Combining ICPC with Computing Education in China

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ICPC (International Collegiate Programming Contest) has obtained rapid development in the whole world since 1977. There are 6,700 teams representing 1,821 universities in 83 countries competing at 213 sites in the 32nd ACM/ICPC regional contests. And among all these teams, about half of them come from Asia. Especially, Chinese teams is a majority of all the Asia teams. This is a surprising thing. You know, ACM/ICPC appears in Chinese Mainland only since 1996. But all these are not accidental, it concerns with the unique charm of ACM/ICPC.

1. The charm of ACM/ICPC

Nowadays, The Collegiate have many opportunities to participate in all kinds of contests, for example, MCM, ICM and so on. But, ACM/ICPC has its own special characters.

- **Realtime**
  Both team members and their coaches can get a realtime ranklist during the contests. This is just as in the stock market, and it is really a great job because it makes the contests so exciting. It fit nice to young students because they are just in the stage in which they pursue exciting and success.

- **Objective & Impartial**
  A recognition's merit about ACM/ICPC is its objective and impartial. Nobody but yourself can help you whenever you enter the contest site! This is the life of ICPC in my eyes.

- **Interesting**
  I really fell in love with ICPC at the first sight of floating balloons in the contest site. This character reflects the funny side of the contest, it is more like a game than only a contest. Further more, it is also a party for the programmers when they come together from around the world. In some sense, the friendship harvest maybe have already surmounted the competition itself.

- **Practice Online**
  Everyone can get practical experience about programming in the course of training and contests. Furthermore, training online is also a interesting way for the collegiate nowadays.

2. The shortcoming of traditional education of computing sciences

In my opinion, on the one hand, the rapid development of ACM/ICPC reflects its merit mentioned above, on the other hand, it also reflects the need for educational reform. As we all know, there are some obvious shortcomings for traditional
education of computing sciences.

- **Lacking of programming ability**
  This is a universal problem in the computer education especially in China. But, programming ability is just the basic request to everybody who is studying in computing science. I usually meet the students who can get high scores in the exams, but they are not good at programming. Although this phenomenon has been noted for a long time, and some attempts have been taken to try to change this situation, but the effect was not very good.

- **Lacking of interest**
  One of the essential reasons about lacking of programming ability lays on the lacking of interest to programming. It is fatal because, as we all know, interest is the best teacher. And if we make a further research about it, we will find that one of the important reasons is that these students have not realized the pleasure of programming.

As a teacher, I think one of the important tasks is to lead students to realize the fun of studying, and ICPC can help me in this side.

3. **My efforts about combining ACM/ICPC and computing education**

- **Developing an online judge system HDOJ** ([http://acm.hdu.edu.cn](http://acm.hdu.edu.cn))
  It is in 2004 when I knew and joined in ICPC as a coach. And then we developed an online judge system which we named it HDOJ in the next year. To today, we have held the contests for more than 20 times. And now it becomes the training base for many ACM/ICPC beginners. There are more than 500,000 submitting records although the system is only less than 3 years old. And now the number of submitting is increasing by about 1000 records per day.

    Especially, I designed 8 very very easy problems which is used to practice input and output for the beginners. This thing is one of my most proud things although these problems looks so easy. It is just these problems which bring the sense of achievement to those students who are lack of interest and confidence. You know, it is a very important step to encourage these students to enhance the programming ability. Furthermore, I also designed about 50 problems which are described in Chinese. And all these works is for the same aim.

- **Giving a course named “ACM Programming”**
  I began to give a course named “ACM Programming” Since 2004. Although the content of this course is very similar with the course “Introduce to Algorithms”, but the teaching methods have changed much. There is more than 1500 students who have studied this elective course.

- **Leading students to make practice in HDOJ**
  I also suggested my colleagues who taught related courses to use the online judge system to carry on the teaching activities. Today, more and more teachers have joined in. We also specially created a forum which provides a very convenient platform for students. In forum everybody can carries on the discussion about the related questions.

- **Writing a book about introduce to algorithms(in the process…)**
These days I am writing a book about introduction to algorithms, but it is different with common books about algorithms, I am trying to introduce the algorithms based on the fun and lower access needs, for my aim is to let readers gain both algorithms and fun.

4. Gain from ICPC

ACM/ICPC is a interesting and profound contest, all those have attend in it will gain much.

For those ICPC team members, they can get the certificates of achievement, opportunities to famous company and so on, but all these are only the superficial sides, what is more precious that they have better self-study ability which will benefit them all their life.

I also get much as a coach. On the one hand, I can get some interesting or classic problems which can be used as examples in the lectures. On the other hand, I deeply feel happy when I know many students have bright future.

We know that the meanings of Olympics is not only to pursue Swifter, Higher and Stronger, but also to inspire common people’s passion about sports and health. It is Similar to ICPC because some students’ attending in ICPC can invoke much more classmates to practice, and then the whole group enhanced their programming abilities.

In the process of my lecture, I always instill my viewpoint that study is not incompatible with pleasure into my students. My argument just lays on that attending ICPC is a funny thing. I hoped all my efforts can arouse their activity and passion to study, especially to those who have succumbed to internet games. Maybe I cannot awoken all these students, but It is also the fact that some students have benefited from it and get a bright future now.

Not only participator but also the students around them can benefit from ICPC, this is my final aim.

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Bibliography
1. http://icpc.baylor.edu/icpc/

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