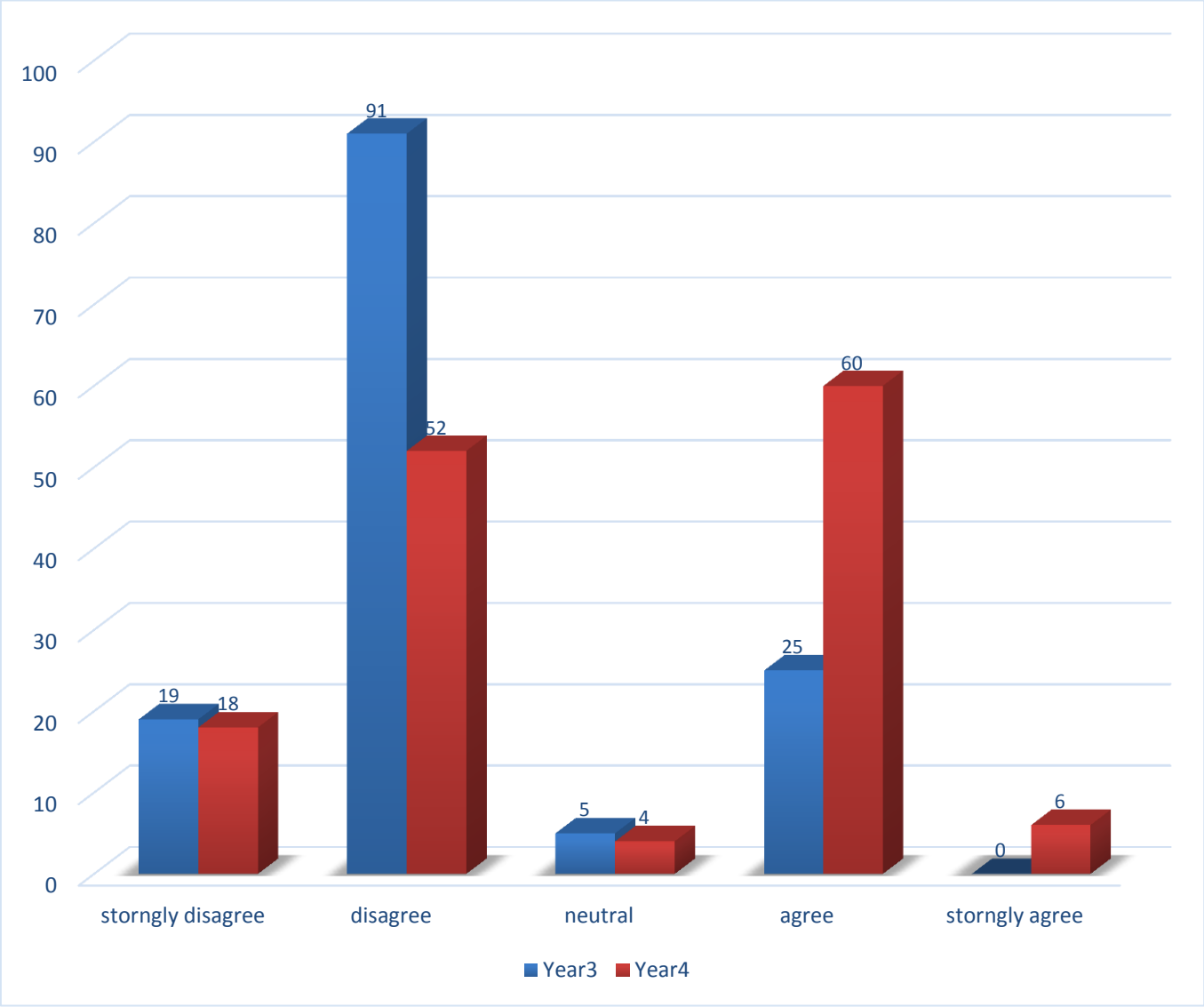

Figure9: The rating of assigned tasks whether they are related to real clinical problems or diseases

The result was extreme when students rated the relation between the assigned tasks and the real clinical problems and diseases happening in the real world.

Figure 9 actually displayed that nearly half of year-fourth pharmacy students chose to disagree while another half chose to agree. This crossing idea made a problem to the students at the end of the term when they were obliged to get through the final clinical test as well as PBL implementation. However, it was surprisingly that most of year-three students collectively chose to disagree; it meant that the assigned tasks they got were not related to the real clinical problems. The extreme rejection from these students would cause a big problem to PBL practice inside class.

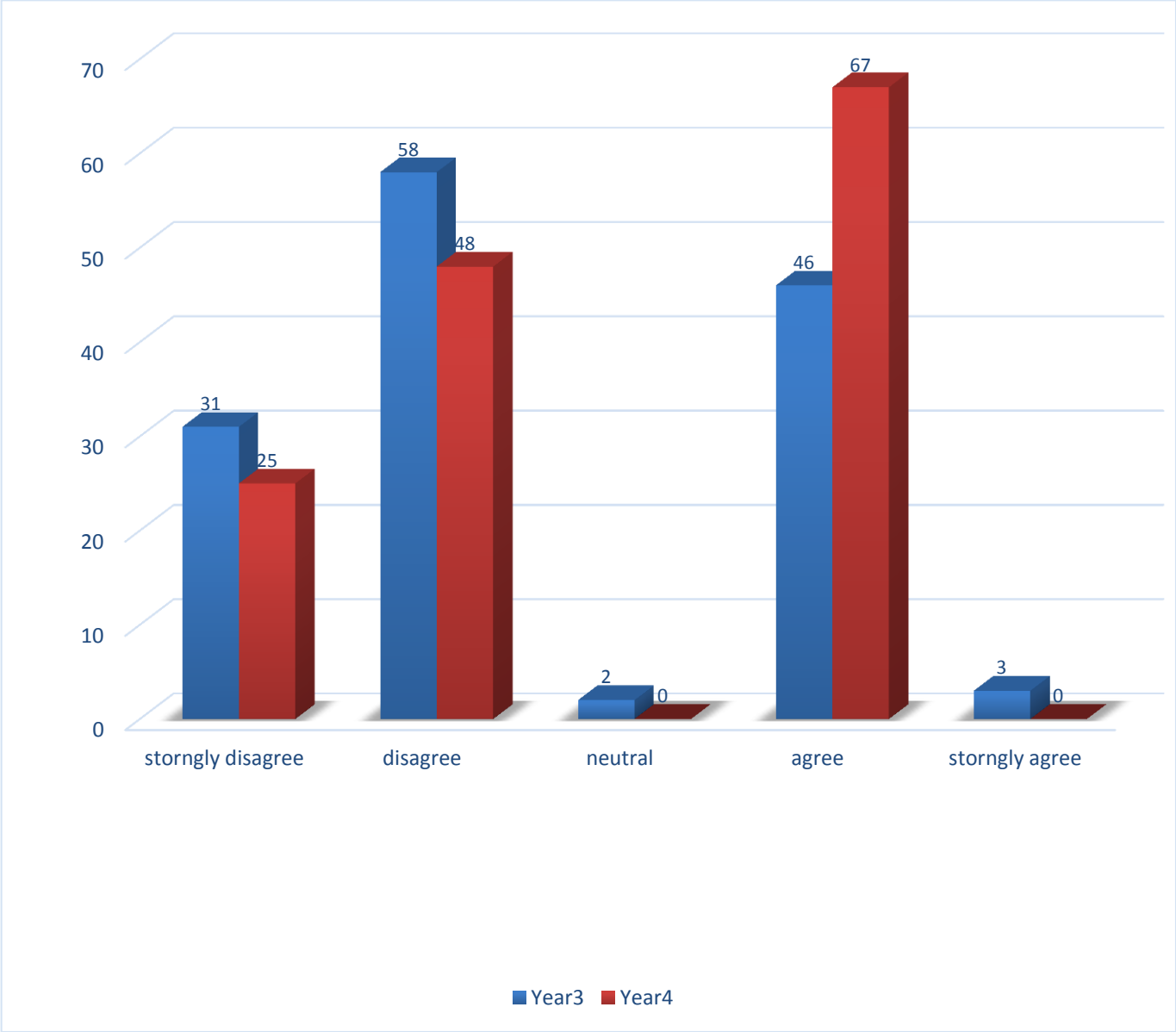

Figure10: The rating of understanding level of assigned tasks during clinical clerkship

When students were asked to rate their understanding on assigned tasks during clerkship at the hospital, they seemed to response differently.

According to the chart above, the majority of year-fourth students positively chose to agree while only a slight number decided to disagree. It seemed that the guideline and explanation from their lecturers were clear and understandable that they could perform it better in clinical clerkship comparing to year-three students. Initially, most of the year-three students contrastingly rejected that did not understand well what they were supposed to do during the clerkship and this led to the failure in clerkship performance at the hospital and test.

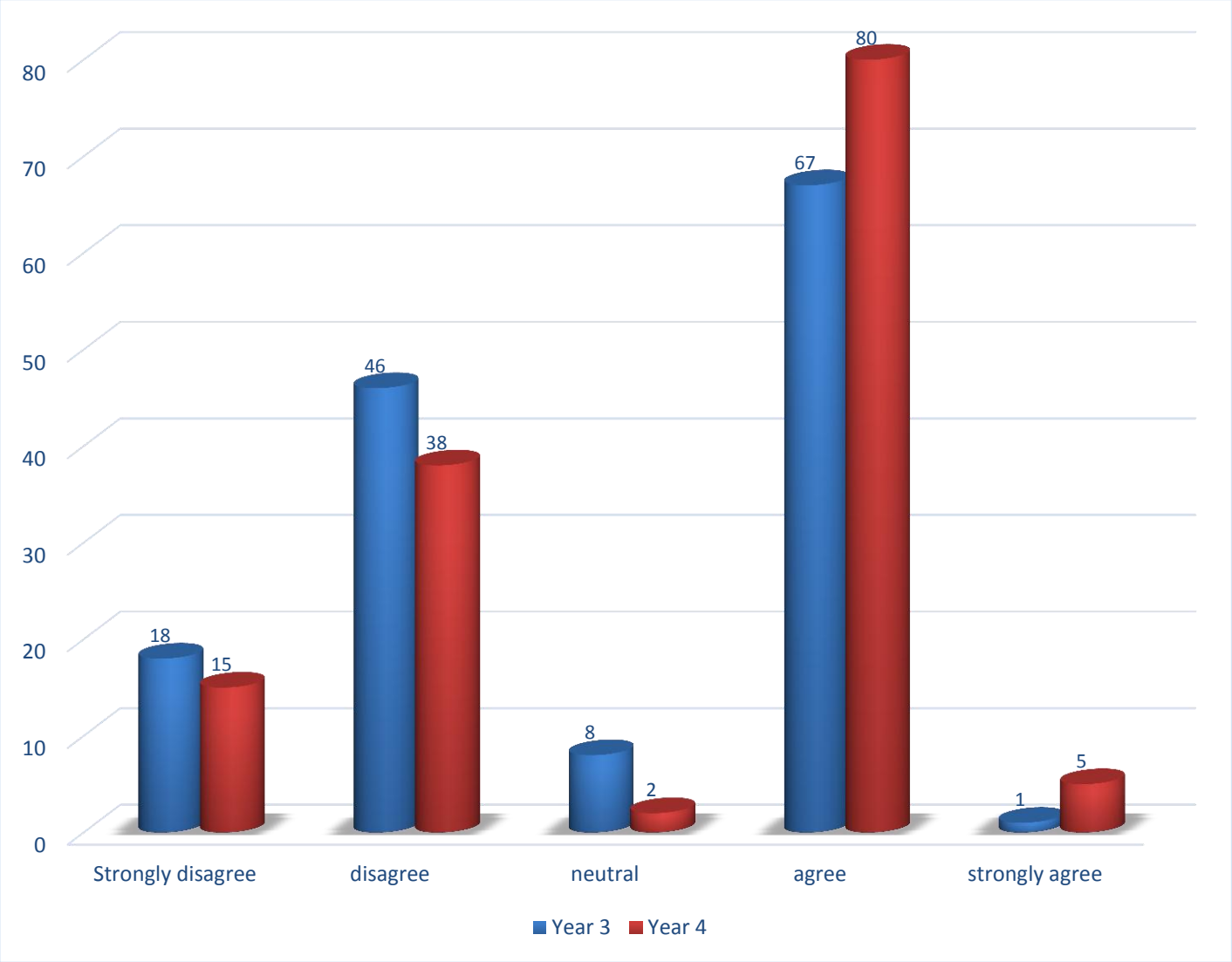

Figure11: The rating of familiarization students to the assigned tasks

This graph shows the familiarization of the assigned tasks from the lecturers by the students.

Depending on the graph, most of the year-three and fourth pharmacy students accepted that they were familiarized with the assigned tasks from their lecturers and demand to get it more; however, only minority of them disagreed respectively.

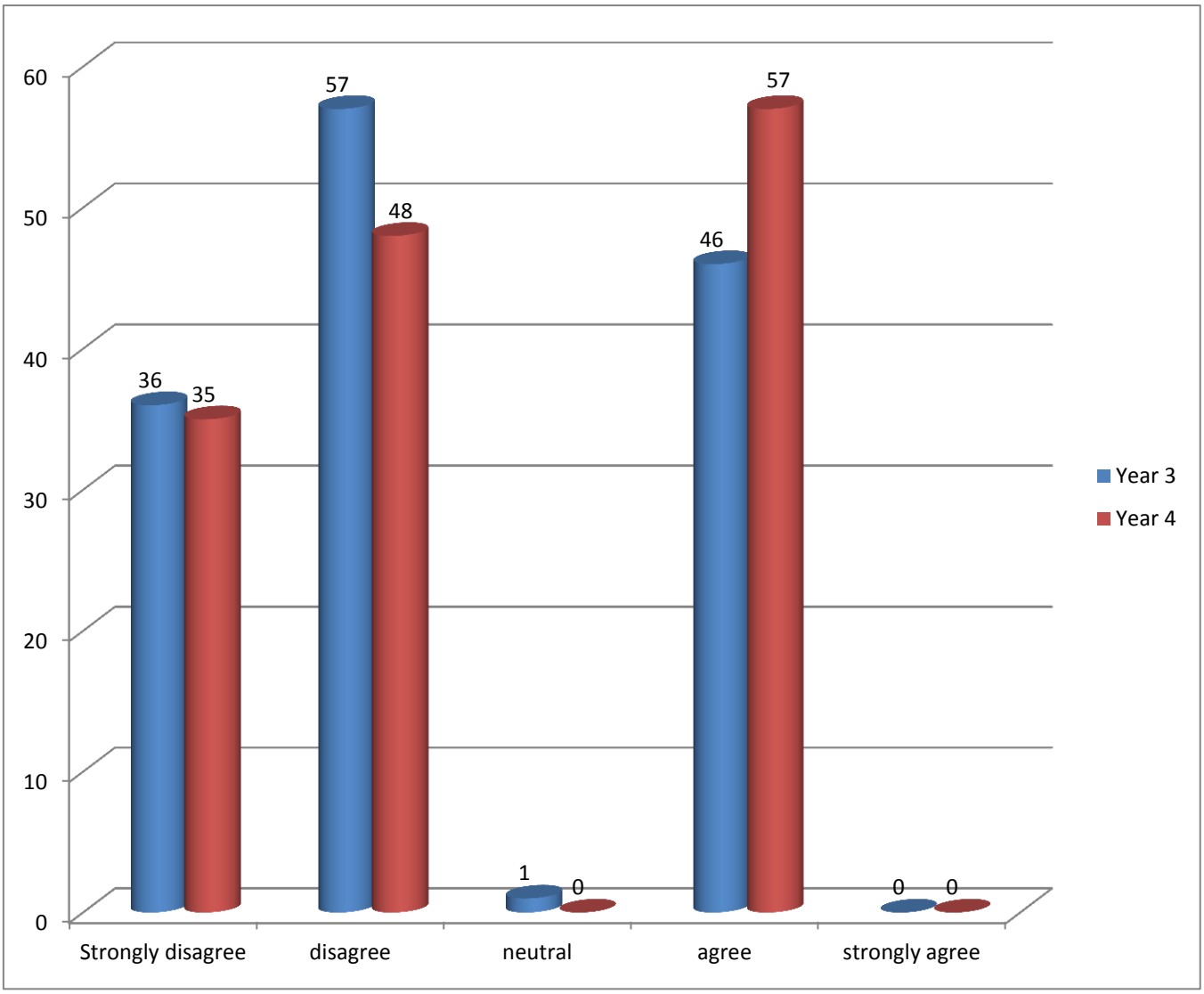

Figure12: The rating of challenging level from lecturers to the students by giving reasonable and logical arguments

This point comes to the important part of the question when the students were measured their experience on receiving the challenge from their lecturers.

According to the chart, almost half of year-fourth students agreed that they got a reasonable and logical argument from the lecturers; however, another half of them said that they did not received so; once students were not challenge with logical and rational arguments then they would not understand the real causes of the problems and this could lead to a problem for PBL. Conversely, the majority of the year-three students, again, disagreed and it seemed that year-three students faced more problems and difficulties comparing to year-fourth students.

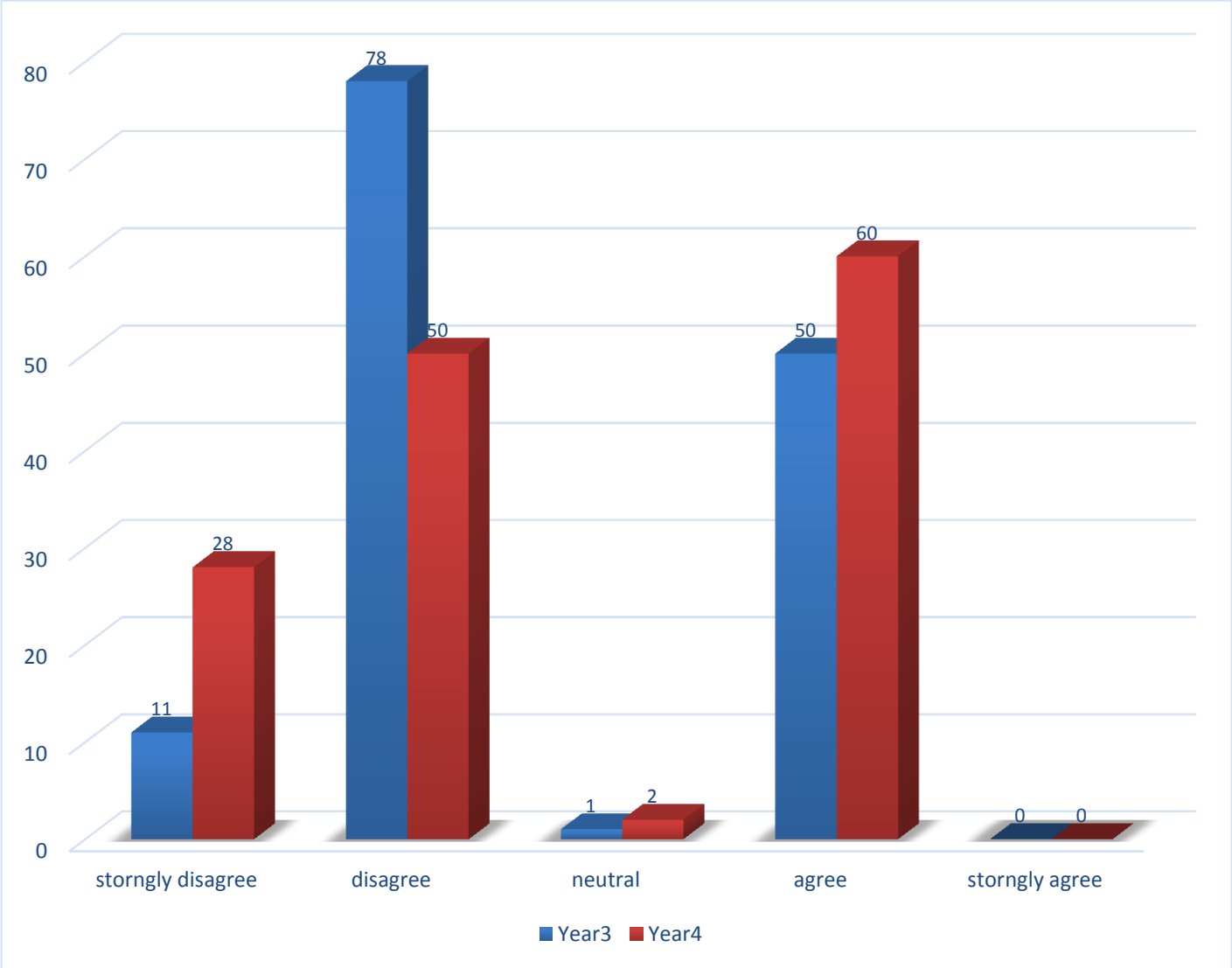

Figure13: The rating of accepted challenge idea from lecturers to students

The bar chart above describes the accepted challenge idea from the lecturers to the students. It seems that the majority of the year-fourth students agreed that the way their lecturers argued them was fair and acceptable enough while almost half of them disagreed. Nevertheless, if we looked at year-three students, most of them decided to choose to disagree to illustrate that they did not receive fair and acceptable challenge idea from their lecturers. This negative experience could lead to the extreme satisfaction and failure of PBL implementation.

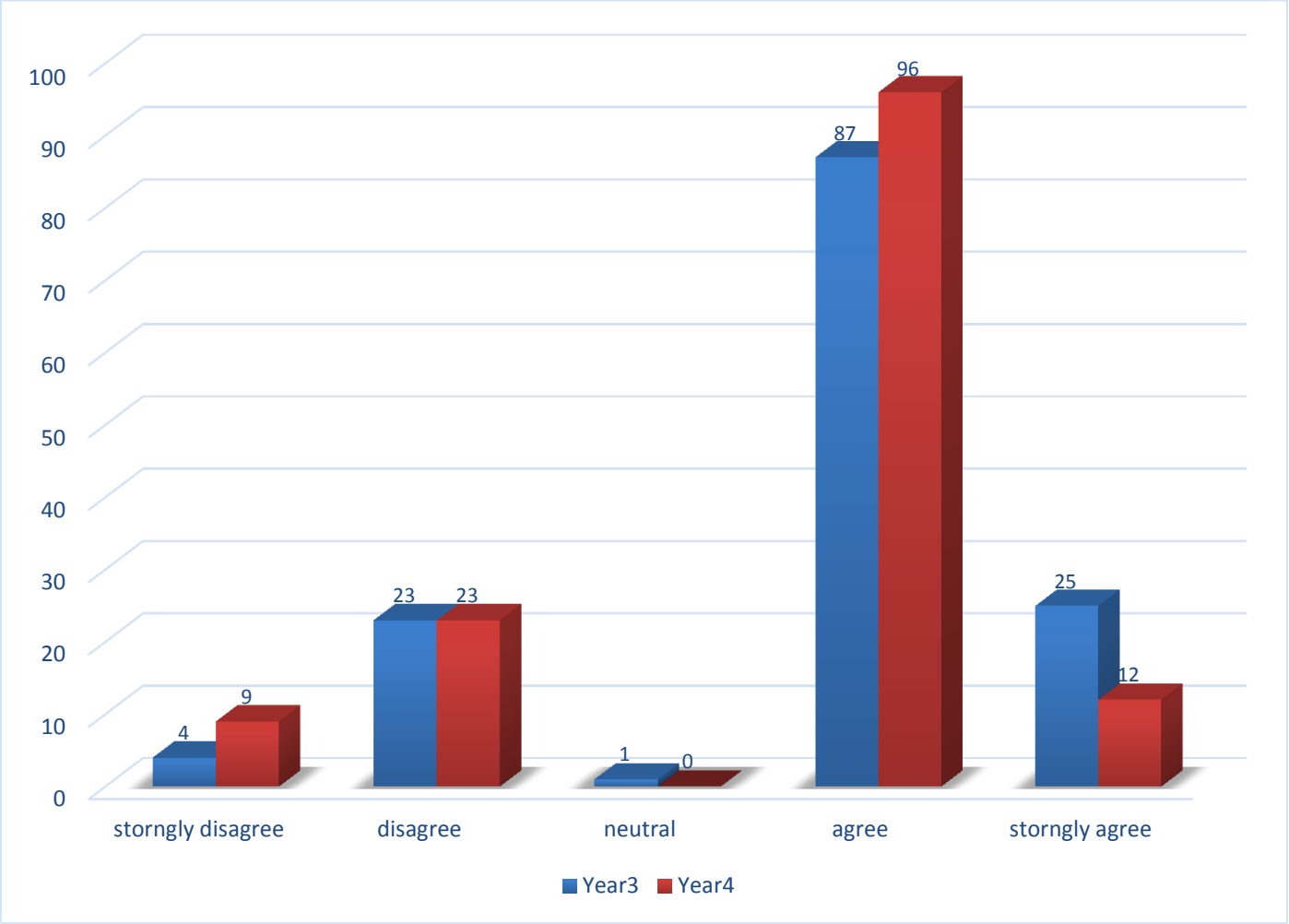

Figure14: The requirement of student's reflection on the presented problem

When the students were asked to rate their experience on the requirement to do reflection on the presented problem, most of them responded mostly the same.

According to figure 14, the majority of all respondents from year-three and year-fourth accepted that they were asked and informed to reflect their opinion to the current situation of the health problem and diseases during class presentation; exposing the students to the reflection would positively affected their flexibility and creativeness.

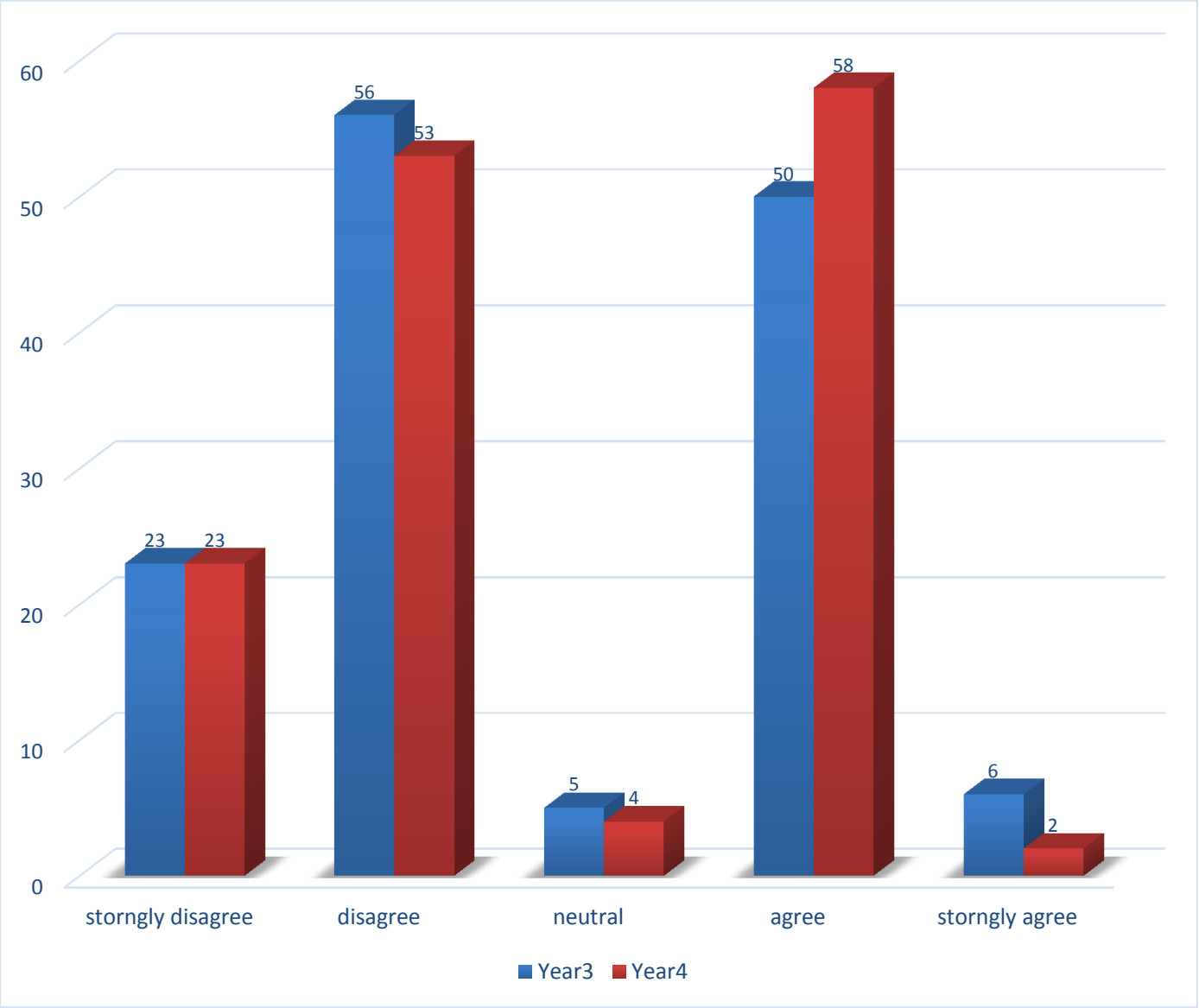

Figure15: The ratings of students whether the assigned tasks can guide them do well during clinical clerkship

The graph above illustrated the problems that the tasks, students were assigned to do during the class, could not make them do and apply well during clinical period or clerkship at hospital. According to the graph, even though half of year-fourth students chose to agree that the assigned tasks could help them to do well during clinical clerkship, another half disagreed. Moreover, it also applied the same case to year-three students since the majority of them chose to disagree.

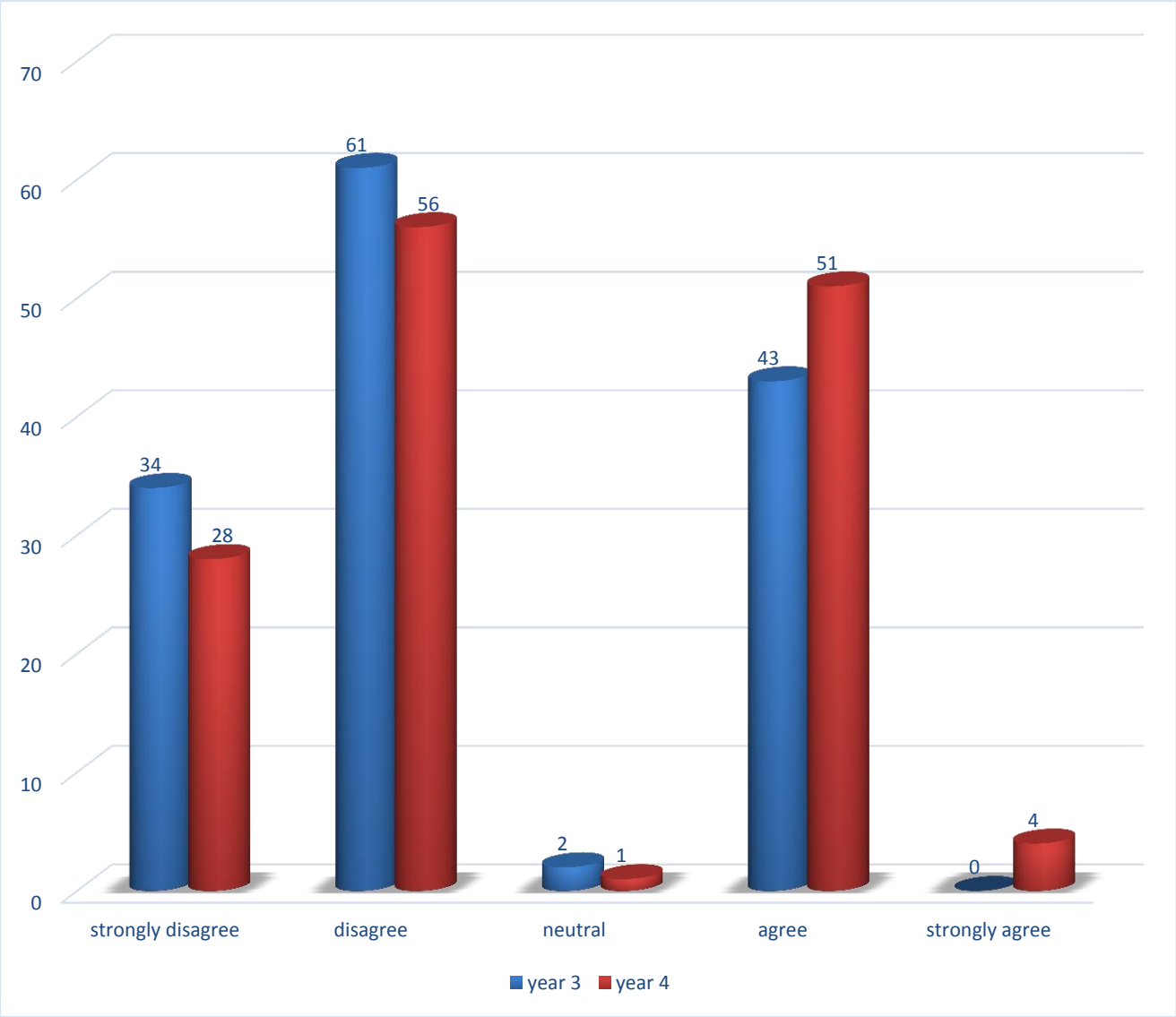

Figure16: The rating of confident level during the problem tests

The graph above displayed the confidence of the students during the test when a case problem included. Ironically, the majority of year-fourth students chose to disagree that they were not confidence during a clinical test while another half chose to agree. Actually, it also applied the same to year-three students when most of them chose to disagree.

Lecturer Section

According to the information obtained from the semi-structured, all the findings could be classified as below for better understanding and explanation. Noticeably, during the interview the researcher found some important information that could be taken as a basement to build up appropriate hypothesis to analyze the problem

Teaching Experience

Actually, all of the interviewees had ages of teaching experience in health sciences subjects and had higher positions in the university. Importantly, most of them understood that problem-based learning was not a new approach for health sciences students in the foreign countries to follow but the problem was that this approach is very new to the students in Cambodia.

Limited Knowledge

It was a surprise for the researcher when the four full-time lecturers admitted the fact that they had inadequate knowledge related to PBL. In fact, the concept of PBL was once introduced by the Dean of faculty of health science since 2013 in the form of seminar and short training to both full-time lectures and later to students but these were considered as not enough. The immediate implementation of PBL was strongly demanded by the management team, especially Dean of faculty of health science expecting that PBL would positive increase student's learning capacity and gradually compete with other ASEAN's students. However, after the implementation in 2017 in Department of Pharmacy, the lecturers themselves were quite confusing at the early stage. One of the interviewees said that *he did not quite support with this sudden implementation because there were not any full-scale researches of lecturers on PBL yet; moreover, not many students were ready for this change.* From this perspective, the researcher could see that there was a problem since the beginning stage of PBL implementation because there was not consensus from the lecturers who were supposed to be the main agents to deliver the knowledge through PBL method to the students; the absolute decision was based on the top management team.

Limited Time

Since the change to the curriculum was so quick to be adopted, the teaching materials and problem-based cases related to clinical clerkship were not done properly; moreover, the lessons to be taught were also not well enough to covered PBL. In addition, there were only four-full time lecturers; therefore, there were not appropriate for them to do research on PBL and teach at the same time. All lessons to be taught had to be well collected and injected by PBL and they had to inter-related to the clinical exam and genuine cases; therefore, time constraining caused a major problem to the lectures. Seriously, when the interviewees were asked whether they handed enough problem-based or authentic tasks and always challenged students' idea, they confessed that everything was not enough for the students. Knowledge deliverer needed enough time to ensure the quality of lessons and teaching method they did in class to affectively improve student's capacity based on the concept of PBL.

Student's capacity

Even though pharmacy students were selected through national entrance examination, still their analytical and critical thinking skill were low; this was because the problem in the general education in high school level. According to the interviewees, most of them depended on the instruction from the lecturers and were lazy in doing research. Furthermore, the level of PBL implementation was somehow higher than the potentiality of the students. Furthermore, a serious case happened when students failed the ultimate examination and clinical test. Actually, the lecturers were trying hard to reduce and minimize the level of guidance to solution for assigned clinical cases, but the matter was that the students rejected and asked for direct solutions or supported documents; if the lecturers refused then the complaint letter would be appeal to the top management team. Significantly, one of the interviewee in the pharmacy department who had a high position admitted that there was not enough human resource who were capable of teaching PBL and in addition, PBL implementation were on the process of verifying and modifying to better help the students.

Limited financial resource

The interviewees told the researcher that it was not impossible to increase teacher's capacity before injecting PBL to students, but the main problem was that the university did not have enough budget for long-time training abroad for full-time lecturers and so did the teaching's experience exchange seminar with foreigners who had experience in teaching PBL abroad. Effective implementation of PBL could be happened when the knowledge-based deliver were sure and fully equipped with problem-based strategies and further seminar and training had to be conducted for sure.

4.2. Research question 2: What challenges do the students and lecturer face in the implementation of PBL?

Student Section

When the students came to the open-ended questions in the last section of the questionnaire, some of them gave very important information related to their difficulties and challenges in class that could be considered.

Obscure instruction and explanation

According to the information obtained from the last section of the questionnaire, some year-three and year-fourth students were not satisfied with the obscure instruction from the lecturers. The instruction and guidance to perform the tasks assigned in class were not clear and understandable and these made them to failed to produce a correct response to solve certain problems. One of year-three students said that *he found out the lecturers themselves sometimes were not quite sure with what they were explaining to the students and his classmate and him were quite confusing with what they had to do.* In addition, one of the year-fourth students also expressed his opinion that *he could not understand the instruction from the lecturers when he was obliged to solve problem-based cases; moreover, the explanation of the lesson was not very much clear.* The students suggested to be delivered better explanation and clearer instruction in class.

Difficult clinical Test

The finding from the students was that most of them pointed out that the assigned task in class were easier than the real clinical test. Students had to go through ultimate clinical examination at the end of the academic year, and what they found out was that the clinical problems appeared on the test were quite complicated and critical; it was hard for them to solve and; as a result, some of them failed the test and if the others passed the test but score was quite low. One of the students in year-three said that *he could not imagine that such as clinical problem could occur during the test because it looked new to him and it was too difficult*. Moreover, the other year-fourth student stressed that *she could not finish the test because it was very hard and she also, once, complained to the academic team in the university about this problem but nothing she could get back.*

Inadequate time to research

The participants from year three and four illustrated in the last section of the questionnaire that they didn't have enough time to do research on the assigned problem cases from their lecturers. If we had a look at **figure 5**, we could see that mostly half of year-three and year-fourth students disagreed to receive enough time from their lecturers and they elaborated in the last section that the assigned tasks were hard and needed more time to do research to gather more information and evidence to prove and to formulate hypothesis; however, the deadline of the submission did not match with the size and level of the problems at all. It was sure that the explanation inside class was not enough for the students so that they had to study in team to further discuss the case and collectively found out the related sources to support their answers; however, lecturers did not agree to delay the submission date; as a result, not many groups received good grade on the tasks. One of the year-fourth students said that *the sources related to the assigned tasks were quite hard to obtained, thus my group and I needed more time to work on it if the lecturers wanted us to accomplish a good working achievement.*

Low Confidence

Some of the participants from both years wrote that they didn't have a feeling of confidence at all when they were obliged to do presentation, to sit for final clinical test, or even perform a clinical clerkship at the hospital. The subjects and the way they were taught were

changed dramatically that they could not see any positive signs occurring for them. One of the year-fourth students mentioned that *she was very confusing when PBL was introduced to the class and her score was starting to decrease still then. She did not have any confidence at all when she was assigned to go through the clinical test at the end of the year.*

Lecturer Section

However, if we looked at the lecturer's side, most of them seemed to complain to the most three hottest issues in the university- low level of the students, financial constraint and inadequate human resource. Honestly, depending to the interviewees, PBL required students to possesses high level of understanding and habit of doing research and these criteria were not mostly possessed by the Cambodian students.

Low level of the students

Like what we could found out in the finding section in question research 1, the four full-time lecturers complained about the ability and capacity of the students to adapt PBL. The learning ability of the current students does not match with PBL since most of the were still taking a habit of spoon-fed students and even though year-fourth students were armature to study independently; however, their critical and analytical thinking skill were quite narrow and limited; they needed more guidance and documents from the lecturers. Minimal guidance, a concept of PBL, could only be injected to the students with better capacity and if the management team wanted to implement exactly in the university, they had to give more time for students to adapt; a current injection of PBL into health science curriculum was too fast to do and this could lead to the fragility of the students' capacity not the better one. One of the lecturer said that *he received complaints from the students in year three related to the change of curriculum, but I could do nothing but to move on since it was the top decision. I tried to simplify my lesson and explanation, but I understood that it was still hard for the students to catch up.* The management team primarily expected that implementing PBL was the best choice to improve student's learning capacity and force them to be more competitive than the other students in the country but it turned out different.

Financial Constraint

Implementing PBL did need enough financial resource to support since there were not many lecturers familiar with this new teaching method; therefore, hiring foreigner professional lecturers and guest speakers who had years of PBL teaching experience was dramatically demanded. Moreover, lecturers' exchange program and training were also important to the implementation of PBL as well; in fact, these strategies needed adequate finance to operate to ensure a sustainability of the program implementation. Ironically, the university seemed to have inadequate finance resource to support the lecturers to be fully-equipped with PBL. One of the lecturer said that *he could not have mentioned it in this research, but it was a truth that the university did not have enough financial resource to support teacher's training. My mates and I needed more training to further fulfill our knowledge, on the other hand, we would not be able to affectively deliver the concept of PBL to the classroom.*

Inadequate human resource

It was a fact that all the four full-time lecturers of DOP had experience in technical teaching but not PBL. According to the finding in research question 1, the four of them were not properly trained the ways to teach and deliver a proper PBL to the students; what they had received was a short training or seminar that the university had conducted. Importantly, the goals and expectations set by the management team somehow did not match with the quality of the lecturers, knowledge deliverers, and this problem could lead to the failure of the implementation since they were considered as the most important factor to help students push up their learning capacity. One of the lecturers said that *he suggested the management team to hire some foreigners who had competent knowledge on PBL but then was not approved due to financial resource.*

CHAPTER V: Discussion

In fact, a true problem-based learning in class happens when a minimal guidance from instructor is given to the students to allow them to explore fundamental principles through investigatory activities (Van Joolingen, de Jong, Lazonder, Savelsbergh, & Manlove, 2005).

However, **based on the research question 1** in the survey, the majority of year-three pharmacy students did not even know that they were subject to problem-based learning teaching and the lack of information could lead to misunderstanding and confusion that gradually obstructed the process of effectively applying PBL inside the class; more importantly, although, PBL was introduced to the students, most of the participants in year 3 still preferred to solely rely on their lecturers to provide them clues and explanation but not to independently worked on their own way. Based on the finding, we understood that there could be two possible reasons behind this habit of students. The first and foremost was the unreadiness of the students to challenge with the difficulty given tasks through PBL implementation. As a matter of fact, their capacity of learning did not match with the level of PBL injected in the class; therefore, it was hard for them to adapt with. Secondly, the traditional perception was still existed, and the students would rather be fed but not to fish. Technically, the students should be independently teaching to solve certain problem by using their own flexibility, criticality, and investigation through team work and group discussion under a minimal help from the lecturers. In this sense, the students will face challenges once they are obliged to do the clinical clerkship or sit for the real health science national exit exam.

Significantly, most of the students from year three and four were found it hard to find enough time to focus more on their assigned problem-based assignments; it was sure that in PBL class, students were allowed to explore the answers to solve certain problem by receiving less instruction from the lecturers. In case they did not, their flexible, critical, analytical skill would be limited and blocked so that the process of PBL was not possible to achieve. Moreover, according to the finding, it was sure that year-fourth students responded more positive and better comparing to year-three students in most of the questions but not when they were asked how much they felt confidence when they were supposed to go through the clinical test at the end of the academic year. They did not feel confidence that they could pass the exam; it could because the assigned tasks in the class was easier than the actual test in the final one and because they were not truly and clearly understood with the lessons and tasks they had been gone through in the whole

semester. Critically, when the students did not possess any confidence and challenge like this, it seemed that the process of PBL implementation was not accomplished but had to verify and modify in some sections.

Noticeably, according to the framework, the four instructional models- active learning, integrated learning, cumulative learning, and learning for understanding- are the important elements helping PBL to be effectively implemented inside the class for they help to maximize independent, critical, and analytical skill of the students.

However, based on the finding from the semi-structure interview with the four full-time lecturers, not all of them had experience teaching PBL but all of them used to go through internal PBL short trainings conducted by the university to increase teaching potentiality; however, it was not enough for them since they had to be equipped more teaching strategies to ensure the quality and sustainability of PBL. In addition, lecturers seemed to face many problems during the implemented period such as time and student's capacity. They could not accomplish two things at the same time; the available teaching materials and sources were limited, so teachers had to find out and do research to compile the documents. Moreover, they had to think about the effective ways to deliver the best effective PBL lesson inside class; these actions were too much and heavy for them while they were heavily responsible to teach hundreds of students. Time constraining, needless to say, caused severe unpreparedness to the lecturers and the quality of delivering lesson and applying PBL were also low as well. It was not doubt that most of the students felt not confidence when they faced final problem-based test because they were not received properly instruction and explanation.

Besides, students' capacity was also a troublesome for the lecturers to face with. It was a fact that, most of the student's learning capacity were not suitable enough to go through the implementation of PBL because they did not ready to improve their ability yet. It was not completely because they were careless or lazy but it was a partial mistake from the education system they had been through in the high school that did not help shape them to be critical, analytical, and rational enough. Most of the lecturers believed that it was not an easy task to inject this new learning perception to young Cambodian learners; one of the interviewees said that "*it is hard to teach them how to fish while we are totally expected to feed"*.

According to result from **research question 2**, inadequate training and unclear explanation seemed to be a problem occurring to most of the pharmacy students and it was crucial for the students to have more time to practice and work in group to solve the assigned problems. Needless to say, these two factors could possibly lead to the failure of PBL's implementation since when the students were not able to comprehend and understand the case, then appropriate solutions under the accurate investigation would not be accomplished. Moreover, there was a complaint from both types of students that the level of the ultimate clinical test was extremely harder than the ones assigned in class. Regarding this problem, it could have two possible reasons standing behind. First and foremost was that the students did not understand the lessons in which they were taught and was not be able to comprehend and to figure out the solutions. The instruction and explanation were not clear and understandable that could possibly cause to the misunderstanding of the lesson. Secondly, it could be the misconduct of the test, itself. Actually, the level of the assigned tasks in class had to, in some extent, was in the same level of the final clinical problem test so that the students could use their experience and theories they learnt in class to solve the problems in the final test. Conversely, if the final test level was created higher than the tasks in class then it was a technical mistake that the test had to be verified.

Nevertheless, based on the semi-structured interview, the lecturers also raise their challenges like what we discussed in the research question1. Most of the students had a very weak foundation of problem solving skill and this skill was not basically taught during the university level but in the lower level. Actually, problem-solving skill should be taught to the students since in the primary level and according to the experience of the researcher when joining teaching camp in Philippines, this concept had already been practiced to the students since primary level. Remarkably, the university had to think in advance about the two factors before applying new approach or implementation to the curriculum. Firstly, it had to think about the available human resource in hand during the implementation. According to the findings obtained from the lecturers, the university had only 4 full-time lectures who were supposed to conduct the PBL teaching while they, themselves, did not receive fully training and understanding about the concept of PBL. Moreover, those lecturers did not have enough time to prepare lessons for the students since they had to perform many tasks in a row; this was a very negative point when new

implementation was injected. Secondly, adequate financial resource had to take into serious account because it was the only factor push up the quantity and quality of human resource and at the same time helped maintain a sustainability of the new project.

Actually, tools used in this research were carefully selected and employed to ensure the accuracy of the given information from the respondents, and since the population of the research was recruited in the workplace of the researcher, then the effectiveness and efficiency of the data collection procedure and required information were also achieved. However, since this study took place in the workplace of the researcher; therefore, some critical and sensitive issues happening in the university were not be able to address to the public. Nevertheless, to reduce the high level of bias, researcher tried his best to convince the management team in the university to be permitted to exhaust all the collected information obtained from the subject.

CHAPTER VI: Conclusion

In conclusion, it is undeniable that problem-based learning is exceedingly crucial for Cambodian university students, especially health sciences students to increase their analytical and critical thinking skill. Moreover, it also helps them to improve their clinical problem-solving ability to make sure that they can save the life of the patient on time without taking any risk. However, the process of implementation PBL inside the classroom is very difficult and costly, especially for health sciences universities. The major problem is that the Cambodian students are not exposed to the problem-solving task and independent work since they are a child; therefore, it is hard to forcefully inject PBL to them. However, there are some recommendations for University of Puthisastra (UP) to help improve the process of injecting PBL approach to be more effective. Firstly, the management team and the lecturers must do the survey to measure the actual ability of the students before applying PBL. it is a fact that UP did not conduct any surveys to measure their student's ability and knowledge before injecting PBL and it is a wrong concept since the medicine must be given only after a specific symptom is figured out or measured. With the actual measurement, technical team can compromise and make an appropriate curriculum of PBL that exactly suit the student's level. Secondly, UP has to increase its human resource by two ways- recruiting more full-time PBL professionals and providing more training to existing PBL lecturers. Recruiting more professional inside and outside a country can be a costly process; however, it is very helpful to increase teaching quality and the level of effectiveness of PBL implementation. Those professional can be taken as core lecturers who can lead and teach the others so that UP can save some budget by not conducting frequent seminar or training. Furthermore, when the numbers of lecturers increase, then they will have more time to do research and prepare well for the lesson. Besides, if it is costly, UP can think of giving more training to the existing lecturers because most of them are fully equipped with problem-based teaching method; the continuous training must be provided so that this long-term investment will ensure the rigid foundation of the implementation. Last but not the least is the financial capability. Surely, finance is the basement of every start; the source of finance can be obtained inside and outside the university. UP management team should try to create generous events or fund raising to help fund the PBL implementation or find help from other partners institutions to maintain the program. Remarkably, only if the three recommended suggestions are taken into account in the university, will the implementation be able to effectively and efficiently sustain.

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Appendix A: Research Tools

Semi-structured Interview

1. Would you please briefly describe yourself by telling me your name, position, role, and responsibilities in this education institution?
2. How many years have you been teaching in health science institutions? and at University of Puthisastra?
3. Have you ever known about problem-based learning? Would you please tell me in a brief explanation about PBL?
4. Have you been trained by the department before applying PBL into classroom at UP? and how is the quality of training? Is it enough for you? If no, why?
5. How often do you give a problem-related tasks for your students to solve? Do you always give them instructions or just give them a minimal guidance? Do they response with logical and reasonable answer?
6. How often do you use authentic task in association with lesson or real society to be the subject of the problem? For example, you give them a problem task related to the dealing with the real patient or current disease happening in today's society.
7. Do you always challenge their idea or just accept it when solutions are presented? And do they act professionally when dealing the problems assigned by you?
8. Are there any personal reflection during case presentation? and are there any constructive feedbacks to them?
9. How much do you think students satisfy in the way they are taught? And what your challenges when implementing PBL in the class?
10. Are there any suggestions or comments to better improve PBL at UP?

Questionnaire

I. Introduction

I am currently doing my master degree majoring in Education at Royal University of Phnom Penh and this questionnaire is one of my research tools to collect the information that is matter to my research study.

Actually, I am very interested in problem-based learning approach that is very popular in today's education sector and it is very important for health science students. According to Schmidt (1983), problem-based learning (PBL) is an instructional method delivered to the students aiming at providing suitable knowledge to improve problem-solving skill. It consists of carefully designed problems that challenge students to use problem solving techniques, self-directed learning strategies, team participation skills, and disciplinary knowledge. Seeing the important of PBL, UP has also adopted it into the classroom firstly for dentistry students since 2013 and later on for pharmacy students; however, there are still no observation report analyzing the implementation and challenge in the class. In this sense, this research study will mainly look at the perception of the lecturers and students toward PBL practice in the class; meanwhile, researcher will ask for apparent recommendation and feedback.

There are no known risks and/or discomforts associated with this study; your identity and personal information are surely kept confidential. The expected benefits associated with your participation are the information about the experiences in learning about problem-based learning, the opportunity to participate in a qualitative research study, and co-authorship for those students who participate in the detailed analysis of the data.

II. Personal Information

1. Your gender: ☐ Male ☐ Female
2. Your age:

☐ 19-22 ☐ 23-26 ☐ 27-30

3. What year are you in?

☐ Year 3 ☐ Year 4

4. What is your study major?

☐ Pharmacy ☐ Dentistry

5. Where is your place of birth? (if your place of birth is Phnom Penh, then leave question number 6)

☐ Phnom Penh ☐ Province ☐ Smaller town ☐ Rural area

6. How long have you been studying in Phnom Penh?

☐ 1-3 years ☐ 4-7 years ☐ 8-11 years ☐ 11-14 years

III. Problem-based learning

1. Have you ever heard or known about problem-based learning? (if yes, go to question number 3)

☐ Yes ☐ No

2. Do you know student-centered teaching approach?

☐ Yes ☐ No

3. Do you prefer studying independently with a little instruction from your lecturers or depending totally on your lecturers to give you clues and explanation?

☐ Independently with a little instruction ☐ depending totally on the lecturers

4. How often does your lecturer assign you a task to solve certain problem related to disease or clinic or patient? (if you choose never, then skip question number 5)

☐ Frequently ☐ sometimes ☐ often ☐ rarely ☐ never

5. What level does he/she assist you to solve the assigned task?

☐ Fully help with documents and clues ☐ partially help with documents ☐ never

6. How often do you work in group when problem is assigned?

☐ Frequently ☐ sometimes ☐ often ☐ rarely ☐ never

7. How often do you do presentation?

☐ Frequently ☐ sometimes ☐ often ☐ rarely ☐ never

A short tutor evaluation questionnaire created by Diana Dolmans is adopted to evaluate PBL tutors

Please indicate the closest response to the statement:

1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

N0	Questions	1	2	3	4	5
	Constructive or Active learning					
1	My lecturer gives me enough time to do research on the assigned case and problem					
2	He/she makes me really feel confident to present the case and the solution to the class					
3	The way my lecturer teaches really motivate me to use					

	logical and reasonable way to present the problem and solution in the class
	Integrated Learning
4	Normally, the tasks from lecturers are relevant to what I have learnt inside the class
5	Mostly, the assigned tasks are about the real clinical problems or disease happening in the current world
6	Sometimes, I have a chance to clearly understand the assigned tasks during my clerkship at the hospitals
	Cumulative Learning
7	I feel familiar to the task assigned by the lecturers and demand to get it more
8	Normally, lecturers always challenge my idea by giving reasonable and logical arguments
9	The way lecturers challenge my idea is fair and acceptable
	Learning for Understanding
10	Lecturers sometimes require me to give my reflection to current situation on the problem that I present to the class
11	The problems that I am assigned to do during the class can make me do and applying well during clinical period or clerkship at hospitals
12	I am confident to do well during the test when a case problem is included

Open-ended Questions

1. What are the challenges and problems you face during the class?

   _____

   _____

   _____

   _____

2. What are your suggestions and recommendations to better improve the current teaching and learning situation?

   _____

   _____

   _____

   _____

This is the end of the questionnaire!
Thank you very much for your participation in this research!

Appendix B

Timeframe

Research Activities	August, 2016				September, 2016				October, 2016				November, 2016			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
collecting data																
analyzing the data																
interpreting the results																
discussing the results, referring back to literature																
concluding the research findings																
writing research thesis																

Appendix C

Consent Form

Problem-based Learning: The Perception of Health Science Lecturers and Students of University of Puthisastra

Dear Participant,

The following information is provided for you to decide whether you wish to participate in the present study. You should be aware that you are free to decide not to participate or to withdraw at any time without affecting your relationship with the researcher.

The purpose of this research study is to mainly look at the perception of the lecturers and students as well as their challenges toward PBL practice. In addition, it will generate some practical solutions to help improve PBL practice in the future. At this stage in the research, process will be generally defined as experiences of problem-based learning and making sense out of qualitative research.

Data collection will employ interview questions used with the four selected full-time instructors and the voice-recorder materials.

Do not hesitate to ask any questions about the study either before participating or during the time that you are participating. I would be happy to share my findings with you after the research is completed. However, your name will not be associated with the research findings in anyway, and your identity as a participant will be known only to the researcher.

There are no known risks and/or discomforts associated with this study. The expected benefits associated with your participation are the information about the experiences in learning about problem-based learning, the opportunity to participate in a qualitative research study, and co-authorship for those students who participate in the detailed analysis of the data.

Please sign your consent with full knowledge of the nature and purpose of the procedures. A copy of this consent form will be given to you to keep.

_____ _____

Signature of Participant Date

Bota Chhin, MEd

Appendix D

Interview Protocol

Problem-based Learning: The Perception of Health Science Lecturers and Students of University of Puthisastra

Time of Interview: 9Am

Date: 22th July, 2016

Place: University of Puthisastra

Interviewer: Researcher

Interviewee: Mr. A

Position of Interviewee: Student

The purpose of the research is to mainly look at the perception of the lecturers and students as well as their challenges toward PBL practice. In addition, it will generate some practical solutions to help improve PBL practice in the future.

Questions:

1. Would you please briefly describe yourself by telling me your name, position, role, and responsibilities in this education institution?
2. How many years have you been teaching in health science institutions? and at University of Puthisastra?
3. Have you ever known about problem-based learning? Would you please tell me in a brief explanation about PBL?
4. Have you been trained by the department before applying PBL into classroom at UP? and how is the quality of training? Is it enough for you? If no, why?
5. How often do you give a problem-related tasks for your students to solve? Do you always give them instructions or just give them a minimal guidance? Do they response with logical and reasonable answer?
6. How often do you use authentic task in association with lesson or real society to be the subject of the problem? For example, you give them a problem task related to the dealing with the real patient or current disease happening in today's society.

7. Do you always challenge their idea or just accept it when solutions are presented? And do they act professionally when dealing the problems assigned by you?
8. Are there any personal reflection during case presentation? and are there any constructive feedbacks to them?
9. How much do you think students satisfy in the way they are taught? And what your challenges when implementing PBL in the class?
10. Are there any suggestions or comments to better improve PBL at UP?

(Thank the individual for participating in this interview. Assure him or her of confidentiality of responses and potential future interviews.)