IMPLEMENTING THE USE OF E-MENTOR MENTEE AND MIND TWISTER PROGRAM IN MONITORING AND IMPROVING THE STUDENTS' ACADEMIC PERFORMANCE

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Abstract

This research paper discusses the two strategies used in monitoring and improving the performance of the students from the Department of Electrical, Electronics and System Engineering, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia. The first strategy is the online mentor mentee system, also known as e-Mentor Mentee stores the academic records and important information such as CGPA, email addresses, phone numbers, academic performance, and other relevant data of all the students/mentees. The objective of developing this system is to make it easier for the mentors to have access on students' information in a fast and simple fashion. Previously, mentors manually saved the information in their own computers and if the information happened to be lost, they had to request to the chairman of the Student Development Committee (JPPel) for the new one. This whole process was very complex and consumed a lot of time, thus a new online system in which the chairman will upload all the information into the system for storage and mentors' can easily access the information was created. The second strategy is known as Mind Twister program which aimed to encourage the participating students to challenge their critical thinking skills. Thirty four students from the Department of Electrical, Electronics and System Engineering have participated in this program. An experimental research is carried out on the program using pre-test and post-test approach, in the form of a questionnaire to the students. From the paired sample t-test conducted, a p value of 0.00 which is lower than the alpha value (p-value ≤ 0.05) is obtained, demonstrating significant differences in the students' perception before and after completing the program. The students are inclined to have positive response on the Mind Twister program after attending it.

Keywords: Mentor mentee system, Online, Mentee's record, Easy, Educational programs, Students' performance.

1. Introduction

Each department in the Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia implements its own distinctive mechanism in monitoring the students' academic performance. For the Department of Electrical, Electronics and System Engineering, this mechanism involves all of the department's program coordinators and lecturers (mentor) with the head of department takes on the leading role [1].

To aid the planning of strategies aimed at boosting the students' performance, a unit known as the Student Development Committee (JPPel) is established. This unit consists of the head of department on the highest hierarchical order, followed by the committee chairman, committee members, coordinators for all three programs in the department (Electrical & Electronics, Communication, and Microelectronics), and industrial training coordinator. The committee's organization chart is depicted in Fig. 1.
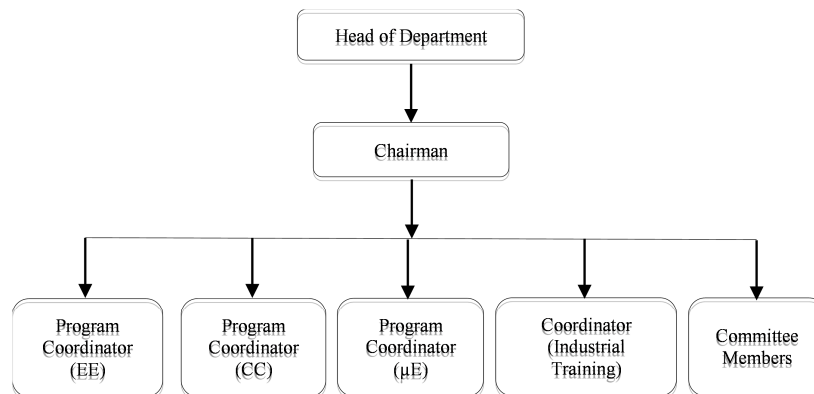
Fig. 1. Organization Unit of the Student Development Committee (JPPel).

In this paper we describe the two strategies currently being used by JPPel, namely the e-Mentor Mentee system and Mind Twister program in its attempt to improve the academic performance of the students from the Department of Electrical, Electronics and System Engineering. Section 2 explains the basic structure of the Mentor Mentee system which serves as the pioneer to the development of e-Mentor Mentee system described in sub-section 2.2. Whereas section 3 explains the details regarding Mind Twister program and the experimental approach used to identify the students' impression on the Mind Twister program before and after joining the program.

2. Mentor Mentee System

One of the approaches that are currently being carried out is the mentor mentee system [2], with the objective to provide advice and guidance to the students concerning their academic and future career, and also to give support in handling the students' issues which include financial problems, stress and emotional-related problems, family and peer relationships, spiritual conflicts, time management, and self-esteem, to name a few [3-5]. Through this system, the

lecturers/mentors will become the advisor to the students/mentees from the first year of their study until the final year or even after they have graduated [6]. Each mentor is responsible for a group of mentees of about 2 to 4 students from each year. The mentees are advised to see their mentor at least two times per semester to discuss their academic progress and other related matters [7].

At the end of each semester, the overall performance of the students is measured based on the results from the Faculty and Department Examination Meeting. JPPel is responsible in taking appropriate actions in accordance to the results, in which focus are given towards the students who score with a CGPA of 3.67 or higher and of 2.6 or lower. Students with a CGPA of 3.50 or higher will be awarded the Dean's List while those who got 2.6 or lower are required to meet and discuss their problem with their mentor, head of department, and the JPPel's chairman. This mechanism is depicted in Fig. 2.
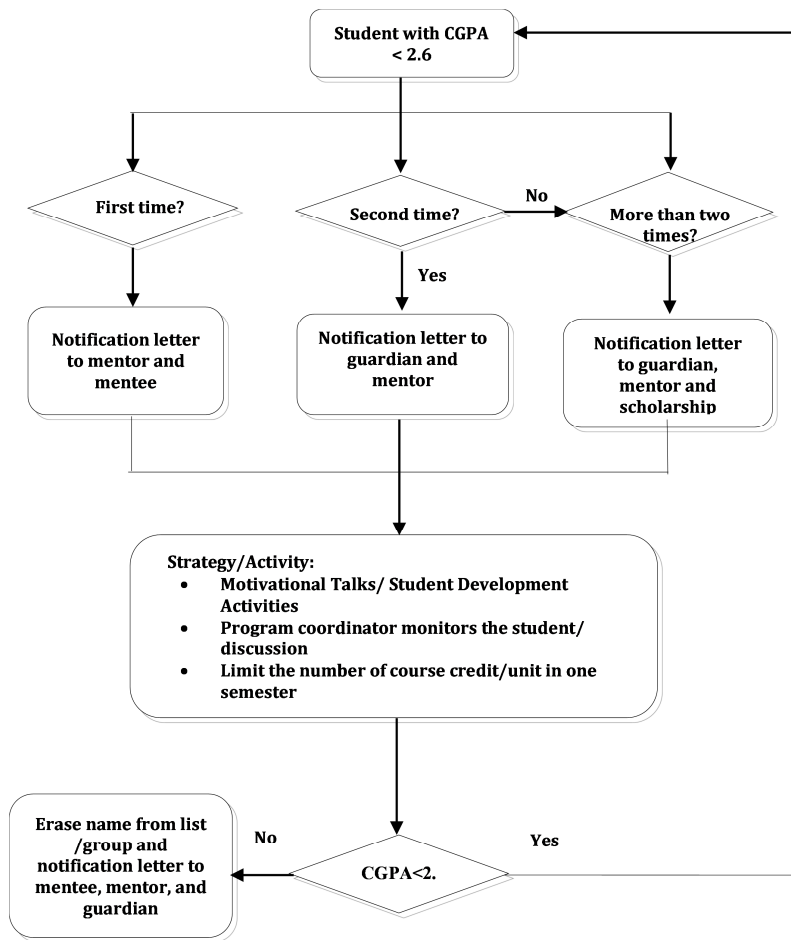
**Fig. 2. Flow Chart of the Monitoring System
for Students who obtain CGPA of less than 2.6.**

The flow chart shows the process used to monitor the performance of students having a CGPA of 2.60 or lower. If a student's GPA is below 2.60 but his CGPA stays above 2.60, a notification letter about the student's performance will be sent to his guardian and he will be required to meet the department's program coordinator, his mentor, and also his tutors/lecturers in order to identify and solve the problems. While students with CGPA of 2.60 or lower are recommended to attend activities organized by the JPPel such as motivational talks and learning workshops as these activities can greatly improve their learning performance [8]. The department also plays an active part in promoting excellence among the students by organizing numerous activities including induction to the mentor, motivational talks, workshops, academic exhibitions and many others [9].

e-Mentor Mentee

The mentor mentee monitoring system is an effort made by the JPPel to reduce the complexity of traditional mentor mentee practice. This system stores all the relevant information of each mentee (student) such as CGPA, email addresses, phone numbers, academic performance and others as shown in Fig. 3. This diagram shows the front page of Mentor Mentee Monitoring System that uses the offline format. While the system is indeed better than the traditional practice, it also has its own share of setbacks. To overcome this, a thorough study has been done on how to make the system more user-friendly and the result is presented in Fig. 4; an upgraded version of Mentor Mentee Monitoring System that uses the online format, hence named e-Mentor Mentee [10].

Figure 4 shows the login page of the e-Mentor Mentee System and the mentors need to input the username and password in order to access their respective mentees' information. Figure 5 shows the display of information where mentors can view the performance of the mentees throughout their study years with clear indication of grade increment/decrement. The actual marks are not shown but instead colour code is used to describe each class of result for security purpose, as students' information is confidential.
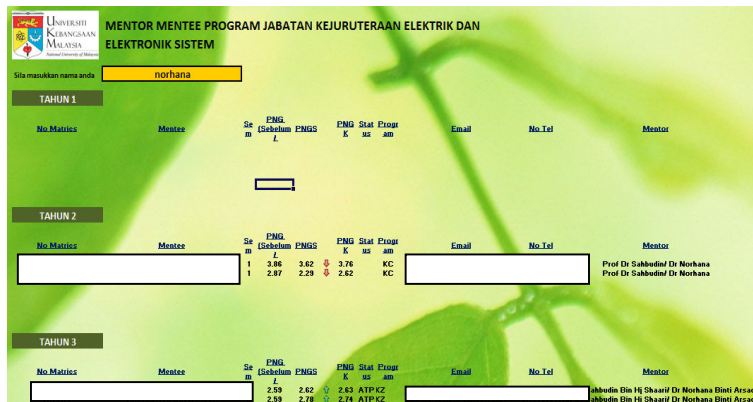
**Fig. 3. The Offline Mentor Mentee System
that was used before e-Mentor Mentee.**

Fig. 4. e-Mentor Mentee System Login Page.

Fig. 5. Mentee information being displayed upon login.

3. Mind Twister Program

JPPel has conducted a lot of activities throughout its establishment for the sake of facilitating student towards better learning practices that will translate into greater academic achievements [11]. One of these activities is known as Mind Twister program, a program that challenges the students to use their critical thinking skills to a maximum level [12]. Thirty four students from the Department of Electrical, Electronics and System Engineering participated in this program, which constitutes of 2 first year students, 9 second year students, 15 third year students and 8 fourth year students. An experimental research on this program that utilized the pre-test and post-test approach was carried out. A questionnaire was administered to the students before and after joining the program. The identical set contains 11 questions investigating about the students' knowledge, impression, thoughts, and level of satisfaction towards the Mind Twister Program. The list of all 11 questions is given in Table 1.

Table 1. List of 11 questions contained in the questionnaire.

Question (Q)	Explanation
Q_1	Capable of improving the quality of education
Q_2	Boost the learning spirit
Q_3	Can effectively carry out the learning activities
Q_4	Acquire changes in attitude and discipline
Q_5	Being cooperative as a team
Q_6	Able to motivate oneself
Q_7	Able to improve self-value
Q_8	Respect the course mates and lecturers
Q_9	Have goals and objectives
Q_10	Fix the negative habits
Q_11	Acquire skills to manage oneself well

An analysis was then carried out using the Statistical Packages of Social Science (SPSS version 15.0) to find out whether this program is thought to be effective in encouraging critical thinking among the participated students. Paired Sample T-test is used to identify the differentiation between question before and after joining the program. The questions was analysed one by one by comparing means of the questions. The test was tested to identify whether there are any changes with the students after involving themselves in the program. The null hypothesis of each of the questions is the same where:

H0 = There is no difference between before and after attending the program.

The alpha value for the hypothesis is $\alpha = 0.05$. If the significance value for the tested questions is smaller than alpha value (p-value ≤ 0.05), then the null hypothesis will be rejected. Thus, there is a difference between before and attending the program. However, if the significance value for the tested question is bigger than alpha value (p-value ≥ 0.05), then the null hypothesis is failed to be rejected. Thus, the null hypothesis is kept; there is no difference between before and after attending the program. The result of the t-test is shown in Table 2.

The column labelled "Mean" is the difference of the two means. Pair 4 produces the largest value of -1.0294 while pair 9 produces the smallest value of -1.32353. The next column is the standard deviation of the difference between the two variables. Pair 8 produces the largest value of 0.81431 while pair 1 produces the smallest value of 0.45863. The column labelled "t" gives the observed or calculated t value. Pair 8 produces the largest value of -7.582 while pair 1 produces the smallest value of -14.958. The column labelled "df" gives the degrees of freedom associated with the t test. All pairs produce the same value of 33. The column labelled "Sig. (2-tailed)" gives the two-tailed p value associated with the test. From the table it can be seen that all the pairs have the same p value of 0.00, indicating extremely small p value. The largest exact p value comes from pair 5, with a value of 0.009518436819163. The smallest exact p value on the other hand is given by pair 1, with a value of 6.996638801576e-009.

The overall p value of the test is 0.00 where it is smaller than the alpha value (p-value ≤ 0.05). Thus, the null hypothesis is failed to reject which indicate that there are differences between before and after attending the program. Before joining the program, students mostly took neutral standpoint and were more inclined to give

negative answers in the questionnaire, probably due to the perception that academic activities are boring and monotonous. After the completion of the program, the students possessed generally higher satisfaction towards Mind Twister program, proven by the extremely small p value. It can be said that the students perceived the Mind Twister program as effective in training their critical thinking skill.

Table 2. Paired Sample T-test of the 11 questions.

Question (Q_before/Q_after)	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Q1_before – Q1_after	-1.17647	.45863	.07865	-1.33649	-1.01645	-14.958	33	.000
Pair 2 Q2_before – Q2_after	-1.294412	.57889	.09928	-1.49610	-1.09213	-13.035	33	.000
Pair 3 Q3_before – Q3_after	-1.14706	.50045	.08583	-1.32167	-.97245	-13.365	33	.000
Pair 4 Q4_before – Q4_after	-1.02941	.52138	.08942	-1.21133	-.84749	-11.513	33	.000
Pair 5 Q5_before – Q5_after	-1.08824	.79268	.13594	-1.36481	-.81166	-8.005	33	.000
Pair 6 Q6_before – Q6_after	-1.29412	.71898	.12330	-1.54498	-1.04325	-10.495	33	.000
Pair 7 Q7_before – Q7_after	-1.20588	.68664	.11776	-1.44546	-.96630	-10.240	33	.000
Pair 8 Q8_before – Q8_after	-1.05882	.81431	.13965	-1.34295	-.77470	-7.582	33	.000
Pair 9 Q9_before – Q9_after	-1.32353	.72699	.12468	-1.57719	-1.06987	-10.616	33	.000
Pair 10 Q10_before – Q10_after	-1.14706	.55772	.09565	-1.34166	-.95246	-11.992	33	.000
Pair 11 Q11_before – Q11_after	-1.05882	.69375	.11898	-1.30088	-.81676	-8.899	33	.000

4. Conclusion

The mentor mentee monitoring system is a system used by the department to monitor the academic performance of the student. Mentor's role is not only limited to the academic side of the students; it covers a vast area including emotional, spiritual, career, psychology, and other related sides. The development of an online mentor mentee system is a way to help the mentors to carry out their duty efficiently as they can check the current status of their mentees anywhere, anytime. Mind Twister program is one of the many activities planned and organized by JPPel in order to enhance the students' performance. Through this program, the participating students learn how to actively use their critical thinking skill. A paired sample t-test done on this program showed a p value of 0.00 which is lower than the alpha value (p-value $\leq$ 0.05), indicating significant change in students before and after attending the program. The students were inclined to have positive perception on the Mind Twister program after attending it. Both these strategies possess innovative qualities that help the organization in its ongoing endeavour to improve the students' academic performance.

Acknowledgement

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