

The Programming Contest Impact for the IFTM Education

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Abstract. *The concern over high school dropout rates has been part of the routine of Brazilian public schools. In recent years various public policies have been proposed in an attempt to minimize this problem, nevertheless, federal institutions have sought alternatives to improve the quality of education offered and ensure that students remain attending classes ensuring a high level of learning. This paper describes how Programming Contests can increase the quality of education in the Federal Institutes, as well as foster the inclusion of these students in the job market, playing an important role in combating to school dropouts. As an object of study will be presented Algar Telecom Group shares in the management of Programming Marathon which involves several institutions of higher education, among them the Federal Institute of Triângulo Mineiro (IFTM).*

1. Introduction

Challenges for students can bring the studies more interesting and pleasant for them. In this perspective, techniques as programming contests can help to encourage greater devotion for learning and to inspire the students to see the benefits for their future.

Motivated by the possibility to contribute with the education and the society evolution, this work aims to show some benefits in the use of programming contests in the Federal Institute of Triângulo Mineiro (IFTM).

In this paper, section 1 presents the programming contest history and section 2 the education perspectives for the IFTM. Section 3 shows the research impact and section 4 presents the conclusions and suggestions for future work in this research area.

2. The Programming Contest History

The International Collegiate Programming Contest (ICPC) started in 1977, in the USA, and has been widespread around the world. Today, it is the most traditional and important programming contest in the planet.

Its impressive growth, in the last 16 years, is showed in Figure 1, depicted from [ACM 2013]. This increasing students participation interest brings some possibilities to analyze, deeply, the programming contests as a tool for the improvement of the educational system.

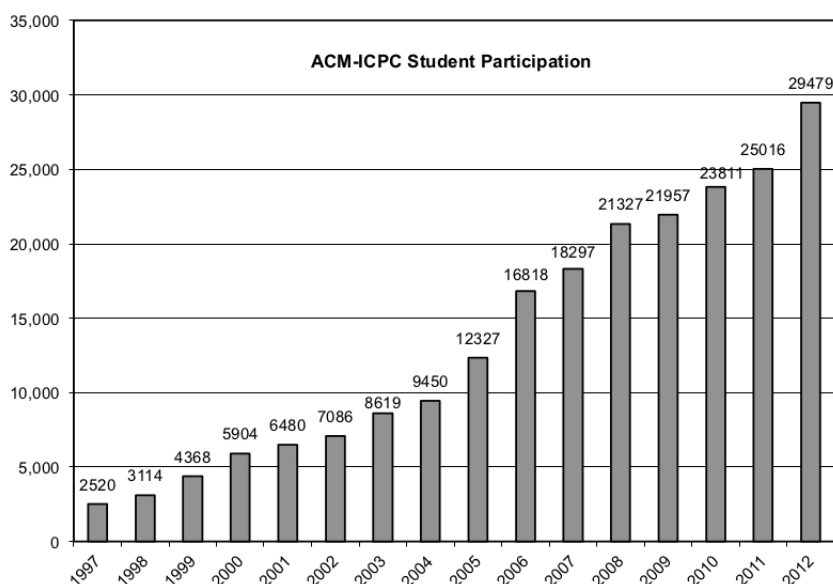


Figure 1. ACM-ICPC Student Participation Growth.

In Brazil, the first participation in the ICPC was only in 1996 and, until today, it was not widespread in the entire country institutions, neither the Brazilians have conquered enough performance to be closer to the podium [USP 2013].

2.1. Triângulo Mineiro Programming Contest History

In the Triângulo Mineiro, the programming contest participation started in 1998, however, the more expressive improvement in the students participation and performance just happened in the recent years, with the systematic organization between the most of all IES in the region and the partnership with the Algar Telecom company [Algar Telecom 2013].

In this systematic organization, the IFTM has a important participation and partnership and, by this, Algar Telecom offers scholarships for the IFTM students, by their performance in the Triângulo Mineiro programming contest. This have been motivating and stimulating for the students to reach higher knowledge and programming skills, by the incentive for their studies and connection with the future employment possibilities in high level technology companies.

3. Education Perspectives

In the context of Brazilian public education the issue of school dropout has been the protagonist of the main conferences on education in this country. Public incentive policies to permanence of the student in school, like student assistance programs, have played an important role in this function, an interesting discussion about public policies for education can be found in [Adachi and Peixoto 2010] where researches from UFMG conclude

that many other actions are necessary to achieve the target set by the government for the next years.

The Federal Institute of Triângulo Mineiro (IFTM), in the last two years, have been encouraging study groups in order to diagnose the major causes of school dropouts. The actions taken by each campus of the Institute include the particularities of the localities where they live. Nevertheless, analyzing the specific case of computing courses, there is a problem that is part of the scenery from many important universities in this country, it is the difficulty of the teaching / learning caused by the first programming disciplines. [Prietch and Pazeto 2010] considers the lack of understanding about the logical reasoning as one of the main causes for the high failure rate in programming disciplines and, in some cases, by the dropouts of the course.

The Federal Institute of Triângulo Mineiro, in the last two years, have been encouraging study groups in order to diagnose the major causes of school dropout.

The high failure rate in these disciplines is alarming and has been a major reason for earlier dropping out from computing courses. In 2012, the Advanced Campus Uberlândia passed to encourage new students in the course of Technology in Internet Systems to keep training for contest programs, mainly for the Programming Marathon. On IFTM, a training program was created, in principle, with the proposal to overcome the students' learning difficulties in the area of algorithms and programming, after this, students ended up surrendering to the challenges of the training program and to the healthy environments of competition among participants.

In a complementary way, as a result of student participation in the regional marathons, the main sponsor of the event, Algar Telecom Group, has played another essential role on placing these students in the job market. In 2013 an important agreement was signed for cooperation between the Algar Telecom Group and IFTM where, from the training program for the Programming Marathon and extending to other areas of research conducted at the Institute, there is an expectation of greater student involvement and the fortification of the link between school and the job market.

Obviously there are several factors that contributed to the reduction in dropout, but certainly the training program for Programming Marathon is among them and should be intensified in the coming years. Figure 2 shows the percentage of dropout students in the last 3 years for the Technology in Internet Systems course, who started its activities in 2010, and the measurements have been done at the beginning of each year. Considering the 30 vacancies offered and filled in 2011, were 16 dropout students, the number dropped to 13 in 2012 and in early 2013, only 6 students were counted as dropouts.

4. Research Impact

The graphic presented in section 2 brings some possibilities about the correlation of students challenges and their dropout reduction. This dropout reduction, also can be influenced by the better access to the labor market, affected by the programming contests ranking list, published freely in [Algar Telecom 2013].

This correlation needs to be explored in deeper details, and this will be possible expanding the analysis interval, in the next years.

Also, this analysis will be extended with research interviews, with the previous

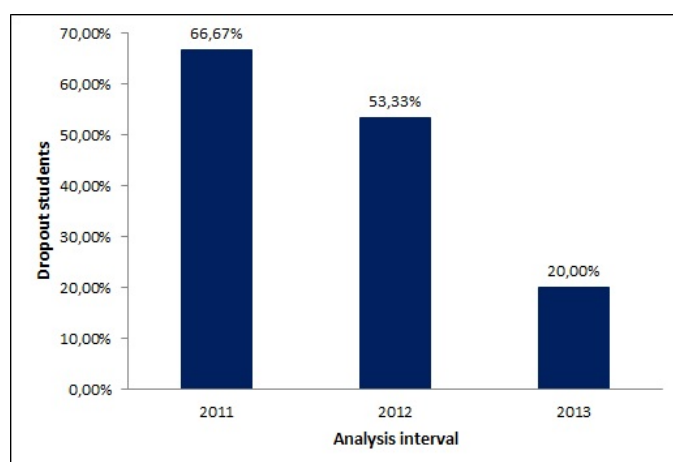


Figure 2. Dropout students in Technology in Internet Systems from IFTM.

dropout students, and the actual ones.

5. Conclusions

There are possibilities to reduce the students dropout in the Federal Institutes with the combination of contests challenges connected with the access to the labor market.

This can brings the education more attractive for the students and to influence them to greater dedication and to learn with enthusiasm.

The future work in this education area will collect more data in the next years, and will correlate them with students interviews, to try to improve the teaching techniques in one evolutionary world, nowadays, in a transformation period. In advance, the Technology in Internet Systems course chose an expert professor to work as a coach for the students, in this case the training has been intensified and is getting more adepts.

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