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The Possibilities and Limitations of Gifted Education in Korea: A Look at the ISEP Science-Gifted Education Center

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Education for gifted children is currently one of the hottest educational issues in Korea. Much money and effort are being invested in this area of education. Recent announcements by the Korean Ministry of Education state that all children should be educated to the level of which they are capable, and the current program for gifted students should be and will be extended. However, there is little attention paid to the actual substance of gifted education in Korea. What is happening in the name of gifted education? What is the meaning of giftedness and gifted education? How and in what respects can the gifted program be differentiated from general programs? What are the problems and concerns in serving gifted students? What are the effects of gifted programs? These are the main questions of the present qualitative study. For the purposes of this ethnographic study, the ISEP science gifted education center in Korea was observed for a six-month period, and 10 professors and 50 students at the ISEP were interviewed in depth. The results of the study are as follows. First of all, the ISEP science gifted education center provides differentiated learning environments and teaching methods. Second, through these differentiated learning experiences, students improve their thinking skills and creative problem solving abilities, as well as developing positive self-esteem. In addition, the formation of human net works, the special meaning of the 'gifted' label, and the acquisition of personal knowledge were seen to be some of the major educative possibilities on offer at the ISEP gifted education center. However, some professors' low levels of motivation, the absence of individualized educational plans, bureaucratic management, weak student commitment to set tasks, and a lack of opportunity for students' social activities were clearly limitations of the ISEP gifted education center. The results of this study will contribute to, specifically, the search for new ideas to improve the operation of gifted education as well as helping to surmount the hidden problems lurking beneath the surface of the current gifted education practices in Korea, and, more generally, to enhance our understanding of the diverse gifted educational practices in operation worldwide.

Key words: gifted education in Korea, science gifted education center, differentiated learning experience

Introduction

The gifted are those who have the ability to keep asking questions about phenomena that most children happen to know from natural ones to complicated ones. They strive to find the answers with their own interest and willpower. I have been too easygoing to be one of them. We might have the potential to be gifted if we possess 'the openness of an artist', 'the knowledge of a scholar', and 'the profoundness of a philosopher' and merge these traits with our passion, or at least at the very moment we attempt to do so (from fourteen-years-old RJ's note in the intensive Earth Science class).

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Education enables a person to become a better or a more desirable person, although the words 'better' or 'more desirable' might be too loaded or controversial in their implications. Gifted education, in this respect, might not accomplish its goal unless enabling a gifted student to become a more enriched one or a better gifted one. There could be versatile answers to "who is a better or who is a desirable gifted student?" and "what does a desirable gifted education look like?" as even the manifest definitions of the gifted and gifted education remain unsettled or controversial. However, we can draw some common characteristics of what constitutes desirable gifted and the better gifted education in reference to experts and the literature, and also from the voices of the participants in the actual practice of gifted education.

Gifted education is one of the hottest issues in Korea. Gifted education has emerged as one of the most rapidly developing areas of education in the 21st century, and it has been supported by both the Ministry of Science and Technology (MOST) and the Ministry of Education and Human Resources Development (MOE & HRD). These ministries have allocated a budget of billions of dollars to the projects associated with gifted education. Consequently, gifted education has been booming and also is being expanded every year. Twenty-five science-gifted education centers affiliated to universities across the country have been established since the Law of Advancement of Gifted Education was enacted in 2000. In addition, gifted education has been extensively activated while each school district office has run centers as well as classes for gifted students since 2002, and currently about the upper 4% of the entire school population is being served under the gifted education system.

In fact, gifted education in Korea began earlier than it is thought; since the early 1980's, seven years after the high school equalization policy (HSEP) took effect. At this time, not only science high schools but also special programs for able students in some ordinary high schools were facilitated, though they were not referred to nor defined as gifted education. These specialized schools and programs have aimed to offer optimal programs for each individual student, therefore, to develop each student's potential and talents to the maximum levels. This has been the main goal and responsibility of gifted education since it began.

It is worth at this point, however, to point out that very little research related to gifted education practices in Korea has been conducted. There has been very little effort to look inside gifted education. It is amatter of extreme urgency to discover what is actually going on with classroom practices in the name of gifted education as well accumulating useful information on it. Such data has been hitherto unavailable due to a dearth of research on gifted education in Korea. What is the meaning of giftedness and gifted education? How and in what respects are gifted programs to be differentiated from general education programs? What are the desirable points and inherent problems in operating a gifted education system in Korea? The present qualitative study originated from these main questions.

Very few qualitative studies scanning the intrinsic characteristics of gifted education institutes and attempting to fully understand the gifted as well as gifted education in general have been conducted in Korea. This is in contrast to many other countries (Barone, 2003; Cross, Stewart, & Coleman, 2003; Delcourt, 1994; Hertzog, 2003; Mendaglio, 2003; Neumeister & Herbert, 2003; Peine, 2003). Most of the studies so far, in fact, have overlooked the need to look deeply into gifted education practices and to discuss the meaning and function of gifted education itself, both synthetically and systematically, focusing mostly on the development of policies, systems and programs from a broad perspective. As a result, it has often been believed that gifted education contains an element of mystery to it, since the actual content, instructional methods, and opinions of the participants have been almost completely veiled. This can be considered rather endemic in that new studies following new educational approaches in other new fields are apt to continuously turn up to test the possibilities and limitations inherent in them (e.g., Woods, 1996).

In sum, the present qualitative study explores the functions and meanings, as well as the logic and practice of gifted education in Korea in order to find out its possibilities and limitations through long term observations and interviews at a university-based science-gifted education center. The results of this study will contribute to, specifically, the search for new ideas to improve the operation of gifted education as well as helping to surmount the hidden problems lurking beneath the surface of the current gifted education practices in Korea, and, more generally, to enhance our understanding of the diverse gifted educational practices in operation worldwide.

Method

One of the most fruitful approaches in seeking to understand any phenomenon is to be a part of it, to observe the distinct situation and communicate with the people inside it in regards to their problems and concerns. The present study, under this presupposition, employs an ethnographic approach. The most prominent feature of the ethnographic approach lies in the fact that the researchers are likely to be a part of the phenomena of which they intend to study while looking, listening and experiencing it themselves. Most of all, they observe the phenomena 'as they are' both in detail and more generally without any intention to manipulate or configure the findings.

Setting and Sampling

For this ethnographic study, a purposive sampling was used to select a public gifted education institute with a well-established gifted program for students. The ISEP science-gifted education center selected for the present study is a university-based science-gifted education center established in 1998 through the support of the Ministry of Science and Technology. The ISEP science-gifted education center is located in Incheon, a metropolitan area in Korea. At the request of the center, the center remains anonymous in the study, and fictitious names have been used for the professors and students. Approximately two hundred and fifty six students, from first to third grades in middle school, are currently enrolling in basic, intensive, and mentoring courses. Although students choose one of the six subject areas such as mathematics, physics, chemistry, biology, earth science, and information based on their interests, the projects dealt with in class are rather interdisciplinary in nature. Students come to the gifted education center every Saturday after school, and have lessons for three hours, from three to six. To attend the ISEP gifted education center, students were formally screened and were desinated as being gifted through the use of a combination of intellectual indicators. Teacher recommendations, academic aptitude tests in science, tests of creative problem solving abilities in math and science, in-depth interviews and scientific experiments with experts in science were considered as admission criteria. Although multiple selection criteria were used, the scores on creative problem solving tests in math and science and the results of in-depth interview were the major criteria in the process. The mean IQ scores of students attending the ISEP gifted education center was 142 using the Raven Advanced Matrix.

Procedures

To describe the actual experiences of the ISEP gifted education center in detail, a combination of ethnographic interviews and participant observation was used to gather data for this qualitative study. Along with interviews and observations of participants, a review of formal and informal documents, such as the students' records providing a clearer picture of their experiences, were examined. Specifically, observation was done for 12 weeks from May to July during the first semester, and for another 14 weeks from September to the middle of December during the second semester of 2004 (for 26 weeks in total - approximately about 80 hours). Both the method and period of observation were flexible for each class. Mathematics, physics, chemistry, and earth science classes were observed four times each (20 times in total) and the information class was observed twice. During the observation, the students and the professors chatted informally with the researcher, and none of them seemed uncomfortable with the presence of the researcher in the classroom. Thus, the researcher assumed the role of 'participant observer,' the term used to describe the researcher who enters the world of the people he or she plans to study (Bogdan & Biklen, 1982).

In addition to the participant observation, 10 professors and 50 students were interviewed in depth, and some of them were interviewed twice. These semi-structured interviews consisted of open-ended questions designed to explore a few general topics, not only to gain information directly from the participants, but also to develop insight into how they interpreted aspects of their experiences at the center. The interviews were usually performed in the classrooms and the meeting room of the center, or in researcher's office after class, most of which were done individually, but some of the interviews with the students were conducted in a group of two or three at the request of them. The interviews with the professors and 30 of the students were conducted by the researcher, and the rest of the interviews were performed by two trained graduate students under the researcher's supervision. Each interview

lasted about 30 minutes to two hours. In addition to the formal interviews addressed above, informal interviews took place in the form of chats with the professors and the students about a variety of issues related to the center during the same six-month period of time.

Data Analysis

Field notes, observation notes, and transcribed interviews were coded and analyzed according to the three-stage process proposed by Strauss and Corbin (1990). The first stage of analysis consisted of open coding, whereby all transcribed field notes and interviews were read and analyzed line by line to generate initial categories. The second stage of coding then identified consistent themes and relationships in each of the three sources: participant observations, interviews with professors and students, and document review. After these general categories emerged, each source was reviewed once more to locate additional evidence in the data. Strauss and Corbin described this process as axial coding because it involves analysis focused individually around the axis of each category. A third stage, selective coding, then compared the general themes across all sources of data, identifying much broader and more consistent themes. The inclusion of several data sources not only increased the validity of the specific findings, but also provided a comprehensive perspective of the data. At several points in the research process, member checks were used with some participants to verify or extend the researcher's understanding (Lincoln & Guba, 1985).

Findings

The Possibilities of Gifted Education at the ISEP: On 'Being Truly Gifted Education'

> I was wondering "who is gifted?" when I applied for the gifted center. I didn't have any idea why it was enrolling gifted students only in science and math areas because I thought there could be gifted students in other areas too. I was curious as to how smart one should be in order to be classified as being gifted, and one day I was granted admission. To be honest with you, I didn't believe I was a gifted student since I knew there were plenty of other students smarter than me. On the first day when I had an interview, I met my new classmates who were supposed to be 'the gifted in physics'……(omission)……I could see our progress week by week while doing experiments and being involved in discussions together every Saturday and each vacation. We were becoming more 'scientific' even though we didn't exactly know what made us like that. We were expressing ourselves more logically while doing experiments and being involved in discussions and exchanging our own ideas with each other, and we even could get a glimpse of everyone's philosophy. Therefore, around the time we finished the first year, we were good enough to come up with an appropriate answer to a new question right away. It was probably the program of the center which helped make me who I am now, but I think I was also developing and polishing my own potential while competing with other gifted peers, feeling myself sometimes better and sometimes worse than my intellectual rivals, staying up many nights to improve myself and to advance one more step than them. In the meanwhile, the whole year went by. By the end of the year, apparently we had become so different, even some of us who were not really gifted had progressed dramatically, as did I. With a passion to be better than the rest, I was always working on the advanced physics and math. My classmates won second, or even the first prize in a number of science and math contests and I became one of them. Now, I can't exactly describe what to be gifted means but I am sure all of us who have had this meaningful experience at this center are gifted. Not the gifted as described by the mass media who have incredible abilities for their age, but still, we are the 'beautiful' gifted students and the 'true' gifted minds who continuously strive to develop ourselves, competing with the others and repeatedly ask ourselves 'who is the gifted?' and 'am I one of them or at least can I be?' to overcome ourselves….. (excerpts from a note of K on the homepage of the ISEP)

Education for Thinking

Whitehead(1967) claimed that the most unproductive person in the world is the one who owns knowledge but cannot use it, like packing articles in a trunk or merely

executing intellectual minuets. According to him, the purpose of education is the acquisition of the art of utilizing knowledge to stimulate and guide students' self development, and therefore, dead knowledge, the so called inert idea, which is merely received into the mind without being utilized, tested, or thrown into fresh combinations, is not valuable in itself. His educated man has the ability to reflect ideas, to apply and connect them to a variety of experiences in real contexts. He/she also has the creativity to rearrange the learned ideas and further to create new knowledge beyond simply reproducing them. The purpose of education, which Whitehead proposes, can be applied to all education settings, but in particular, it is exactly the same as that of the ISEP gifted education center. The ultimate goal of the center is to encourage students to develop their abilities to think and to apply what they learn to the real world, and ultimately to change the pervasive idea that education is failing, and that nothing can be therefore produced by education.

The program of the ISEP gifted education center is designed to help the students come up with their own ideas, which are not judged to be right or wrong, while solving a real world problem or conducting a unique experiment. It is basically aimed to let the students learn how to think, following a process led pattern of learning. During the whole class, the students cannot but think in order to present their own results on their chosen experiment or problem. Practically no hints on either method or process of the experiment or the problem is given. In class, the teacher is rather a facilitator, a coach, and peer in the process of learning, not a provider. Students are encouraged to be autonomous, self-directed, and responsible in their learning as much as possible. In fact, this is one of the most differentiated aspects of the ISEP. In traditional classrooms, a teacher has been merely able to inculcate the procedural knowledge of how-and-what. In doing so, however, we have often lost the essence of "doing science" and have not met the needs of gifted students.

Professor Park, one of the teachers of the ISEP, argues that 'to understand something' is different from having a base of knowledge, and also 'to roughly understand' is almost the same as to understand nothing, which, however, encourages most people to believe that they truly do understand fully. According to Professor Park, the main goal of his class is to have the students realize the difference between deep understanding and shallow knowing, and become accustomed to having real scientific attitudes, all of which are not easily achieved. Note the conversation with one of Dr. Park's students as outlined below;

Researcher: "How do you think the program of the ISEP center helps you?"

JG: "As a matter of fact, it really helps. In particular, it makes me think. Now I try to think both in different ways and in depth when I meet a certain phenomenon or a problem."

HS: "I am supposed to find the right process of an experiment for myself here unlike following the teacher's instructions at school. It's more like an in-depth class with a certain subject, so now I find myself thinking at all times. I have become a better thinker here."

SM: "In my case, I have learned how to study. I feel like, now, I kind of know what I am supposed to do when I study."

SK: "Personally, I have developed the ability to approach a phenomenon in steps and to probe into the different aspects of a given phenomenon."

YC: "I have learned how to think. The program here makes me think about phenomena that I rarely thought about before."

As evidenced by the above, the students have suggested that their thinking skills, creative problem solving abilities, and scientific attitudes were the elements which developed the most through the ISEP program. The program is designed to trigger these abilities by offering a variety of intensive questions and an opportunity to think about numerous phenomena or issues that the students have never encountered before. It is also expected to provide the students with an opportunity to test certain theories and apply them to real contexts. In addition, the teachers continuously encourage the students to try to think inform a variety of possible perspectives to draw second and third possible answers, and therefore to realize that this method is an effective way to approach a problem. Professor Park in his physics class, for example, keeps asking the students questions such as "what makes you think so?" "does anybody have any other different ideas?" or "why don't we try to think aboput this issue from this perspective?" which encourages them think a lot, and about a large variety of phenomenon, from the obvious to the complex. The students

agree that they can concentrate more and better in this kind of teaching and learning context. Some students explain that they experience a so called ‘flow’ process while absorbed in this kind of learning process.

It is still quite noticeable that some students do admit that their ability to think, especially in both creative and scientific ways has developed, although not all of them do. Development of the ability to think creatively and scientifically is one of the most important tasks gifted education should pursue (Borland, 2004; Coleman, Sanders, & Cross, 1997; Tomlinson, 2002). What the students say above may prove that the superficial evaluation of the general public, that is, that gifted education may not be appropriate to develop creative problem solving abilities since it is more likely to cram advanced knowledge in an accelerated way, is fundamentally flawed.

Education for Differentiation

Definitely, a high-tech and advanced educational environment is the most differentiated aspect and at the same time the strength of the ISEP gifted education center. Actually, the reason why gifted education centers are affiliated with the universities in Korea is to utilize its human resources and latest educational equipments and facilities for more optimal educational environment. Diverse kinds of new experiments that the students can seldom experience in their regular schools are often operated at the university based ISEP gifted education center. The center offers as many opportunities for experiments as possible for the students who want to study the latest theories while operating highly advanced equipment and use scarce materials themselves at the center unlike in their regular schools where they can only see or have very limited access to such resources. Besides this, the small number of students (about 8-15 students in each class) gives each student more opportunities to join in experiments and express their own opinions. Therefore, students suggest that the ISEP center must be a good place for little budding scientists, since it a place where they can be exposed to real scientific experiences in an optimal educational environment.

Identification, curriculum, and teachers are regarded as the most critical factors in gifted education, and of all these, the teacher factor is considered the most important (Lee, Cramond, & Lee, 2004; VanTassel-Baska & Feng, 2004). The teachers who have broad knowledge and scientific minds work as effective role models to students. Related to this, one of the greatest advantages of the ISEP is that there are many teachers with years of experience and high levels of commitment to teaching gifted students. Professor Kim describes this as follows,

> Enthusiastic participation by the professors is the biggest advantage of our center, and I think it determines our competitiveness. Our center tries to have an effective management system by creating an excellent environment through the cooperation between our highly experienced professors in teaching these gifted students.

Therefore, it is no wonder the class at the ISEP is distinguished from other regular classes. During the class, students participate in in-depth discussions on one specific topic and carry out their own experiments based on these discussions. Two principles, “do not cover too many things at once” but "complete one thoroughly" are actually the initial rules the professors stick to at the center. Professors at the center never deal with too many things at any one time because it may prohibit students from thinking deeply. Sometimes students deal with one subject, such as ‘water’, for the whole semester.

However, students have suggested that the program of the center does not really help to gain better grades at school, as it is form of study quite distant from that of their school in terms of both content and method. As a matter of fact, some students give up the gifted education centers for the very reason that the program does not help them get better grades at school. At one point, the percentage of students who quit gifted education centers for the reasons above was high enough to be reported in the newspapers. As a result, some parents were concerned and have asked to rearrange the program for their children to improve their school grades, however, the professors at the gifted education centers stood up for their beliefs and ideas. Related to this issue, an interview with a student in a physics class revealed the following:

> To be honest with you, the program of the center does not really help to improve my school grade, but it does help in other ways. You know physics is based on formulas, and I can somewhat more easily approach them since I have already learned how to infer from

them at the center. Besides this, I can also study one subject in depth through experiments and also apply it by discussing with the other classmates. I think I am getting much more precious things here at the ISEP that cannot be comparable to school grades.

Education for Confidence

Confidence is one of the most essential virtues that our children should possess. Researchers of gifted education emphasize the social and emotional needs of improving gifted children's self-esteem (Silverman, 1994). In fact, some gifted students tend to develop negative perceptions about themselves together with a lack of intellectual challenges, social maladjustment, inappropriate self concepts, and so on. Gifted students who show tendencies of under-achievement can have even more serious difficulties with social and emotional problems.

In this respect, the ISEP gifted education center is more than a place that delivers knowledge. Students seem to develop more confidence and positive self esteem as well as intellectual challenge through their experiences at the center. JJ in Physic class has mentioned that 'finding who she is, knowing there are others just like her, and accepting that it's ok to be just herself have been the most important learning experience at the center.'

Through the experiences at the gifted education center, some of the students who used to think they were the best and show off their top grades at school become modest while competing with their intellectual rivals. While having opportunities to be educated at their intellectual level, to work with other gifted students, and to think seriously about who they are, what they know, and why they study and so on, students at the center form appropriate and healthy self concepts in a natural way. MK in intensive Physics class remarked thus:

> The program makes me feel more confident about myself. The facts that I learn from such intelligent professors and the fact that I can answer to the professors' difficult questions gives me some kind of confidence. Besides this, the fact that I am the only one who got admission to at the gifted education center out of thousands of students in my school makes me feel pride. Sometimes I find the positive side of myself when I find myself staying up several nights working on the challenging ISEP assignment. The students here can discuss and share a lot of things with me unlike the students from school. There are so many great peers who encourage me to study harder and who bring up intelligent conversations in the area of science. Besides this, we can help each other prepare for the competitions together, thus I feel like we are in the same team supporting each other, which I have never felt with my classmates at school. I can't forget the night when I had an intense debate with my ISEP peers on one specific question in physics for the KYST (Korean Young Scientists' Tournament). It was such a great experience.

Education for Networking

The formation of human networks is definitely one of the biggest advantages students can benefit from at the ISEP. While getting together with other students of similar ability and interest, students exchange a lot of useful information related to their studies, find their own effective ways of studying through observation of and competition with rivals, and most of all, stimulate and challenge each other to satisfy their intellectual desires. Sometimes interaction with the same age peers, especially those of similar intellectual ability and interest, can be more educational than that with teachers (Borland, 2004; Silverman, 1994). Having conversations with other students outside classrooms, both in personal and academic matters, becomes also a natural way of studying. In addition to the classmates at the center, professors and graduate students of the university based ISEP center are great human resources for the students, providing useful advice, mostly academic, and sometimes on practical matters, such as career choice. The relationships with peers and professors at the center are more likely to be long term, which is connected to high schools and university levels after the completion of the whole course at the ISEP gifted education center. JK, one graduate of the ISEP center, expresses what he thinks about this:

> I did learn from the other students. Actually, when they solved the problem, which I did not even get the hint of, I was really stimulated. Here at the ISEP, I met a lot of people who helped me both in and outside of class. Most of all, I made friends with peers of similar intelligence, achievement, interest, and motivation

whom I hardly met at my regular school. Since many of us shared common interests and visions, we often met outside of the center, such as at science contests and competitions. After the graduation of the center, about half of my peers from the center entered the A Science Academy, a specialized high school in Science. At the A Science Academy, I was also lucky to work with familiar professors whom I have known through the ISEP for the Research and Education Project. I believe the people that I have known at the ISEP will be great assets for my future.

Education for Future Plans and Careers

Gifted students are different from non-gifted students in many ways. But above all, gifted students are mostly differentiated in that they do have definite future goals and specific plans to pursue them. Compared to non-gifted students, gifted ones think much more seriously and early on about "who am I?" or "what should I do for the future?" Of course, diverse and unique experiences at the gifted education center help them to make careful considerations about their future plans and careers.

At the ISEP center, students are exposed to a variety of topics in the basic course, then they experience more advanced subjects and projects in the intensive course, and finally, they can work with professors as research assistants or as team members of real research projects at the mentoring stage. Through these experiences at the ISEP, students have good opportunities to find out whether they are really interested in the area of science and to decide whether they should keep studying science for their future careers. In the middle of the process, the professors work as a catalyst and as a role model. It is not surprising that the scientist-professors can be role models for the students who want to be future scientists. RJ in physics class indicates this as follows,

> Studying with the professors at the center, I realized that I wanted to be a scientist just like them, and that is the reason why I went to the A Science Academy. Now I am certain about what I want to be and do in the future.

Apparently, the programs and experiences of the ISEP center at least inspire the students and initiate their interests in science. Most of the students agree that they can get to study science with greater enthusiasm and interest, which surely enables them to approach science with ease. Despite some public criticism that the program of gifted education institutes is designed to focus on not developing giftedness but identifying the gifted, the interviews with students indicate that the program at the center does help students identify and develop their interests and giftedness in the area of science. At least we can assume that the gifted education center has accomplished one of the goals of gifted education, which is to encourage the students to major in the area of basic science and engineering. SY in chemistry class spoke on this as follows,

> Here I can actually discover whether I am science-gifted myself. I have several dreams so I change my future plans from time to time, which sometimes makes me quite confused. However, I am really thankful to have opportunities to think about what I am really good at and what I really want to do through real experiences here.

Professor Lee, in chemistry class, often emphasizes the point "no enthusiasm, no achievement." He says to the students "you should have strong enthusiasm to be better than the others. Be enthusiastic to be successful. There is nothing you can not achieve out there in the world with strong enthusiasm." In fact, what he says is linked to the motto of the ISEP gifted education center. The ultimate goal of the ISEP lies in that the students finally have the ability to decide what they really want to do and what they best can do and do their best to accomplish their dreams.

Education as Benefits and Advantages

The label 'gifted' definitely gives great advantages and benefits to students who are identified as the gifted. The 'gifted' label differentiates them from ordinary students. For instance, they are permitted to miss some classes at school for science events or competitions. They are mostly recommended and qualified to participate in national competitions and contests without a pre-test simply because they are enrolled at the gifted education center. In short, the 'gifted' label works as a kind of privilege for the students. Some students, therefore, want to continue to study at the center so as not to give up the advantages the 'gifted' label

provides. They also will be able to gain an extra five points if they apply for the Science Academy, which can make a big difference when competing with others. As a matter of fact, some students, who wish to stop attending the center as its program does not really help to improve the school grade, still stay there for these kinds of advantages. MJ in chemistry class describes her experience as follows:

> I like studying here because of the differentiated classes and smart classmates, but most of all, I never want to lose the priority as a gifted student at school, being an important part of most school events in science and other subjects.

Previous studies, nevertheless, have insisted that there could be also different kinds of disadvantages the 'gifted' label has like social isolation or alienation of the gifted students (Colangelo & Brower, 1987; Coleman & Cross, 2001; Cross, Stewart, & Coleman, 1993; Hershey & Oliver, 1988; Kerr, Colangelo, & Gaeth, 1988). They also showed that some gifted students sought to hide their giftedness or to make mistakes so as to better associate with ordinary students at school, otherwise, the 'gifted' label might cause them to be isolated or stigmatized. Some students at the ISEP do agree that they sometimes feel uncomfortable and more responsibility because of the ‘gifted’ label in their regular schools. At the ISEP, however, they feel much more comfortable as themselves in the group of gifted students with similar interests and abilities. There have been very few studies in Korea investigating what kind of positive or negative effects the 'gifted' label has on gifted children in social and emotional terms so far. Since the educational and cultural differences are distinct, the previous studies on the meaning of the gifted label in other countries might not be applied in the Korean situation in an appropriate way. It may be true regardless of time and place that people tend to be poorly disposed to those ‘better’ than themselves, but the meaning and function of the gifted label might be very distinct in Korean society in which academic achievements are mostly valued.

The Limitations of Gifted Education: Suggestions for Successful Implementation

The lack of willingness and motivation of some participating professors. It has already been proposed that teachers should be the most important factor in gifted education. Their beliefs and motivation cannot be over-emphasized for successful gifted education practices. Several professors at the center, however, become concerned about lowered motivation and passion of some participating professors. There is no doubt that the successful management of the center could not be guaranteed without the professors' full support and willingness to participate in educating the gifted. Professor Kim gives his opinion in relation to this issue:

> Actually, some of the classes seem inappropriate for the gifted students. I am not saying those professors are less qualified, but I am saying they are losing their motivation to improve the quality of their class. I think the professors should put more effort in preparing for the classes, to be honest with you; sometimes they just walk into class without being ready. To improve the quality of the program, we must find out ways to engage professors and to draw forth their intrinsic motivation and passion.

Teaching gifted students is a kind of ‘extra duty’ for the professors. This extra duty involves extra responsibility and takes much time developing materials for the class and teaching the gifted students. The fact that they have to work on Saturdays for the gifted class, furthermore, is another discouraging factor. Nevertheless, teaching gifted students is not counted as regular teaching or research hours by the university. The monetary compensation is not enough either. Besides this, sometimes they feel themselves not appropriately competent to teach the students owing to deficiencies in their expertise in gifted education. There is no doubt that teachers are the most important factor for the success of the program, nonetheless, there is no doubt either that teachers, not only students, should work at the optimal conditions based on mutual understanding. What Professor Lee mentioned needs attention in this respect,

> I think what teachers endeavor in educating students is invisible, but invaluable. I don't think the future of education would have any hope without teachers’ strong motivation to teach. I want to feel myself needed and important. The current system is not appropriate to draw forth participants’ intrinsic desire to teach. Staff should consider carefully the way to recover the initial passion of participating professors.

"Too Easy or Too Hard": The Different Levels of Each Student

People assume that individualization may not be necessary for the gifted class, since the gifted education is a kind of individualized education itself. Because it is a group of students with similar abilities and interests, many people assume that the individual differences would not be a big problem in this case, but this is a serious misconception. Inside the gifted class, there exists a huge individual variation. In an interview with some students, it is revealed that each of them has different ideas responding to the same class,

> Interviewer: "Would you like to tell me about the class you have just finished?"
>
> ES: "I really enjoyed it. The experiment was pretty interesting and helpful, but I wish the class could be more advanced because it is much easier than I expected. I think we should be exposed to more challenging and updated subjects."
>
> GT: "The experiments are definitely too professional. I don't think the professor is sure about our level, so he doesn't know how difficult or easy the class should be. In fact, I can't understand what the professor says at all sometimes. Most of the classes are way too difficult for me."

he students, however, come up with their own ideas to solve the problem. Each of them provides different suggestions like: covering one theory more thoroughly with a related experiment; more detailed explanation on the contents of textbooks; more specific comments on their assignments; applying more problem-based learning (PBL).

The findings show similar endemic problems in general schools in Korea, in which students' abilities or interests are considered as secondary in the name of 'equalization.' A class, after all, should be fun and meaningful for the students. The students cannot have fun if it is either too hard or too easy for them. Diverse efforts should be made to make the class fun and meaningful with new ideas and plans to meet each student's interest and ability. Many gifted students have already experienced 'educational alienation' in their regular schools. They should not go through 'educational alienation' again at the classes for the gifted because of the lack of perception on the necessity of individualized education for each individual gifted student.

Searching for Evidence: Bureaucratic Management

> Like the other parts of our society, in the area of gifted education, personally I think there is an invisible bureaucratic or even political power that manipulates the gifted education centers. I believe our center should be able to concentrate on developing itself qualitatively rather than wasting its energy to suit various bureaucratic measures, which is a numbers game. (Professor Min in chemistry class)

The government annually evaluates all gifted education centers based on outcomes and accomplishments. Since the annual evaluation tends to focus on the visible and quantitative aspects in a superficial way, such as the number of enrolling students, the number of participating professors, the ratio of students who went to the Science Academy and won the science related contests and so on, the qualitative growth of the program is likely to be overlooked. As a side effect of this form of evaluation, many experts and professors have warned that gifted educations centers are focusing on increasing the number of enrolling students rather than practically improving the quality of programs so as to receive good results from the government evaluation.

The gifted education centers have been established to supplement and reform the public education system in Korea. In order to do so, they need to guard their autonomy for creative and innovative management. Quantitative growth should not keep back the qualitative improvement in the name of evaluation. Additionally, the gifted education center should not be regarded or evaluated as the route to prestigious schools and not lose its primary goal as the place for creative teaching and a centre for learning for those with creative potential.

The Never-ending Problems of Public Education: Lowered Levels of Passion and Interest of Students

> The ability of each person cannot be equal. Some people learn new things in no time and with very little effort, but in contrast, some people need a lot more time

> even with the utmost endeavor. Without regard to how fast they are, the true winners should be those who never stop trying. People say that you can make everything possible if you never give in, which implies giftedness would not make anything possible in itself without persistence. As addressed by Ii, Su-woo in the Chosun dynasty earlier, some people cannot achieve anything as a result of their laziness even though they used to be called a genius when they were children. In his book, he praises the people like Gim, Deuk-shin, one of the historic people in Korea for his persistence in overcoming the limitation of his ability, repeating, for example, the same book hundreds of times until he could completely understand it without frustration. Lately it has not been so difficult to meet a number of remarkable geniuses around us. However, it is somewhat rare to witness intelligent people being able to achieve great things with restless endurance and persistence. (from an interview with professor Choi in mathematics class)

Teaching new knowledge and developing problem solving abilities are two important goals which gifted education centers pursue at the same time. Nevertheless, in the case where they have to opt for one of them, it should be the latter. Some of the classes at the center, unfortunately, are more inclined to provide knowledge for the students. The professors, in these unbalanced classes, defend themselves with the sensible argument that they are obliged to teach students based on the facts and knowledge, rather than big ideas, because of the lack of self-initiated participation and the interest levels of many students. Some professors argue strongly that the center should drop the under-motivated students for the more efficient and effective management of the best few students. However, some students do admit that it is hard to get motivated in the classes of the center as the programs are neither linked with their school classes nor helpful in improving their school grades, although the experiences at the center may be helpful in the long-term view. The following is what MJ in Physics class has to say on this;

> Sometimes I think I waste too much time at the center every Saturday. Actually, the travel to the center means I can hardly do anything else on Saturdays. First of all, I spend almost two hours traveling. Besides this, I can't really concentrate on the class, as I feel worried when thinking that my school classmates are working very hard on schoolwork while I'm wasting my time here. I know even though the classes here can't be really beneficial for me now, they might be so in the future. But now, I just can't stop thinking that I'm probably wasting my time here.

As presented above, gifted education shares an identical problem with public education in Korea. This problem is not as serious as is the case with public education, but it is obvious that fewer students engaged actively in the classes at the center than before. Professor Jung in the chemistry class refers to this issue in the following way:

> Let's suppose there is an assignment to make a box with a drawing. During the first a few classes, about 10 out of 12 students would do it, but now, only about between three and five students would do it. Even though I make sure that I will use their assignment next class, not many students listen to me with interest. I understand that more and more students attend other kinds of private institutes after school for better school grades and to prepare for the university entrance examination in advance. I think, therefore, it might be natural for the students to pay less attention at the gifted education center. These kinds of students can hardly motivate me as a teacher. I'm tied up with my work at the university but I'm teaching the gifted students because I thought it would be worth putting my time and effort into it. However, when I do not see any feedback from either the students or the parents, I am actually getting quite disappointed and discouraged.

There is no wonder that, first of all, unless the education system, including the university entrance exam changes to evaluate students' creative problem solving ability in appropriate ways, the issue of raising students' motivation at the center may not be fundamentally solved. The fact that some students regard the center as less important and practical for them is also a problem waiting to be solved at the motivational level. The center, in this respect, might try to link its classes with school credit hours as a substitute subject to increase the students' motivation and interest. Accepting students' ideas and requests as much as possible in deciding the curriculum and program of the

center would also be helpful in drawing forth students' intrinsic motivation. Finally, utilizing more project-based learning with interesting and practical themes can also be a solution. A project-based class is basically student-orientated in the respect that the contents and process of learning can be relatively adjustable to diverse learning needs, which in turn can possibly be used to solve the problems caused by individual variation (Han, 2004).

Lack of Social and Emotional Activities

The imbalance between academic and social-emotional activities is another limitation the center should overcome. Most activities at the center are academically oriented. The students, however, are still children who need free time and fun regardless of the fact that they are the 'gifted.' The center cannot be an interesting place for them if they have to take several classes in a row and then go back home directly without any fun activities provided from time to time. The center should be responsible for providing some free time, space, and activities for the students to build more intimate relationships with each other. In addition, some of the students are not closely connected to the professors either, which can be an obstacle to facilitate the students' vibrant participation in class. For the formation of intimate rapport between the professors and the students, the center should promote a variety of events or activities that can encourage them to work together in non-academic ways. The professors at the center also highlight the importance of formal and informal gatherings with the students as they can reinforce the students' leadership and help them develop well-rounded personalities.

According to the professors of the center, moreover, the impressive gifted students whom they still remember are not those who have more talent or competence but those who are personally, attractive with good personalities. Emphasizing the necessity of education for humanity, the professors acknowledge that gifted students cannot fully develop their ability unless they improve their personality and sociability. It is crucial that education for humanity should be regarded not just as one of many optional programs but as an inevitable factor of the education for the whole person. The weak point of discourse on issue of well-rounded education, however, starts from the fact that it is thought to be merely one of the optional elements of education. In short, the education for social and emotional growth should be absorbed through each class of the center. Although the center seeks to prompt the students to acquire a set of virtues in class such as conservation in a natural environment, compassion, courtesy, and morality, generosity, and leadership and so on, the current practice is not enough for them to perceive the importance of these virtues. Offering more opportunities to socialize with other students and professors through meaningful and fun social and emotional activities cannot be less important than the academic programs to foster whole, well-rounded gifted students.

Conclusion

It is undeniable that the students of the center are gifted although the definition of giftedness is still controversial. To determine whether they are born gifted or have become so through education can be neither manifest nor productive. To decide what to do so as to develop the ability of each gifted student, in contrast, should be the main issue now. The gifted education centers, including the ISEP observed in the present study, will be able to draw closer to truly gifted education when it offers not just the advantages of the 'gifted' label but the opportunity to reflect and develop the giftedness of their students.

In fact, there exists more potential of the gifted education center than the preceding possibilities would suggest. To the question, "what did you learn and how are you changed through the experience of the gifted education at the ISEP?" a majority of the students could not adequately describe their opinions, but they were certainly sure that they did change somewhere deep inside themselves. They would answer as follows, "well I am not sure what it is and don't know how to explain but I did learn something. I cannot explain, but I feel it deep inside of me." "While studying at the ISEP, I feel like I am really learning and realize what true learning is like, which I have never felt at school before." It might be the acquisition of 'personal knowledge', as Polany (1958) authoritatively mentions that they know more than they can describe. Though there still exist some limitations, the gifted education center observed definitely provides a break through to the students who experience a sense of educational alienation at their schools.

The current competitiveness of the ISEP gifted

education center is a reward for the decisiveness and endeavors of all the participants in accomplishing their goal, which is the realization of true gifted education. Not to lose its initial goal, the center should continue developing and reinforcing its competitiveness through greater efforts, and practice and develop for a more optimal gifted education program and environment. After all, the limitations addressed above can be overcome by doing so.

In sum, the present study has investigated the possibilities and limitations of gifted education in current Korean society, based on the observation of the ISEP gifted education center, including interviews with the students and professors there, and it has also provided some educational suggestions. There is the need for follow up studies which can follow up on the progress of the graduates of the gifted education center. What would they do after graduation? How would they evaluate the gifted education program they have experienced when they become scientists in the near future? The answers to those questions would be another useful measure to evaluate gifted education programs.

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