

PLAN FOR MANAGEMENT AND GROWTH OF GWANGJU REGIONAL SCIENCE CENTER

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Abstract

The Regional Science Center Project supported by The Korea Science Foundation in accordance with the 2004 <Science Korea> movement has three objectives: 1. To make it possible for all people to experience and enjoy science in their everyday life 2. To promote interest and learning in science among young people and motivate them to go into fields in science and engineering 3. To spread the grass-root level scientific culture and contribute to nation's science and technology development

Gwangju Regional Science Center started off in November 2004; classes in mathematics and science were held once a week, first in four resident-operated social centers, and now, in ten resident-operated social centers and in two welfare facilities. Every 6 month we invite all the participants of the program to the University and hold classes that concerns timely and costly experiments which could not be covered during regular sessions. Our program is distinguished from the programs in other Regional Science Centers with our focus in mathematical as well as scientific experiments and highly qualified lecturers. In response of requests for more classes, we attempt to conduct research on future management of the Center and ways of maximizing the effect of our program.

1. Gwang-ju Regional Science Center – Introduction

(1) Center Initiative

The establishment of the Gwang-ju regional science center was supported by the Korea Science Foundation with the initiation of the 2004 <Science Korea> movement. To make it possible for all people to experience and enjoy science in their everyday life and to promote interest and learning among young people, the center offers classes in 11 sub-district offices and 1 welfare center.

(2) Organizational Structure

Gwangju Regional Science Center is supported by the Korea Science Foundation and is a

subgroup of the Women in Science and Engineering (WISE) Gwang-ju Chonnam Regional Center at Chosun University. The resident-operated centers in the sub-district offices help the operation of the classes. There are 13 staff members in the science center: 1 center manager, 2 administrators, and 10 lecturers.

(3) Current Operation Status

The Regional Science Center Project supported by The Korea Science Foundation in accordance with the 2004 <Science Korea> movement has three objectives: 1. To make it possible for all people to experience and enjoy science in their everyday life 2. To promote interest and learning in science among young people and motivate them to go into fields in science and engineering 3. To spread the grass-root level scientific culture and contribute to nation's science and technology development

The foremost objective of the Center is to reach out to the residents and give them an opportunity to experience science in a more direct manner. Learning the principles of the nature through carefully devised experiments, one will be able to enhance their thinking abilities and become interested enough to pursue the various topics in the sciences in their future stages in life.

The science classes offered as a part of the 'Outreach for the Needed' program strives to close the learning gaps among the children from various income levels, and provides an opportunity for socially neglected children to have a chance to experience how interesting science could be.

Besides the regular classes offered every week, the center also provides special programs with various scientific experiments that could not be covered due to spatial and equipment limitations. The university (Chosun University) hosts Children's Science-Fest to the participants twice a year and conducts a separate course for the mothers as well.

Regular workshops and meetings are held for the lecturers and teaching assistants to develop new programs and share the experiences and knowledge in proceeding with the experiments. A lot of suggestions on class organization and management in general are made in the meetings as well; it works as an open ground to talk about the current status of the center and discuss further improvements of the Center.

2. Operation of the Gwangju Regional Science Center

(1) Science Class at the sub-district offices

Classes at the sub-district offices are offered once a week, and each term runs for 2 months. Every term provides different programs, so students who have participated in previous sessions can enroll again. For convenience of the students, before each term is over, the students and their parents are provided with an application form and an outline with the programs that will be provided in the following term. All 11 sub-district offices follow the same schedule, which allows the lecturers and assistants to plan the classes together and share their experiences. An evaluation of

each term is done before the next term commences.

(2) Current status of the science classes at the sub-district offices

Since October 16th, 2004, classes have been held every week at 11 sub-district offices and 1 welfare center. The places that offer classes are as below.

Dong	Average number of students	dong	Average number of students
Munheung2dong	25	Punghyangdong	20
Hwajung4dong	30	Hakoondong	15
Ochi2dong	20	Jungangdong	15
Chumdan2dong	25	Oonam3dong	6
Oonam1dong	15	Sungbin girl's house	20
Chumdan1dong	30	Chung-hyodong	20

The classes held in the various sub-district offices have been getting a highly positive feedback from the students and their parents. Classes offered at the Sung-bin House for Girls are also being welcomed by the students and the management of the facility: it works well with the overall motivation of the facility, which tries to offer the girls of the education and care they need.

(2) Status of the 'Science Classes for the Needed'

The Gwangju regional science center also offers classes at the Mu-deung Childcare center that takes care of parentless children, and children from the low-income families and single-parent families. Social workers and volunteers help the lecturers in conducting various experiments. Distracted and uninterested children are gradually showing enthusiasm in science and mathematics, and once passive children are voluntarily participating in the programs.

(3) Special Program Status

A. The 1st Children's Science-Fest

Date	May 28th, 2005
Place	The Grand auditorium at the Natural Science Building, Chosun University
Number of participants	250 (kindergarten and primary school students and their parents)
Topic	Playing with the Kaleidoscope, making my own celestial sphere
Special performance	Science no-rae-bang (Club at the WISE Gwangju Chonnam Regional center at Chosun University)

Since the venue and equipments for the science classes held in the sub-district offices are not enough for certain experiments, the Center provided a Science-Fest to offer such sessions and to advertise its existence to the local residents. According to the survey conducted after the Science-Fest, almost all of the students' sense of belonging to the Science center has increased and made them fonder of the sciences in general.

B. The 2nd Children's Science-Fest

Time	November 26th, 2005
Place	1st floor, Natural Science Building, Chosun University
Number of participants	314 (kindergarten, primary students and their parents)
Topic	Making a soccer ball, Science in 'dalgona', Making a Top, optical illusions, mini-volcano

Through various advertisements in the webpages of the local media and district offices, students residing in areas where no current Science classes are offered participated. At this Science-Fest, students were divided into several groups and experienced all five topics using both the traditional class method and the booth method. This helped to operate the entire program smoothly that could have been crowded and disorganized because of the large number of children participating.

The text exclusively made for this program drew a huge positive response from the participants and their parents. According to the survey at the end of the program, and the Center's own evaluation, the best feature about this Science-Fest was that the whole program proceeded in a well-organized manner based on the different manuals provided to the students, lecturers, teaching assistants, and the parents. Parents that accompanied their children to the Science-Fest were introduced to the Science Classes and were provided a chance to participate in the experiments by themselves without their children, which according to the survey, have rekindled the sense of wonder that they had about the nature when they were young.

C. Outreach at the Childcare Centers in the Summer

participants	Children at the moo-deung child-care center, Sung-bin girls Dormitory, and Gwangju Il-mak-won
Time period	7/28 , 8/8 ~ 8/12

Since the Science Classes for the Needed is only offered once a month at the moo-deung childcare center, we have selected three welfare centers that we could visit during the summer. The

negative response from the children when they first heard the phrase ‘experiencing science’ dissipated after a week of classes. The lecturers who participated in the program have reported to have learned a lot throughout the experience and watch them change. At least two sessions were held in the summer at the three welfare centers and Science Classes are still regularly offered at the Mu-deung Childcare and Sungbin House for Girls.

(4) Lecturers and programs

A. Lecturers in Gwangju

The WISE Gwangju Chonnam Regional Center is in charge of recruiting and supporting the lecturers of the Science Classes. Women with at least a Masters degree in science and engineering with recommendation from their professors are eligible to apply. The candidates should be willing to practice science in their daily lives and should love to volunteer. Lecturers are divided into two fields, mathematics and science. To standardize various classes among each sub-districts, before a new term commences, lecturers get together to plan, prepare, and discuss the programs beforehand. Two lecturers - one in mathematics and the other in sciences – are assigned to each sub-district (dong) and take turn to give lectures. There was a communication problem between the sub-district office and the Science Center at first because the lecturers would alternate in going to the office - we solved the problem by selecting a representative lecturer.

Since for almost a year the lecturers have been preparing material with others, their expertise in the other field has increased and now one lecturer covers each sub-district by oneself. They function as the bridge between the management facility and the sub-district office, focusing on their roles as teachers and also advertisers the program to the local residents.

The lecturer writes a session report after each session ends and evaluate the enthusiasm and responses from the participants. Then in the following meeting they and share the facts with other lecturers and administrators of the Center. This is now being done through a website, and checking attendances and writing notes on experiments can be done online as well.

B. Program Development

Most of the contents used in the Gwangju regional science center were developed based on the programs provided by the Korea Science Foundation. Various science books for children were also drawn on to develop interesting curriculum.

The text developed to accompany the program is distributed to the students before the actual class commences. All the lecturers share the program contents with the others and follow the same schedule. Certain modification would take place depending under special circumstances. We are putting extra effort to teach the fundamental principles and methods of experiments tailored to the various levels of students.

For example, in case of learning about the atomic structure of carbons and polyhedrons, we first demonstrate it by making soccer-balls with balloons and papers only. Through the pentomino game that people can encounter easily, we introduce monomino, domino, tromino, tetramino, and pentomino peaces and learn to make them using styrofoam or paper.

Since it is hard for primary school students to draw and make the polyhedron just by observing it, we provide tracing paper to help making the strips. If it is impossible to finish within the time limits, the lecturers would prepare the material so that the class understands the principles and can jump right in to the essential steps of the process.

3. Future goals of the science center

We believe that the Science Classes are contributing in enhancing the interests and understanding of the local residents and children in the nature and the science in general. They have started to learn the excitement of approaching and understanding a phenomenon through careful observation and experiment.

Since the 'science classes for the needed' focuses especially on minimizing the gap among the children from various income levels, we should offer it more often and provide it once a week - it is currently once a month. Moreover, by engaging more sub-districts and welfare centers, jobs could be created for women in degrees in science and engineering. The science center project is one of the first projects of the Korea Science Foundation that links the university and the community. Having this as a benchmark, we will be able to build a common ground that links various programs offered by the ministry of welfare and health, the ministry of education, and the ministry of women. The municipal offices could provide the space, the program by the management organization (university), and funding from the Korea science foundation: it will have a huge impact on the education and safety of children and adolescents from low-income families and moreover, it will be a chance to create jobs and contribute in lowering the un-employment rate.