

Learning UNIX in First Year of Computer Engineering

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ABSTRACT

We describe an experience of cooperative learning for teaching the UNIX operating system in first year of Computer Engineering that helps the students to work with constancy, motivates them to attend the laboratory sessions, stay with the subject, and promotes social and communication skills. This methodology has been very satisfactorily valued by the students.

Categories and Subject Descriptors

K.3.2 [Computer and Information Science Education]:
Computer science education.

General Terms

Human Factors.

Keywords

UNIX operating system, cooperative learning.

1. INTRODUCTION

When a student begins the study of Computer Engineering it is desirable that he/she learns to manage well an operating system. In the Computer Engineering course at the University of Valladolid (Spain), these knowledge and skills are provided to the student in the Introduction to Computer Science subject that is taught during the first year. That subject has a practical part devoted to teach UNIX on a user level.

Our experience of more than ten years teaching this subject is that the students come up against difficulties in learning to manage the UNIX Operating System. They give up on the laboratory sessions and do not pass the exam.

We think that motivating the students is very important for learning. The traditional methodology, in which the teacher presents the concepts and the students take notes, study and apply the concepts by means of practical exercises at the laboratory, does not achieve the goal that most of the students participate actively in the learning process. Additionally, at present, facilitating a student's social and communication skills (group work, oral expression, etc.) is very important.

We have applied a new methodology based in cooperative work for improving learning of UNIX and solving the problems mentioned above. This experience has been performed by members of the *Study Group for Teaching Innovation in Engineering* (GrEIDI).

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2. METHODOLOGY DESCRIPTION

We organize the students in *work groups* of three members chosen randomly. They attend eight sessions of two hours each.

Some sessions are devoted to a theoretical explanation of the subject. The lecturer does not teach all the concepts in consecutive sessions, but after teaching some concepts, the students study them in groups using cooperative work.

In these cooperative work sessions, they work on a task, specially chosen for promoting learning, which has been given to them in advance of the laboratory session. We used the puzzle technique to ensure that each student has an active part in the personal and group learning process, since all the pieces are necessary for a global understanding. Thus, we get that each student feels indispensable and does not give up the laboratory sessions. In this particular case, we give out the commands in three sets and each member of the group has to study and write a report about one of the sets. In the laboratory they meet in *expert groups*, i. e., several students that have studied the same set of commands, resolve their confusion and carry out some simple exercises. Then, they meet in the initial groups, where each member explains to the rest the set of commands he/she has learned. After that, they are prepared for solving a more complex set of exercises. The teacher assists the students in the resolution of their confusion during the session.

In the session following that with cooperative work, an assessment of the students is carried out. The teacher randomly chooses a student of a group, he/she explains the answer to an exercise orally, and his/her mark is assigned to all members of the group. Thus, each student is motivated to put in more personal effort to ensure that all members of the group learn well all the concepts.

Finally, in the last session, an assessment of exercises of the same type as those on the final exam is performed. Hence, the students are prepared for the exam.

3. FINAL REMARKS

The students filled in a questionnaire giving their opinion of this new methodology. They think that they have learned UNIX better than with the traditional one and in a more dynamic and satisfying way. This methodology motivates them to study with constancy, though some of them complain about the extra effort they have to put on it.

In our opinion this method is positive because it helps them to acquire study habits, to have a better assimilation of concepts and to develop social and communication skills.

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