BUSAN CAMPAIGN FOR PROMOTION OF SCIENTIFIC AWARENESS IN YOUTH

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Abstract

In regional institutes, the needs for a proper mentorship system is hard to answer because of limited research infrastructure and human resources. When mentoring programs start accumulating public recognition, 'mentees' have to be specified and 'mentors' provided. In the city of Busan, a city-run program named BWSE (Busan Women in Science & Engineering) was launched in 2002 with the purpose of raising scientific interest (rather than creativity) among young female students. Two types of mentoring classes were created: One is an 'open' and 'moving' laboratory program and the other one is a continual mentoring program. 'Open' and 'moving' laboratory programs mainly consists of visits to and participation in contemporary laboratories mostly run by female scientists, as well as field trips to local natural habitats. Continual mentoring programs (also known as 'Kids-Moms class') are curriculum-based and center on developing the ability to express one's ideas and to probe into the mechanisms behind phenomena. Moreover, a "Three-Track Career Development Program" was established to aid in improving job interview skills for female students in Busan, This program is crucial for a city like Busan which consists of a large female students population due to cultural tendency. E-mentoring and teletutoring services are also planned to be launched in 2006. However, no matter how well things seem, more resources need to be put into developing mentors and mentoring programs in Busan.

Keywords: Busan, women, scientific awareness, mentoring,

1. Introduction

Busan is the second largest city in Korea with around four million people. But Busan has a limited research infrastructure and human resources in science and technology. Busan has many female students due to a cultural tendency. In 2002, a career guide program for women students was started with university-based funding, which promoted a city-run program of the Busan Women in Science and Engineering (BWSE, 2004; BWSE, 2005) in 2003. The program was first designed as a program for behind teaching and mentoring to young girl students of middle and high school. When mentoring programs started with increasing public recognition, the specification of 'mentee' and the providing of 'mentor' were very important. The limitation of the number of qualified mentor triggered the designing a limited program for school students. We attempted to have a promotion program for mentors, who attend university education. And then we met school teachers and made a teacher-scientist network.

The primary aims for mentoring was rousing of scientific interest and scientific awareness rather than scientific knowledge. The mentees are grouped into Kids for elementary school students, teenage girls, and female university students. In relation to education for children, through camp and continual class every Saturdays, mentees participate in peer-group mentoring among groups of friends. Actually natural mentoring was pointed out to take place within a wide range of relationships (Philip, 2000). We tried to give trust to young students and to take a close relationship as mother, mentor, and teacher.

2. The Outline of Busan Women in Science and Engineering

2.1 Goal and objectives

- Encourage domestic girls in Busan using by a mentor and mentee-network,
  (mentors are experts in the fields of sciences and engineering, or their alumni).
- Provide second education for experiences and thinking
- Promote scientific awareness
- Guide into scientist and engineers
- Establish wide relation

2.2 Activity contents

- Mentoring between mentor and mentee
- Camp with play and magic
- Cyber interview through internet
- Enhancement of experiences: Open Laboratory, moving science school, visiting institute, small group meeting, open conference
- Program using regional industry: ocean-related experiences and fisheries by visiting related institutes.
- Career development program by life cycle education

3. The Programs for Young Students

3.1 With Science Magic

Lee (2005) mentioned the relationship between magic and science as follows. “Science was magic before it became well known to the general public. Magic will make a good means of arousing children's curiosity and ingenuity about science under the present conditions that children lose interest in science to the general public.”

While children are watching the magic performance, an unforeseen occurrence happens in their presence, and they have fun and raise doubts, 'How does it happen?' In contrast to most foreigners who just enjoy watching the magic, Koreans have a tendency to pump principle out of a person. So, children raise doubts through the magic and they study science and grow in originality by inferring the reason from their opinion and verifying from tests. Magic is a more effective way than hearing a simple explanation about a principle or making an experiment in scientific education, because they have time to think by themselves prior to solving the problem.

Science magic needs a combination of principles of science and magical performance or special effects which can explain a principle of science even though it doesn’t have a principle of science. There are many kinds of science magic. For example, domestic science magic, mental magic, chemical magic, story magic, etc. Science magic also has the possibility of child development. Through science magic, very young students of Kids-Moms class (Fig.1) enjoyed science as a play and magic. We will continue to develop science magics for Kids and adults. The main idea for promotion is attending of the mentees in the magic show.

Figure 1. Magic class for Kids-Moms class.

3.2 Kids - Moms class

Young elementary school students are important resources of the future. And their parents want to play a role as a good supporter. Moms also have a role as guide for transportation. A continual mentoring program (also known as ‘Kids-Moms Class’) is made for Kids and Moms (Fig.2). This program aimed to promote scientific awareness through opening of their ideas. To continuously supply the scientific awareness and knowledge, this class has been held every week. Actually peer-group mentoring occurred among themselves via long-term relationship.

Figure 2. Kid-Mom class. Mothers join to do an experiment.

The Kid-Moms class takes a 6-month course and progresses by simple lectures and experiments in a variety of science fields including earth science, physics, chemistry and biology with mentors. Here mentors continously attend class to make a close relationship, because trust is very important for making a relationship. In Kids-Moms class, the most important thing is writing a report and presenting their experiment results.

The scientific camp, which was one of the most interesting experiences was held during the vacation period. It aroused students' interest in science and, at the same time, helped students to develop independency by being away from their parents. Figure 3 shows the photo of the Kimchi (Korean traditional food) institute and meteorological observatory visit. The Moms and Kids tend to prefer an experience program such as visits and making things.

The Kids-Moms class is mainly operated in a university laboratory. As a special class, a field trip including 'ecosystem field trip', 'Kim-Chi research institute field trip', 'high-tech experience tour', etc. and meeting with scientists offered every month. This program provides a lot of opportunities for an experiencing a variety of cultures and a good education. Eventually we hope to implant scientific awareness as scientist and engineers. In these participants

Figure 3. Kids-Moms class visiting program to the Kimchi institute and meteorological observatory.

In the Kids-Moms class, we activate scientific awareness and motivate an interest of science to students who are important resources of the future. Through parents' as well as students’s participants, the importance of technology and the fact that development of technology is fundamental for the future were informed to the general public.

3.3 Camps Using Mentor Networking

Through the networking of Busan-Kyungnam branch of the Korean association of women scientist and engineers(KWSE-BK), BWSE and the X-science team, a joint camp program was prepared for children and mothers. In the Busan center of the Korea Basic Research Institute, the X-science program was launched in 2004. This program was made with the intention of three “EX” parts of “experience, experiment and expert ”. The X-science program for Public Understanding of Science and Technology started in 2004. This program intends to contribute to the public understanding of science and technology by developing various participation programs and providing them to teachers, users and other public as well as students. The participants have gradually increased since 2004 as a result of the

positive public relations and functions of the team and by the connections with educational counter partners. One of the interesting events is the on-line program using micro imaging with the Scanning Electron Microscope for the nano-materials, which is conducted with the mentee's personal computer. Teachers also want to use on-line programs in their classes to have more opportunities connecting to such expensive devices.

Figure 4. A joint camp of "playing with Science"

4. The Programs for University Women Students

4.1 Backgrounds and Objectives

The primary aims for the program involving female university students tend to be career-related. Students of higher education have reached a higher level of academic attainment, while their view tends to be narrow due to specific major education. In many universities, female students are far behind male students in terms of job opportunities even though their grades are better. The women professors act as role models and show what can be achieved through application at university.

4.2 Three-Track Career Development Program

In relation to the university promotion programs, we made a career development program called the "Three-Track Career Development Program" for female university students in science and engineering school. One of the schemes of this Three-Track Career Development program was applied to female students at Pusan National University, who attended a class titled 'Women and Occupation'. The first of the three tracks is the inquiry stage. First of all, all students take a vocational aptitude test. Then, students attend invited lectures of successful career women who currently work from various sectors. After talking this class students must attend a second program for job ability promotion. This class includes topics such as awareness of job, preparing for job, and related skills. Skills for job at the second stage involve presentations, discussions, language and compute-based skills. The final track is the practicing process for job interview and writing up a good resume and personal biography.

Table 1. Program for the prior and the first track of career development program of 2nd semester, 2003 for PNU women students.

Program	title	lecturer
Prior test	A vocational aptitude test	Education expert
≪**The first track**≫	Career development in foreign company	Director of Intel Korea

Enhancement of Job awareness	Large enterprise	Head hunter
	newspaperwomen	Kookje newspaperwomen
	Media artist	artist
	Administrator in science & technology	Officer in minister of science and technology
	Government employee	An office women of Busan City Gov.
	Bioinformatics	biologist

Same as in Table except for the second track.

Program	title	lecturer
≪**The second track**≫ Promotion of basic ability for job	Presentation skill	Director in training, company
	Communication skill	Communication expert
	Best way to select job	Ph.D. in education engineering
	Leadership skill	Director in a large company
	Human relation improvement skill	Director in company

Table 3. Same as in Table except for the third track.

Program	title	lecturer
≪**The third track**≫ Improvement of actual employment skill	Writing resume	expert
	Essay	Director
	Image making	Beauty artist
	Actual interview	Expert

5. Summary

In Busan, the BWSE was designed as a city-run program since 2003. We prepared a life-cycle related program for very young students of elementary school to female university students. The most successful program was the Kids-Moms class for students of grade 4th and above with their mothers. The key reason for success tends to be the continual program because mentoring was established with mentor's scientific awareness as well as scientific contents. Also the early promotion program might be good for scientific awareness education.

The BWSE developed programs for women career development according to life cycle from young girls to university students. The most important thing might be the relationship between mentor and the mentee to give a trust. So we suggest an education program for mentor's awareness and scientific communicator, which is strongly required in undergraduate and graduate school programs of the university level.

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