Implementation of Problem Based Learning in St. Dominic College of Asia and Its Impact on Students' Learning

Christian S. Tu, RN MSN

***Abstract*---Problem- Based Learning is a teaching strategy, which emphasizes active learning. The main objective of the study is to identify the strategy and the effect of Problem- Base Learning in teaching and learning in St. Dominic College of Asia. This study utilized two-research design quantitative and qualitative methods with descriptive design. The research instrument consists of set of questionnaires semi- structured interviews. The research survey forms was administered to 128 bonafide students of St. Dominic College of Asia who were chosen randomly. Interview sessions were carried out on eight selected respondents. Quantitative data were analyzed using descriptive statistics and content analysis to analyze qualitative data. The results show that the students were able to solve the problem presented using lecture approach, group activities, lecturer guidance and independent learning approach. The findings show that Problem- Based Strategies could enhance soft skills specifically on students' motivation, communications skills, collaboration and independent learning. Students also found to have positive perceptions towards the implementation of PBL in their learning process. In conclusion, PBL is a teaching strategy that needs to be applied in the learning process in St. Dominic College of Asia towards the development of students who are brilliant and competent.**

***Keywords*-- Problem- Based Learning, St. Dominic College of Asia, Teaching Strategies**

I. INTRODUCTION

Problem-based learning is a kind of learning used worldwide or as a good alternative to traditional classroom learning in order to improve the student's ability to learn actively in a way that they discover and work with content that is determined as necessary to solve the problem. Problem-based Learning is a style of active learning. Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to resolution of the problem.Professor Dr. Howard Barrows at McMaster University, Canada in the medical field (Hung, et al, 2009; Norhaslini, 2011)[1] [15] first introduced problem Based Learning (PBL) in the world of education in the 1960's. It was then expanded to other medical schools around the world, such as Michigan State University in the United States, Maastricht University in the Netherlands, and Newcastle University in Australia (Barrows (1996) in Hung, et al, (2009)[2].

Christian S. Tu, RN MSN, *Faculty, School of Health Science Professions, BS Nursing, Clinical Coordinator, SHSP Research & Community Coordinator,*

Consequently, PBL is then expanded in other fields such as engineering, economics, science, language, history and education.Currently, problem-based learning approach and the use of real cases or PBL has been one of the very popular curriculum innovations in education. It is because this approach encourages students to be transparent, flexible, having diversified ways of thinking and is considered as a paradigm of multidisciplinary studies. It also integrates learning content with real-life applications through the context of a particular problem or. Accordingly, PBL has become a major focus of education researchers in the development of civilization in the 21st century.

Problem Based Learning (PBL) is a learning method, which uses 'real problem' as a trigger in problem solving. Through PBL, students actively identify learning needs with the help of facilitators. Barrows and Tamblyn (1980) defines PBL as a direct result of the learning process to understand or solve a problem[3]. Problem discovery is the first step in the PBL learning process. This problem serves as a boost and by focusing on the use of problem-solving skills and reasoning, students are encouraged to find new information and organize existing knowledge. Consequently, the problem is finally resolved.

Tan (2003) states that PBL design focuses on first solving problems presented to students[3]. The second aspect is seen in terms of the role, expertise and guidance of a facilitator. Moreover, if viewed in terms of the students' role, the main focus is the involvement of students, which shift from being passive to actively solve a given problem. According to Graff and Kolmos (2003), PBL education strategy can solve problems during learning process[4]. Goodman (2010) also supported the idea by stating that (2010) through the use of problems in PBL; students are motivated to learn concepts and ideas[5]. Generally, the problems starts from day-to-day issues customized based on the main objectives and criteria of education. The process of learning using problems can be summarized as Figure 1.

St. Dominic College of Asia instructors utilized this kind of teaching modalities and improve the student's ability to think critically. It is also part of student assessment activity in an Outcomes- Based Education curriculum. This study aims to identify the teaching strategies and the effect of PBL in teaching and learning in St. Dominic College of Asia. Furthermore, the study also aims to identify the level of satisfaction towards the use of PBL in their learning.

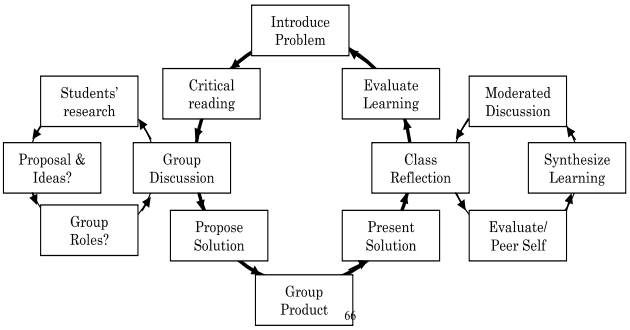

Fig. 1. Problem Based Learning Process

As shown in Figure 1, PBL process starts by submitting critical reading and identification of problem and followed by a group discussion. In groups, students as respondents will conduct a research; formulation of ideas until reaching the proposed settlement. Through the process of improvement, outcome is discussed in the class. Assessment is carried out in the course, followed by group discussion of the conclusion. Lastly, assessments are done either through implementation of successful problem solving objectives. In short, PBL is an inductive learning method, namely learning of specific things that lead to more general ideas (Goodman, 2010). PBL nowadays is ranked as one of the alternative techniques either in basic education or higher education institutions.

II. METHODOLOGY

This study utilized quantitative and qualitative methods with descriptive design. Descriptive explanations explain its phenomenon while the quantitative method was reinforced by interviews to strengthen the findings. The study population composed of 124 St. Dominic College of Asia students who were chosen randomly. Research data were obtained using a modified tool and interview questions. First part of the research tool was the profile variables of the respondents: the participants answered Age, Gender, Year Level, and School. A set of questionnaires with 29 items examined strategy, impact and level of students' satisfaction towards teaching and learning process using problem- based learning approach. Five- point Likert scale was used for the collection of data. Data were analyzed using Statistical Package for Social Science (SPSS 21.0). To obtain frequency, percentage and distribution, and mean value and Analysis of Variance (ANOVA) and T-test to determine the significant difference.

III. RESULTS AND DISCUSSION

This chapter presents the analysis and interpretation of data gathered in the study. The data were tabulated and presented thru graphs and tables and statistically treated after the corresponding qualitative

TABLE 1. PROFILE VARIABLES OF THE RESPONDENTS

AGE	***f***	**%**
16-20	107	86.3
21-25	12	9.7
26-30	4	3.2
31-35	1	.8
TOTAL	**124**	**100%**
GENDER		
MALE	34	27.4%
FEMALE	90	72.6%
TOTAL	**124**	**100%**
YEAR LEVEL		
Second Year	42	33.9
Third Year	75	60.5
Fourth Year	7	5.6
TOTAL	**124**	**100%**
SCHOOL		
SHSP	64	51.6
SBCS	25	20.2
SIHTM	18	14.5
SASE	17	13.7
TOTAL	**124**	**100%**

Table 1 shows the Profile Variables of the Respondents in terms of Age, Gender, Year Level and Schools.

The most number of the respondents belongs to aged group of 16- 20 years old, comprising of 86% of total population of 124 respondents. While the remaining 14% belong to the age group 21- 25 years old, 26- 30 years old and 31- 35 years old. In this age student are explorative and ready for new ideas and accepts any challenges in classroom settings.

Developing independent autonomous thinking within a professional context- practitioner is required to become lifelong learners and this is inherent in this experience. According to Biggs & Tang (2007), accepting responsibilities for being a motivated adult learner. This means that students are aware of their active part of their learning process, setting goals for learning and negotiating with staff rather than being passively led through a training experience. This way student develop a commitment to using their own time in directing learning as they would when they become qualified[6].

In gender female has number of respondents with percentile score of 72.6% and male with 27.4% it means that the most number of enrollees in SDCA are female.

According to Commission on Higher Education (2015), Overall College enrollees increased by 38%, from 14.8 million to 20.4 million. But, over that the time span, the number of female enrollees increased by 40% versus 32% for men[7].

Gender differences in application of PBL that the boys consistently performed better than girls (Jonassen, 2006)[8]. Contrary to that, he states that boys and girls performed comparably during sophomore and junior days, until the boys' skills increased faster than girls', beginning around the ages of 16 or 19, reaching a significant difference in achievement scores by tertiary level (Burhannudin, 2011)[9].

Gender equality issue in education has been a major concern in many countries, including South Africa, Philippines and Canada, because of its link with health and nutrition, economic development, and civic responsibilities. the concept of 'gender equality in education' follows the UNESCO (2003) interpretation, which refers to the notion of boys and girls experiencing the same advantages or

disadvantages in attending school, receiving teaching methods, curricula, and academic orientation, and producing equal learning achievements and subsequent life opportunities (Mpofu, 1998)[10]

Collegiate year level third year students has most number of respondents with percentile score of 60.5%, followed by second year with 33.9% and least number is from fourth year 5.6%.

Gibbon & Wall (2011), similar to case-based learning, the effectiveness of mastery problem- based learning has long been demonstrated in all college year levels in Yale University. It is indicated that after implementing PBL at Yale University, the main achievement of PBL, it improves, class attrition reduced, and promote positive attitudes towards Problem Based Learning were witnessed by the Students and faculty members[10].

Problem- Based Learning per school,

Respondents under the School of Health Science Professions (SHSP) with 51.6%, School of Business and Computer Studies (SBCS) 20.2%, School of International Hospitality and Tourism Management (SIHTM), least, percentile score is from School of Arts Sciences and Education (SASE) with 13.7%

The term is deceptively simple at face value- learning that continues over a lifetime (Field, 2000). According to Clouston, Westcott, Whitcombe, Riley & Matheson (2010) The implications are clearly desirable for individuals, educational institutions and the workplace. There is, however, a political subtext to lifelong learning, which recognizes the need for a flexible workforce, able to adapt to future changes in working practices and the demands of a modern society. This has made the definition of lifelong learning more complex in Allied Health Professions[11] [12].

In business aspects it made another popular pedagogical strategy that originated outside of the business and economics fields and is also aimed at enhancing real-life application of theoretical concepts is problem-based learning (PBL). PBL was originally designed in medical education to address the lack of problem-solving skills in medical students (Dunlap, 2006)[13] [33]. In contrast to the traditional lecture-based model, PBL uses realistic problems and case studies to structure student learning around problem solving. Utilizing the PBL approach encourages students to learn not only from the instructor but also from their peers. The role of the instructor is transformed to that of a mediator. Existing empirical evidence on the impact of PBL (Dochy et al., 2003)[14]. Demonstrates a positive effect on learning and problem-solving skills. Some studies in fact claim that PBL is "perhaps the most innovative instructional method conceived in the history of education" (Hung et al., 2008)[15].

Problem-based learning takes problem-based learning further, in that students work on either a directed problem, or develop a PBL of their own. While usually undertaken alongside other learning activities or modules, projects will be more significant and as such, more time consuming. This may therefore involve the solution to multiple problems and take an even more realistic approach. Valdez (2013) outlines an example used for a BA Hotel and Catering Business course, and emphasized the value of using real world problems, with the students addressing a genuine business need for a real client[16]. Using real life projects can help maintain student interest and enjoyment, however it is not without risk. The danger is that, with real-life clients comes real responsibility, and so there is always the potential of real failure. It is this reality check that students respond to, as they feel like they are finally able to apply their existing knowledge, as well as explore new skills (Garlick, 2014)[17].

College of Arts & Education, Holmes (1996) notes that learning in the liberal arts tradition "takes the long-range view" of education by focusing on content and processes that prepare students to be "persons."[18] Pedagogically, writing is at the heart of learning in the liberal arts tradition (Hersh, 2004), and writing is inherently a problem-solving activity through PBL[19]. In one sense, then, problem solving is the heart of liberal arts. Professors who are teaching in institutions that support a liberal arts mission are bypassing that mission if they do not design their pedagogical approach to support problem-solving activities.

Collaboration Lectures and Group Activities

Based on Problem

The results showed on Table 2, that PBL sessions were dominated by lecture meetings (mean= 3.56) as well as group work (mean= 3.69).

Regular lecture activities were applied as college instructors and students were expected to accomplish the credits based on the courses taken. Lecture meetings were also implemented to provide a brief guide of the problem presented and the course to be absorbed by the students. However, traditional lectures were no longer dominated by strategy of chalk- and- talk. Instead lecture activities became a mode for lecturers and students to present the problems to be solved in-group activities. The following interview transcript further describes:

Researcher: How do you present your problem in PBL?

Student 1: Present muna po naming in a lecture format.

Student 2: Yung professor po naming explain nya muna yung problem na kailangan naming isolve.

Student 3: Si Mam ginaguide nya po kami sa group discussions and yung strategy po kung papaano masolve yung problema, kung ano po yung mahalaga dun sa issue at kailangan. naming malaman and ano po ba yung information na kailangan naming malaman

Active Learning

The results also show that students were given active roles in PBL such as learning in groups (mean= 3.69).

Researcher: Describe the activities undertaken during the implementation of PBL.

Student 1: Hinahati nya po kami sa 4 hanggang 5 groups.

Student 2: Tinatanong nya po kung sino ang nassign na magdidiscuss nung problem.

Student 3: Nagappoint na po kami ahead of time ng leaders, transcriber, and yung taga research po and the rest po group members na po.

The transcript indicates Problem Based Learning implementation based on active learning in groups. This is in line with Zaleha and Daliyanie, (2011) who suggest that Problem Based Learning is a method implemented in collaborative learning, where students will not be given content.

Thus, students are encouraged to play an active role during the learning process in order to obtain information and knowledge to solve problems[20]. Zaleha and Daliyanie (2011) also add that students often find their own information related to the problem presented in Problem Based Learning[21].

TABLE 2. PROBLEM BASED LEARNING IMPLEMENTATION STRATEGY

Some of your subjects will be taught using Problem- Based Learning (PBL) approach. At this point, how often do you think you will be doing the following activities?	**Mean**	**Interpretation**
1. Attends lecture, seminar- workshop-using PBL.	3.56	Moderately Implemented
2. Work in a PBL group led by a Teacher.	3.69	Moderately Implemented
3. Work in unsupervised PBL groups in the Classroom.	3.04	Not Implemented
4. Find a resource on- line/ library to solve ill- structured problems.	3.35	Neutral
5. Write PBL group reports in a tickler.	3.15	Neutral
6. Attends a PBL laboratory/ seminar- workshop.	3.13	Neutral
7. Sit exams and tests in PBL courses.	3.39	Neutral
8. Give presentations in PBL class.	3.56	Moderately Implemented
OVER- ALL MEAN	**3.31**	**Neutral**

5.00- 4.50- Strongly Implemented 4.49- 4.00- Implemented 3.99- 3.50- Moderately Implemented 3.49- 3.00- Neutral
3.00- 2.50- Not Implemented

Guidance to Students

Researcher: Did lectures provide guidance?

Student 1: May time po na pinapalist down po ng prof. namin yung lahat ng issues na alam at hindi po naming alam.

Researcher: What happened in large lecture?

Student 2: Minomotivate nya po kami kasi minsan nahihirapan din po siya sa dami namin.

Researcher: Did you need coaching from lecturers?

Student 3: Opo, paminsan di naming alam kung saan magstart bago po kasi ang PBL sa pandinig naming nasa business world lang po
ang alam namin, pero ginaguide naman po kami kung papaano po ang proseso.

This shows that students still need help and guidance from lectures when accomplishing group assignments. Lecturers play important role in the success of group discussions. Zimmerman, Zaleha and Daliyanie (2011) support the issue when they said that students still need guidance and attention while conducting Problem Based Learning. Teachers are important in promoting and guiding students' participation in Problem Based Learning activity[22].

The Effect of Applying the Problem Based Learning among SDCA Students

This research study focused on the effect of the implementation of problem- based learning discussion on motivation, self- learning, collaborative and communication skills. The result shown in Table 3.

Increase Student Motivation

The study indicated that majority of the students motivated to learn in their respective class. It also helped to increase intrinsic motivation, and built skills for higher knowledge. Majority of the students (mean= 3.61) believed that learning environment was the primary influence in increasing students' motivation to learn through problem- based learning (PBL).

Research: Is PBL increase your motivation?

Student 1: Opo napaghahandaan po naming lalo na sa subject na may PBL.

Student 2: Enjoy po ang PBL, it prepares me everyday.

Student 3: Ang saya po kasi it can easily solve a problem, kahit mahirap hanapin ang sagot mapapahanap ka ng sagot.

The findings support previous result, which show PBL gave positive response in students' motivation towards their courses (Diggs, 1997, Ram 1999; Senocak, Taskesengil & Sozbilir, 2007; Tarhan & Acar, 2007; Rajab, 2007; Serin, 2009; Kelly & Finlayson, 2009). However, some respondents denied that they were motivated to learn because of PBL[23].

Researcher: Does PBL increase your motivation to study?

Student 1: I dunno, ahhh oo naman it make me ready everyday.

Student 2: Opo naman super motivated po ako everytime I attended my PBL sessions with Mam ang galling nya po magbigay ng problem in every tickler.

Student 3: Opo the best po ang Prof. namin magaling sa MS

The transcript shows that most students were burdened the PBL implementation that somehow reduced their motivation. Similarly, a number of previous studies indicate that PBL does not affect motivation (Kocakoglu, 2008). It was also acknowledged by Sungur (2004) that PBL does not have positive impact on students' anxiety, self- efficacy and beliefs in learning [24].

Increase Self- Study

Based from the results of the study it shows that PBL can improve independent learning skills. Majority of students can take responsibility for their own experience during PBL. This self- paced learning is actually able to build self- directed learning, inquiry skills and curiosity among students thus creating level of confidence and believe in them. Moreover, most students agreed that PBL able to cultivate the skills to be responsible for their own learning, create efficient time management, set a goal to learn on their own responsible learning with highest mean score of (mean= 3.81). The results

also show that students are more likely to find information on the Internet during PBL session (mean= 3.77). Internet access at professional institutions of higher learning in addition to the many resources that are available to solve the problem.

Researcher: Does PBL help independent learning?

Student 1: Opo

Student 2: Yes

Student 3: Yes po!

Researcher: Can you explain more?

Student 1: Natutunan po kami humanap ng Information.

Student 2: Madalas po sa internet lalo na kung wala po sa book ang hinahanap

Student 3: Paminsan tumitingin din po sa library or humihiram.

Researcher: What about time management?

Student 1: Nahandle naman po naming yung time naming.

Student 2: Minsan po nauubusan sa dami po ng discussion….

Student 3: Worth it naman po kasi kahit mahaba ang oras pero minsan parang bitin din we want more pa sabi naman kay Mam.

This result is in line with the statement by Zimmerman & Schunk (2001) who claim that self- learning strategy is decisive for the achievement of quality learning[25].

Enhance Group Learning

More than 80% respondents believed that enhancing collaborative skills are also an effect of PBL (mean= 3.45). Students prefer to work in groups because it can help students to learn academic content better. Lynda and Megan (2002)

TABLE 3. THE EFFECTS OF APPLYING THE PROBLEM BASE LEARNING AMONG SDCA STUDENTS

Motivation in PBL Class	Mean	Interpretation
1. I am studying with full of interest during PBL class.	3.61	Moderately Effective
2. I enjoy attending my class because of the use of PBL approach.	3.54	Moderately Effective
3. Professional Higher Education institution raise my interest and motivation in learning PBL.	3.61	Moderately Effective
OVER- ALL MEAN	**3.58**	**Moderately Effective**
Self- Directed Learning in PBL Class		
4. I learn a lot by reading books either in actual or on- line inquiry.	3.73	Moderately Effective
5. I am finding information in the line library during PBL class or seminar- workshop.	3.58	Moderately Effective
6. I am finding information on the internet during PBL class or seminar- workshop.	3.77	Moderately Effective
7. I manage my time effectively during PBL.	3.67	Moderately Effective
8. I can identify my learning goals without depending on my supervisor during PBL.	3.57	Moderately Effective
9. I take responsibility for my own learning during PBL.	3.81	Moderately Effective
OVER- ALL MEAN	**3.68**	**Moderately Effective**
Collaborative Skills in PBL Class		
10. I am working well in a PBL team with other group members.	3.65	Moderately Effective
11. Working as a PBL team or group helped me in learning academic content.	3.73	Moderately Effective
OVER- ALL MEAN	**3.69**	**Moderately Effective**
Communication Skills in PBL Class		
12. I am good at writing reports/ essays in PBL class.	3.38	Moderately Effective
13. I speak well in front of a group in PBL class.	3.45	Moderately Effective
OVER- ALL MEAN	**3.41**	**Moderately Effective**

5.00- 4.50- Strongly Effective 4.49- 4.00- Effective 3.99- 3.50- Moderately Effective 3.49- 3.00- Neutral 3.00- 2.50- Ineffective

states that through group learning. A variety of skills can be formed It is also supported by Murray, Curtis[26], Cattley and Slee (2014) who state that PBL process give ample room for students to develop collaborative skills[27]. Cooperation, which existed in collaborative skills from positive student behavior and draw their attention to learn.

Communication Skills

According to Stefl- Mabry and Powers (2013), that collaborative learning is the key to communication. Communication is a skill that is important for the student to share ideas and form new ideas. It helps to correlate existing knowledge with new knowledge. Communication is not limited to words. Ideas and concepts presented in visual presentations also show the importance of communication. Communication skills are not only in terms of skills in writing reports with mean score of (mean= 3.38), but also verbal communication among students. The findings shows that students were confident among other groupmates (mean= 3.45).

Researcher: Does PBL improve communication skills such as writing and speaking?

Student 1: Opo, nagindiviadual reporting po kami kasi yung leader naming gusto niya lahat magsalita sa unahan.

Student 2: Opo, wriiten and oral communication skills nagimproved po.

Student 3: Opo, nagimproved po kasi may journal sharing po kami based po dun sa problema binigay sa min so talagang matuto kang magsalita.

Researcher: What about verbal communication?

Student 1: Nung una po ninerbiyos… pero kalaunan po ok na carry na po.

Student 2: Super nagimprove po ang verbal communication skills ko.

Student 3: Confident enough to talk in front.

This finding was also supported by Simranjeet et. al. (2011), who state that PBL encourages students to read the given problem, gather feedback from their friends, find solutions and finally do group presentations. All of these steps require communication skills throughout the process[28].

Level of Students' Satisfaction on the Implementation of Problem Based Learning

Based on the studies Based on the surveys conducted by previous researchers, PBL has been identified as a catalyst to improve students' achievement (Achilles and Hoover, 2013)[29].

TABLE 4. LEVELS OF STUDENTS' SATISFACTION IN THE LEARNING PROCESS

Satisfactory Level in PBL Approach	Mean	Interpretation
1. I learned more in PBL compared to traditional lecture.	3.85	Moderately Satisfactory
2. I will recommend PBL in other subjects.	3.84	Moderately Satisfactory
3. I will attend another seminar- workshop, course and class in PBL.	3.56	Moderately Satisfactory
4. I like tackling unfamiliar problems in PBL.	3.68	Moderately Satisfactory
5. In PBL, I have developed many useful strategies to help me in my learning.	3.71	Moderately Satisfactory
6. My lecturer gives me regular feedback during PBL on how I am doing with my project.	3.74	Moderately Satisfactory
7. I am able to get help from my lecturer whenever I need it during PBL.	3.69	Moderately Satisfactory
8. PBL learning environment helps in shaping me to be a good at thinking critically.	3.84	Moderately Satisfactory
OVER- ALL MEAN	**3.73**	**Moderately Satisfactory**

5.00- 4.50- Very Satisfactory 4.49- 4.00- Satisfactory 3.99- 3.50- Moderately Satisfactory 3.49- 3.00- Neutral 3.00- 2.50- Not Satisfactory

The study discussed the implementation of PBL in the level of satisfaction among students. Studies show that most of the students gave a feedback on the implementation of PBL.

Students Positive Outlook on PBL

The findings showed that majority students agreed that more things can be learned in PBL as compared to traditional lecture method interpreted as moderately satisfactory with mean score of (mean= 3.85). It is because in PBL, students will not only be exposed to capture content in education, but also must master a variety of thinking skills, especially the ability to think critically and creatively in order to find the right solution to a shared problem (Kenneth and Williams, 2001)[30]. Furthermore, majority of students also agreed that PBL is always included in other subjects with mean score of (mean= 3.84) PBL is an effective way in developing students' thinking process skills because students are exposed to multifaceted inquiries and able to develop

skills in giving reasoning that require good understanding of content in order to solve problems (Dorothy and Diane, 1986); Kenneth and Williams, 2010)[31]. The results also showed that the respondents agreed that they preferred to face and solve problems, which were uncommon (mean= 3.56).

Researcher: Are you satisfied using PBL strategi**es?**

Student 1: Hmm… satisfied po the best ang PBL nung una lang mahirap.

Student 2: Madami po akong natutunan, I learn collaboratively yung with the help of the whole group.

Student 3: Better understanding compared to chalk- board lecturers parang ordinary na lang kasi yung sa ngayon as compare po with PBL, nakakachallenge po ang siya kasi and magiisip po kayo lahat…haha… The best kahit nakakapagod pero ang galing nya pagnatutunan mo.

This finding consistent was consistent with a recent study conducted by Keller (2013) who suggested that PBL can be considered as a challenging learning approach[32]. This is also in line with natural human instinct that tends to dominate challenges and hindrances. In addition, learning environment in professional institution help the students in the development of the variety of learning strategies (mean= 3.71). Reasoning process is one important element in PBL. Learning in PBL environment is not as simple collecting the facts alone. As recommended by Dunlap (1996), abilities and

Developing independent autonomous thinking within a professional context- practitioner are required to become lifelong learners and this is inherent in this experience. According to Biggs & Tang (2007), accepting responsibilities for being a motivated adult learner. This means that students are aware of their active part of their learning process, setting goals for learning and negotiating with staff rather than being passively led through a training experience. This way student develop a commitment to using their own time in directing learning as they would when they become qualified[25].

Table 6 shown that there is no significant difference on the implementation; effects of PBL in motivation, self- directed learning, communication and collaborative and students' level of satisfaction in terms of Age.

According to Hussain (2006), Gender and Students' Academic Achievement Gender differences in mathematics achievement dated back to the 1960s.The early results provided a scenario showing that boys consistently performed better than girls[25]. Contrary to that, Maccoby stated that boys and girls performed comparably during primary school, until the boys' mathematical skills increased faster than girls', beginning around the ages of 12 or 13, reaching a significant difference in achievement scores by high school. Again, gender equality issue in education has been a major concern in many countries, including South Africa, because of its link with health and nutrition, economic development, and civic responsibilities. the concept of 'gender equality in education' follows the UNESCO (2003) interpretation, which refers to the notion of boys and girls experiencing the same advantages or disadvantages in attending school, receiving teaching methods, curricula, and academic orientation, and producing equal learning achievements and subsequent life opportunities Studies have shown that Mathematics is stereotyped as male domains in the academic setting (Fennema and Sherman 1977; Nosek et al. 2009)[38].

cognitive processes are required for activity in PBL. These activities stimulate higher order thinking skills and can ensure better knowledge transfer in the future[33].

Most respondents (mean= 3.84) believed that they were stimulated to be good thinkers as a result of teaching approaches practiced by the professors in SDCA. PBL learning environment also encourages independent learning among students which simultaneously help the students to become good thinkers (Keller, 2013)[34]. Moreover, students in PBL have the role to trigger their own learning, asking questions and solving problems during learning process. Norman and Schmidt (2013) found that undergraduates will be more independent thinkers and more responsible for there own learning and the notion was supported by a study conducted by Jonassen (2006)[35]. Researchers in other studies also (Lo, 2010; Martin, et. al. (2012); Schelton and Smitd, 2014) found that more students were able to integrate theory with actual situations after lesrning through PBL[36].

As shown in Table 5, 6, 7, & 8 the significant difference in the implementation of PBL in St. Dominic College of Asia in terms of Age, Gender, Year Level and Schools.

There is no statistically significant difference in strategy of implementation; effects of PBL in motivation, self- directed learning, collaboration, communication skills and students' level of satisfaction in terms of

Statistically result in table 7 shows that there is no significantly difference in terms of year level.

Khumsikiew, Donsamak and Saeteaw (2015), Universtities who were used PBL to aid anticipated learning outcomes and practice competencies for pharmacy student. The purpose of this study was to implement and evaluate a model of small group PBL for 5th year pharmacy students in the clinical environment that facilitated by pharmacy instructors. A PBL model was implemented in 1-day periods each week in total of 15 weeks at clinical practice sites. PBL activities consisted of providing quality service, collection based on stakeholders' data, and its evaluation[39].

Ram (2016), PBL has proven to be an effective way of motivating college students. Undergraduates in a chemistry course at Emory worked on a problem of water quality assessment using the PBL methodology. If students are given an authentic problem that is challenging and real, they will be motivated to learn and to enjoy the learning process immensely. PBL problems can be structured to fill the curricular goals of undergraduate courses. When students follow the PBL methodology, they learn to gather facts specified in the problem, generate multiple hypotheses about how to solve the problem, identify topics that require new information, perform self-directed study in these topics, and evaluate their self-directed study and problem-solving skills[40].

Table 8 presents the implementation of PBL in SDCA in terms of school per college as shown in the result there is no significant difference in terms of School/ department, though the result contrary to the results in table 8. In the School of Health Science Professions PBL is highly utilized because of its practice. In the business program of SDCA PBL started in more basic problem as well as in Hospitality and Tourism Management. In School of Arts Sciences and Education

TABLE 5. SIGNIFICANT DIFFERENCE IN THE IMPLEMENTATION OF PROBLEM- BASED LEARNING IN ST. DOMINIC COLLEGE OF ASIA IN TERMS OF AGE

Problem- Based Learning Inventories in Age	df	F	Sig.	Interpretation	Decision
1. Strategy of Implementation of PBL	3	.211	.805	No Significant	Accept the Null
2. Effects of PBL Class in Motivation	3	.149	.886	No Significant	Accept the Null
3. Effects of PBL Class in Self- Directed Learning	3	.160	.835	No Significant	Accept the Null
4. Effects of PBL Class in Collaborative Skills	3	.301	.737	No Significant	Accept the Null
5. Effects of PBL Class in Communication Skills	3	.543	.531	No Significant	Accept the Null
6. Level of Students' Satisfaction in PBL	3	.261	.700	No Significant	Accept the Null

TABLE 6. SIGNIFICANT DIFFERENCE IN THE IMPLEMENTATION OF PROBLEM- BASED LEARNING IN ST. DOMINIC COLLEGE OF ASIA IN TERMS OF GENDER

Problem- Based Learning Inventories in Gender	df	F	Sig.	Interpretation	Decision
1. Strategy of Implementation of PBL	1	.304	.491	No Significant	Accept the Null
2. Effects of PBL Class in Motivation	1	.112	.687	No Significant	Accept the Null
3. Effects of PBL Class in Self- Directed Learning	1	.794	.231	No Significant	Accept the Null
4. Effects of PBL Class in Collaborative Skills	1	.045	.801	No Significant	Accept the Null
5. Effects of PBL Class in Communication Skills	1	.001	.977	Significant	Reject the Null
6. Level of Students' Satisfaction in PBL	1	.288	.468	No Significant	Accept the Null

particularly in Education and Psychology it is highly utilized by the department.

Problem-based learning (PBL) is becoming increasingly widespread in U.S. medical education. The growth of PBL as an educational model brings with it both new challenges and new opportunities for health sciences libraries and librarians. This article presents the characteristics of problem-based learning and discusses PBL's implications for health sciences libraries and librarians (Block, 1997)[41].

Problem-based learning has great potential for management education. Placing students in a problem-centered environment may help bridge the gap between theory and practice. One important but underdeveloped issue for problem-based learning is the context design of the problem-solving situation (Sherwood, 2015)[42].

Problem- based learning by framing the class into "real world" examples, students were able to dissect the problems, to identify situational constraints, and ascertain a clear understanding of the desired outcome (Dawson & Titz, 2011)[43].

Problem- Based Learning in College of Arts & Education. Holmes (1996) notes that learning in the liberal arts tradition "takes the long-range view" of education by focusing on content and processes that prepare students to be "persons." Pedagogically, writing is at the heart of learning in the liberal arts tradition (Hersh, 2004), and writing is inherently a problem-solving activity (Lindemann, et. al, 2005)[44]. In one sense, then, problem solving is the heart of liberal arts. Professors who are teaching in institutions that support a liberal arts mission are bypassing that mission if they do not design their pedagogical approach to support problem-solving activities.

TABLE 7. SIGNIFICANT DIFFERENCE IN THE IMPLEMENTATION OF PROBLEM-BASED LEARNING IN ST. DOMINIC COLLEGE OF ASIA IN TERMS OF YEAR LEVEL

Problem- Based Learning Inventories in Year Level	df	F	Sig.	Interpretation	Decision
1. Strategy of Implementation of PBL	2	2.210	.491	No Significant	Accept the Null
2. Effects of PBL Class in Motivation	2	.543	.687	No Significant	Accept the Null
3. Effects of PBL Class in Self- Directed Learning	2	1.008	.231	No Significant	Accept the Null
4. Effects of PBL Class in Collaborative Skills	2	.411	.801	No Significant	Accept the Null
5. Effects of PBL Class in Communication Skills	2	2.839	.977	No Significant	Accept the Null
6. Level of Students' Satisfaction in PBL	2	.743	.468	No Significant	Accept the Null

TABLE 8. SIGNIFICANT DIFFERENCE IN THE IMPLEMENTATION OF PROBLEM- BASED LEARNING IN ST. DOMINIC COLLEGE OF ASIA IN TERMS OF PER SCHOOL/ COLLEGE

Problem- Based Learning Inventories in School	df	F	Sig.	Interpretation	Decision
1. Strategy of Implementation of PBL	3	1.532	.210	No Significant	Accept the Null
2. Effects of PBL Class in Motivation	3	1.227	.303	No Significant	Accept the Null
3. Effects of PBL Class in Self- Directed Learning	3	1.005	.371	No Significant	Accept the Null

4. Effects of PBL Class in Collaborative Skills	3	1.210	.309	No Significant	Accept the Null
5. Effects of PBL Class in Communication Skills	3	1.008	.392	No Significant	Accept the Null
6. Level of Students' Satisfaction in PBL	3	1.036	.379	No Significant	Accept the Null

TABLE 9. ANALYSIS & SUMMARY OF THE IMPLEMENTATION OF PROBLEM- BASED LEARNING PER SCHOOL

PROBLEM- BASED LEARNING INVENTORIES	SCHOOL/ PROGRAM	MEAN	OVER- ALL MEAN	PER SCHOOL INTERPRETATION	INTERPETATION
Implementation of Problem- Based Learning	SHSP	4.10	**3.31**	Implemented	Neutral
	SBCS	3.00		Neutral	
	SIHTM	3.15		Neutral	
	SASE	3.00		Neutral	
Effects of Applying Problem- Based Learning in Motivation	SHSP	3.35	**3.58**	Neutral	Moderately Effective
	SBCS	3.40		Neutral	
	SIHTM	3.55		Moderately Effective	
	SASE	4.00		Effective	
Effects of Applying Problem- Based Learning in Self- Directed Learning	SHSP	4.25	**3.68**	Effective	Moderately Effective
	SBCS	3.15		Neutral	
	SIHTM	3.40		Neutral	
	SASE	3.90		Moderately Effective	
Effects of Applying Problem- Based in Collaborative Skills	SHSP	4.00	**3.69**	Effective	Moderately Effective
	SBCS	4.05		Effective	
	SIHTM	3.70		Moderately Effective	
	SASE	3.00		Neutral	
Effects of Applying Problem- Based in Communication Skills	SHSP	3.60	**3.41**	Moderately Effective	Neutral
	SBCS	3.00		Neutral	
	SIHTM	3.50		Moderately Effective	
	SASE	3.55		Moderately Effective	
Levels of Students' Satisfaction in the Learning Process	SHSP	4.00	**3.73**	Satisfactory	Moderately Satisfactory
	SBCS	3.30		Neutral	
	SIHTM	3.85		Moderately Satisfactory	
	SASE	3.78		Moderately Satisfactory	
OVER- ALL MEAN		**3.57**	**3.57**	**Moderately Implemented**	**Moderately Utilized**

SUMMARY ON THE IMPLEMENTATION, EFFECTS AND LEVELS OF SATISFACTION ON PROBLEM- BASED LEARNING IN ST. DOMINIC COLLEGE OF ASIA

School	Over- All mean Per School	Interpretation
SHSP	3.88	Moderately Implemented
SBCS	3.32	Neutral
SIHTM	3.53	Moderately Implemented
SASE	3.54	Moderately Implemented
TOTAL MEAN	**3.57**	**Moderately Implemented**

Based from the analysis and summary with regards to Problem-Based Learning, School of Health Science Professions SHSP (mean= 3.88) practicing PBL to enhance critical-thinking analysis and aid as their teaching modalities. School of Arts, Sciences and Education with mean score of 3. 54, which is moderately implemented and enhance their teaching style for future teachers and psychologists. PBL in School of International Hospitality and Tourism Management started to improve their client relationship in hotel and tourism practice. School of Business and Computer Studies with a summary mean score of 3.32 which is on the neutral side of PBL, as new to the course.

CONCLUSION AND RECOMMENDATIONS

1. Based from the result of the study the following the Problem- Based Learning gives positive impact in increasing students' motivation, self- learning and soft skills.

2. Group learning activities and leadership functions help to develop students' communication and collaboration skills.
3. This strategy is appropriate for the implementation of PBL in St. Dominic College of Asia.
4. Though, there were an issue from some students about the challenges they faced in solving problems and mastering the content.
5. Time limit and multiple tasks that must be completed for each course created these issues.
6. In this case, the lecturer has an important role to motivate students and provide effective guidance to them.
7. Finally, it may be concluded that most of the students of SDCA agree with the implementation of PBL in higher education institutions due to its effectiveness in the learning development of the students.

RECOMMENDATIONS

For the improvement of the PBL in SDCA, the researcher offers the following recommendations:

1. Submit a Strategy to understand the problem presented utilizing cognitive tools such as table or ticklers learning issues in each program (what is known, what is not known, what needs to be known). Cognitive tools to focus the students to understand the problem as a whole and realize the task that must be executed to solve the problem critically and efficiently.
2. Provide a clue to the students in the monitoring process of implementation during the meeting as well providing encouragement and motivation that encourages them to learn to be more active and organized.
3. Arrange a meeting schedule and monitor the progress of students from time to time. Use social media as a medium of group discussion.

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