# PEER ASSISTED LEARNING PROGRAM (PAL): A STUDENT-CENTRIC ENGAGEMENT TOOL FOR FOUNDATION STUDENTS

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**ABSTRACT:** The School of Foundation in Science at University of Nottingham Malaysia had observed a trend whereby students' failure rate in Mathematics modules was 5-15% for every module offered each semester. As such, the Peer Assisted Learning (PAL) program was offered as a pilot program to provide learning support for students who needed to do the re-assessment examination. Prior to the implementation of the PAL program, a briefing and a survey were conducted to gauge students' level of commitment towards the program. 94 % believed that the PAL program would increase their knowledge of the failed module. Students who had to re-sit the Mathematics modules were then encouraged to participate in the PAL program on a voluntary basis. Participants were assigned to student volunteer Mentors who had scored distinctions in their Maths modules. A minimum of 20 hours mentoring was required to be fulfilled by each of the Mentor-Mentee pair. In summary, the findings support much of the previous literature and case studies related to PAL programs. In addition, both PAL mentors and mentees perceived a number of benefits from the program. The re-assessment examination results also showed that the mentees outperformed their peers who prepared for the examination via self-study.

## I. INTRODUCTION

Over the years, the School of Foundation in Science during the Exam Board Meetings had noted a trend with the Mathematics module whereby students' failure rate was 5-15% for every Mathematics module offered each semester and it was the module with the highest number of student failures. Students who failed any one or more modules are unable to progress into the Undergraduate (UG) program. The university is not only losing these students as they will have to be terminated but on the students' end, they would have wasted their time as they will have to repeat a different Pre-University program in a different field or Institution to pursue their Undergraduate degree. Hence, the Peer Assisted Learning (PAL) program is proposed to help these students in their re-assessment examination.

### 1.1 Background of the study

This program seeks to provide the learning support that the students will need before the re-assessment. This learning support is provided through a peer and so it is known as the Peer Assisted Learning (PAL) program. Many educational institutions have implemented this program and have seen the benefits of this program (Capstick & Fleming, 2002.; Green, 2011; Packham & Miller, 2010). The transition from school or college to a less structured environment which requires more self-direction can be quite a challenge for some students and even more in bigger classes (Boud, Cohen, & Sampson, 1999; Boud, Cohen and Sampson, 2001, as cited in Hammond, Bithell, Jones, & Bidgood, 2010).

### 1.2 The Peer Assisted Learning (PAL) Program

According to Boud et. al. (1999), peer learning refers to "the use of teaching and learning strategies in which students learn with and from each other without the immediate intervention of a teacher". It is a very old practice, traceable back at least as far as the ancient Greeks. There were several revisions in the definitions evolving under peer learning. According to the current source, the definition of peer learning is "people from similar social groupings who are not professional teachers helping each other to learn and learning themselves by teaching" (Topping, 1996). The PAL program also combines personalised attention and experiential learning of an apprenticeship with the benefits of a non-hierarchical, non-threatening, collegial environment, created among tutors and learners who share a high level of cognitive congruence (Lockspeiser, O'Sullivan, Teherani and Muller, 2008, as cited in Umapathi & Tsang, 2015).

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There are two forms of peer learning, Supplemental Instruction (SI) and Peer Support. In general, SI is when the peer learning happens outside the mainstream curriculum with the SI users' attendance for the sessions being completely voluntary. The role of the peer facilitator is to facilitate discussion of the course content with the SI users rather than lecturing them (Ashwin, 2003). In this program, the SI form was adopted whereby the SI users are the mentees and the peer facilitators are the mentors. The PAL program has been found to be effective in many science-related subjects (Tariq, 2005) as well as non-science related subjects such as Accounting (Sudhakar, Tyler, & Wakefield, 2016) and Mathematics (Baker, Gersten, Dimino and Griffiths, 2004)

## 1.3    Benefits of PAL for Mentees

Past research using the PAL program recorded numerous benefits for the mentees. In a study by Cui, Huang, Cortese, and Pepper (2015), the researchers aimed to identify and evaluate the faculty and academic staff perceptions, experiences and expectations towards a bilingual PAL program. They found that the PAL program showed a positive effect on the participating students' performances. The results also indicated that the academic staff were very supportive of this type of student learning program. Another research by Capstick (2017) where potential benefits of the PAL program were recorded, concluded that the PAL program helped participating students by giving them the opportunity to clarify basic concepts, better understand the subject matter of the course and air concerns away from teaching staff. A case study by Baker et al (2004) found that the PAL program improved students' math proficiency as reported by the teachers in the school. There were others that also found the PAL program to be very beneficial and the results were immediate where Mathematics-related modules were concerned (Calhoon & Fuchs, 2003).

Apart from the PAL program having a direct impact on the students' academic performances, Hodgson, Benson, and Brack (2015) reported that students who attended the PAL program contributed to the development of qualitative conceptions of learning such as deep processing or constructing meaning and development of metacognitive abilities. Ashwin (2003) mentioned that effectiveness of a PAL program where students' academic performances improved also depended on other factors such as the form of peer learning, the course that is being studied and the quality of students' learning, in order for them to fully enjoy the benefits of the program.

## 1.4    Benefits of PAL for Mentors

The PAL program not only benefitted the participating students or mentees but it has also been reported to have added-value to the mentors or peer facilitators. Micari, Streitwieser, and Light (2006) found that peer facilitators or mentors perceived themselves to have progressed in three general areas termed as cognitive, personal and instrumental. Cognitive growth merged in three areas which are consolidating knowledge in the discipline, enhancing conceptual understanding and developing problem-solving skills. Personal growth was described as their ability to engage with mentees and they reported development in their communications skills which includes self confidence, audience understanding, self expression and pedagogical skills. Instrumental growth was described as to how the facilitation experience would be good for their professional growth. Facilitators reported to have gained experience that would help them in future careers, such as teaching and leadership experience, as well as developing a well-rounded understanding of the discipline.

In another study, Saunders, Gibbon, and Saunders (2006) reported that student mentors within the Business School benefitted from the PAL program as they mentioned that they gained satisfaction from being able to positively help their peers, improved self-confidence, better communication skills and being able to strengthen their CVs. Ford and Thackeray (2014), who evaluated the PAL program at Bournemouth University found that the PAL leaders continue to value the experience of supporting their peers, reinforcing their learning and developing transferable skills. PAL leaders also recognised that that they had developed a range of attributes such as organisational skills, communication and confidence that can increase employability. When asked, PAL leaders associated confidence and

preparation as important attributes to be a successful PAL leader.

## 1.5    Present study

This study examined the effectiveness of the PAL program which was also a pilot program in the Foundation in Science school at the University of Nottingham Malaysia. The program was offered to students who had re-assessments in any of the three Mathematics modules that were offered throughout their Foundation program. The research questions that formed the basis of the study were:

1.  Can the PAL program benefit both the Mentors and Mentees in their mentoring journey?
2.  Will the students with reassessment who attend the PAL program successfully progress from Foundation to the UG programs?

The hypotheses were:
1.  Both Mentors and Mentees will benefit from the PAL program.
2.  All the students with reassessment who attend the PAL program will successfully progress onto the UG programs.

## II. METHODOLOGY/MATERIALS

### 2.1    Survey

Before the implementation of the PAL program, a briefing was done after a core module lecture, and a survey was conducted with 144 students from the Foundation in Science to gauge students' level of commitment towards the program. The briefing on the PAL program covered the structure, aims, benefits and the selection of mentors and mentees within the group (Hammond et.al. 2010).

### 2.2    Interview and Focus Group

Students who had to re-sit the Mathematics modules were encouraged to participate in the PAL program on a voluntary basis. Those who responded were assigned to student volunteer Mentors who had previously scored distinctions in their Maths modules. 4 mentees and 4 mentors

volunteered for the program. A minimum of 20 hours of mentoring was required to be fulfilled by each of the Mentor-Mentee pair and this was recorded in the log sheet provided by the coordinators. Data collection via case study methodology was done after the implementation of the program, whereby data from focus groups and interviews were collected and analysed. The questions for the interviews and focus groups were adapted from a study by Smith, May, and Burke (2007).

## III. RESULTS AND FINDINGS

### 3.1    Survey

From the survey to gauge the students' level of commitment before the execution of the PAL program, 67% of students were either likely or very likely to be part of the program. On the other hand, 94 % believed that Peer Mentoring will be able to improve their knowledge. Table 1 shows students' responses when asked about their perceived motivations to attend the PAL program and the students were allowed to choose more than one response.

**Table 1:** Students' responses on Motivation to attend the PAL program

| Motivation | No. of students |
|---|---|
| Enhance Knowledge | 110 |
| Improve Level Of Confidence | 89 |
| Increase Friendship Network | 59 |
| New Study Approach | 50 |

### 3.2    Interview and Focus Group

Open-ended interviews, both individual and focus group interviews, were conducted for both mentors and mentees. The responses were analysed using a method of thematic analysis. A theme is defined as the experience of meaning, or a simplification of the summary of a significant factor (Van Manen, 1990, p. 87, as cited in Smith, May and Burke, 2007). Several themes had emerged from the individual interviews and focus groups for both mentors and mentees.

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3.2.1    Mentor Focus Group Interview

### Mentor focus group theme 1: Experience with mentees

The feedback from the mentors indicated that even though the pairing of mentors with mentees was random, there was no cross-cultural or even gender-related issues for both mentors and mentees as both parties had no problem or argument with each other during the program.

According to the mentors, the best experience throughout the program for them was meeting new friends. They also found satisfaction in watching their mentees improve in their studies and eventually do well in the reassessment exam. Other comments from the mentors were:

> "…it was a good experience because at a very short time you not only helping the mentees, you also make friends, it was good for me…"

> "I was happy to see my mentee improving on his study and passing on the reassessment exam…"

Having said that, the mentors did mention a few minor challenges that they faced:

> "…the problem during the program is the issue of making sure that everyone can attend..."

> "…since it was semester break and I was staying off-campus, it was a far journey for me all along the way here…"

Apart from the minor inconveniences mentioned above, generally, the mentors showed their satisfaction towards the overall process of the PAL program.

### Mentor focus group theme 2: Benefit gained during the program

The mentors viewed the benefit of the program from a different perspective than that of the mentees. They felt that both parties gained different kinds of benefits from the program. The benefit gained by the mentors will be discussed in this section.

According to the mentors, a majority of them felt that their communication skills had improved through the PAL sessions.

> "…usually I don't feel comfortable to crowd situation and meeting with strangers, but this time I have to take the initiative to get familiar with my mentees…"

Some of the mentors admitted to being introverts, but after participating in the program, they saw some differences in their personality. This was evident during the interview sessions as they seemed to have developed their communication skills, and were more confident when speaking. Besides that, mentors also developed their teaching skills and time management skills during the sessions:

> "…teaching one-to-one helps me to know about myself and also sharpened my teaching skill…"

> "It helps me in elaborating difficult terms in easier way overtime…"

### Mentor focus group theme 3: Quality of a good mentor

The qualities of a good mentor will be discussed in this section. The recruitment of mentors for the program was based on grades achieved during the exam. Besides their exam grades, other aspects were also considered:

> "A good mentor should know exactly about the content of teaching…"

Clearly, a good mentor needs to be confident of what is he/she is teaching to avoid confusion among the mentees. Moreover, the mentor should be patient in teaching, be an expert in the module taught, and be confident that what is being taught is correct. Most importantly, the mentor must have good communication skills in conducting the sessions.

> "The communication skill is important, as if you can't communicate well, it's already

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a barrier to them before actually going into the topics."

Other than that, a good mentor should be able to connect with their mentees, so that the mentees are willing to learn from them instead of feeling forced to do so.

## Mentor focus group theme 4: Barriers during the sessions

There were some barriers that affected the PAL sessions. According to mentors, all the mentees were absent from attending the PAL sessions at least once. Some mentees were absent due to emergencies, some informed of their absence in advance, while some others did not even inform the mentors, causing the mentors to turn up for sessions with no mentees present.

> "…one day I reached campus but my mentees didn't show out. Then I discovered that my mentees have personal problem that cause them unable to attend. But there's no prior call…"

According to one mentor, the mentee's absence could have been excused if he/she had at least informed the mentor prior to their meeting instead of causing the mentor to waste time travelling all the way to campus.

As such, they suggested that a rule is applied to the mentees prior to their participation in the program; this being that any absence of the mentees should be informed at least one day prior to the session, and this should be communicated to the coordinator as well.

### 3.2.2    Mentor Individual Interview

## Mentor theme 1: Becoming a mentor

The mentors were interviewed regarding their reasons for participating in the PAL program as a mentor. One of the reasons for their participation is because they were inspired to do something they can to help others. The following are some of their reasons:

> "…because I have experience of teaching before and also, I want to do something as a feedback to the school…"

> "…to find some beneficial way of spending time during the summer break…"

All the mentors of the PAL program have had some previous teaching experience. Their previous experience did help them in tutoring in the program, according to one of the mentors. However, there were some differences mentioned between teaching one-to-one and one-to-many (like a tuition class). According to one mentor, one-to-one teaching will only focus on that one particular student, whereas in a tuition class, it is necessary to make sure that everyone is listening; therefore, one-to-one teaching is comparably easier and more focused.

## Mentor theme 2:   Achievement after the PAL program

> "I gained satisfaction in the program. I am glad that my mentee has passed the module and successfully proceed to degree."

The mentors have attained the goal of the PAL program by being able to assist their mentees in doing well in the Mathematics module(s). Their achievements include developing teaching experience, a deeper knowledge of the topics taught, and a higher level of confidence.

This shows that the PAL program was not only a platform to teach the mentees to pass in their reassessment exams; it was also an opportunity for the mentors to gain experience in teaching as well as develop their personalities, which would be beneficial for their future careers.

## Mentor theme 3: Attitude of mentees during the sessions

The mentors were asked to comment on their mentees' attitude during the sessions. They indicated their satisfaction towards the mentees in terms of their active participation during the sessions.

> "My mentees frequently asked question during the session. He would be interested in that topic once he understood it…"

Overall, the mentees tried their best throughout the sessions, giving full cooperation to the

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mentors and being proactive to make the program a successful and effective one. This was confirmed by the log sheet the mentors and mentees have submitted to us.

## Mentor theme 4: Improvement on the structure of the program

From the perspective of the mentors, there are some improvements that can be done for the program in future. The following are the mentors' suggestions:

"If planning to increase the size of the session, the coordinator will have to keep track on timing of the session to avoid clashing with other stuff, same subject in per group."
"…coordinator need to provide a suitable venue for the session…"
"…the program should start earlier prior to the reassessment exam…"

With regards to the pairing of the mentees and mentors, it was suggested that the ideal ratio of mentor to mentees would be 1:3 so that it is manageable for the mentors and the sessions can be focused. In terms of the venue of the sessions, instead of leaving the decision of venue selection up to the mentors and mentees, perhaps the coordinator could suggest suitable venues for the groups who need some guidance. Small meeting rooms would be preferable, according to the mentors.

3.2.3 Mentee Focus Group Interview

## Mentee focus group theme 1: Motivation to attend the PAL program

Mentees chose to attend PAL sessions as they were keen to pass the reassessment exam in order to proceed to undergraduate:

"University is not like high school which you can still proceed to higher form although failing in certain subjects, it needs the passing grade for the progression."

## Mentee focus group theme 2: Differences between PAL program and lectures

Mentees highlighted some differences between the PAL program and lectures in terms of environment and processes. During lectures, students learn basic knowledge from the lecturers.

"…we actually follow the lecture as it is the basic of what we learn…"

On the other hand, the purpose of the PAL sessions is to help students who understand the basics but do not know how to apply the knowledge and thus cannot keep up with lectures.

"…some students cannot follow the progress of the lecture as the lecturer would usually move on to the next topics based on the understanding of majority students in the class…"

They believed that their inability to keep up affected their performance in the end of semester examinations. In contrast, during the PAL sessions, which were either one-to-one sessions or among a small group of students, the mentor would usually follow the progress of the students and if they have a problem with certain topics, then the mentor would provide guidance on these.

"….by peer mentoring, you would be more confident that you can understand a topic since there's someone helping you when you're in doubt."

"…even when you do any mistake during a small test in class or exam, you couldn't learn anything on your own, but it is solved when someone is there to teach you…"

## Mentee focus group theme 3: Benefits gained from the program

After participating in the PAL sessions, the mentees were confident that they had a higher chance of passing the reassessment examination. Besides that, there were other benefits gained by the mentees in terms of knowledge. The mentees also felt that their knowledge of basic concepts of certain topics had been enhanced during the sessions.

"…actually, I understand more concept on basic statistics stuff and eventually I am using it

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for my degree now and feel happy as I already understand it…" (according to a mentee who took the Statistics module as the program module)

Mentees also noted that the sessions enabled them to build effective learning skills after attending the program:

"It helps me to figure out questions better instead of blindly follow the instruction and solve the question without knowing what is going on."

According to mentees who had more than one reassessment module to sit for, the program saved their time revising for certain topics covered during the sessions, thus enabling them to focus on other modules at home.

## Mentee focus group theme 4: PAL Learning Environment

The mentees gave positive feedback regarding the environment of the session venues. The mentees commented that the campus was quiet during the semester break, so it was more conducive to have sessions on campus. According to them, The Core, which was the venue they chose, would usually be noisy and crowded during the semester when classes were going on. Moreover, the time chosen for the sessions was flexible as the coordinator allowed the mentors and mentees to decide on suitable times for the sessions, taking into consideration their different learning habits:

"I think the flexibility that you give the choosing of time slot toward mentors and mentees is good for them to set their preferred time slot for the session."

## Mentee focus group theme 5: Effectiveness of mentor

The success of the PAL program is indubitably dependent on the quality and commitment of the mentors leading the sessions and also the 'chemistry' between the mentors and mentees, ensuring the effectiveness of the PAL sessions. According to the mentees, the mentors were excellent throughout the program; they displayed dedication in guiding the mentees towards

achieving a passing grade for the reassessment exam.

"The mentors were really nice and extremely hard working. They took equal interest and showed immense concentration."

A good PAL mentor, according to the mentees, displayed the following:

"…having a good teaching skill…"

"…balance in way teaching and also being friendly to the mentees…"

"…easy to communicate…"

3.2.4   Mentee Individual Interview

## Mentee theme 1: Importance of the PAL session in terms of understanding the topic

Before attending the program, mentees indicated their confusion towards the subject chosen, but afterwards, the program was effective in enhancing their understanding of the topics chosen:

"Honestly, I didn't understand statistic at all as it was confusing to me but after being taught by my mentor, it went okay for me…" (according to a mentee who chose Statistics module)

The feedback collected from the mentees also indicated that they felt it to be easier to be taught by their peers as "the level of understanding is rather similar among the people of the same age", and moreover, it is easier to ask questions and communicate with friends of the same age.

In addition, the mentees also stated that there were more opportunities to clarify both basic and complex concepts of the topics compared to during a lecture.

## Mentee theme 2: Experience of the PAL program – the process

The overall process of the PAL program was described by the mentees as being satisfying. They eventually became friends with their mentors after

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the program. Although the pairing of the mentors and mentees was done randomly, both parties got to know each other as friends. The program was also described as being not intense like a lecture whereby the mentees were able to study in a more relaxed manner. Most of the mentees enjoyed attending each session.

"We have a lot of fun during the session…"

According to the mentees also, the mentors worked hard to guide the mentees on how to revise for the modules.

"I was surprised that my mentor did a very hard work even for someone they don't know. They were very dedicated and managed to make the whole process running well. At first, I don't really know them but eventually after this program we have become good friends."

In a nutshell, all the mentees had an enjoyable experience during the PAL program and learning occurred in a more relaxing way which eventually led to them passing the reassessment examinations with flying colors.

### Mentees theme 3: Soft skills gained by the mentees from the program

According to the mentees, the PAL sessions boosted their confidence level in facing the examination. By learning how to solve challenging questions during the sessions, the mentees gained more confidence that they could solve most of the questions during the reassessment exam.

"…I was very down when I realized I failed four subjects, but after taking part in the program, I was more confident in facing the reassessment exam…"

Besides the increase in confidence level, the mentees also indicated that they developed other soft skills such as communication skills, study skills and time management:

"…I am able to communicate a lot with my lecturers now..."

The communication skills that were developed among the mentees eventually enabled them to build relationships with different kinds of people instead of just among friends of the same age. Besides making more friends during the program, these skills would certainly help them to create better work relations in the future.

### Mentees theme 4: Learning Materials used during the PAL program

All the mentees were satisfied with the learning materials provided by the coordinator. The mentees stated that the materials were helpful to them to enhance their knowledge where basic concepts were concern providing them deeper understanding of the latter.

"Materials are helpful, some of them also challenging enough, that help me to learn and have more confidence to sit for the reassessment exam…"

During the sessions, the mentors did not just hand out the materials to the mentees; in fact, they also did some homework on the module and to supply extra questions to help the mentees as well.
The dedication of the mentors and the effectiveness of the materials had a clear influence on the mentees and increased their confidence to sit for the reassessment examination.

### Mentees theme 5: Suggestions for improvement of the PAL program

Most of the mentees suggested offering more modules for students, so that they have more options to choose from while taking part in the PAL program. This would also increase the number of participants for the program.

"If it is opened for other module, it will be more people coming for the program because mathematics module is actually not the problem for majority of students…"

Considering the fact that this was the first time the PAL program was conducted, there was lack of knowledge on the part of the students concerning the nature of the program. Hence, only a few students participated in the program, and only the Mathematics modules were offered for the PAL

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program. In addition, the mentees commented that the time frame for the program was rather short, and that the program was conducted too close to the reassessment examination. The students only had a few weeks to prepare for the reassessment exam; this was specifically the case for the September intake Foundation students who received their results just two weeks prior to the reassessment exam. As such, the participants felt that the time frame for the program was too short and that it felt rushed.

## IV. DISCUSSION

From the results, both the mentors and mentees reported benefitting from the PAL program that was executed as a pilot program as part of the school's effort to help students with their re-assessment in the Mathematics modules. As for the mentors, they found satisfaction in watching their mentees improve and do well in the re-assessment exams; which was in line with the findings of Saunders et al. (2006). Mentors also reported that they personally saw growth in themselves in terms of their communications skills (Ford & Thackeray, 2014; Micari et al., 2006; Saunders et al., 2006) and even their personality. There were other skills such as their teaching skills and time management skills that were seen improving while they were part of the PAL program which can be useful for the future. The mentors thought that in order to be a good PAL mentor, one needs to be confident of the content of the module (Ford & Thackeray, 2014). Mentors also mentioned some challenges that they faced during the PAL program, such as mentees giving last minute notice of cancellation of sessions as well as time constraint.

From the mentees' point of view, their motivation to enrol in the PAL program was ultimately to get help to get through the re-assessment and eventually start their courses. The program provided them with a platform to experience one-to-one assistance which was very different from lectures or tutorials. They had the opportunity to clarify their doubts without having to feel embarrassed with a peer of almost the same age (Capstick, 2017). Mentees also affirmed that they could understand basic concepts and that the mentors shared their knowledge or tips on how they understood the topics in Mathematics

(Hodgson, Benson, and Brack, 2015). The flexibility of the program where mentors and mentees get to decide the slots and where they want to have the PAL session (although restricted to within the campus vicinity) was definitely a strength of the PAL program. This decision was made by the PAL coordinators due to the fact that the program was carried out during the summer holidays and majority of the students were on a semester break. The coordinators did not want to impose rigid rules; instead, they wanted to provide only the necessary support for the mentors and mentees (Cui et al., 2015; Tariq, 2005). Mentees mentioned that they were overwhelmed by the dedication and hard work that was coming from their mentors which also motivated them to push themselves. The benefits they gained from the mentors ranged from content knowledge of the modules, to tips on how to tackle examination questions as well as confidence in managing time. Lastly, mentees suggested that the PAL program be opened to include Chemistry modules. They also felt that the time frame for the PAL program was too cramped. Implementing the PAL program is always a risk (Hammond et al., 2010) as the student numbers are not consistent since the program runs on a voluntary basis. With that in mind, the hypotheses were supported. It is also necessary to bear in mind that the effectiveness of the PAL program must be constantly evaluated in order to gather feedback to improve its structure (Boud et al., 1999.; Sudhakar et al., 2016).

## V. CONCLUSION

In conclusion, although the PAL program was conducted using a small number of participants in the pilot run (Saunders, 2016), both mentors and mentees recorded numerous personal benefits. The mentors found fulfilment in observing their mentees' progress in their understanding of topics in addition to them developing effective teaching skills and communication skills. The mentees felt that they had acquired effective learning skills and appreciated the commitment displayed by the mentors. In addition, the learning materials were found to be helpful in enhancing their knowledge of basic concepts. Most importantly, the program had a direct positive impact on their performance in the reassessment, which showed marks obtained ranging from 49-83% with all of the

mentees getting through their re-assessment

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