Virtual student mentorship: Future-proof for new learning ecosystems

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ABSTRACT – Most of the new undergraduate students are unable to study physically at university and undergo the academic session in the new norm due to COVID-19 pandemic. The purpose of this paper is to examine the impacts of a virtual student mentorship (VSM) that involved first and second year undergraduate engineering students in the new environment of learning ecosystem. Data survey responses from 38 mentors and 169 mentees reveal that VSM provided important contribution towards the new learning ecosystem to support the student's academic achievement. It is envisaged that the VSM can be practiced effectively and sustain in the future.

1. INTRODUCTION

In early 2020, the SARS-CoV-2 (COVID-19) pandemic has caused most of the universities or any related education institutions to have a paradigm shift from physical learning to several alternative virtual (online) learning approaches [1]. Through this new challenging environment, the students are encouranged to stay at home and continue their academic learning process remotely with the comply guidelines by government agencies [2]. Consequently, faculty and university are always looking for the best and efficient learning ecosystem to sustain the student's academic achievement, similar to the benefits from physical learning approach.

On top of that, five high impact principles for efficient conduct of online education have been introduced [3]. An adequate support by the teaching assistants to student is one of the required principles that highly relates and leads to a student mentorship approach. The student mentorship or peer to peer mentoring is an exchange of knowledge and experience between mentor and mentee [4-5]. In fact, the student mentorship is well established as a symbiotic relationship that provides an effective mechanism to foster student's sense of belonging and support their resilience and academic progress [6]. According to Hamilton [7], the mentees accrued several benefits from participating in the physical mentorship program. In order to fully utilize the advantage that is offered by the physical student mentorship, the virtual student mentorship (VSM) program is also possible to be implemented among the university students.

Several literature have demonstrated the roles of virtual mentoring [8]. The virtual mentoring enables the exchange of information in the digital realm through virtual digital platforms [9], in directly increased the flexibility and provided more confortable environment for mentor and mentee communication especially in meeting times or locations [10]. Despite those virtual mentoring that have been presented, the needs and effects of undergraduate engineering student mentorship through virtual implementation are not much being discussed.

In the study, the virtual engineering student mentorship program is carried out as a pilot project. The study examined the outcomes of a VSM program that paired junior (first year) and senior (second year) undergraduate engineering students as mentees and mentors, respectively. The idea is to observe how the mentor and mentee students adapted their VSM as a new learning ecosystem during the COVID-19 pandemic. Specifically, the outcome of the program is to exermine whether this program should be continued or otherwise. While the findings are focusing on engineering students of Faculty of Electrical Engineering, Universiti Teknikal Malaysia Melaka (UTeM), the results are also useful and applicable across other disciplines.

2. METHODOLOGY

The VSM program was implemented during the second semester of the academic year 2020/2021. The particular academic year was selected due to less students physical monitoring, guidance and support based on the first semester during COVID-19 outbreak, which leads to high probability of academic failure. The VSM was inherently collaborative and highly dependant on communication between mentors and mentees. Therefore, most communication methods that frequently used to support VSM were video conferencing (eg. Webex or Microsoft Teams) and Messaging Apps (eg. WhatsApp or Telegram).

The targeted populations are among the first and second year undergraduate engineering students who had been identified as mentors and mentees from three different engineering programs namely Diploma of Electrical Engineering (DEK), Bachelor of Electrical Engineering with Honours (BEKG) and Bachelor of Mechatronics Engineering with Honours (BEKM). All the first year students of each program were compulsory to join the program while the second year students were carefully selected as mentor according to the Cumulative Grade Point Average (CGPA). The identified mentor students represented a range of CGPA from 3.50 to 4.00. It should be noted that this program was supported through group mentoring of one mentor and four to five mentees.

A 10-question online survey was generated and administered to the respondents using the Google Form platform, which included a variety of multiple choice questions, Likert scale and short response questions. Initially, the respondents were required to state their roles (mentor or mentee) and gender (male or female). Then, the questions were focused on the impact of student's academic experiences, activities satisfaction and determine whether VSM program contributed to an improvement or worsening in their own self-ratings. The distribution of the questionnaire was conducted from July 13 to July 23, 2021 with clear instruction to ensure the respondents follow the guidelines and timeline given. In addition, the respondents were encouraged to forward and share the survey among mentor and mentee groups.

3. RESULTS AND DISCUSSION

Figure 1 illustrates a summary of respondents demography with 207 students from different programs (DEK: 87; BEKG: 61; BEKM: 59) who participated in the study. The overall final sample consisted of 38 mentors (18.36%) and 169 mentees (81.64%), while majority of the respondents were male (70.53%). No questions such as race, age or ethnicity were asked. The complete percentage of respondents and gender were also presented in details as recorded in Table 1. Student responses and referrals were recorded as shown in Figures 2, 3, 4 and 5.
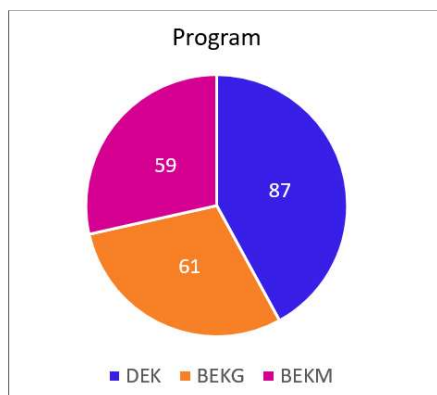

Figure 1 Respondant demography.

A triangle diagram of the VSM activities is shown in Figure 2, which include a variety of multiple-choice answer responses. The triangle diagram was ranked based on the most selected activities by the repondents during VSM program. Since the VSM program always encourages mentors to share any related academic experiences with mentees, it can be generalized that the academic tips sharing has become the most favourable to the respondents. Furthermore, the mentors were given the freedom to conduct any alternative activities based on their interest and creativity for the mentees. Then, the next popular activities were sharing of previous/recent notes, sharing of test/final exam question papers, group discussion and tutorial class that builds a sense of community. Even though the minority of the respondents had chosen tutorial class as their least popular activity, this effort can be useful for students who really need a serious guidance from the mentors.

Table 1 Respondents' Characteristics.

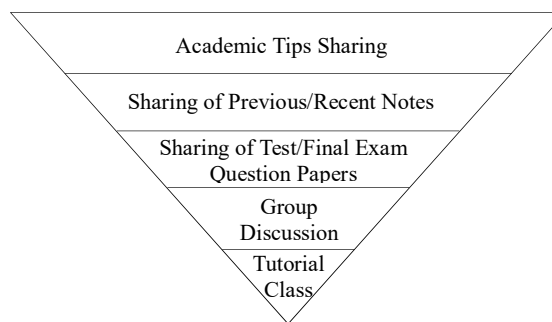| Program	Respondent	Gender
DEK	Mentor: 15 (17.24%)	Male: 9 (60%)
		Female: 6 (40%)
	Mentee: 72 (82.76%)	Male: 56 (77.78%)
		Female: 16 (22.22%)
BEKG	Mentor: 12 (19.67%)	Male: 8 (66.67%)
		Female: 4 (33.33%)
	Mentee: 49 (80.33%)	Male: 28 (57.14%)
		Female: 21 (42.86%)
BEKM	Mentor: 11 (18.64%)	Male: 7 (63.64%)
		Female: 4 (36.36%)
	Mentee: 48 (81.36%)	Male: 38 (79.17%)
		Female: 10 (20.83%)

Figure 2 Activities with VSM Program.

Besides, VSM offered an ability to have an alternative way to share and communicate with any related problems such as academics, welfare and psychological needs among mentors and mentees instead of academic advisors (lecturers). Data in Figure 3 shows the positive feedback where a total of 125 respondents (60.39%) preferred to get help from their mentors and mentees. This indicates that the mentees were comfortable to share their problems with mentors and helpful in reducing the barriers. In addition, the mentors could easily to be contacted anytime especially after office hours compared to academic advisors. Nevertheless, the need of academic advisor remains important for other 68 respondents (32.85%) while 14 respondents chose 'others' such as parents and best
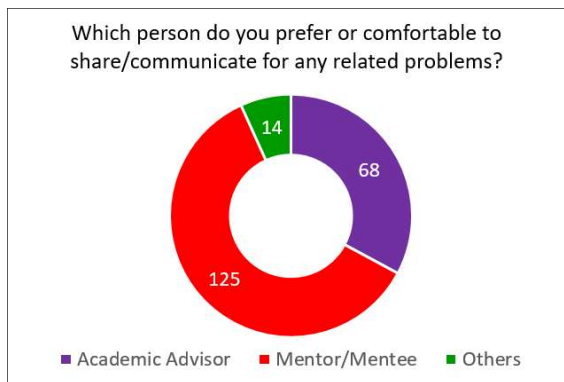
friends.

Figure 3 Preferable mentorship.

In Figure 4, both mentors and mentees reported positive perceptions with 195 (94.20%) respondents believed that the VSM program had inspired them to strive and enjoy in the new learning ecosystem even though they are not in university environment. This highlights the fact that the VSM program were favoured by the participants which helps to achieve the objective of mentoring.
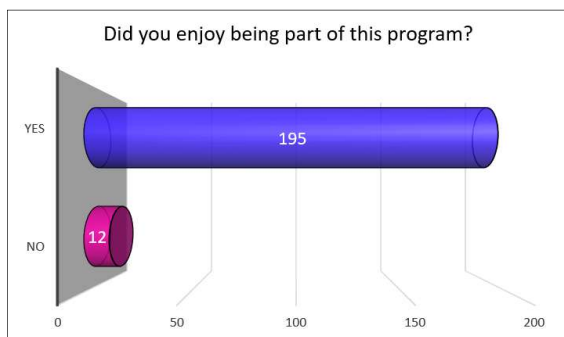

Figure 4 Self-satisfaction in participating VSM program.

In contradistinction, a minority of 12 respondents (5.80%) felt awkward and highlighted negative experiences for not being able to meet their group members physically due to the nature of virtual mentorship. In addition, they felt burdened and needed space/time to focus on their own assignments, classwork and other personal responsibilities during the weekend. Indirectly, it decreased the excitement of the program a little bit.

The respondents were further asked about the overall rate of VSM program. Interestingly, examining the responses of the mentors and mentees revealed that the high responses distribution falling into the "Good" and "Excellent" categories with 93 (44.93%) and 68 (32.85%), repsectively as shown in Figure 5. In contrast, the low responses disribution falling into "Very Poor" and "Poor" categories with 2 (0.97%) and 5 (2.42%), respectively. The negative responses from 7 respondents were reflected to the participants who answered "No" in Figure 4, which did not enjoyed being part of VSM program. Overall, this has proved that most participants believed the quality of the VSM was the most important factor and helpful in mentors and mentees academic
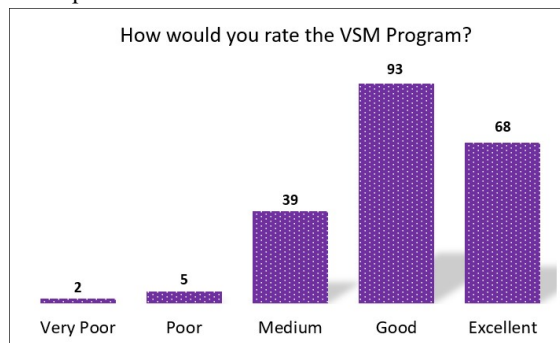
development.

Figure 5 Overall rate of VSM program.

Their satisfaction with the VSM program has also been expressed in the open comments with positive views. As evidenced, some of the random respondent's comment are shared as below:

Respondent 1
"*Everything was good. Keep doing this VSM in the future. All the mentees need more support and tips from the mentors and I hope all the mentors keep doing their best for the mentees.*"

Respondent 2
"*Always imagine to have this kind of wonderful mentoring program*"

Respondent 3
"*Continue the VSM program in every semester for students to keep them interact with people during online meeting*"

Thus, the VSM is vital in sustaining the personal and academic development of the mentees as the context of positive relationships with mentors through the creation of new environment of learning ecosystem.

4. CONCLUSION

The findings of this study confirm that VSM has made a significant impact to support and sustain student's academic achievement, similar to the benefits from physical learning approach. In fact, the program provide an alternative opportunity for the new undergraduate students to have respected group among senior members to share and communicate for any related problems such as academics, welfare and psychological needs. It is really important for the both mentors and mentees to collaborate and learn together to succeed. In the next cycle of VSM program, the best mentees that involve in this program will be selected as mentors to assist a new generation of undergraduate engineering students. Overall, successful of VSM is required to be continued and could have a lasting impact of future-proof learning ecosystem.

5. ACKNOWLEDGEMENT

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