An Overview of International Engineering and Technology Congresses Contributions in Brazil

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Abstract

Brazil’s quick ingression into international educational communities both in North America and in Europe and growth of quality level of Brazilian engineering standards of education became an objective reality in recent years. Its active participation in the work of various conferences and societies all over the world has considerably enhanced old educational traditions and formed a new generation of young engineers capable to resolve many acute problems of Brazil’s national economy in the most efficient way. In many aspects this success is supported by a series of recent conferences intended to increase the role of national engineering education and to attract the recognized international organizations and institutions for mutually beneficial cooperation. The educational policy of Brazilian government has played a decisive part in all these enterprises. The stability of the steady gradual rise of engineering education quality in Brazil is in many aspects caused by organizing regular international conferences where all vital and important problems of engineering education are being discussed in utmost open and lively atmosphere. Theoretical and practical issues are considered in sessions and workshops intended to give an immediate vocational training to young Brazilian educators participating in the event. In their turn, the young professors are eager for applying their newly acquired educative ideas and innovative initiatives to their local universities; and the regular conferences with a participation of recognized educators from foreign and national technical universities give a good basis for that.

1. Introduction

Brazil has been present in international educational communities not only in North America but also in Europe and the growth of quality level of Brazilian engineering standards of education became an objective reality in recent years [1-3]. It is due partly to the active participation in the work of various conferences and societies all over the world that has considerably enhanced old educational traditions and formed a new generation of young engineers capable to resolve many acute problems of Brazil’s national economy in the most efficient way. In some ways the success is supported by a series of conferences with the goal to increase the role of national engineering education and to attract the recognized international organizations and institutions for mutually beneficial cooperation. The educational policy of Brazilian government has played a decisive part in all these enterprises [4-6].
2. Brazil and Engineering Education Conferences.

In many ways it can be said that the gradual rise of engineering education quality in Brazil is caused by the organization of regular international conferences where all vital and important problems of engineering education are being discussed in utmost open and lively atmosphere. Theoretical and practical issues are considered in sessions and workshops intended to give an immediate vocational training to young Brazilian educators participating in the event. In their turn, the young professors are eager for applying their newly acquired educative ideas and innovative initiatives to their local universities; and the regular conferences with a participation of recognized educators from foreign and national technical universities give a good basis for that. Five important conferences on engineering education took place in last years:

- 1999: International Conference on Engineering and Computer Education (ICECE-99), Rio de Janeiro, August 11-14;
- 2000: ICECE-2000, Sao Paulo, August 27-30;
- 2002: 7th International Conference on Engineering and Technology Education (INTERTECH-2002), Santos, March 17-20;
- 2004: World Congress on Engineering and Technology Education (WCETE-2004), Guarujá, March 14-17.

Another international conference on engineering education has been scheduled for 2005 in Bertioga. The period (final of summer and beginning of autumn in Brazil) is the one that has been showing the most favorable because it is not so warm but it is still possible to enjoy the excellent climate of Brazil.

A comparative analysis has been elaborated to demonstrate the undoubted success and progress of these events as well as their influence on formation of young engineers. The analysis utilizes the dates of the first four conferences only, because the analysis of WCETE that happened recently has not been done yet.

Below there is a list of main supporters of conferences that includes both recognized international and Brazilian organizations, which demonstrated their great interest to these events.

The conferences count with the Technical cooperation of:

- IEEE (Institute of Electrical and Electronics Engineers);
- IGIP (International Society for Engineering Education);
- SEFI (European Society for Engineering Education);
- INTERTECH (Interamerican Council for Engineering and Technology Education);
- ASEE (American Society for Engineering Education);
- ASIBEI (Iberian-American Association of Engineering Education Institutions);
- ABENGE (Brazilian Society for Engineering Education);
- RBE (Brazilian Network of Engineering);
- NPABS (Brazilian Nucleus of Environmental Researches).

These conferences have as sponsor the largest Brazilian Agency for Development of Science like:
- CNPq (National Council for Scientific and Technological Development);
- FAPESP (The State of São Paulo Research Foundation);
- CAPES (Coordination for Improvement of Personnel of Superior Level).

And also some Brazilian enterprises like Petrobras the largest petroleum company of Latin America and other local ones.

![Pie chart showing participation distribution by continent and country](image)

**Fig. 1.** Overall participation in four conferences (upper diagram) and most active participants.

**Foreign countries that presented not less than 3 papers**

- Russia: 29
- Germany: 5
- Great Britain: 12
- Spain: 17
- Portugal: 7
- Sweden: 3
- Switzerland: 4
- France: 5
- Poland: 3
- Taiwan: 3
- USA: 108
- Peru: 4
- Argentina: 48
- Mexico: 31
- Cuba: 3
- Venezuela: 7
- Chile: 3

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The overall global involvement into Brazilian conferences (nearly 1000 participants) is illustrated on Fig.1 that shows the total number of foreign papers presented at four conferences [7]. The Figure reflects the countries that presented not less than three papers at four conferences. The percentage of “continental” participation is shown on a pie-diagram at the top of Fig.1. As one can see, Brazil, of course, is the chief contributor (558 papers submitted). It is important to underline that Brazilian contributors really present the whole large country: from Rio and Sao Paulo to its most distant regions. These results are very promising and could only be achieved under a constant and steady attention of Brazilian government at all levels of the national education where the engineering education is definitely a priority. The states of Rio de Janeiro and Sao Paulo with the largest concentration of best universities were successfully selected as centers for international forums.

It seems that there are three main reasons to make a very favorable ground for further successes in this area:

1. There works a very efficient system CAPES, which coordinates the means to improve the level of the personnel responsible for higher education. Practically, CAPES bears responsibility for all post-diploma education and the quality of the corresponding academic curricula. Besides, CAPES is involved into broadening of the international cooperation and providing young students with scholarship to their education in Brazil or abroad.

2. Strong control of the quality of higher education realized owing to two important factors:
   - General National final examination to receive a diploma of higher education. This examination is considered as obligatory.
   - Program of Institutional Evaluation of Brazilian Universities (PAIUB). The evaluation embraces all the aspects of a university life on a voluntary basis.

3. General progress of engineering in Brazil and a prestigious status of engineer as a specialist.

All these three aspects taken as a whole make the engineering education in Brazil very efficient and promising for young people [8-9]; and a tendency to organize international conferences on engineering education puts Brazil forwards to one of leading positions in this area.

Another aspect that has to be taken into account are the new policies that are rising in the country specially in the Atlantic Coast Region of São Paulo state where the recent efforts are focused on the fostering of a whole year business tourism.

3. Conclusion

A rapid penetration of Brazil into international engineering educational process and its active participation in various conferences all over the world allowed resolving many acute problems of national economics in the most efficient way. In many aspects organizing regular international conferences where all vital and important problems of engineering education are being discussed stimulates this success. The work shows a comparative analysis based upon five recent international conferences on engineering education.
The data exposed shows that the conferences have been a success. They can contribute to the dynamic discussions of engineering education in Brazil once they bring what has been done abroad and what has been done in the country. New local policies will provide a better support for this level of conferences once it brings to the Atlantic Coast Region of São Paulo the international tourism that also cooperates to maintenance of jobs and economy. Although it is a small number of conferences in this particular area the rising number of participants shows that it has a future.

Bibliography

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