ACTIVITY TRENDS OF COMMUNICATING WITH NATURE IN NATIONAL SCIENCE MUSEUM OF KOREA: A KOREAN CASE STUDY

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Abstract

This research is a case study based on a program entitled "Exploring the Nature" to analyze trends of science communicating programs in National Science Museum of Korea. This activity has been prepared for elementary and middle school students, accompanied by parents from 1994 to enhance interesting and understanding about nature. From 1991 to 2005, this program was operated on 138 times and 11,040 students were educated. The fifteen-year period was divided into the stages I (1991~1993), II (1994~1997) and III (1998~2005) based on relative activities such as operating times and educated students. The number of students educated annually in the stages I, II, and III averages 0, 370, and 1,194, respectively, which shows a marked increase in quantity during the period. The program was provided only in summer and winter vacations in early stage. But from 1999, the program has been also run in 1st and 2nd academic terms, and operated throughout the year from 2002. The contents of the program were composed of birds, insects and fishes in the beginning but gradually extended to the plants, seas, fossils, and cave. This implies that the role of the Science Museum is extended to support school education by giving youth such an experience, which is useful in training and promoting their ability of scientific thinking and mind.

Keywords: Exploring the Nature, Science communicating programs, National Science Museum, Korea

1. Introduction

Recently, Korea is going through severe socio-cultural phenomenon, which shows that the rate of applications for the universities of science and engineering is sharply being reduced after high school students graduated. Such phenomenon is caused by disinterest in science and poor treatment about scientists in Korea society in process of structure modification in society and enterprises due to foreign exchange crisis (IMF crisis). Besides, there are many factors that make them evade science and engineering in Korea. But, of them, the basic cause is that scientific education in school is not working well. That is, students do not have enough opportunity to experience and enjoy the usefulness and pleasure of science and technology by themselves. They are inclined to think science is 'too complicated and difficult' or 'too boring and so the subject to evade'. Thus, they do not want to enter the universities of science and engineering.

Fortunately, there are positive endeavors in our society to popularize science and technology and expand scientific culture. Also, to solve causes of that evasive environment, various solutions are presented. As one of solutions, a program to increase class achievements of students, and interest and understanding about the field of science and engineering is presented. It aims at enforcing the education of science experiment in middle and high schools, holding such events as science camp and scientific festival and giving educational courses related to science all together. Besides, the motivating programs are planning to produce for female students because they have not inclined to study natural science relatively, compared to male students.

Observation-centered learning and science experiment activities, effective methods of solutions for evasive environments, are presented to further scientific creativity [3],[4]. Scientific creativity is produced in concrete science experiment activities. And, thus, to develop it, abstract and theoretical contents as well as real phenomena in nature should be thought of simultaneously [1], and 'field education' such as field investigation, class and experiment activities, and workplace activities become very important.

Science museum is a place where all people, regardless of age and sex, are able to experience and understand science technology, and, moreover, to increase scientific knowledge, and to create sound science culture. In doing so, science museum performs a variety of exhibitions and research, and also implements learning activities. National Science Museum has carried out various science research programs to increase their scientific observation and thought ability and to help them understand the principles of science on the basis of the performance of museum's educational function. For instance, such programs as Exploring the Nature, Research Association of Natural History, Research Group of Scientific and Cultural Assets, Celestial Science Class, and Trip to Constellations on Weekends are being operated now. In this paper, trends of science communicating programs, which have been operated since National Science Museum was opened in October in 1990, will be analyzed

2. A Case Study: A Program Entitled 'Exploring the Nature'

Observation and experience about natural phenomena and things in Nature as an object for science provides the opportunity to have nature-friendly thought of nature. And also they give a new way of living and idea in harmony with nature by making us think of the importance of it and understand that human beings are a part of nature. Besides, respect and impression on nature influence on the course of science, or, otherwise, they are formed as unforgettable memories in life [2].

Since 1994, National Science Museum has carried out a program titled 'Exploring the Nature' with intention of helping adolescents have an interest in nature and understand it, creating and strengthening scientific creativity, and supporting theoretical education of science in class.

This paper is a case study, which aims at analyzing trends of science communicating programs of National Science Museum that were operated from 1991 to 2005. So, as one of analysis cases, a program called 'Exploring the Nature' was analyzed. For fifteen years, they were operated 138 times and 8,878 students in total were educated. Operation number of the programs and the number of participants was shown in the table 1 below according to the unit of the year.

Table 1. The frequency of the program of operation and the number of students educated by years.

Year	Number of operation	Number of participants
1991	0	0
1992	0	0
1993	0	0
1994	4	160
1995	6	390
1996	5	400
1997	7	530
1998	15	978
1999	14	930
2000	22	1,400
2001	16	1,407
2002	13	1,693
2003	12	990
2004	12	786
2005	12	1,364

3. The Frequency of Operation of the Program entitled 'Exploring the Nature' by Years and Increase of the participants

The frequency of operation of the program titled 'exploring the Nature' has been increased over the past fifteen years as a whole (Table 1). The program was operated four times in 1994, the first year, and, since 1998, has been carried out more than 15 times each year. The fifteen-year period was divided into three stages in order to look into operation and education condition.

3.1. Stage I (1991-1993)

The stage I come to the three-year period (from the opening of National Science Museum to the year of 1993). In this stage, only science programs such as open science class, construction science class were operated, but the program called 'Exploring the Nature' wasn't.

3.2. Stage II (1994-1997)

The stage II comes to the four-year period (from 1994 to 1997). From this period, the frequency of operation of the program and the number of students educated were gradually increased. The total frequency of operation came to 22times for four years, and thus its average was 5.5 times. The number of students educated was 1,480 persons. So its average number came to 370 persons.

According to the analysis of the contents of the program, the program was operated in summer and winter vacations only. During this period, the number of experience in each subject of the program and the number of students educated are shown in the table 2. Its contents were mostly composed of the field of birds, and fishes and insects partly. In case of birds, the percentage of the number of students educated was relatively lower than the percentage of the total number of education, while, in case of the seas and plants, the percentage of participation in each field was relatively higher. However, the operation time and experience subjects were restricted at that time.

Table 2. The frequency of education, number of students educated, relative percentage to each subject during the second period.

Field	Number of operation	Percentage of the total number of education in each field	Number of participants	Percentage of participation in each field
Birds	9	41	520	36
Fishes	3	14	200	14
Insects	3	14	200	14
Seas	2	9	190	13
Plants	2	9	160	13
Fossils	1	5	40	3
Constellations	1	5	40	3
General subjects	1	5	130	3

3.3. Stage III (1998-2005)

Stage III consists of 8 years from 1998 to 2005. This period showed a marked increase in both the frequency of operation and number of students educated. From 1998 to 2005, the frequency of operation came to 116 times in total and thus its average was 15 times. Also, 9,548 students were educated. And the average number was 1,194 persons.

According to the analysis of the contents, the program was provided only in summer and winter vacations in 1998. But from 1999, it was also was run in 1st and 2nd academic terms, and operated throughout the year from 2001. During this period, the number of experience in each subject of the program and the number of students educated are shown in the table 3. Mostly, participants participated in the fields such as birds, plants, and fossils. The percentage of participation in each subject was relatively higher, compared with that of participation in general subjects. Compared with stage II, there was no change in the frequency of experience in the field of birds, but the activities of experience in the fields of plants and fossils began in earnest.

Table 3. The frequency of education, number of students educated, relative percentage to each subject during the third period.

Field	Number of operation	Percentage of the total number of education in each field	Number of participants	Percentage of participants in each field
Birds	31	27	2,519	26
Plants	22	19	1,522	16
Fossils	21	18	1,600	17
Insects	16	14	1,082	11
Fishes	12	10	888	9
Seas	10	9	667	7
Constellations	1	1	86	1
Caves	1	1	260	3
General subject	2	2	924	10

4. A Survey on the Activities of 'Exploring the Nature'

To complete this survey, the questionnaires were given to all participants of the program to research and analyze the actual condition of the activities of the program operated. The results of it will be used to run the observation and investigation activities of National Science Museum more effectively during the period of program.

4.1. A method of Study

As a method of study used in this paper, questionnaires were sent to all the elementary school students by email and also returned back by email. The research term comes to 2 months from September to October in 2004. The number of elementary school students who belonged to the program is 787 persons in total. The questionnaires were given to all of them, but the rate of response is only about 11 percent because 86 persons of them answered the questionnaires.

Nevertheless, it is thought that it is used enough to the basis of materials for the performance of the programs. The question paper consists of 23 questions, which are all related to the condition of the respondents, their experience in classes before participation in the program, their registration for the program, students' inclination, program operation, and relation between the program and school class.

4.2. A Result of Analysis

The respondents, who answered the questionnaires, consist of 51 male students (59%) and 27 female students (27%). And there were 8 persons (9%) not answered. The rate of students, who participated in prior science programs, run by Research Institute of Education and Science, YMCA, and Natural Environment Studying Institute, not National Science Museum, came to 16 percent. The analysis of the contents of questions due to sex was not implemented because of the lack of the number of students.

4.3. Registration of Students for the Program

According to the result of analysis of question that how are they heard of the activities of the program?, 77% of the respondents answered they were heard about the program by their parents. Other respondents replied that they knew it through mass media like newspaper and broadcasting, and internet. According to the result of analysis of question that how are their parents heard of it?, it was answered that 50% of them were heard of it by on-line media like internet and 30% of them knew it through their friends or neighborhood. According to the result of analysis of question that when do they register in that program?, 40% of them replied that they registered in 2004, and 26% of them in 2003. To sum up, the above questions shows that most students joined that program by their parents, who experienced it first, and the rate of response by the respondents, who registered that program recently, was higher.

4.4. Student's Inclination

According to the result of analysis of their inclination about questions, they themselves answered that they were inclined to participate in the subject several times if they really liked it (49% of them), or if they really wanted to know it more correctly (38%). Also, from the result of the question about which subjects do you like most?, we could know that they liked Nature first (40%) and lively lifestyle(26%) second. These questions showed that many students were inclined to join that program repeatedly according as the frequency of their participation in it was more than 5 times. Consequently, this item showed that students who already liked the subject of nature were likely to take a part in that program again.

4.5. Program Operation

The present program, 'Exploring the Nature' starts at Sunday, 09:00 a.m. and finishes at 18:00 p.m. that day. 66% of students were satisfied with the operating time of the program when they were asked whether it was reasonable or not. 26% of them answered average when they were asked the same question. And whenever they had a question about something related to that program while they were in the program, they directly questioned their teachers (64%) or their parents (24%) on it. The most interesting subjects that students liked were fossils (28%), fishes (27%), insects (17%), and birds (15%) in order. The subjects that students want to add were 'exploring caves', 'observing the animals', and 'observing constellations'. About the question that how many times is the frequency of operation going to be held?, 68% of students answered that one time a month was good, and thus 12 times was reasonable for a year. 24% of them said average. Therefore, this survey showed that most students were satisfied with the operating time and the frequency of operation and they had a positive attitude in that they asked questions about something by themselves while being participated in the program (88%). This result proved that this kind of study was not possible to be found.

4.6. Relation between the Program and School Class

According to the result of analysis of the question that what were the different points when experience activities of the program were compared with those of school class?, 77% of students answered that the program was unique in a way that it gave them interesting experiences that school classes could not provide. But 56% of them replied that the contents of the program were almost similar to ones of school's program. Also, 69% of them thought that participation in the program by National Science Museum was helpful to school class because they had an opportunity to observe and quest the theoretical contents that they studied in class directly, so that the program was memorable, and the program is so satisfactory because it gave them enough time and detailed explanation to understand and observe. Consequently, most students believed that the activities of the program were different from those of school class, which taught only theoretical aspects, a closely associative relation between the program, and school education existed, and direct participation in field experience was very productive in school education.

5. Summary

Scientific creativity can be developed in many ways. National Science Museum has developed and operated various kinds of science communicating programs associative with school class activities in order to develop and increase scientific creativity. In this paper, the trends of science communicating programs were analyzed through the program called 'Exploring the Nature' run by National Science Museum. As a result, this program shows a remarkable increase in quantity and quality for over 15 years. There are many factors that make it possible to succeed in operating

the program. First, it is a family-oriented program; so all family members can enjoy it on weekends. Second, it provides students with an opportunity to observe and study nature of their own, so it results in stimulating their curiosity and pleasure. Finally, the quality and effectiveness of the program is very good because both human resources and material resources of National Science Museum has operated it

On basis of this successful operation of it, National Science Museum has operated Research Association of Natural History for science teachers and adults since 2001 for the purpose of networking the systems related to "Exploring the Nature" all over the country and raising leaders by making them learn the method of field experience and the truth in nature, who are able to lead students.

Therefore, through operation of science communicating programs like a program titled 'Exploring the Nature' the role of National Science Museum is extended to support science education in class theoretically and promote students' ability of scientific thinking and mind, not just take a passive role which should display exhibits only.

6. References

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