

Development of a remedial course for students who attend classes of circuit theory

Original

Development of a remedial course for students who attend classes of circuit theory / Perano, ENRICO FAUSTO; Manfredi, Paolo. - ELETTRONICO. - (2022), pp. 8-9. (Intervento presentato al convegno 4th International Conference on Higher Education Learning Methodologies and Technologies Online (HELMeTO 2022) tenutosi a Palermo, Italia nel 21-23 settembre 2022).

Availability:

This version is available at: 11583/2972342 since: 2022-10-15T16:38:25Z

Publisher:

Società Italiana di Ricerca sull'Educazione Mediale (SIREM)

Published

DOI:

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The participants were recruited on a voluntary basis at the beginning of the semester. Students who already attended classes in the past years, and failed the exam, were warmly encouraged to enroll. A bonus of up to 4 points on the final exam score, out of a maximum of 30 points according to the Italian grading system for university exams, was introduced to further encourage participation, and could be earned based on the cumulative performance at check-in and check-out tests. Specifically, for each of the 13 modules, a full score of 4=13 points was awarded if the check-in test was passed, whereas 2=3 or 1=3 of the above score was earned by the students who had to follow the remedial program and passed the check-out test on the first attempt or with multiple attempts, respectively. Eventually, 185 students enrolled in the remedial course, out of a total of 406 students enrolled in the regular classes. This was a satisfactory result, which led to two fairly balanced populations and allowed for a comparative assessment.

3 Analysis of Results

The students who attempted the final exam in the first available session were 256. Out of these, 141 completed a significant part of the remedial course. A small number of students, who only took a minimal part of it, were excluded from the following analysis.

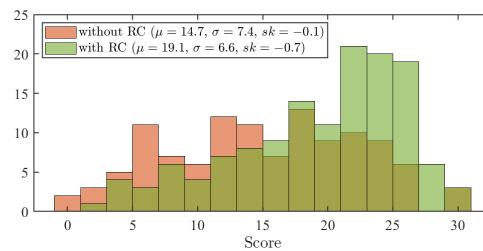


Fig. 1. Comparison between the scores obtained by the students who have (green) or have not (red) attended the remedial course.

The histogram in Fig. 1 illustrates the results achieved by the students. The score distribution of the population who followed the remedial course (in green) is shifted towards the highest grades compared to the score distribution of the remaining students (in red). Indeed, as reported in the legend, the average of the green distribution is 19.1, compared to 14.7 of the red distribution. Therefore, a remarkable average improvement of over 4 points out of 30 was achieved by the students who followed the remedial program. Furthermore, it is interesting to note that the skewness coefficient SK is negative for students who have followed the remedial course, which indicates that their score distribution is biased towards the highest scores, whereas it is close to zero for the remaining students, denoting a symmetric dispersion around the average.