6th International Forum on Engineering Education (IFEE 2012)

Effectiveness of early evaluation test as a method for identification of problematic students

Noorfazila Kamal a,*, Norhana Arsad a,b, Hafizah Husain a,b, Afida Ayob a,b

aDepartment of Electrical, Electronic & System Engineering, bCentre for Engineering Education Research
Faculty of Engineering & Built Environment, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Malaysia

Abstract

The decline in university students’ performance has become an issue of great concern to university educators. An early detection of problematic students can help the educators to monitor and improve the student performance. Previously, we propose a method to identify problematic student via an early evaluation test. In this work, we measure the effectiveness of the early evaluation test method. The students performance are monitored for three semesters, and their results are compared to the early evaluation test results. This study shows that only six out of 48 students are out from the early prediction, which gives the method 87.5% in accuracy.

© 2013 The Authors. Published by Elsevier Ltd.
Selection and/or peer-review under responsibility of Mohd Zaidi Omar, Ruhizan Mohammad Yasin, Roszilah Hamid, Norngainy Mohd. Tawil, Kamaruzaman Yusoff, Mohamad Sattar Rasul

Keywords: Early evaluation test; problematic students; grade point average (GPA);

1. Introduction

The achievements of students from the Department of Electrical, Electronic and Systems Engineering (JKEES) is on the decline and some students have been disqualified from their degree program as a result to such performance [1]. Furthermore, a number of students from JKEES who obtain CGPA (Cummulative Grade Point
Average) less than 3.00 are increasing. This issue has raised concern to the department. Such a phenomenon is not supposed to happen as the students comprise of those who used to obtain excellent results during the pre-university and secondary school stages. Additionally, the student selection scheme predetermined by the university requires results that are highly qualified, not only in the academic field but also in the area of co-curriculum.

The issue of poor academic performance among university students is a serious issue because of the high hopes put on university students by the community, that the students be individuals who are knowledgeable and are able to tackle current societal problems [2]. Therefore, we proposed a method to identify problematic students at early stage of study [3]. Identification of problematic students at early stage can helps mentors to monitor the student’s performance starting from the beginning.

The proposed method in the previous work requires results from the early evaluation test and the first semester. In this work, we measure the effectiveness of the early evaluation test method by comparing the students’ results in their second and third semester with Grade Point Average (GPA) from early evaluation test and semester 1.

2. Methodology

In the previous work, a method for identification of problematic student at the early stage of study has been done [3]. The identification is based on results from early evaluation test and semester 1. The first year students in batch 2011/2012 were given an early evaluation test. The early evaluation test contains ten questions, which include mathematics, basic engineering and English knowledge. Figure 1 shows the early evaluation test question. Each question carries one mark, which gives the total marks of ten. The student’s mark is converted into GPA scale. Student’s early evaluation test result is then compared to their semester 1 result to identify problematic students. Based on these results, students are classified into four groups, namely A, B, C and D as shown in Table 1. Group A represents students who can really adapt themselves, Group B: students who are able to adapt themselves, Group C: students who have problems in adjusting themselves and Group D: students who are really problematic.

<table>
<thead>
<tr>
<th>Group</th>
<th>GPA evaluation test</th>
<th>GPA semester 1</th>
<th>Performance level</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≥ 3</td>
<td>≥ 3</td>
<td>Students who are really able to adapt themselves to the learning environment</td>
<td>17</td>
</tr>
<tr>
<td>B</td>
<td>&lt; 3</td>
<td>≥ 3</td>
<td>Students who can adapt themselves</td>
<td>4</td>
</tr>
<tr>
<td>C</td>
<td>≥ 3</td>
<td>&lt; 3</td>
<td>Students find it a problem to adapt themselves</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>&lt; 3</td>
<td>&lt; 3</td>
<td>Students who are very problematic</td>
<td>23</td>
</tr>
</tbody>
</table>
In this work, we measure the effectiveness of the early evaluation test as a method to identify problematic students at the early stage of study. The student’s results in semester 2 and semester 3 are obtained, and according to these results, students are classified into four groups. Then, number of student in each group is compared to number of students in Table 1.

### 3. Results

Students are classified into four groups according to their early evaluation test result and semester results. Three semester results are obtained in order to measure the effectiveness of early evaluation test as the problematic student identification method. Table 2 shows the number of student in group A, B, C and D, and Figure 2 shows group A and C student results for early evaluation test, semester 1, 2 and 3.
Table 2. Student’s classification based on early evaluation test and three semesters results

<table>
<thead>
<tr>
<th>Group</th>
<th>early evaluation test GPA</th>
<th>semester GPA</th>
<th>Number of students (Semester 1)</th>
<th>Number of students (Semester 2)</th>
<th>Number of students (Semester 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≥ 3</td>
<td>≥ 3</td>
<td>17</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>B</td>
<td>&lt; 3</td>
<td>≥ 3</td>
<td>4</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>C</td>
<td>≥ 3</td>
<td>&lt; 3</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>D</td>
<td>&lt; 3</td>
<td>&lt; 3</td>
<td>23</td>
<td>19</td>
<td>21</td>
</tr>
</tbody>
</table>

As shown in Figure 2, total number of student in group A and C (where their entry evaluation test GPA is equal or greater than 3.0) is 21. Each student is represented as a number. In the first semester, 17 students manage to achieve GPA equal or greater than 3.0, which is classified into group A, while 4 students (represented as number 10, 13, 19 and 21) get GPA less than 3.0, and classified into group C. In semester 2, the students in group A and C remains the same. However in semester 3, student number 17 drops his/her performance, while students number 13 and 19 increase their performance, resulting changes in number of student in group A and C. Therefore, only three out of 21 students are out of their early prediction.

Figure 3 shows group B and D student results for early evaluation test, semester 1, 2 and 3. There are 27 students in this group. In the first semester, only four students are classified into group B, and 23 students are in group D. However, this number changes in the second semester, where four students from group D (student number 29, 38, 39 and 44) improve their performance and goes to group B. Therefore, in semester 2, the total number of students in group B increases to eight, and students in group D decrease to 19. In the third semester, the four students that improve their performance in the second semester (student number 29, 38, 39 and 44), dropped their GPA to less than 3.0. Meanwhile, two students (student number 36 and 37) improve their GPA to greater than 3.0. Therefore, in the third semester, group B contains six students and group D contains 21 students. From 27 students in group B and D, only six students changes between group B and D in three semesters, while others are remain in their group as expected from the early evaluation test method.
4. Conclusion

Early evaluation test was used as a method to identify problematic students at the early stage of study. Based on early evaluation test and semester 1 results, students are classified into four different groups. Student’s results are monitored in semester 2 and 3, and they are grouped according to their results. When compared to the previous grouping, which is based on early evaluation test and semester 1 results, there are only six out of 48 students involved in group changes in three semesters. Therefore, the early evaluation test is an effective method to identify problematic students at the early stage of study.

Acknowledgements

This research is funded by Universiti Kebangsaan Malaysia (UKM) under Action Research Grant for funding this research (PTS-2012-102). The authors would like to thank the committees of JPPel (Jawatankuasa Pembangunan Pelajar) JKEES.

References

