

# **EXPLORING STUDENTS' EXPERIENCES IN INTENSIVE PROBLEM-BASED LEARNING (IPBL) IN AN AREA OF INFORMATICS**

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Problem-based Learning (PBL) has been around for a few decades and there are variations in terms of implementation among practitioners. In the polytechnic in Singapore in which this study was conducted, PBL pedagogy is geared towards moulding students into lifelong learners through the development of self-directed learning, collaborative learning, thinking and problem-solving skills, and reflective thinking. With the implementation of intensive scheduling, the concept of “intensive PBL”, or iPBL, is investigated in this study.

The population consists of final year students taking an informatics subject in a three year diploma course. Data sources of students' responses include online questionnaire survey and group interviews. Students' experiences through the eyes of the tutors were also garnered through individual interviews.

The study indicates that the students were generally receptive to iPBL and the majority perceived they had further developed their self-directed learning skills with scaffolding from the tutors. The area of collaborative learning received mostly positive feedback as the cognitive load could be distributed among group members so as to fulfil the assessment criteria in the intensive schedule. Though thinking and problem-solving skills were cultivated gradually in the students' prior years of education, the majority of the students perceived they had practised and gained confidence in these skills through iPBL. However, the majority felt that they had limited opportunities to practise reflective thinking through journal writings though they had more opportunities during presentations and group interactions. The issue of intensive schedule affecting PBL was highlighted and there is a need for the institution to manage the assessment criteria in intensive scheduling. The usual problems associated with self-directed and collaborative learning had their effects intensified under the compressed time frame.

The study on senior students is relevant as they are about to embark on a career in the industry. If the students' attitudes and skills are indeed as reflected in the study, iPBL would be an appropriate pedagogical approach in an informatics area if it is fine-tuned to infuse more reflection on work done.

Keywords: Problem-based Learning, Intensive Scheduling, Informatics

## INTRODUCTION

In Singapore, the mission of the polytechnics is to train middle-level professionals to support the technological and economic development of the nation (Ministry of Education, 2009). A school within a polytechnic offers Informatics and Information Technology (IIT) diploma courses. The School promotes self-directed learning (SDL) and collaborative learning (CL) through pedagogies such as Problem-based Learning (PBL). The School also introduces intensive or block scheduling, which organises the students' school time-tables to facilitate more time-concentrated periods for learning and teaching activities.

This paper explores students' experiences in PBL in the intensive schedule and I would like to coin it as "intensive PBL" (iPBL).

### *Background*

The School offers diploma courses of three years (six semesters) duration. The School believes that by focussing on fewer subjects in a block, students could explore the subjects in greater depth through individual research, CL and self-reflection. Intensive scheduling is introduced only from the fourth semester onwards as the School feels that a slower pace of learning is needed for foundation subjects in the first three semesters.

In intensive scheduling, a semester is divided into two blocks of seven-and-a-half weeks each and the semester's subjects are distributed between the blocks. iPBL is implemented for a subject in half or a quarter of the number of weeks usually allocated to the subject.

The population under study consists of students of ages 18 -19 taking an informatics subject. The students have been educated mainly in didactic teaching in the first 10 years of their education. In the subject, students were required to design and implement IIT solutions for the tourism industry. The students had little or no prior knowledge in the tourism domain and there were eight hours of scheduled facilitation sessions per week with each session lasting four hours. During the sessions, students worked in groups to address the problem statements, while the tutors facilitated the groups.

The research explores the following:

- What are students' experiences and perceptions in iPBL in an area of Informatics?

It focuses on students' experiences and perceptions related to:

- Self-directed learning
- Collaborative learning
- Thinking and problem-solving skills
- Reflective thinking

## LITERATURE REVIEW

### *Problem-Based Learning*

In PBL, students use problems as a context in which they acquire problem-solving skills and basic knowledge (Banta et al., 2001). The learning process starts with the tutor giving a “problem statement” to the students. Students have to be active learners: “they have to develop a range of skills including being able to work in teams, formulate a problem, find information, explain new information to others, make decisions and reach conclusions, etc – all quite different from memorising information” (Wood, 2004, p. 2). These reflect the “real world” out there in the industry where merely possessing knowledge is not sufficient to meet the challenges of the fast-paced IIT industry. Very often, the problems posed by customers are ill-structured and open-ended, not to mention the ever-changing requirement specifications. In PBL, students use self-directed and collaborative learning to deal with uncertainties of data, information and solution (Tan, 2003).

PBL is also increasingly being seen in education and training as a means of managing the growing and widening knowledge base of individual disciplines when the curricula can no longer expand fast enough to cope with such demands (Savin-Baden, 2000). This point is especially relevant to the field of IIT where knowledge and the application of knowledge changes and increases rapidly within a relatively short time span. Students should therefore be able to ride on the fundamental knowledge and skills learnt in the course and more importantly, to harness their lifelong learning skills when they embark on their careers.

In a didactic setting, tutors provide the content for the subject and students attempt to absorb the content without questioning its relevance as they consider the tutors to be the domain experts. There is concern that such knowledge is “ill-adapted in contemporary communications-based societies; it lacks applicability, flexibility and durability” (Scaife, 2000, p. 1).

Constructivist theory is based on the premise that knowledge is constructed by individuals and within social communities (Phillips, 1995) and that “individuals must be socially engaged in learning - actively creating knowledge from their existing knowledge base, beliefs, and personal experiences” (Hackmann, 2004, p. 697). PBL is “extremely consistent with constructivist philosophy” (Cheaney & Ingebritsen, 2005, p. 2) and the concept of constructivism is in line with my thinking of how learners should acquire knowledge and skills in IIT.

PBL promotes skills in independent learning, collaborative learning, problem solving, and decision making (Tan, 2004a). Literature on learning and pedagogy appears to support the use of PBL (Tan, 2004a) though there are also diametrically opposing views (Kirschner, Sweller & Clark, 2006). There are arguments that behaviourist models, rather than learner-centred practices promoted by constructivists, are necessary in certain instructional situations and disciplines (Hackmann, 2004). In my opinion this could be true for some subjects where didactic teaching is useful. However, I feel that for the IT discipline, the constructivist philosophy is highly relevant to PBL.

## ***Block Scheduling***

Block scheduling modifies school time-tables to facilitate longer and continuous periods for students' learning and teaching activities. It decreases the number of classes scheduled daily but increases the length of each class. The model adopted by the School requires students to take around three subjects per block of half a semester. The semestral approach would typically entail two 1-hour and one 2-hour sessions per week for 15 weeks. In the block schedule, there are fewer movements from one classroom to the next and less "settling-down" or "warming-up" time for each session.

With the fewer number of subjects per block, there will be longer periods of uninterrupted time for student learning (Evans, Tokarczyk, Rice & McCray, 2002) and teachers would have more opportunities to engage in a variety of innovative and creative instructional strategies such as interactive learning (Wilson & Stokes, 1999b; Queen, 2000). Students have opportunities to engage in independent and collaborative projects and are more active in classroom activities (Evans, Tokarczyk, Rice & McCray, 2002). Findings suggest that block scheduling provides more opportunities for teachers and students to explore content and ideas in greater depth (Benton-Kupper, 1999).

Larger blocks of time might facilitate the use of constructivist learning strategies (Elmore, 1995; Elmore & Windschitl, 1999) which lead to more project- and problem-based learning activities (Buckman, King & Ryan, 1995; Evans et al., 1998).

PBL is mentioned positively in both constructivist and block scheduling literature (Hackmann, 2004). However, it remains to be seen if PBL is able to flourish under block schedule as ideas and learning take time to germinate through metacognitive activities and collaborative learning.

On the other hand there are those (e.g., Benton-Kupper, 1999; Mathews, 1997), who feel that a block schedule may not benefit all learning environments, and call for more rigorous studies to substantiate claims of effectiveness. If a block schedule is implemented without a sound pedagogical foundation, academics may increase their didactic teaching to fill up the extra time instead of focusing on the process of learning which is in line with constructivist principles (Hackmann, 2004). Appropriate changes in instructional practices coupled with the effective use of class time are necessary for effective learning in a block schedule (Queen, 2000).

## **METHODOLOGY**

A case study approach is used in this research. Case studies allow researchers to inquire into and reflect upon particular instances of educational practice (Freebody, 2003). My view is that a reader of a case study can interpret the findings of the case study and relate them to their own context. Hence, the concept of relatability rather than generalisation would be more useful in my research.

A case study allows researchers to focus on specific issues and to identify the various interactive processes at work; some of these processes are crucial to the success or failure of an organisation but may not surface in a large-scale survey (Bell, 1999). If a

case study is carried out methodically, thoroughly and critically, it helps improve pedagogical practices that academics can then relate to their own classroom experiences (Bassey, 1981).

In my study both quantitative and qualitative data were collected. For the quantitative data, I attempted to ensure some degree of validity by iteratively reviewing each survey question carefully, consulting my colleagues, and conducting pre-pilot and pilot runs.

Despite its potential pitfalls, qualitative data analysis could better provide insights into why the findings are as they are; however these insights are lacking in quantitative data analysis (Opie, 2004b). In my study both quantitative and qualitative methods were used for triangulation.

The population consists of 158 students with similar prior exposure to PBL and intensive scheduling. Out of the 140 students contacted, 92 students (66%) responded. The survey consists of both closed-ended and open-ended questionnaires. The closed-ended questions consisted of a number of statements for which the students indicated their level of agreement on a Likert-type scale. The open-ended questions allowed students to enter their responses for a set of questions. Pre-pilot and pilot phases were carried out prior to the actual release of the survey.

Semi-structured group interviews were conducted for nine students in groups of two or three. Group interviews may encourage more sharing by the interviewees as they have the company of others and hence may feel more relaxed and less threatened (Yeo, 2005a). Students from different bands of academic attainment were invited for the interviews to attempt to gather a more representative feedback. Individual semi-structured interviews were conducted for the four tutors facilitating the subject.

I sought permission from the interviewees for me to take notes during the interviews and I was able to do so effectively as the interviewees took turn to speak in the interviews. My experience was that with note taking, interviewees were put at ease and they could take a breather and ponder on what to say next. The notes were subsequently sent to the interviewees for vetting to help improve the reliability of data collected.

## **FINDINGS & DISCUSSIONS**

### ***Self-Directed Learning***

#### *Survey – Quantitative Data*

A high percentage of students (94%) felt that they were able to acquire the required contents and skills through SDL (e.g., to seek and research for the relevant information, summarise information to address problems).

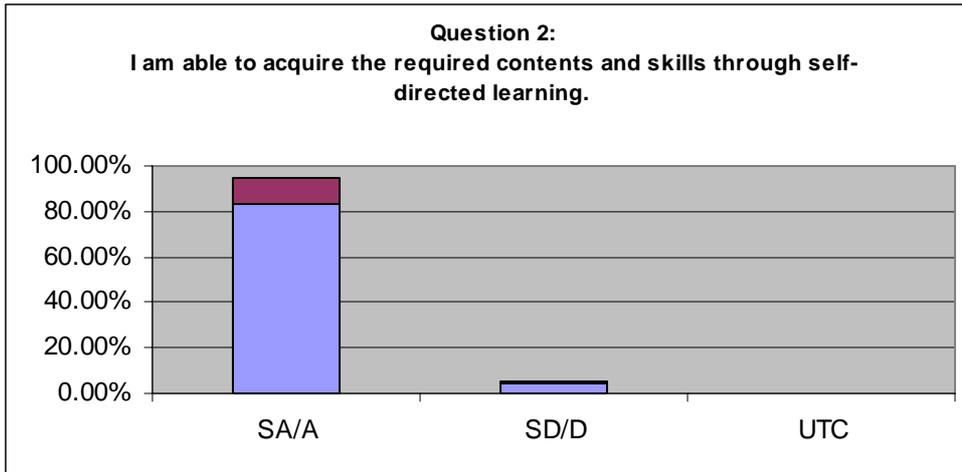


Figure 1: Question 2

90% felt they were able to achieve the learning goals (e.g., evaluate/design IT solutions for the tourism industry).

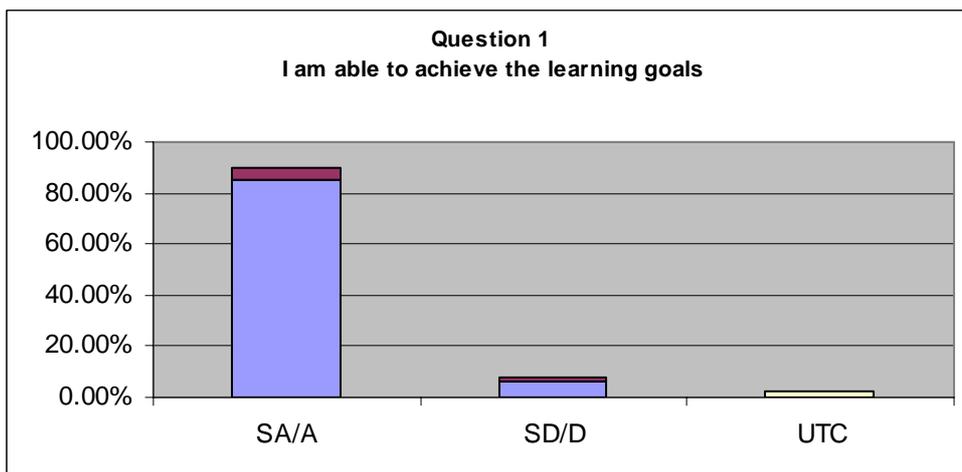


Figure 2: Question 1

91% perceived they had increased ability to learn a subject independently.

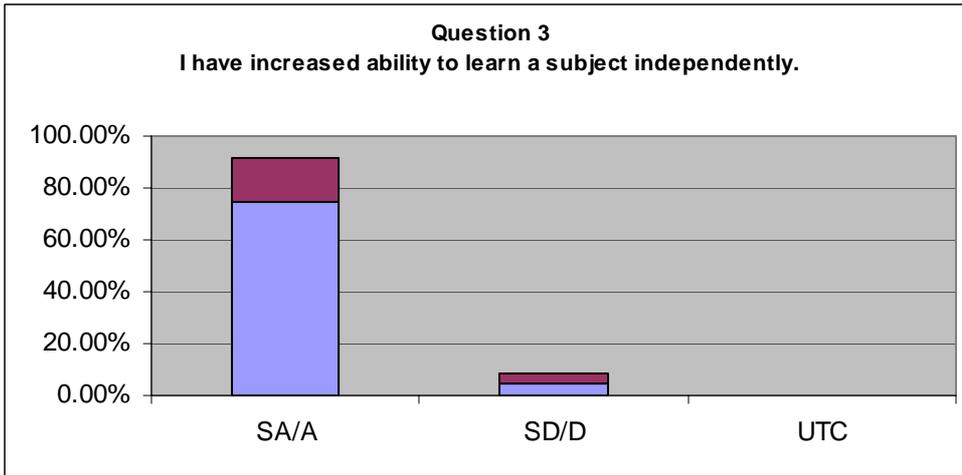


Figure 3: Question 3

Given the block schedule, 81% felt that they had sufficient time for independent learning of the subject.

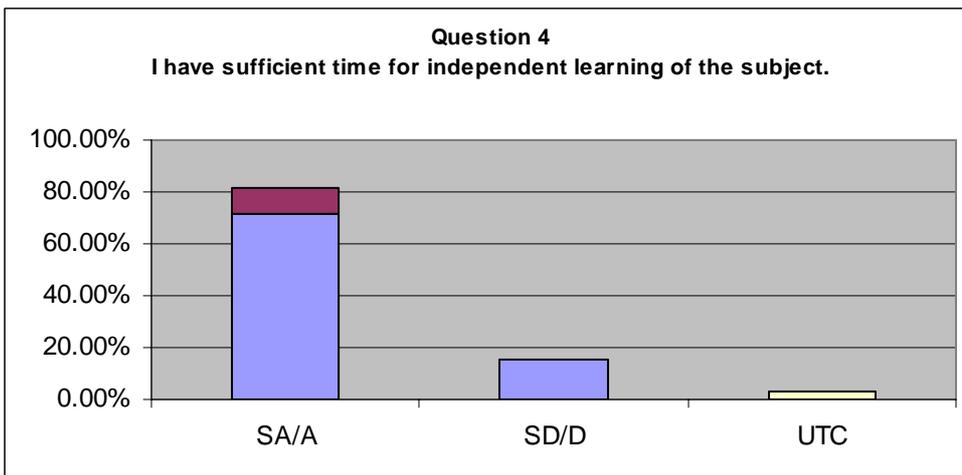


Figure 4: Question 4

90% responded that the facilitation sessions allowed their group to decide for themselves what they needed to research on in order to address the given problems.

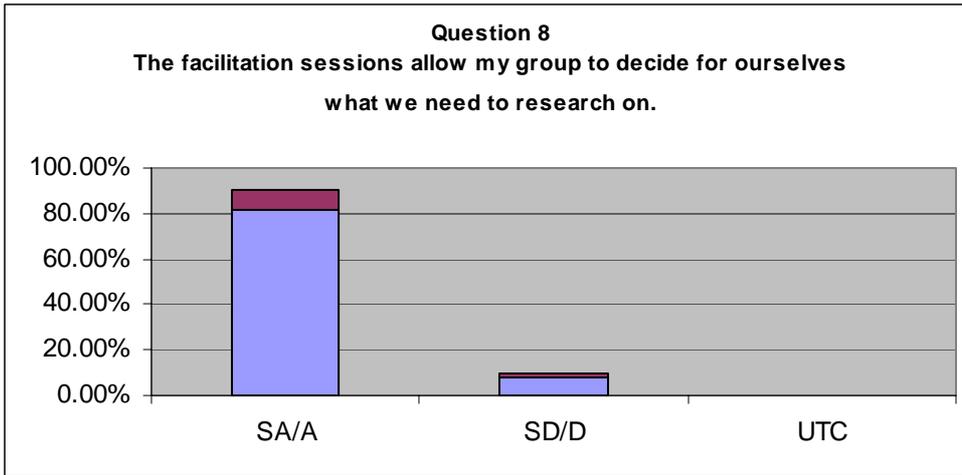


Figure 5: Question 8

75% felt that they had sufficient time to find information needed to complete the assignment.

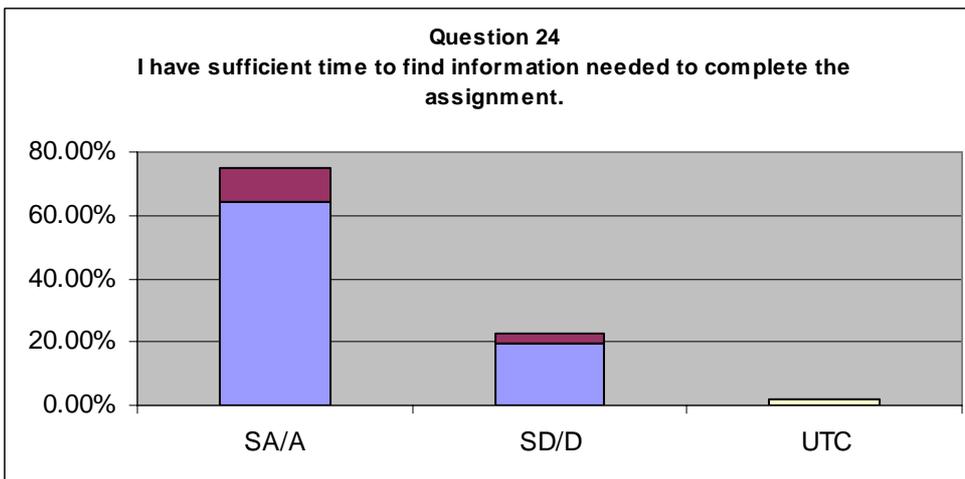


Figure 6: Question 24

68% opined that block schedule provided quality time for learning in PBL.

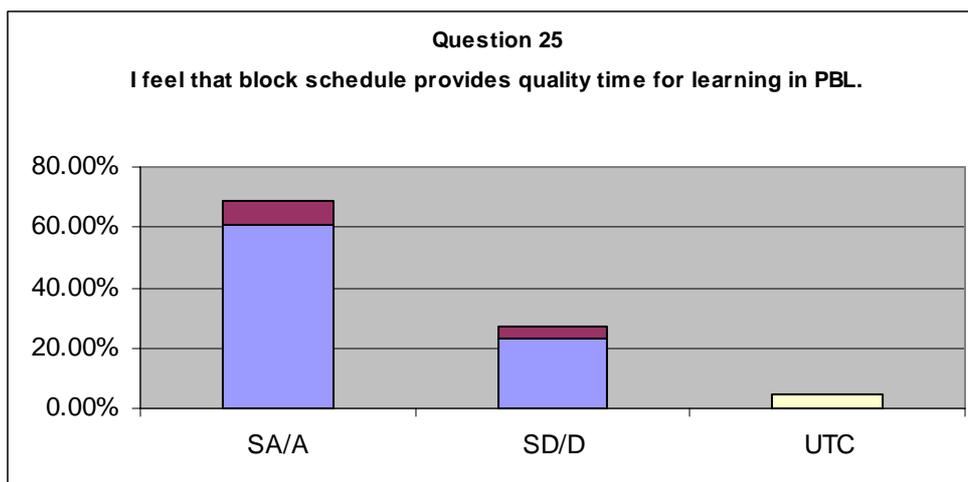


Figure 7: Question 25

### Survey – Qualitative Data

The majority of the students wrote that the iPBL had provided them a lot of opportunities for SDL and they had benefited from this mode of learning. Some representative feedback is given here:

*I feel it's great because we can learn to be independent. This would train us when we are in the industry without any helps from the lecturers.*

*It motivates me to plan and learn on my own and be less reliant towards our tutor. I notice when learning on my own I'm able to learn much more things compared to what is being given to us.*

One of the frequent concerns raised by the students was the fear of going on the “wrong track”. This is illustrated by the following feedback:

*Self directed learning might lead some of us to the wrong track in which causing us to get all confuse even further. Maybe self directed learning but with a sharing session at the end of the day may help the students to understand further.*

*It's good in that it helps us be more independent in our learning but we can get really lost sometimes with no idea how to get help.*

*Have to do own research and this may lead to out-of-point and irrelevant research if tutor not around to guide.*

Students might still expect tutors to help them in more in-depth problem solving as quoted here:

*I have learnt most of the things in the subject independently because the teachers only provide superficial knowledge which could be obtained from the Internet. So, teachers should be focusing on key in-depth problem tackling issues surrounding the problems we were given.*

The issue of time availability for SDL was brought up by some students:

*It is good to have self-directed learning but more time should be given.*

*Although we are given time to go do research on our own, I still feel that having PBL in the block-mode is not preferable. With PBL, we need a longer period of time to research, evaluate and analyse the problem in more details.*

Some students were able to develop SDL skills given the intensive schedule:

*The subject had helped me to develop better individual skills and time management for my self-directed learning.*

*It allows us to manage our time easier. It enables us to concentrate on that subject for a particular period of time more. We don't have to worry about other projects that we have to hand in.*

*Allows me to manage my time well and able to work at a faster pace.*

### **Collaborative Learning**

#### *Survey – Quantitative Data*

88% responded that iPBL facilitated discussions with group members.

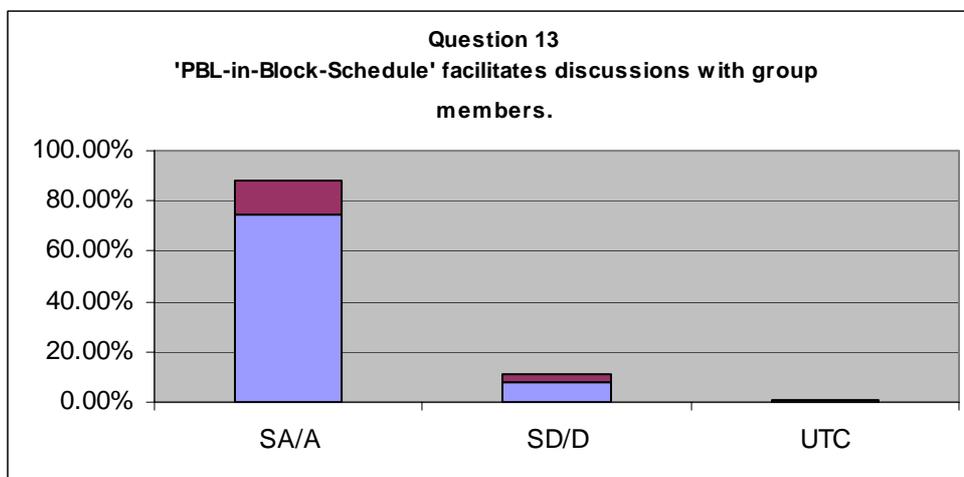


Figure 8: Question 13

87% felt they had sufficient opportunities to conduct peer sharing of information within their groups.

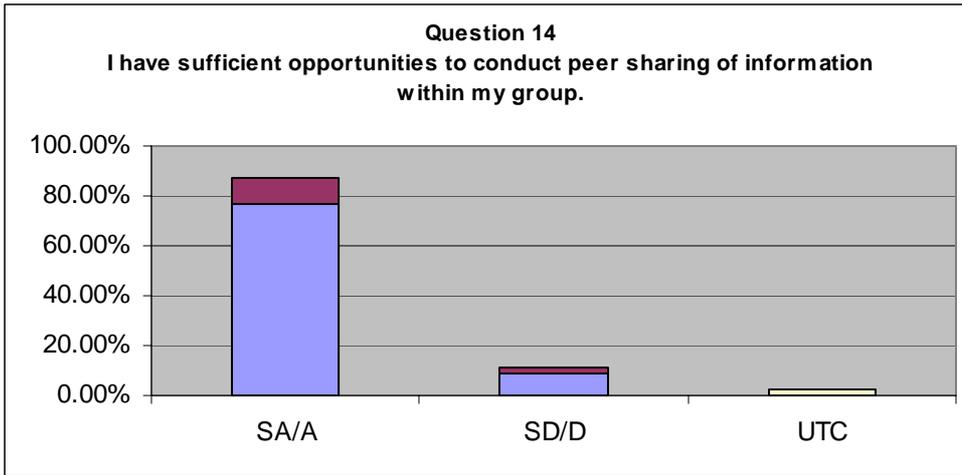


Figure 9: Question 14

78% felt that they had enough time to address the given problems with their group members.

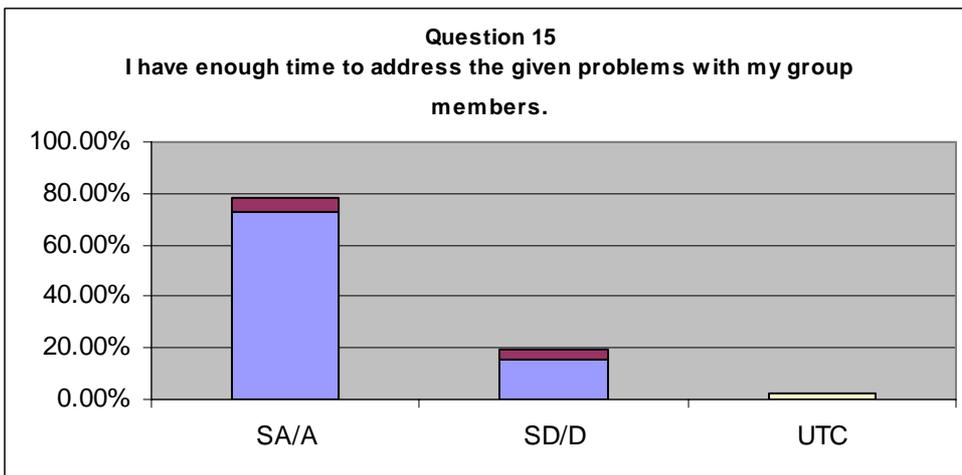


Figure 10: Question 15

79% responded that their groups were able to work well in iPBL.

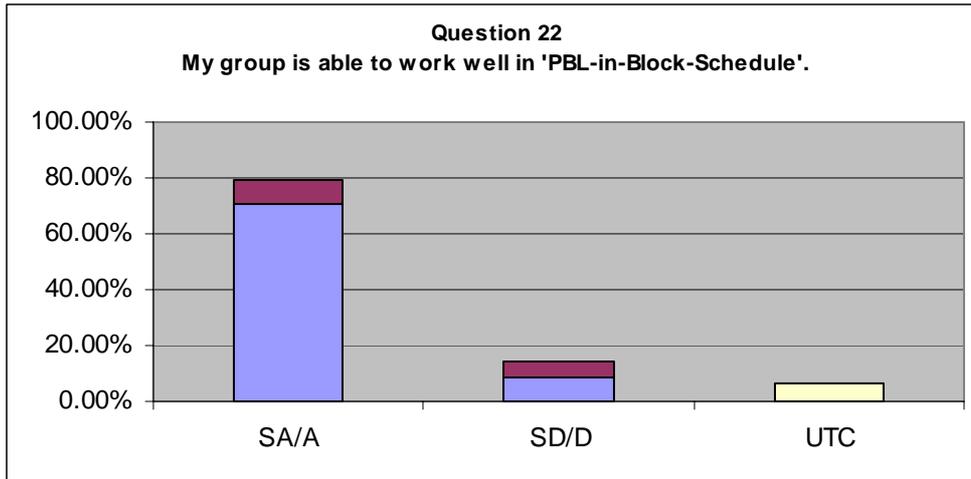


Figure 11: Question 22

78% felt that the tutors had sufficient opportunities to facilitate the group (e.g., to assist in accomplishing objectives such as group discussions, clarifications, etc).

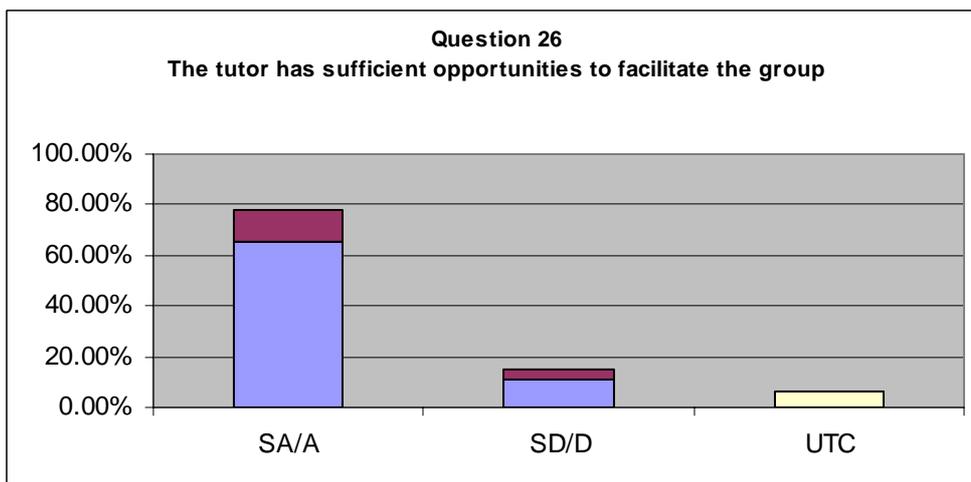


Figure 12: Question 26

Survey – Qualitative Data

The majority of the students provided positive feedback on CL in iPBL. Some representative feedback is provided below:

*Learning in a group helps to generate more ideas and at the same time able to learn more things from each other.*

*We learnt knowledge and experiences from one another. It had been enjoyable to work within a group...*

*As a group, we normally brainstorm for ideas and solutions and we divide the work equally among ourselves.*

Though some students felt that the lack of time was an important consideration in group work during iPBL, most students were able to ride on CL to help them learn and to come out with the deliverables:

*PBL definitely encourages collaborative learning and I am satisfied with how my group members and I work together to do our project. With tasks given like FILA [Facts, Ideas, Learning Issues and Action], it ensures that we sit down together and discuss our opinions on a certain issue.*

However, some students felt that germination of ideas takes time:

*More ideas are being brainstormed. However, there is not much time for us to do deeper discussion because of the insufficient time.*

*I do not like this schedule as it cannot give enough time for group members to deliver their work. It is tough to achieve and deliver work given such a hectic and rushing schedule...*

*As timing was tight, we have to come out with a good idea fast and target the question given.*

Some learnt to adapt to the limited time and to make full use of group effort:

*The subject is in block schedule and time is limited thus we have to learn to work together in a group to solve the problems we faced.*

On the whole, the students were able to work well in their groups as they formed their own groups. However, there were pockets of complaints on students not contributing sufficiently in some groups:

*However some members of a group are not cooperating and this isn't fair to the other members.*

*It is good as we learn to do work as a group. However, it depends on the individuals. Working in groups may not be a good idea if some of the individuals do not contribute.*

### ***Thinking and Problem Solving Skills***

#### *Survey – Quantitative Data*

93% perceived that they had developed learning skills in addressing problems.

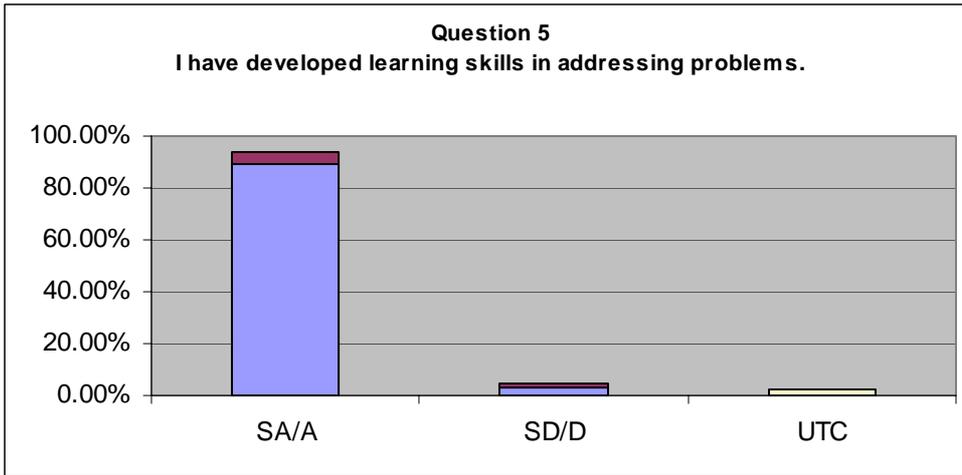


Figure 13: Question 5

Given the block schedule, 84% felt that they had sufficient opportunities to develop analytical skills.

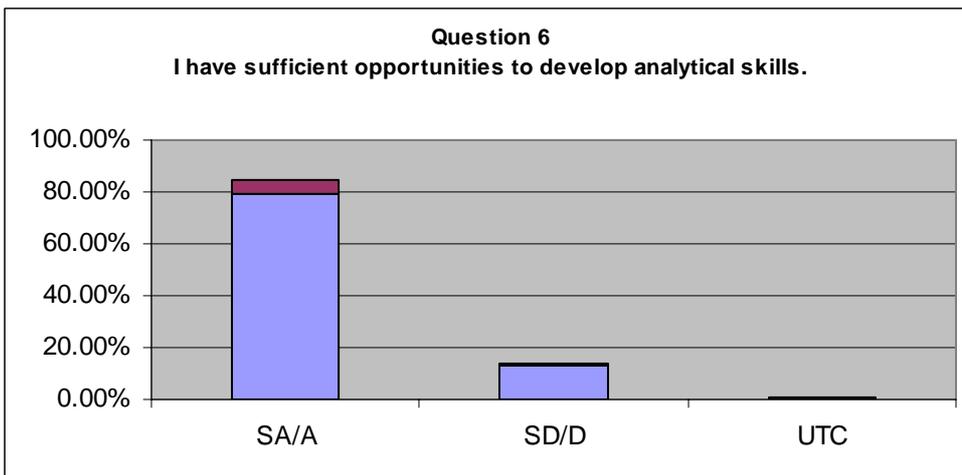


Figure 14: Question 6

79% felt that they were able to achieve deeper understanding of the subject, not just surface learning and recall.

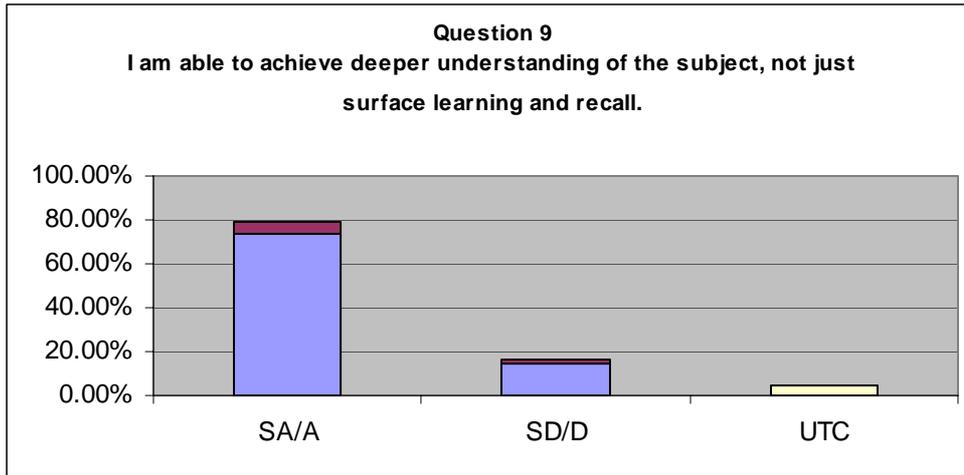


Figure 15: Question 9

88% thought they were able to connect what was being learned with their own prior knowledge and experience.

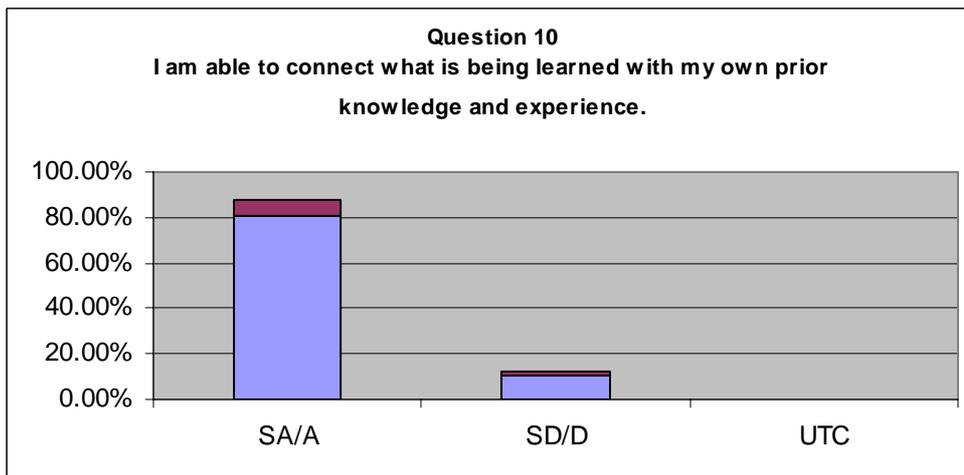


Figure 16: Question 10

82% agreed that iPBL had developed their thinking skills (e.g., acquire, interpret, organize and apply knowledge).

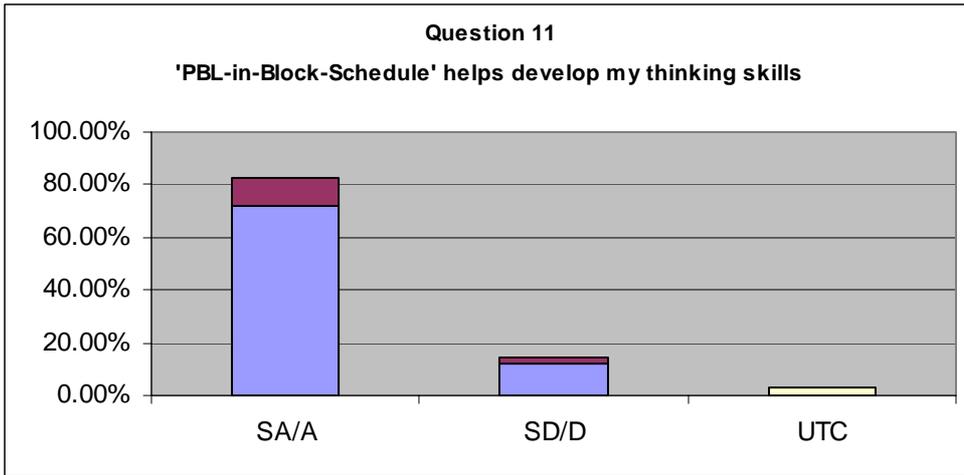


Figure 17: Question 11

82% felt that they had sufficient opportunity to apply their knowledge in addressing the given problem.

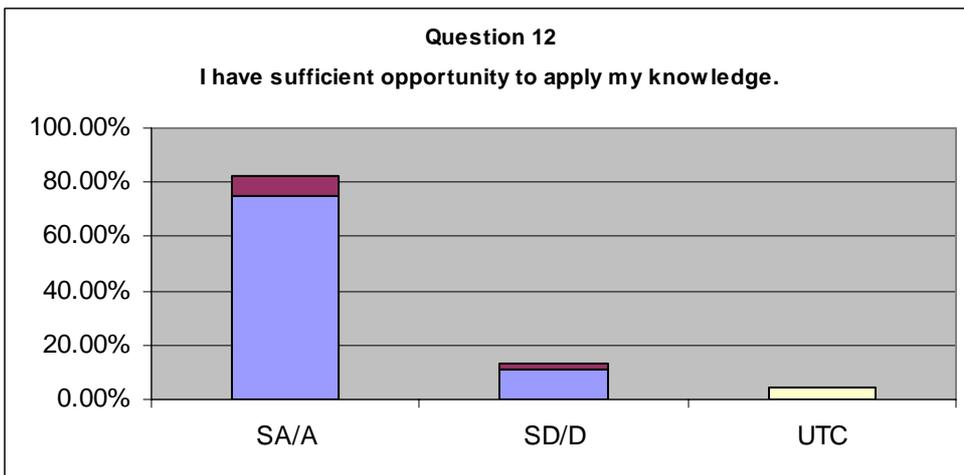


Figure 18: Question 12

84% reported that the facilitator guided their thinking rather than told them the answer.

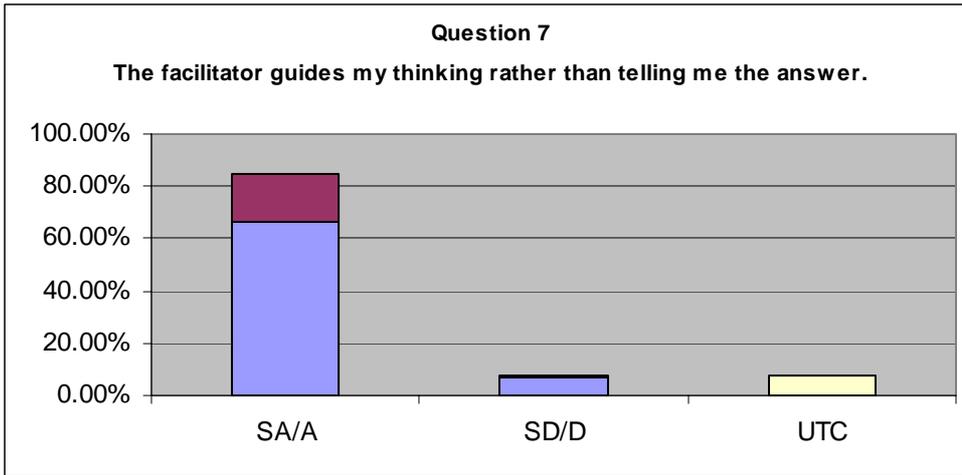


Figure 19: Question 7

85% felt that they were able to apply their research findings to the problem statements.

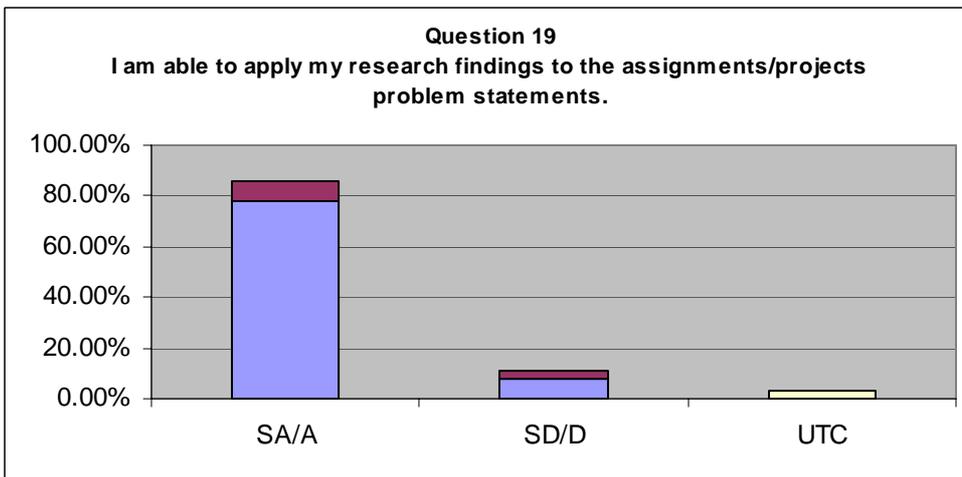


Figure 20: Question 19

83% felt that there were sufficient opportunities for them to learn problem-solving skills (i.e. ability to evaluate factors involved in a problem, and to generate and evaluate possible solutions).

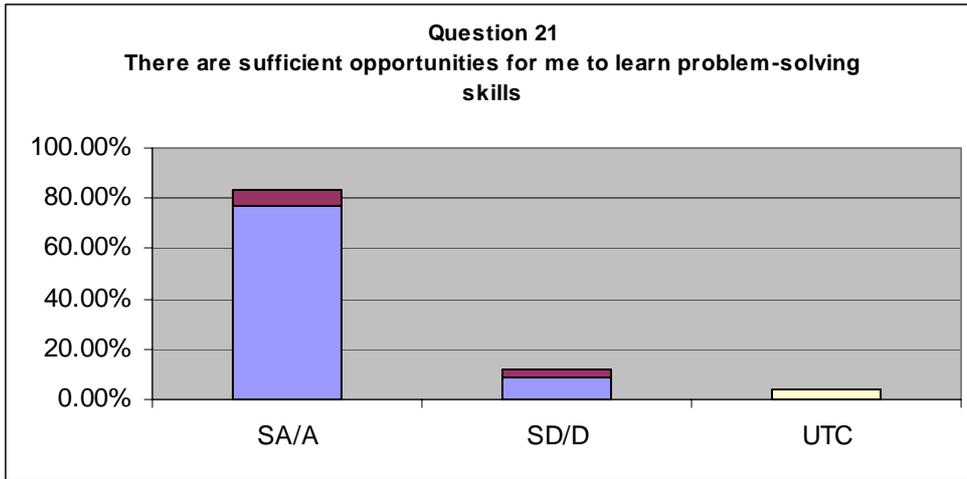


Figure 21: Question 21

At the end of the subject, 84% perceived that they had become more experienced in problem-solving.

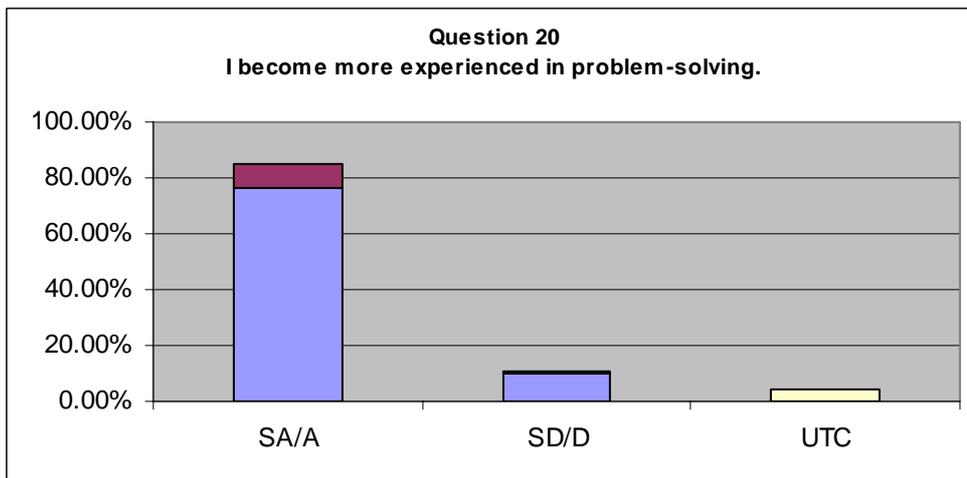


Figure 22: Question 20

### Survey – Qualitative Data

Most students provided positive feedback in the area of thinking and problem-solving skills and a few quotes are provided here:

*Good. Working independently allows us to think before we approach the lecturers for help, which will let us solve problems better.*

*A problem is given for me to solve it and I find it very effective and it stimulates my thinking. It also makes me do more research to find out more.*

*It really pressures, challenges, and tests our thinking skills to come out with the best solution for a certain problem so that we're able to 'shine out from the crowd'.*

*Researching, comparing and brainstorming information and ideas provide me to produce a better solution. It provides me a better understanding about the task I am working on.*

*It has increased my ability to think deeper into the details instead of just the surface and think of other alternatives when it comes to solving problems.*

However, there are some who felt that the time was too short for “deep thinking”:

*Timeframe too short to expand and think deeper.*

*Have more time for brainstorming.*

*It was good. I was able to come out with different solutions for the problem given. But if I was given more time, I think I should have come out with a better solution to support my idea.*

*I find this quite challenging as well. Due to the insufficient time given as the deadlines are close to each other; it's really quite hard to manage. But in a way it is good though, this is so as to keep us on track with the development of our project.*

### **Reflective Thinking**

#### *Survey – Quantitative Data*

79% felt that they had sufficient opportunities to practise self-review of their learning (e.g., journal writing, presentation, blogs, wikis).

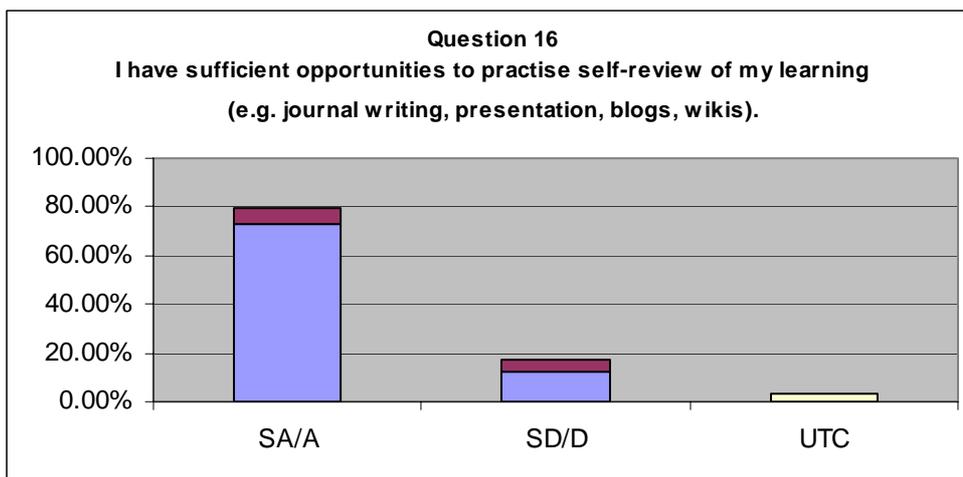


Figure 23: Question 16

75% were of the opinion that they had sufficient opportunities to review and improve their work.

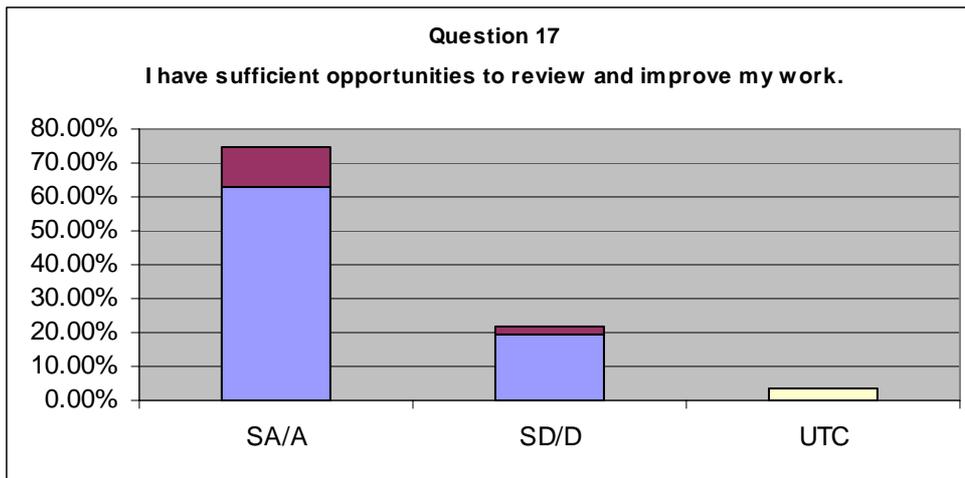


Figure 24: Question 17

80% reported they had received useful feedback from their facilitators on their performance which could help them in their reflection work.

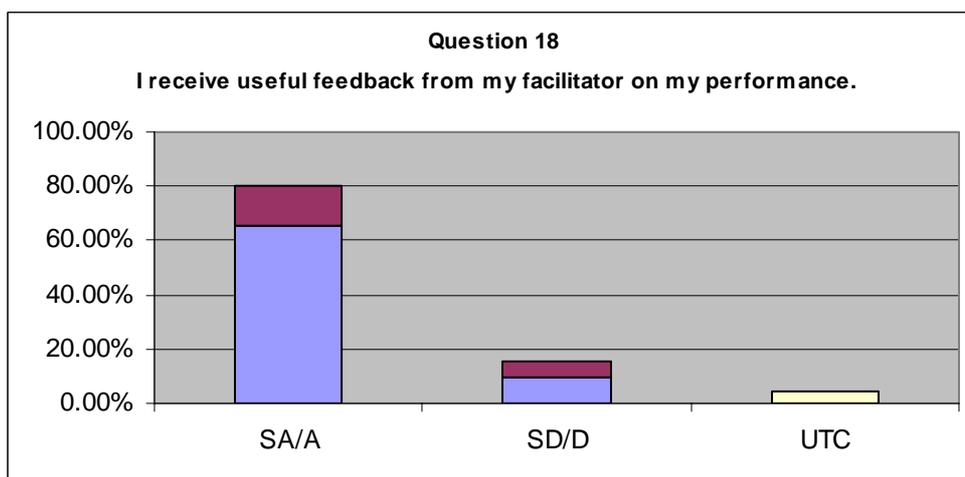


Figure 25: Question 18

64% felt that learning an informatics subject via iPBL was more effective compared to learning the subject through PBL in semestral mode.

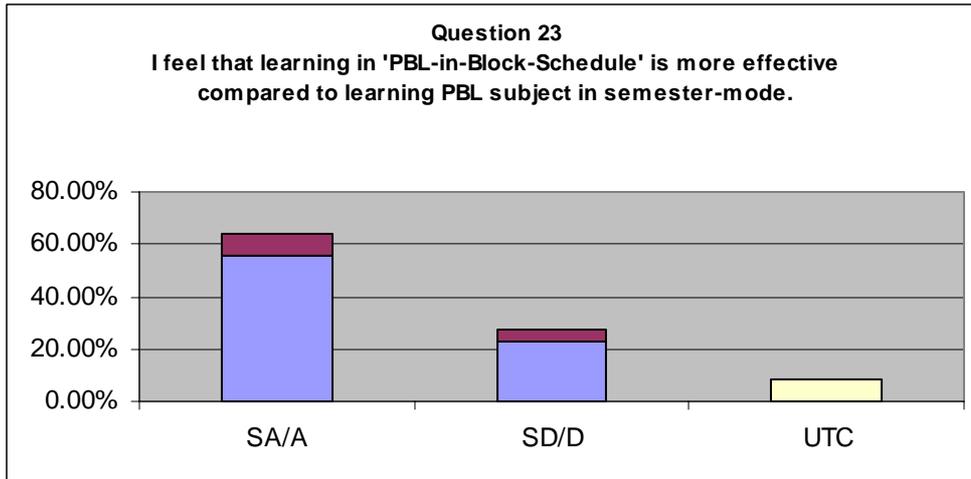


Figure 26: Question 23

Overall 83% were satisfied with their learning under iPBL.

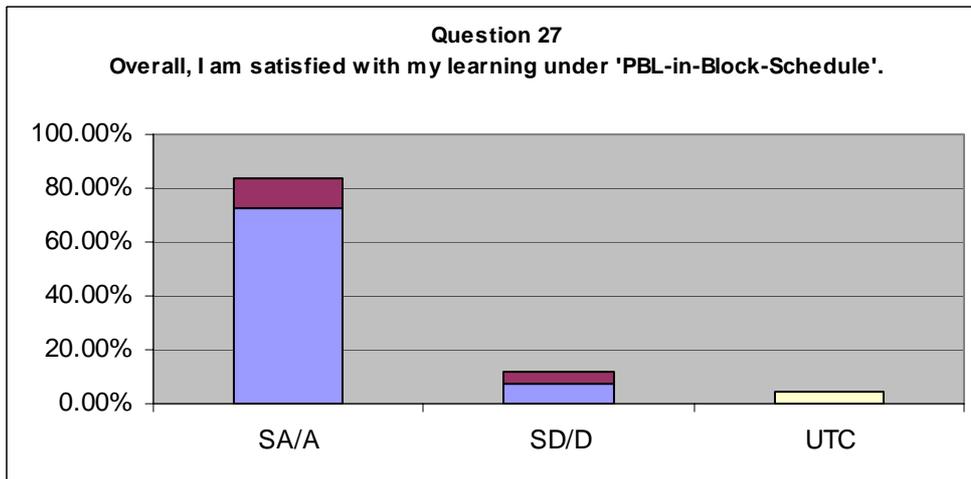


Figure 27: Question 27

*Survey – Qualitative Data*

Some feedback from students is provided below:

*From the comments and feedback by teachers, I have learnt to reflect on the mistakes of my work and also from these mistakes, I have learnt to be better in my learning and thinking.*

*We are able to make judgements and conclude what has happened and this allows us to understand the problems and what is needed for us to do about it.*

*It allows me to have an analysis of what I have done and what I could have done to make it better so that if any mistakes were made, I would not repeat it.*

## *Discussions*

The majority of the students perceived they had further developed their SDL skills and they expressed more confidence in setting their learning goals, planning their learning and seeking for information. SDL skills, while not measured explicitly by the tutors, were reflected through the feedback from the students. One key issue was the need for tutors to scaffold learning and provide prompt feedback as students had less recovery time if they went on the wrong track in an intensive schedule. Students might also face information overload due to the lack of discernment in sieving up the relevant information and dwelling on irrelevant issues.

A challenge in SDL was the influence of didactic learning habits among students and this was further aggravated by the compressed time frame. Tutors still need to offer appropriate guidance and hence the need for effective facilitation sessions. In reality, a balance needs to be struck between being student-centric and teacher-centric in iPBL. The role and facilitation skills of the tutors in PBL are important; in iPBL it is even more crucial given the additional constraint of time.

The issue of time in an intensive schedule affecting SDL was highlighted by most students. There is a need to design problem statements appropriate for intensive scheduling and which are authentic and relevant to the industry and which stimulate students' interest. Overall, iPBL for an informatics subject is suitable and appropriate pedagogy for SDL for this population.

The area of CL garnered the most positive feedback for iPBL. Most of the students depended heavily on CL to complement SDL in order to deliver their projects on time. Peer sharing and teaching were frequent occurrences in iPBL without which the cognitive load would be too heavy for individual students to bear.

The usual problems associated with group work surfaced and this needed to be resolved at a faster pace as compared to the semestral mode to fulfil the submission schedule. The facilitator would need to step in to intervene as early as possible if a group could not resolve the issues. Time-tables need to allow students to have enough common time slots to meet outside of the scheduled sessions.

Thinking and problem-solving skills are areas that are difficult to gauge quantitatively within a short period. Tutors could infer the level of such skills through facilitation, and assessment of students' reports and presentations. Such skills were cultivated gradually throughout students' years of education and iPBL would further enhance them. The majority perceived they managed to practise and gain confidence in these skills through acquiring, interpreting, organising and applying knowledge; evaluating factors involved in a problem and generating and evaluating possible solutions. Through addressing the problems, they had a better understanding of the new domain area.

Problem-solving skills need to be learned prior to iPBL. The role of the facilitator in encouraging thinking and problem-solving skills in iPBL is crucial. Tutors need to strike a balance between encouraging cognitive activities and providing assistance to the cognitive activities. Tutors could ask leading questions to probe students' understanding of issues. The study indicates that the students were generally receptive to the idea of having to think and problem-solve on the given problem statements if appropriate

scaffolding is provided by the tutors. Some were concerned about the lack of time for “deeper thinking”. There is a need for students to be more involved in feasibility studies, justification and evaluation of proposals.

The majority of the students felt that they had limited opportunities to practise reflective thinking through journal writing. Journal writing could be encouraged or enforced throughout the block through appropriate management of workload and assessment points in the block. With this, they would be able to participate in metacognitive activities. Students’ reflections were often prompted by the tutors during the facilitation sessions. Presentations and group interactions serve as good platforms for reflective thinking and in iPBL, these appear to be the more effective means to promote reflective thinking.

In the intensive schedule, reflective thinking was often relegated to the background and this phenomenon is quite common in densely packed schedules. There was also no explicit emphasis on reflection though this requirement was implicit in the project requirements. Reflection could be improved through better facilitation and clearly stated expectations. The assessment criteria could also encourage and reward students who put in effort in reflection. Getting students to “think about their thinking” is important in iPBL though this is a challenge in practice as students may not have the luxury of time to engage in scholarly reflection due to assessment deadlines and lack of skills or motivation in doing so.

The study shows that in general, senior students are receptive to iPBL for an informatics subject. Tutors have to design appropriate learning goals that lead to deep understanding, provide scaffolding in learning, provide feedback on students’ progress and facilitate self-directed and collaborative learning.

## **CONCLUSION**

The study on senior students is relevant as they are about to embark on a career in the IT industry. If their attitudes and skills are as reflected in the case study, iPBL would be a suitable mode of learning in an informatics area prior to them joining the industry. Some key points for review would include: facilitating and motivating students to do more reflection; providing appropriate and timely scaffolding and feedback; resolving issues related to group work promptly and effectively; cultivating further problem-solving skills; managing effectively the subject schedule, workload and assessment points; and planning resources and time-tables to support SDL and CL activities.

Various factors affect students’ learning, such as being assessment-driven and using strategic approaches to study in order to fulfil assessment criteria. Students also faced the tension between practising good attributes of iPBL and achieving grades acceptable to them. Students may, if pressured, adopt a different pedagogical stand from the original intended stand. It is important that the tasks given to the students are appropriate for the intensive schedule and students have some prior knowledge before embarking on a new domain.

The following are some of the key points to note for future implementation of iPBL in the future:

- Given the intensive schedule, there is a need to manage the number and scope of summative assessments so that students will not be obsessed with “chasing deadlines” and will not be driven mainly by assessments. This is to minimise the chances of students sacrificing the depth of understanding for the sake of meeting the passing criteria of a subject. Time is needed for students to think, plan, execute and evaluate. The emphasis should be on transferability and application of knowledge which is in line with constructivist thinking.
- In SDL, it is important to give timely and appropriate feedback to students and to assure them if they are on the right track. If they are on the wrong track, tutors need to steer them back to the right track through good questioning techniques and facilitation of students’ self-reflections.
- Reflective thinking is one of the components of iPBL that is likely to be “sacrificed” by the students due to the lack of time and/or motivation. Students may not have the motivation or discipline to reflect through journals and some weighting could be allocated to the assessment criteria for evidence of reflective thinking. If workload is an issue, then reflections should be actively facilitated and encouraged during classroom time, group discussions and student presentations.
- It may be more realistic to practise a hybrid mode of iPBL where some didactic teaching and direct guidance take place in the initial stages of the block to help jumpstart students’ learning process. However, the temptation of giving too many complete answers and too much direct guidance after the initial stages must be restrained. This temptation is especially strong when time is running out and the tutors are answerable to the school management for the students’ performance.
- In iPBL, tutors need to intervene early and quickly any unresolved conflicts or problems related to group work. There is less recovery time under an intensive schedule and the affected groups may suffer as a result of prolonged, unresolved issues. The tutors could help mediate between opposing factions or counsel uncooperative group members. The project requirements specification may need to be adjusted if any group members are on extended leave or go missing-in-action.
- Tutors should not assume that all students would be competent in analytical and problem-solving skills by the time they reach their fifth semester. A proportion of the student population still needs more hand-holding and scaffolding when addressing problems during iPBL.

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