The level of impact on student success of participation in lectures and laboratory exercises

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Abstract

Student success in exams is interlinked with different factors. More affecting factors include prior knowledge level that is gained during his/her previous studies, available infrastructure, especially when it comes to studies that require the use of laboratory equipment. In addition, higher student success, regarding acquisition of knowledge, relates directly to active participation in lectures and labs. In this paper, we present the effect in student success as result of regular attendance in lectures and labs. For this purpose, we collected data from tests of certain courses for several exam terms. To process such data, we initially created adequate computer programs. After processing the gained data, we analyze them using respective tabular and graphical representation. The obtained results clearly show that the impact of student presence in lectures and practical work in laboratory is evident. This imposes the need for professors to ensure regular attendance of students in lectures and exercises in labs.

1. Introduction

Success in learning process is important for students, as well as for the institution where they are enrolled. Therefore, in universities there are always sought solutions aimed at improving the knowledge level of students, which has an impact in building up the reputation of the respective institution, and increase the number of best applicants wishing to enroll for studies. At first, the prior knowledge level that is gained during previous student studies has an important impact (Wößmann, 2005) on student success. But this may be a basic knowledge level, which during the process of studies is normally increased and advanced.

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Students, in order to raise the level of knowledge will have to use all learning opportunities provided by the Faculty, ranging from basic ones, including lectures, exercises, laboratory work, books, e-learning options, or even learning through on-line lectures. But, despite the opportunities provided, usually a number of students (Friedman et. al., 2001), because of the other life chances, especially the first year students, don’t utilize these opportunities sufficiently, or utilize only some of them. Therefore, the imperative is to identify solutions obliging students to utilize all learning opportunities provided to them. In this paper we analyze the impact of active student participation in classes and labs on the success, as well as finding solutions to improve this participation.

2. Impact of the regular class attendance

Based on suggestions given in various papers (Friedman et. al., 2001; Matauranga et. al., 2010; Terence, 1988), but also based on results presented below, it is clear that keeping record of attendance of student in classes has an impact on their success. It particularly has a significant effect when dealing with the first year students, since a huge number of them, for the first time, is out of the family control, living in a new environment, close to the university. In such conditions, young students are facing two options: free life out of the university premises on one hand and learning at the university on the other hand.

Keeping record on regular student class attendance requires an extra effort from the professor. It is a time consuming job to call out names of all students, especially in cases when there is a higher number of students present in the classroom. Even though calling out students may bring the professor closer to them, since at least, the professor will become acquainted with their names, or sometimes even with problems faced by them. On the other hand, it usually becomes monotone, and students consider it as lost time.

A better solution to record student attendance is to do it using the appropriate electronic cards. But, this record of attendance may be inaccurate, since students may borrow the card to their colleagues. In such a case, use of fingerprint readers may be a practical solution, but certainly it costs more since dealing with a bigger number of students it will be necessary to establish more attendance record entry points.

but also on professors who are obliged to deal with student class attendance record keeping in the beginning of each class. In order to avoid the above mentioned options, it is possible to use the process of video recording of present students (Shehu et. al., 2010) and subsequently to make an automated processing of students’ face recognition (Shehu et. al., 2009). In this direction a lot is done, but still there are no solutions that provide complete coverage of student attendance process evidence. The problems faced include the specific position of particular students in the classroom, their cloths in different seasons, face covered with a beard, wearing or removing glasses, etc. that make it impossible an accurate recognition of students (Shehu et. al., 2010; Shehu et. al., 2009). But, such a method doesn’t create discomfort to students and professors, as it is the case with other procedures of record keeping, mentioned above.

3. The impact of active class attendance

The student physical presence in class is not sufficient to have a positive impact in their performance and success. In order to have students more active during the classes, it is necessary to address questions to them, about previous and ongoing lectures. The answers provided by students should be evaluated and recorded (Dwyer, 2011; Terence, 1988), in order to take them into consideration during their final grading.

A better opportunity to check the active participation of students is given during the laboratory exercises, since they sit in front of the envisioned equipments under assistant supervision. As an example, the student’s lab work in a computer while writing computer programs, is easily checked and evaluated, as they write and execute their programs.

4. Results obtained during the survey

In order to find out what is the impact of lectures and labs attendance on the students performance, we have developed an application to record the student attendance and their performance in exams. In this survey, in total,
1605 students were included. They belong to three different generations of the first year of study. For the envisioned survey we selected the course of Digital Logic Design, which is lectured in the Faculty of the Electrical and Computer Engineering at the University of Prishtina. Due to lack of laboratory equipments and big number of students enrolled in the first year of study, there are different conditions that apply for particular generations, as indicated below:

1) **Generation 2009**: Student lecture attendance records were not kept, and because of the lack of laboratory equipment, the labs were not organized, at all. In the first month of the course, attendance of students was satisfactory, but after around three weeks, it dropped below 22%.

2) **Generation 2010**: Student lecture attendance records were kept and at all times, in average, the attendance was slightly above 90%. At the same time the laboratory exercises were organized where the student’s attendance was also at the same level.

3) **Generation 2011**: Student lecture attendance records were not kept, and attendance in average was at around 24%. The attendance of labs, which were organized in a reduced number of exercises, was slightly better than in lectures. It is understandable that labs were attended mainly by the students that attended the lectures.

Results by grade, in a tabular form for the three generations of students enrolled in 2009, 2010 and 2011 are presented below (cf. Table 1).

<table>
<thead>
<tr>
<th>Grade</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>5.93</td>
<td>17.05</td>
<td>6.17</td>
</tr>
<tr>
<td>9</td>
<td>10.52</td>
<td>16.52</td>
<td>10.21</td>
</tr>
<tr>
<td>8</td>
<td>8.41</td>
<td>16.52</td>
<td>11.95</td>
</tr>
<tr>
<td>7</td>
<td>9.18</td>
<td>12.43</td>
<td>15.99</td>
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<tr>
<td>6</td>
<td>14.34</td>
<td>13.14</td>
<td>8.86</td>
</tr>
<tr>
<td>5</td>
<td>51.62</td>
<td>24.33</td>
<td>46.82</td>
</tr>
</tbody>
</table>

A graphical presentation of results, in a general form is given in Fig. 1.
In the given chart, the success of students is indicated by percentages of each grade that students have achieved in the exam, in a system that includes grades between 5 and 10, where grade 5 means that the exam is not passed, while the other grades 6,7,8,9,10 are passing grades (10 being the highest grade).

5. Analysis of the obtained results

Table 1 clearly shows that students of the Generation 2010 have achieved best results. This is more clearly shown in the chart presented in the Fig. 1, where results of the students belonging to that generation are shown in the middle pillars.

In order to better analyze the student results, we show graphically percentages of grades obtained in exams, for specific generations. Thus, for students of generation 2009, the diagram of percentages of specific grades is shown in Fig. 2.

![Year 2009](image)

Fig. 2 Percentages of specific grades for students of the generation 2009

The chart shows clearly that grade 5 dominates with 52%, which should be taken as an indicator of a very poor success of students. While in the group of the passing grades, dominates the grade 6 with 14%, showing that students have passed the exam without any major commitment. Higher grades (10, 9 and 8), which are represented with 25%, mostly belong to students that have attended regularly the lectures, which as noted earlier were around 24%. The average grade of students that have passed the exam is 7.68%. But, if in the calculation are included grades of students that haven’t passed the exam, the average grade drops to 6.30%.

Results of students belonging to the generation 2010 are significantly better, what is more clearly seen in the chart given in Fig. 3.

![Year 2010](image)

Fig. 3 Percentages of specific grades for students of the generation 2010

From the chart it is seen that distribution of grades is nearly uniform, including non-passing grade 5 that, in this case, it is only 24%. Having in mind that in the first year of studies, students with poor success in the prior education were enrolled, the shown percentage of students that haven’t passed the exam is understandable. On the other hand,
three highest passing grades (10, 9 and 8) have an equal percentage distribution (17%), what is related to the differences between students, despite the fact that they may have worked with high commitment. In this case, the average grade of students who have passed the exam is 8.16. If in the average grade calculations, the grades of students (passing and not passing the exam) are included, the average grade drops to 7.39.

The success of students of the generation 2011 is significantly weaker than the one of the previous generation, but bit better than the one of the generation 2009, which is shown in the chart given in Fig. 4.

![Year 2011](image)

Fig. 4 Percentages of specific grades for students of the Generation 2011

From the chart, it can be concluded that more than half of students have passed the exam. The highest grade (10) is present with a very low percentage compared to that of the generation 2010. The percentages of grades 7, 8 and 9 (16%, 12% and 10%) are higher, that may be explained with the commitment of students, but their poor attendance in lectures and partial provision of labs have resulted with such a grade distribution. In this case, the average grade of students who have passed the exam is 7.79, whereas if in the average grade calculations are included grades of students that haven’t passed the exam, the average grade drops to 6.48.

6. Conclusions

Taking into consideration results presented above, we conclude that regular student attendance in classes and labs directly correlates their success in exams. This best can be seen, if you compare the success of the generation 2010 students, with students of the two other generations. In case of generations 2009 and 2011, the success of most of the students seems to have resulted due to their individual commitment, except for the students that have regularly attended classes.

In order to increase student success, their active participation in lectures and exercises needs to be enforced, for example tests, practical work, questioning, homework etc. This imposes that students work continually by repeating prior lessons learned. Questions at the end of the class might have an impact on the student to be fully concentrated during the lectures.

The learning process can advance if students are provided with laboratory exercises, or even with e-learning facilities through on-line lectures and various interactive tests.

For the first year students, an attendance monitoring system should be utilized so their activities could be somehow recorded.

References


