THE USE OF RESEARCH ACTIVITIES AS LEARNING INSTRUMENT IN ELECTRICAL ENGINEERING AND COMPUTER SCIENCE GRADUATIONS

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Abstract – In this paper we analyze the use of research activities as learning instrument in electrical engineering and computer science. This pedagogic approach was applied in undergraduate disciplines, undergraduate teaching assistance and undergraduate research projects. Our main goals are optimize the learning process using research and motivate the use of research activities as learning instrument.

Index Terms – Learning instrument, pedagogic approach, research activities.

INTRODUCTION

Our pedagogic approach uses research activities as an instrument to optimize the learning process. This approach was applied with gradually varied complexity, dependent of the contexts/moments. The application of these research activities can also motivate students to develop new researches.

The approach was applied in undergraduate disciplines, undergraduate teaching assistance and undergraduate research projects in Pontifical Catholic University of Minas Gerais (PUC-Minas), Brazil.

PEDAGOGIC APPROACH

In undergraduate disciplines, a learning method based on constructivism, group and simple research activities and real-problem solution projects was applied [1]. In teaching assistance a hybrid approach was used. It combines individual/cooperative research and aid in another students learning. In undergraduate research, we applied an advisory model based on construction and exercise of scientific method. This model represents more complex research activities and proposal, preparation and submission of scientific papers.

Verification show that, in disciplines, all students participate of group research activities, producing and presenting simple research results. Some highlighted students published research papers [2]. Usually, teaching assistance activities served as preparation for undergraduate research or as continuation of the research activities in undergraduate disciplines and some papers has been published in scientific events [3]. In undergraduate research projects we obtained the best results, with great quality researches and publication of many papers in national and international events (some IEEE) [4]. Some best students, with scientific research method domain and scientific maturity, are already in graduate programs.

CONCLUSIONS

Research activities optimized the learning, motivating the accomplishment of new and more complex researches. Discipline students approved the use of research activities as learning instrument, independently of posture and behavior changes. The interest and approval increase among teaching assistance students and mainly undergraduate research students. Professors evaluate results as very good, above the expected. We highlighted that researches experience aid in human resources formation, qualified for academic and professional markets. Thus, our goals were reached.

Main contributions are proposition, development, application and verification of a pedagogic approach based on the use of research activities as learning instrument in the graduation. This approach motivates and optimizes the learning. Another contribution is the creation of an undergraduate research environment, in disciplines, teaching assistance activities and undergraduate research projects.

REFERENCES


