# TALENT DEVELOPMENT AROUND THE WORLD

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# CONTENT

## PRESENTATION

This book is a collective effort to set a platform for comparisons between our countries with the purpose to share best practices, and to foster mutual understanding of the challenges of serving gifted students. "Talent development around the world" is a cooperative international effort to better understand policies and practices in gifted education.

Distinguished scholars in the field of gifted education from different corners of the world, under the umbrella of the Templeton foundation, gathered around this project during the Wallace symposium in the United States in May 2010. This book embodies a world wide effort of a number of international scholars into a concrete publication –in English language- sponsored by the Autonomous University of Yucatan in Mexico and the Mexican Foundation for Talent Development (Aptus).

The purpose of this work is to depict various efforts made around the world in fostering and enhancing talent discovery, the development of talents and gifted education in various countries. A shared vision regarding the value of screening and servicing gifted students for the sake of a country's future transpires in every chapter.

Chapters are organized by regions of the world in an attempt to illustrate how cultural differences, views of the world and degrees of social and educational development influence screening and servicing gifted students. For example, it is clear the influence of Islam and religious matters in the Middle East, with emphasis on moral education in the gifted. From this region, a charming description about the context and culture of Saudi-Arabia and Oman illustrates the influence of Muslim practices in educating the gifted.

Focus on science education and on services such as counseling children and their parents are of paramount importance in European countries, whereas educational policies and historical milestones characterize Latin American countries. The importance of talent development in Asia is illustrated in the work of our colleagues from Korea and Vietnam. From Africa, it is clear the emerging nature of talent development and the increasing interest of these countries in identifying gifted students.

We would like to emphasize the value of talent development in a global world. We are convinced that our brightest students are a valuable asset for a country, regardless of its level of development and that a better future can be foreseeing to those countries that value and cultivate their talented kids.

In addition, as a pedagogical piece, we argue as a group, that gifted education and policies to develop talent, should abide to global ethical standards around peace, social justice, and resource exploitation in the battle against poverty. The brightest minds should foster respect for other cultures and tolerance for each other's differences, ideologies and educational practices.

We are all committed to create a global community that in peace and harmony provides a better world for the generations to come.

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Planet Earth 2013

# THE MIDDLE EAST

**CHAPTER ONE**
**Gifted Education in Saudi Arabia: A Historical Perspective**
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### Introduction
The purpose of this chapter is to provide information about the provisions for gifted and talented children in the two biggest countries in the Arabian Gulf, particularly in Saudi Arabia. As education in general and gifted education in particular play an important role in the future of children and their countries, and with the worldwide emphasis on gifted education, it is important to investigate the present situation and future trends in practices regarding major issues in the area of talent development.

### Country and People
Saudi Arabia is situated in the South East corner of Asia. It is strategically located close to the crossroads of three continents: Asia, Africa, and Europe, an important fact given that it is the world's largest oil exporter, and one of the world's largest petrochemical products producers.

This resource base has helped support transformation of what was essentially a nomadic subsistence society (approximately 70% of the

population) in a matter of seven decades, to one where the literacy rate is close to 80% (World fact book). However, its population of close to 28 million (Saudi Ministry of National Economy and Planning 2010 census, and the CIA World Fact book), of which 8.5 million are foreigners, is a young one. It is estimated that above 60% of its native population is under the age of 19, or approximately 13 million people, with school- going age children being in the range of 9 million. As a result, Saudi Arabia's expenditure on education is considered in the top fifth in the world as a proportion of GDP (6.8% of GDP), or the 28th in rank, per the CIA World Fact book.

This demographic profile, and Saudi Arabia's joining the WTO have created twin challenges in terms of development requirement and the need of creating employment and generating the skill sets, that allow Saudi Arabia to compete in an increasingly open global market. Therefore, to further reinforce the emphasis on developing the Saudi human resource in supporting development, the Kingdom embarked on a formal gifted and talented education program in 1999 (Al Nafi et al, 2000).

It can be said that there are three stages in the development of gifted Education in Saudi Arabia in the last three decades. The first stage was the development of the National Project for Identifying and Servicing the Gifted. The second was the implementation of this program and the third was the establishment of King Abdulaziz and his Companions Foundation for Giftedness and Creativity (Mawhiba).

**The Ministry of Education**
The Ministry of Education was established in 1953. It is considered to be the largest centralized educational agency in Saudi Arabia. The ministry of education's main objective is to provide general education for all students. Therefore, the ministry runs elementary, intermediate and secondary schools. Moreover, the ministry of education is responsible of policy making and planning curriculum, teacher and superintendent training, and special education.

The broad aim of education in Saudi Arabia is to satisfy the needs of the individual and the society. One of the main aims is to keep pace with the characteristics of each phase of the psychological growth of young people, helping the individual to grow spiritually, mentally, emotionally, and socially in a well-rounded way. It also studies individual differences among students in order to orient them properly and assist them to grow in-line with their abilities, capabilities, and inclinations (General Directory for Educational Resources, 2002).

The Saudi Arabian Educational system consists of twelve years, divided into six years of elementary school, three years of intermediate school, and three years of high school. One of the main aims of education, in all levels, is the development of different skills and abilities, including the development of creativity. The ministry of education sets overall standards for the country's educational system and is also responsible for overseeing and implementing the Saudi Arabian educational policy regarding gifted education. In the ministry of education there are two administrative units for identifying and serving the gifted. They consist of four units:

- Programs unit.
- Planning, coordination and training unit.
- Identification unit.
- Administrative communication unit.

Through these units, the ministry of education provides the following programs for the gifted in the public schools:

- Acceleration: where a student can be moved from one grade to the next after he/she passes certain criteria. Acceleration is implemented in elementary and middle school.
- Grouping: gifted students of similar abilities take special programs in a special class for the gifted.
- Enrichment: teaching enrichment units for the gifted based on their abilities.

These special programs are provided for the gifted as afternoon classes, Thursday programs (similar to Saturday activities in other countries), summer programs, and enrichment programs for the gifted within the school day. One example of the latter is a program that was developed and implemented to serve the gifted in the elementary schools (Aljoghaiman 2007). The program philosophy and the design of d students' experiences were based on three basic scientific theories. These theories are constructivism theory, Renzully's Three Rings Theory and Sternberg's Triarchic Theory. This program included training teachers of the gifted so they can provide appropriate methods of teaching and enhancing gifted abilities in all areas. In this enrichment program, gifted fourth graders were grouped for a period of time during the school day. Children passed through four levels of the program. The first level concentrated on preparation and it included basic thinking skills like brain storming, some of the skills in the CoRT Program for Thinking, and Scamper Strategy. The second level included Creative Problem Solving. The third level included teaching the Future Problem Solving Program. In the fourth and last level, gifted students went through the research program, which is a comprehensive program of self-regulated learning that included different thinking skills. This program consisted of developing five areas in the gifted children's personalities. These areas are motivation to learn, thinking skills, research skills, learning skills and leadership skills.

### The National project for identifying and servicing the gifted

King Abdulaziz City for Science and Technology (KACST) in collaboration with the Ministry of Education supported the National Project for Identifying and Servicing the Gifted. This national project resulted in the establishment of screening procedures to identify Saudi Arabian Gifted and talented students. It also created two enrichment programs for the gifted; one in science and one in math. These were the first programs for the gifted in Saudi Arabia. (AlNafi et. al, 2000).

Teachers' nominations and school's grades were considered in the first stage of screening, and then gifted students were identified through intelligence,

general abilities and creativity tests. These tests were The WISC-R Test for Intelligence, The Torrance Test of Creativity, and The Group IQ Test for Special Abilities (AlNafi et al, 1992; AlNafi et al, 1995).

This program started in 1997. Another program for gifted female students started in 1998. In this program, a student is considered gifted if he or she demonstrates or has the potential of high abilities compared to his age group in one or more of the following areas: mental abilities, academic achievement, creativity and inventions, and other special abilities that are valued by the society. These gifted students are identified according to different special scales and instruments. These instruments were an intelligence test, a creativity test and a mental abilities test. Gifted students nominated for this program enrolled in enrichment units in religious studies, Arabic language, science, math, astronomy and art. AlNafi et al, 2000).



Figure 1.1 Dr. Abdullah Aljughaiman, director of gifted education program at King Faysal University.

### King Abdulaziz and his companions Foundation for Giftedness and Creativity (Mawhiba)

This foundation was established in 1999 as a non-profit organization responsible of identifying and providing services for the gifted and to help them develop their abilities in order to reach their potential so they can

have a positive impact on the future of the Saudi Arabian society (Mawhiba). It has five main goals:

- To facilitate and foster giftedness, invention and creativity.
- To create professional pathways in the areas of medicine, environmental science, the arts, telecommunication, engineering, science and technology.
- To support and provide enriched educational activities for the gifted and talented students of the Kingdom.
- To educate the population (parents, teachers, and employers) about methods in nurturing gifts and talents.
- To assist educational and professional institutions across the Kingdom in the creation of a comprehensive program for the gifted and talented. (Mawhiba gateway 2010)

Three hundred, 11th grade gifted students, enrolled in nine summer programs in science and technology. In addition to summer programs, other programs for the gifted were introduced in 2005, such as mentorship programs, "the young inventor", leadership and some international summer programs.

Mawhiba has also invested in training teachers and supervisors in the field of gifted education. It has also supported Saudi Arabian inventors by sponsored invention exhibitions. In 2007, (Mawhiba) conducted The First Saudi Arabian conference for giftedness and creativity. The foundation's strategy, which was established in 2008, included the following:

1. Collaboration with distinguished schools in nominating students, curriculum development, training teachers and administrators, and supporting parents.
2. Sponsoring enrichment programs, such as after school programs, summer programs, and competitions and awards.
3. The young leader's initiative, which includes scholarships on job training, mentoring, and skill building programs.
4. The creative work environment initiative. It includes awareness building and training workshops.

This strategy was the main source for establishing the Arab Strategy for

Giftedness and Creativity. This strategy was approved by the Arab League Educational, Cultural and Scientific Organization (Alecso). It provided the future vision that aims at developing an Arabic educational model that is conducive to giftedness and creativity in all fields. It also aims to support young gifted and creative leaders who could have a vital role in developing a competitive economy based on knowledge before the year 2025 (The Project of the Arabic Strategy for Giftedness and Creativity in Public Education, 2009).

In Saudi Arabia, as in all Muslim countries, intelligence is considered to be a gift from God. Therefore gifted children are considered a valuable asset to their country, and as such, educators have a common mission to serve gifted children as best as they can for the sake of their nation's welfare and for the children's personal benefit. Gifted education in Saudi Arabia is relatively recent. Nevertheless, it went through considerable development for the last three decades.



Figure 1.2.- Dr. Sanchez (Editor) with teachers of gifted in Damman SA,

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**CHAPTER TWO**
**The status of gifted Education in the Sultanate of Oman**
*Fatma Anwar Al-Lawati, Ministry of education, Oman*

**Introduction**

Oman is a developing country in the Middle East, located in the Arabian Peninsula. It is bordered by the United Arab Emirates, Saudi Arabia, Yemen, and the Arabian Sea. According to Oman's Ministry of Information website, Oman's population is estimated at 2,331,391, half of which fall under the age of 15 years.

In Oman, public education is free from first grade to the end of secondary education. In 1997, the 'Basic Education' system replaced the three levels of 'General Education': Elementary, Middle, and Secondary. Basic education comprises two cycles: the first cycle covers grades 1-4 and the second cycle covers grades 5-10. The two cycles are followed by post basic education or secondary education.

Historically, the school system in the Muslim/Arab world is based on traditional/ Qur'anic schools, which have recently received negative publicity and criticism from the Western media (Boyle, 2006). These schools, fortunately, played a significant role in the Muslim Arab world, including Oman.

Prior to 1970, there were three forms of schooling in Oman: Qur'anic schools, Almasjid schools, and private schools (Ministry of Education, 2010). For many generations, these schools "continued the march from generation to generation to graduate scientists and leaders where these schools and mosques accounted, for time immemorial, to the graduation of many scientists, literates and talented individuals, who enriched our heritage treasures" (Ministry of Education, 2010).

The role of the three forms of schools in the Omani cultural is highlighted in the following section.

### Qur'anic Schools

Historically, education in Oman was limited to the Qur'anic schools. These were held in various locations including Masjids, teachers' houses, and social gathering places known as "Sablah." The schools hosted students from different age groups; the younger of which were not segregated. Women played the role of teaching youngsters while the older boys were taught by a male teacher. Female after certain age were not expected to continue in formal education; however, by that time, children could recite the whole book of Qur'an. Evidently, these schools focused primarily on teaching the Qur'an and some even taught Arabic, mathematics, and poetry. A Qur'anic school was called "kutab".

Most educated women attend Qur'anic schools. These schools are usualy named after the founder teacher, such as Mu'allima Aminah School in Suwaiq. Boyle (2006) indicated that the Qur'anic schools instructed mixed-aged groups of boys and girlsfor a couple of hours a day, usually between the sunset and evening prayers, rarely using whole group instruction but rather working with individuals and small groups, listening to recitations, making corrections, and occasionally, "meting out sharp slaps on the hands with wooden sticks for those boys who misbehave" ( p.484).

### Almasjid schools

Almasjid schools are considered to be the formal schooling system prior to 1970. Almasjid schools were part of the Mosques where students learnt Qur'an, math, Arabic reading, writing, grammar, poetry, and some advanced Islamic studies. Educating males was the specific goal of these types of schools. Students' ages ranged between 6-14 years. Almasjid schools relied on one teacher who taught all the subject areas. Generally, a single group of students was taught by a teacher and an assistant teacher. In addition, older or more advanced students taught the lower levels. Almasjid schools were located in various areas of the Sultanate of Oman including the capital, Muscat, and Nizwa, Bohla, and Sohar.

### Private education

Unlike traditional Qur'anic schools and Almasjid schools that were found in almost every part of Oman, private schools were mainly found in the capital area —more specifically in Mutrah. Classes in these schools were also taught by a single teacher and a teacher assistant, who was employed by the school teacher, usually the school owner. Students in these private schools were from different age groups. They were grouped by gender at an older age; however, most girls stopped attending schools once they reached puberty. Several well-known teachers in the Mutrah used to run such schools.

There is an important point that has been highlighted by Boyle (2006) in her study investigating the Qur'anic schools "kuttabs" in three countries; Morocco, Yemen, and Nigeria. She noted that:

While Islamic education has a narrower initial focus and broadens over time, Western education begins with a broad focus and moves toward a narrower specialization. In the Islamic tradition, children start with the very specific (i.e., the Qur'an) and, throughout the course of their studies, increase their focus to include a broader and broader range of topics. Conversely, in the West, children tend to start out with a wide variety of subjects to study—science, math, language, gym, art, music, social studies—and specialize as they get older, during their high school and/or university education. (p. 485).

### Gifted education

In 2009, a Memo was circulated throughout the Ministry of Education (MOE) searching for a word that would adequately describe exceptional or gifted students. The Ministry of Education concluded that the word

"Mujeedeen" best describes such students. This is an Arabic word that means to be "Glorious." The Arabic word for gifted students is "Mawhubeen", which originates from the word "mawhibah" and is used in most Arabic speaking countries. However, the word "Mujeedeen" is unique to Oman and carries a greater aspect on exceptional and above average children. Hence, one may assume that this word has a broader definition than the word "Mawhobeen." Furthermore, the word "Mujeedeen" was recognized by the MOE as the only word to be used in all formal documents to describe exceptional and high-achieving students. Since this word for exceptional and above level children took place in the education system in Oman, no further efforts were made to accommodate these (Mujeedeen) students.

Historically, several strategies were used in teaching students throughout the different types of schools. Some aspects of curriculum differentiation were found in the teaching methods of the teachers at the schools.

According to Tomlinson (2001), differentiation is probably more reminiscent of the one-room schoolhouse than of individualization. This model recognizes that teachers "need to work with the whole class, sometimes with small groups and sometimes with individuals" (p. 2). Such variations observed in different classrooms were the basic structure of those schools.

Students in such schools were expected to work individually on the task and at the same time they were instructed by the teacher in a small group of the same level to work on a similar task. For example, in the Qur'anic schools, students would take turns reading a "Sura" (a chapter of the Qur'an) and would later meet with the teacher to have their performance assessed and obtain feedback.

Another new practice in the area of gifted education is the concept of mentoring. According to Clasen and Clasen (2003), the concept "of mentoring is a timeless and universal means of nurturing potentials, it comes to us across centuries and from almost all cultures in which the master takes on the role of mentor to a promising novice" (p.254).

In the nineteen seventies, the economy of Oman grew by means of oil money, which was used for the construction of all aspects of the country's infrastructure in order to catch up, in particular, with the surrounding Arabian Gulf countries. The education sector drew the greatest attention of the government and, as a result, several schools were built. At that time, the Omani education system, to some degree, took some steps in the area of gifted education as a result of the rapid change in the country's economy. This was evident with the opening of a school for females and also through the practice of skipping grades.

In 1981, the first school for gifted/achiever female students was established. Students were accepted to this particular school based solely on their test scores at the end of sixth grade. The school was unique as it boasted exceptional services toward its students. It was an excellent step up in gifted education in Oman. Unfortunately, the school did not last very long as the focus of the school changed into that of a regular public school.

Oman's formal public schooling began in the late 1960's. At that time, there were only three schools that offered education for a very small percentage of the population. By the 1970s, educational opportunities expanded rapidly and many students enrolled for the first time. Hence, the strategy of grade skipping was introduced in the Omani education system in order to quickly build manpower for the development of the country. Grade skipping is an economical way to challenge gifted students. Gifted students have the opportunity to skip one or more grade levels; thus accelerating their education while challenging themselves. Grade skipping was introduced at that time to satisfy the needs of students who were not totally illiterate because of prior informal schooling. Every student in that situation was asked to take a comprehensive exam of the grade that he/she was intending to skip. If the students passed the exam, they would be moved to a higher-grade level. This practice satisfied the needs of the expanding government and the emerging economy by increasing literacy rates and quickly training a working population. However, with a stabilized economy, this option is no longer offered. Despite the lack of gifted education or any recognition for gifted students in the Omani educational system, the educational curriculum is built upon several strategies that

may serve all students in developing the critical thinking skills, problem solving strategies, and creativity.

**The impact of culture and religion**
Oman's unique and strategic geographic location in the Middle East, bordered by Saudi Arabia toward the West and facing Iran across the narrow Strait of Hormuz and on the other side of the Indian Ocean, placed Oman in the center of the Middle East region.

Arabs migrated to Oman from the 9th century BC onward; and conversion to Islam occurred in the 7th century AD. Muscat, the capital of the geographical area known as Oman, was occupied by the Portuguese from 1508 to 1648. Then it fell to the Ottoman Turks, but in 1741, Ahmad ibn Sa'id forced them out, and his descendants rule Oman today (Omani Ministry of Information). The rich Omani history and the natural geographic situation among different civilizations such as the Indian and Persian civilizations, has contributed significantly to the Omani culture.

Islamic teaching emphasizes that knowledge "ilm" plays a vital role in a Muslim's life. This has a significant effect on the value of education in the Omani culture. For Muslims, as Husain and Ashraf (1979 cited in Hilgendorf, 2003) stated, "God is the source of the knowledge, by knowing more Muslimsfelt they were drawing near to God' (p.11).

Islam encourages its followers to pursue knowledge as the first revelation, "Proclaim! (or read!) in the name of thy Lord and Cherisher who created" (96:1).[1] The act of knowledge in Islam is treated as an act of worship. In the "Hadith", which are the sayings of Prophet Mohammad (pbuh)[2],

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[1] The Holly Qur'an is arranged in 114 Surahs (chapters). Each Surah consists of a number of Ayah (verse). The most convenient form to name Surah and Ayah is (96:1) which means the number 96 Ayah from the first Surah (As in the Christian Bible).

[2] To show their respect, Muslims use the phrase "Peace be upon him" after they say or write Prophet Mohammad's name. In this research, I have chosen to indicate this with the parenthetic phrase (pbuh). A similar phrase "Peace be upon him" is used whenever Muslims say or write the names of other prophets.

it is stated that "seeking knowledge is a duty on every Muslim man and woman". The Islamic act encourages its followers to pursue knowledge because it forms the basis of the search for truth, ethics, and wisdom (Daud, 1989 cited in Hilgendorf, 2003).

According to Al-Lawati (2003) "an Islamic recommendation in every aspect of Muslim life cannot be understood independently from its connection to the almighty Allah (God). Likewise, Islamic educational elements are built upon the belief in the ultimate power of almighty Allah, the creator of everything in this globe." Therefore, a Muslim child begins his knowledge by memorizing short verses of the Holy Qur'an at an early age. According to Boyle, memorization and understanding are often considered to be opposites. In Islamic education, memorization of the Qur'an is generally considered the first step in understanding (not a substitute for it), as its general purpose was to ensure that sacred knowledge was passed on in proper form so that it could be understood later.

Daniel A. Wagner quotes the most influential Muslim jurist and theologian, ALSufi al-Ghazali, who pointed out almost a millennium ago that memorization of the Qur'an was a first step to learning, and did not necessarily preclude comprehension later on. "The creed ought to be taught to a boy in the earliest childhood, so that he may hold it absolutely in memory. Thereafter, the meaning of it will keep gradually unfolding itself to him, point by point, as he grows older. So, first, is the committing to memory; then understanding; then belief, certainty and acceptance." (p. 488).

*Attitude and perception toward Gifted Education in Oman*
Despite the lack of formal services for gifted students in the Sultanate, the limited research that has been done in this field indicates a positive attitude of people toward gifted education. Previous research explores Omani schools administrative attitudes in relation to gifted education. Findings indicate that administrative figures within a school with a degree in Education tended to have more positive attitudes than those with no degree in education (Al-Lawati, Al-Hamdan, 2007). In a recent study, Al-Lawati

(2010) researched the citizens of the Arabian Gulf's perceptions regarding gifted education and concluded that most of them have a positive perception toward gifted education. Furthermore, findings suggest that most people would support special schools for gifted students. However, lack of teachers and well trained counselors in the field of gifted education prevent their ability to distinguish between gifted students and underachievers. As a result, no special attention has been given to the needs of gifted overachieving students (Al-Lawati, 2005).

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**CHAPTER THREE**
**Assiting the art of discovery at school age: The Bulgarian experience**
*Evgenia Sendova, Bulgarian Academy of Sciences*

**Introduction**
The importance of assisting the art of discovery as part of an educational strategy is well grasped by the Bulgarian writer George Markov in his essay "Your America" and quoted in as follows:

You are quite aware that it was Columbus who discovered America but you still insist on discovering it for yourself because you feel that it is not just America's existence but it is its very discovering that is important to you. Furthermore, "your" America is unique – unlike mine, Columbus's or even an American's America. It is uniquely yours. Teachers are helpless to reveal it to you. Much as they might like it they would send you off to "their" America…The magic of sailing to "your" America, real or imaginary, will last forever. (p. 211)

When we started discussing the content of the current book at the Wallace Research Symposium on Talent Development held at the University of Iowa, we agreed on a common structure and on writing as representatives of our respective countries. But, even for a small country like Bulgaria, this turned out to be a very difficult task because of its rich variety of activities related to gifted education, and especially to nurturing

young talents in mathematics and science. I interviewed a number of colleagues involved in different aspects of gifted education and I finally realized that to make the process convergent I should write as an individual with rich and long enough professional life rather than giving a general picture based on various experiences. So, here it is in a nut shell.

I started my professional career at the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences more than 40 years ago in the field of mathematical modeling (including composing algorithmic music and models of the cell differentiation). My special interests in mathematics and informatics education have been closely related to the arrival of the computers in the Bulgarian schools (early 80s).

Today we use a more general term – ICT (information and communication technology) but we miss one of its most important aspects – that ICT provides a platform for a learning process in a (guided) discovery style.

Below I am sharing some examples of guided discovery learning that I have been privileged to assist in various contexts.

## Bulgarian model for an ICT-prompted curriculum

### *The historical background*
In the period 1984-1991, I have been actively involved in the Research Group on Education (RGE) – carrying out an educational experiment launched by the Bulgarian Academy of Sciences and the Ministry of Education in 1979. It comprised 29 pilot schools (2 % of the Bulgarian K-12 schools) and its main goal was to develop a new curriculum designed to make the use of computers one of its natural components. The educational materials developed specially for the experimental schools included textbooks, teacher guide-books, a bulletin of/about Informatics and mathematics for teachers, and unified (Logo-based) computer environments tuned to specific subject domains and still allowing exploratory activities in a broader context. The newly developed curriculum enabled students to pass gradually from constructing controllable models (in Lego-Logo context), through Turtle geometry and other problem-oriented microworlds (for explorations in natural languages, music and art) to a fully programmable microworld (for explorations in Euclidean geometry) – Geomland. Such an educational strategy created the feeling of continuity and facilitated the integration of the new informatics knowledge with the experience already gained.

The guiding principles of RGE were learning by doing, guided discovery, and integrated school subjects. The experiment ran for 12 years.

My role was to participate in the development of educational materials – textbooks, the bulletin for teachers, and computer microworlds tuned to studying mathematics, languages, fine arts, and music. The exploratory activities in these microworlds made it possible for different talents to flourish and for the students and the teachers alike to become aware of their own creativity potential.

### *Creating a novel curriculum*
During the first four years, informatics was introduced as a part of an encyclopedic education. One of the main integrated disciplines in the primary cycle was "I read, write and calculate". Along with learning to write, children encountered notions of informatics as coding, decoding, tree-graphs, algorithms, variables, tables, procedures, data, etc. All these notions were introduced and applied in the context of playing linguistic games, coding and decoding secret texts, describing and executing algorithms in mathematics, language, and music, and in generating texts and melodies with a specific structure.

Although the computers were not extensively used at the primary level, in several RGE schools the children (1st – 4th) grade) were introduced to the Bulgarian version of Logo (developed by Roumen Nikolov). They learned how to issue simple commands to the turtle, how to enrich its vocabulary. By means of the turtle graphics they created albums of ornaments, illustrated proverbs, poems, short stories, invitation cards, paintings

based on geometric form, plans of their classrooms, and maps of the road to the school. In one of the pilot schools a robotics project was launched, in which children were constructing Lego models and controlling them by means of a Logo extension, thus making the transition from working with concrete objects to working with abstract ones (the Logo turtle).

Integrating school subjects implied a unified perspective on thinking – one that helps to knit together many areas of the curriculum without compromising the integrity of distinctness of each area. Such a way of thinking was expected by the RGE teachers who were prepared in specialized training programs, but a lot depended on their creativity.

Teachers' reaction to such expectations is illustrated by a primary school teacher of the integrated subject "I read, I write, I calculate" who posed the following problem to second graders: Dr. Dolittle has received a letter from the African monkeys, but it is coded so that Sarah, his evil sister, could not read it. Unfortunately the absent-minded doctor has forgotten the code. Only with the help of the children he could decode the letter, read it and write a coded answer.

The teacher had created a situation in which the children were asked to decode (matching numbers with letters), read, write and code a return message in a context which was very motivating for them.

An innovative idea of integrating the study of mathematics, natural languages (Bulgarian, Russian and English) and a computer language (Logo in this case) was launched in fifth grade. Designed to show the intersection of language study with mathematical thinking in the context of informatics, the experimental textbooks Logo and Language and Mathematics included problems on translating from a natural to a formal language, algorithmic description of basic grammar rules, and ways to extend the Logo turtle vocabulary in several languages.

Applications of informatics notions (e.g. cycle and recursion) were shown in mathematics, physics, music, and graphic design, so that every student could choose a problem according to his/her interest. Since computation provides new tools for self-expression, the students dared to

explore areas they had previously considered inaccessible. The specially designed computer microworlds provided convenient tools for the students to deal with new notions from a procedural rather than from a declarative point of view, i.e. in the style of how to. This has already had an impact on the way we started teaching mathematics, literature, art, and music.

Through their work in the microworlds, students soon realized that making mistakes could be very useful if they would analyze them, and occasionally would lead to very interesting ideas – thus debugging was naturally combined with de-goaling (replacing the original goal with a more promising one).

Before giving specific examples of microworlds in whose development and application in school setting I was involved, let me make a short digression to describe the dynamics behind the meaning of the very notion microworld.

### The microworlds – what are they?

The notion of microworld was first used by AI specialists to describe a small, coherent domain of objects and activities implemented in the form of a computer program. As Weir points out in, microworlds are environments which, quite unlike the traditional classroom, are clearly in the discovery-learning tradition. Noss and Hoyles emphasize in that the microworlds were born in the AI community as a way of capturing the notion of problem solving within an area sufficiently constrained that the computers might be able to achieve a solution. They point out that the contribution of Seymour Papert made a small but significant change to the idea – the simple and constrained area became part of a knowledge domain with epistemological significance. DiSessa also stresses the epistemological basis of a microworld pointing to the importance of making discovery part of mathematics education. Feurzeig defines microworld as a clearly delimited task domain of problem space whose elements are objects and operations on objects which create new objects and operations.

For us, the members of the informatics team at RGE, the fundamental aspect of a computer microworld was that the environment facilitates

discovery learning, i.e. experimentation, hypothesis generation, testing, and open-ended explorations. Furthermore, we wanted the microworld to be a medium where the learner's understanding in the phenomena (specific for the domain) is enhanced during the process of *learning via programming*. An excellent example of a microworld is the Logo *Turtle geometry* (the turtle being the object to think with). And what is associated often with explorations in appropriately designed microworlds is the so-called *Logo spirit.* It goes beyond the principle *learning by doing* and combines it with *discussing and reflecting about what we have done.* This spirit is not dependent on the programming language itself, but rather on the philosophy and the culture we associate with the word *Logo*.

We have frequently found that actually trying out a certain idea in the form of a program can provide new insights. Experimenting with the formalization of this idea brings out further insights, providing a real understanding, which, in turn, possibly provides for a new formalization and new ideas.

As stated by Hofstadter in, pattern perception, extrapolation, and generalization are the crux of creativity, and one can come to an understanding of these fundamental cognitive processes only by modeling them in the most carefully designed and restricted microdomains

### PhiloLogo – a microworld for exploring natural languages

Ideas for exploring natural languages as an educational activity could be found in, in which the authors Goldenberg and Feurzeig illustrate how scientific explorations could be integrated with the mathematical modeling in the context of studying linguistics, informatics and cognitive psychology. I adopted some of these ideas in a microworld called PhiloLogo developed for exploring natural languages (Bulgarian, English and Russian) based on the Bulgarian version of Logo. In this environment children were able to easily manipulate objects of the language, to formulate rules and verify them, and to make the computer generate different short texts – sentences, stories, rhymes. Here are some representative activities.

### Arranging the words in a proverb

In this game, a proverb whose words have been shuffled appeared on the screen and the children (7-8 years old) were expected to guess the original proverb or to create their own one by using the same words. Since the word order in Bulgarian is rather flexible, the children could rearrange the words in different ways, each one being syntactically correct. Sometimes, rearrangements that change the sense of the original proverb were obtained providing a good topic for discussion, e.g.

"No sweet without some bitter." could be changed to

"No bitter without some sweet." which is in fact very close to

"After rain comes fair weather."

This game proceeded in finding several proverbs with a similar meaning. Another interesting idea used by the teachers was to make children find proverbs with the opposite meaning, e.g.:

"Clothes make the man,"

"Clothes do not make the man."

These ideas were extended further when Russian and English were introduced as foreign languages, to support their synchronized study. A specific challenge for the pupils was to find the best sounding examples in the three languages, e.g.:

"Penny and penny laid up will be many."

"Зернинка к зернинке – насобирается торбинка." (Russian)

"Капка по капка – вир става." (Bulgarian)

Finally the discussions would cover situations in everyday life or in literature, where the proverbs could be applied as a moral.

Another game experimented with the second graders was to complete a proverb, having been given its beginning:

"Every man has…"

Neglecting the popular endings, the children showed their creativity not only by thinking of their own completions, but even looking for rhymes. With beginnings chosen appropriately, we received some very condensed "essays" on happiness and friendship, e.g.:

"Happy is who has good friends."

"Happy is who has a good teacher." or

"He is a good friend who will pass through fire and water to save you."

"He is a good friend whose mother is good to you." (?!)

In other words, "as the people so the proverb"…

### Character Sketch

Another program used by the teachers and adapted by them for various situations was Character Sketch, in which the computer tells you what kind of a person you are (your name appearing as acronym). For example, possible character sketches for Pedro, Jenny, Mark and Nick might be

| | | | |
|---|---|---|---|
| Patient | Jokey | Musical | Noble |
| Elegant | Elegant | Attractive | Intelligent |
| Dynamic | Naive | Rational | Clever |
| Rational | Noble | Keen | Kind |
| Optimistic | Young | | |

The younger pupils had the task of guessing the rule according to which the character sketch was made, or to make one of their friends, observing the same rule. For older students, another challenge was added – to use the program for characterization of a specific literature character and to edit the program so that all the features existing in its data bank would be suitable for that character (if possible preserving the author's style). For example, Achilles should not be characterized as anemic.

### Playing poets with the computer

Some simple amusing poems were generated as a result of eight-yeat old children using a program we called Compoetry. They were asked by the program to list different adjectives, nouns and verbs of a specific structure (viz. with specific number of syllables or with a particular rhythm and rhyme), e.g.

DAH-dit DAH-dit dit-DAH-dit

Little monkey is jumping.

(The denotation DAH above stands for the stressed syllable.)

In addition, the endings were supposed to rhyme. The children were amused and surprised by the variety of verses the computer produced after they had listed five words of each kind. They discussed with the teacher which of the computer poems were acceptable and which should be rejected. This game made them think about the structure of the simple rhymes and motivated them to study the grammar categories – something that young people usually find very artificial when studying their mother tongue.

The idea of using the computer as a poem-generator was developed and explored by 14-15-year- old students who worked on somewhat more eccentric poetry structures (e.g. cinquain and haiku). Before writing a Logo program generating cinquains, the pupils were given the task of writing several cinquains with the following structure:

TOPIC – a one-word topic, title, or subject;

DESCRIPTION – a two-word expression of an action related to the topic;

ACTION – a three-word expression of an action related to the topic;

FEELING – a four-word expression of a feeling or evaluation of the topic;

SUMMARY – a one word alternate title or a summary of lines 2, 3, and 4.

It was interesting that some of the poems imitated the style of classical Bulgarian poets (although the cinquain structure was quite new to the pupils). The computer cinquains were sometimes unexpectedly beautiful. Here is an example:

Students

Worried souls

Learning eagerly literature

Touching with their patience
Sages

Where was the creative element after all? In fact, the creativity belonged to the pupils because they had created the list of various possible phrases for the respective lines. Not only did these phrases reflect the creative associations of their authors, but also they provoked new associations. The most interesting part was again the discussion. The pupils had to reconsider their entries in terms of avoiding senseless cinquains.

Still more challenging was the task of writing sonnets with a specific rhyming scheme, e.g.:

ABBA ABBA CCD EED

In this case, the computer generated only the rhymes according to the given scheme – an activity reminding "le bout-rimé" (rhymed ends), highly appreciated by the surrealists.

Having been given the ends of the lines, the students were expected to complete them. Since the task was very difficult, keeping the rhythm was not required. Everything depended on their verbal skills and their abilities to associate things that seem to be "miles apart".

With such poetic experiments, the pupils could show their creativity, even when the restriction of a specific structure was imposed. Furthermore, they realized that to fully appreciate a work of art, one has to be able to recognize its structure.

Identifying the structure of a poem would not be a goal per se as it is often the case in the traditional classes of literature, but creating a model of the process behind its creation. Such a modeling would hopefully motivate the analysis of a given literature work in a learning context. Our experiments with students and teachers have shown that we should not be too skeptical about the computer works. They are neither purely computer, nor random. In poetic models, we always specify the structure of the poem and the sources the computer is to choose from. Thus,

an important application of computer-generated works is that they are a sort of "invitation for an intellectual dance", in which the best verses containing unexpected word combinations could be used as a source for further processing according to his taste and visions. So, here again the idea behind modeling the creative process could be formulated as follows: We create a model of a given poetic work by observing certain patterns and stick as close as possible to the original. Then, we generalize our findings by creating a procedure which might not only generate the original poem, but also other poems in the style of the author, or even more general – a poem with an arbitrarily chosen and fixed structure.

### Modeling aphorisms and dull jokes
When asking students to model short humorous forms, we encouraged them to capture what is invariant about a specific humoristic work (e.g. aphorisms) and then to generate computer variations of it.

Consider for example the following two aphorisms (by Georg Lichtenberg and Carl Sandburg, respectively).

The horse started resembling a donkey – like a translation from German to Dutch.

Poetry is the synthesis of hyacinths and biscuits.

When analyzing the first aphorism, the students realize that, in order to convey the idea, a lot can be lost in translation. When the author compares couples of objects, the first is similar in a certain sense to the second but excelling it. Therefore, they could use an associative list of the kind:

[[horse donkey][masterpiece kitsch][wine vinegar][watermelon pumpkin]]

The computer generator of aphorisms in the style of Lichtenberg will then combine a fixed part (extracted from the original) with a randomly picked couple of words of the above list to produce something of the kind:

The wine started resembling vinegar – like a translation from Russian to Bulgarian.

The masterpiece started resembling kitsch – like a translation from English to German.

The students are usually surprised by the great variety of computer aphorisms, especially if they have created long enough associative lists.

Of course the success of a joke depends on many factors but the important thing in such an activity is that students grasp the structure of the genre, that they understand what is fixed and what could be modified, so that the sense of the aphorism would remain the same.

When modeling the second aphorism (by Sandburg), the students are expected to make an associative list of words which differ semantically but could not be classified as antonyms, e.g.:

[[hyacinths biscuits] [diamonds puddles] [stoves orchids] [perfume glue]]

Here are some creations of a Logo program with the above associative list as input:

Poetry is the synthesis of diamonds and puddles.
Poetry is the synthesis of perfume and glue.

Making associative lists of semantically close or distant words might be an interesting learning activity in a language context. The choice of couples of words could be additionally refined after evaluating the aphorisms generated by the program.

Modeling humorous forms with a fixed part could be followed in the context of nonsense and dull jokes such as the classical example by Freud as quoted in.

• Life is like a chain bridge.
• In what way?
• How should I know?

A "NONSENSE" procedure for generating phrases similar to the first line (but still more flexible) was created by letting the computer randomly combine adjectives with nouns (suggested by the students) allowing for somewhat unusual combinations, e.g. running sorrow, chain moment, flower bridge, etc. Thus, the nonsense might acquire even more philosophical flavor and give rise to interesting discussions among the students.

After generating variations of a joke by means of the computer, students would hopefully resist the temptation to retell a joke by changing a couple of non-essential words. Furthermore, they would realize that something typical for dull jokes is that they are nonsense wanting to pass for wit.

Modeling poetry and humor could have an effect on the development of the esthetical criteria of the students – what the computer generates reflects patterns that they can notice when they analyze certain literature forms or language fragments and present them in computational form. Thanks to the specially designed microworld, the hypotheses become explicit and can be tested for internal consistency. If we leave more degrees of freedom when modeling a certain structure, some of the generated versions could surprise us because of the extreme combinatorial potential of the computer. Then, a strange combination of words could invoke an unexpected association in our mind, or alternatively – we could find a common sense in what was meant to be a variation of a dull joke. (A jest's prosperity lies in the ear / of him that hears it, never in the tongue / of him that makes it).

Such phenomena do not only make the computer a means of checking specific hypotheses, but also a potential assistant in creative processes. An interesting further step would be to define categories from an esthetic point of view (e.g. closeness/similarity to the original) and create a program evaluating the generated work accordingly.

Our experience shows that the language could become a very attractive object of explorations for students at different levels thus motivating them to deepen their knowledge of natural languages and of the specifics of the scientific methods.

When creating computer models of natural language fragments, the students can experience as tangible and concrete notions as the most abstract ones related to the language structure. This process stimulates

important qualities, such as planning the experiments, building hypotheses and theories about the observed phenomena, constructing computer models, testing, and further refining these models. Building computer microworlds tuned to the nature of language explorations enables to put emphasis on discovering the specifics of the linguistic phenomena studied rather than on programming details.

The general impression was that the first literacy can be combined with the second (computer) literacy (a term coined by Andrei Ershov, a true scholar in the field of computation science).

Geomland was another microworld that gave the learners the expressive power of programming by means of navigating and reconstructing Euclidean geometry in an attractive style for them.

**Geomland – a land for explorations in Euclidian geometry**
Building a microworld using mathematics explorations similarly to the Turtle geometry microworld, but being closer to the traditional geometry curriculum was a challenging task. This task was taken on by a team mentored by Bojidar Sendov and comprised Ph.D. students from the Faculty of Mathematics and Informatics at Sofia University (Rossen Filimonov being the principal developer). Since 1986 they have been developing and experimenting with the Plane Geometry System (known later as Geomland), which could be considered as a mathematical laboratory that enables pupils to construct and experiment with Euclidean objects, to investigate their properties, to formulate and verify conjectures, i.e., to discover mathematics. Geomland proved to be an appropriate environment to materialize the abstract mathematical concepts. Bridging the gap between the real world and the abstract world of mathematics by giving students and teachers the chance to perform experiments with materialized abstraction, which helped students move fluently in both directions along the path as needed. Thus, not only were experiences turned into abstractions (e.g. by modeling existing mechanical devices), but also some

abstractions, like the Euclidean elements, were turned into experiences (by creating dynamic geometric constructions).

Our experience in integrating Geomland into the mathematics classes has shown that it is possible to adopt the style of "discovery learning" – a style tuned to the natural wishes of pupils. They got the feeling of becoming contributors to the establishment of mathematical facts. Furthermore, they mastered their mathematical language, since a precise formulation was necessary to make their definitions and solutions workable. With clever guidance, pupils looked for patterns, formulated hypotheses, posed problems, and were highly motivated to prove their own theorems.

Some of the teachers also acted like researchers (not just as a reality-check of the researcher's ideas) – they managed to create whole classes of mathematical problems that were new to the existing curriculum. Before proving their hypotheses, they verified them with Geomland and investigated various extensions of the initial problems. Thus, no longer did the pupils assume that their teacher would know at least one good solution to any problem in the textbook – for them their teacher became the author of new theorems and problems. Here are examples of teachers (I have had the pleasure to work with) in the role of researchers and in the role of "midwife of ideas".

***When an error becomes a source of mathematics resourcefulness***
At the beginning of the school year 1989-1990, we introduced Geomland to seventh-grade pupils taking geometry classes in the RGE schools. The classes in one of these schools were led by a Ph.D student, Madlen Kolcheva, together with an experienced teacher, Steliana Atanassova. The style of "discovery learning" had established a new type of relationship among the participants – the students treated the teacher as a consultant who felt free to take the risk of saying "I am not sure. Let us try and see what will happen…" There was a case that illustrates the new atmosphere in these classes. Ms Atanassova recommended a teacher-to-be, whom she was supervising, to state a problem. The problem dealt with a specific geometric

construction and with a question about the existence of equal segments in this construction. Although the formulation of the problem was not to be proved, it was still not as general as the mentoring teacher would have put it, e.g. find some interesting properties of the construction or formulate as many conjectures as you can about the relationships among the segments, angles, and quadrilaterals. However, such a formulation would be a great challenge for a novice. But, to the great surprise of the supervisor, the students finished their construction in silence – she had expected the usual dynamic discussions. Only after judging the performance of the student-teacher and she left the room, everybody started shouting: No equal segments! Why? Obviously the silence before that was simply an expression of their solidarity with the novice teacher. Only then the supervising teacher realized that she had forgotten the original formulation of the problem and she remembered only the result – two equal segments were to be obtained on a specific side of the triangle. But, under what conditions? - That was the question! After admitting her error, she challenged her pupils – find the initial conditions yielding equal segments. Everybody was concentrated in making measurements and forming conjectures in their notebooks. The statements made were no longer theorems of famous mathematicians, which pupils were supposed to know and to reproduce the proofs of. These statements were theorems of Stefan, Zhivko, Daniela, and the pupils felt fully motivated to prove them. Even if they happened to rediscover America, the process of creative endeavor was worth experiencing. In the search of the original problem, the pupils generated more than 60 problems on their own. The teacher-to-be received a unique lesson – to err is not only human, it is even teacher-like since the only way to omit errors is to avoid new things. And the reward for the pupils was to feel the real spirit of mathematics – to find and pose their own problems. The role of the teacher in this adventure was that of a navigator, unlike of the role of a purveyor of information: Here's what is known, and here's how it is used.

Liberating teachers and students is one of the main achievements of the RGE experiment. Furthermore, the teachers got the message that it often

costs to allow mistakes to slip in, so as not only to show how to analyze it, but how to cope with such situations in general. It may be that "debugging" is one of the most profound educational ideas from the last century.

In mathematics, pupils learned that it is often the case that it is not only the response that matters, but also the way in which it has been reached. Since Geomland was language-based, the activity of any student could be saved as a text (a sequence of commands) and different solutions could be commented on by the whole class. In the mathematical diary, each student was supposed to keep the last entry which was "Ideas for tomorrow". It took them sometime before coming up with the following insight: "We have to draw conclusions first, to sum up the results and then to decide what to do next". When asked what the major differences between the traditional mathematics classes and those in a computer laboratory were, the pupils answered:

In regular classes we only prove ready-made theorems, here we investigate!

In the usual classes we stick to the subject matter, here we may experiment with various ideas of ours.

In the normal classes we may not talk to each other, we may not solve a problem together, everything is one and the same, whereas here we may express our opinion, and we can draw the conclusions together.
• We can share our results and create hypotheses on the basis of comparison.
• Another interesting story happened in a school for perspective Olympians.

### *From a theorem of Cheva to theorems of Dachev*
Krassimir Dachev was a mathematics teacher who taught at a Sofia school for gifted young athletes (not necessarily very gifted in mathematics). He was fascinated by the theorem of Cheva, which is a generalization of the well know property of the medians in a triangle to be concurrent. By applying "what-if" and "what-if-not" strategies Dachev generated a whole class of conjectures (new to the standard Bulgarian curriculum) and decided to check their validity in Geomland before going on with a

rigorous proof or with other variations. Not only was this a good stimulus to look for new problems and theorems, but it was also a good skeleton for defining an educational strategy where his students could witness his emotions, which would possibly reinvent some of his findings, in short - could feel the real flavor of mathematics. Even if they were not able to solve these problems, posing a problem is an essential part of mathematics that students hardly experienced at school. Such an educational strategy is two-folded at least - involving students not only as witnesses of a research process, but also as people whose findings would be of interest to others including their teacher.

One of Dachev's students (who had never seemed to be interested in anything but sports) proudly announced to his parents: "Today we learned a theorem discovered by our teacher!" And even more amazingly to them, he started explaining the very theorem…

Let me conclude this section with the opinions of international experts.

**Experts' opinions about Geomland**
We are enjoying our occasional triumphs with the Plane Geometry software and we can see that it has wonderful potential. In preparation for taking it to our local high school, I am working through the construction of "Book One of Euclid's elements" and I am greatly enjoying it... Kurt Kreith (1989), Department of Mathematics, University of California, Davis, USA

Although the Plane Geometry System has been reported in papers and in international conferences, such papers cannot manage to convey the very impressive state of development and sophisticated user engineering of the latest version of the software. It is a very high-class piece of educational software by any standards. Peter Ross (1990), Department of Artificial Intelligence, University of Edinburgh, UK

Your Plane geometry System was recently discussed during a visit I had with Paul Goldenberg. I had an immediate reaction: Wonderful! Fascinating! I am especially excited about your thoughtful and creative work

extending Logo. Douglas Clements (1990), State University of New York at Buffalo, USA

I am very impressed with the excellent work of your group. It shows a great deal of thoughtfulness and good design regarding mathematical, technological, and pedagogical issues. We would all benefit from having PGS more widely available. Wally Feurzeig (1992), BBN Laboratories, Cambridge, Massachusetts, USA

Geomland offers a rich environment for making conjectures and testing them. It offers a smooth bridge between doing and geometry. Students learn procedural thinking and also practice problem solving. The language is learnable through building and designing. I am very enthusiastic about using it for teaching and learning geometry. Said Assaf (1994), Mathematics Department, Birzeit University, Israel

While we are working hard in the U.S. to connect mathematical problem solving more to real-world experience, Bojidar Sendov and his team show another possibility - making the objects of mathematics themselves more concrete and familiar. A combination of these approaches would perhaps be ideal. Edward A. Friedman (1994), Stevens Institute of Technology, New Jersey, USA

There are now emerging powerful Logo-based microworlds which harness the power of programming in some specific mathematical topic: an outstanding example of such work is Geomland developed by the RGE group in Bulgaria, a Euclidean Geometry microworld with all the power of Logo at its disposal, yet tuned to offer exploration of geometrical objects and relationships. Richard Noss and Celia Hoyles (1996), Institute of Education, University of London, UK

A famous mathematician once said that if the fine arts were taught in the same way as mathematics, they would be reduced to studying the techniques for clipping stone and mixing paints. Having adopted the exploratory style in learning/teaching mathematics, it was natural to transfer it in the context of fine arts…

**Microworlds for visual modeling**

To understand a work of abstract art, the students need to realize that it is not a random combination of geometric elements. With this in mind, we involved students of different ages in visual modeling in the style of famous artists while working in specialized microworlds. Let us consider several examples.

***In the style of de Stijl and Kandinsky***

The term "De Stijl" is usually associated with paintings showing only horizontal and vertical lines and planes of red, yellow and blue, with buildings resembling colored blocks. From a mathematical point of view, it is interesting to discuss the basic elements in the paintings and to classify them. Generating a specific shape, e.g. a square, the process of computer modeling from different initial positions and directions of the Logo turtle enhances the understanding that this is the same shape. The next step is to create a procedure for all kind of rectangles (including the square). A further challenge for students is to generate all the elements with a single procedure for a colored parallelogram thus, reinforcing their understanding that the square and the rectangle are special cases of a more general class of figures.

From an artistic point of view, though, the problem is not only to understand the elements of a composition, but also to understand its balance. This led to develop a microworld in which it was easy to experiment with figures of various sizes, colors and degrees of complexity, i.e. to verify different definitions of balance. In addition, the students could play with Kandinsky's ideas concerning the relation between geometric shape and color, and study the effect of both components in various combinations.

The visual art can be seen as an abstract system relating elements made in visual form. Kandinsky was the first one in defining the basic elements for visual languages - colors, points, lines and planes. He also defined ways of thinking about the structures built out of these elements and an explicit grammar for a visual language.

While working with informatics teachers and art teachers, we could qualify the following factors as relevant in the study of an abstract painting:

- the character of the objects and their composition in terms of clustering, overlapping, isolation, balance, relationship between size, shape and color
- main categories of the objects
- Establishing hierarchy related to the distance of the center, the size, the color, etc.
- functional associations (which objects occur in combination with the work of a given author)

Here are two computer models of Kandinski's paintings generated by the programs of pre-service teachers in informatics:

**In the style of Sonia Delaunay**

A simple -at a first glance- composition of Sonya Delaunay, consisting of what could be called free-hand concentric curves (the first figure below), turned out to be a challenging task. One of the problems was to generate lines imitating a free-hand drawing. If we anticipate the curves as close to circles, we should define what this closeness will be for us, i.e. - which of the basic characteristics of the circle we are going to keep, and which we could vary. After creating a procedure for generating free-hand circles, we had to look for a mechanism which would place these elements according to the concentric principle. This was not a trivial task due to the random character of the free-hand circles. In the first variations, we have used the best approximation of a circle with a constant and with a changing pen width, respectively:
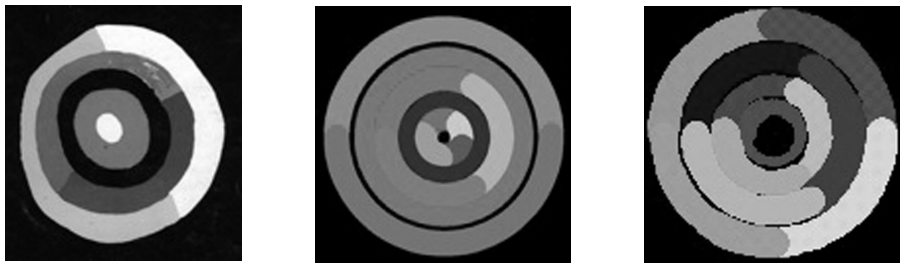


The next step was to make the circle appear as if it was drawn by a free hand. This was done by introducing a random turle turn in an interval around the direction which, if followed constantly, would assure a constant curvature of the curve. The lines we received either did not close or overlap. In the next experiments, we modeled each free-hand circle as consisting of several parts, the last one ending close enough to the starting point:



Now the curves were as desired with respect to being closed, but there was a side-effect which, although was appealing, made our model far from the original.

At this moment it was worth noticing that Kandinsky describes the circle as a line which has been declined from its direction under an external pressure. This description gave us the idea of using two Logo turtles - a leading one, going along a closed contour, and a second one - turning at any given moment toward the leader and making a step forward. The effect was nice but the concentric principle was missing, so in the next variation we moved the leading turtle along concentric polygons.



Further on, we could play with various ideas - to introduce a probability with which the drawing turtle would follow the leader at a given moment, to change the speed of the drawing turtle, etc.

Some other works of Sonia Delaunay representing costumes for the ballet of Diaghilev were more appealing for modeling to the students. Below are some of their computer variations on these works:

We started with a stylized version and then identified the geometric figures and transformations which could be used to create the closest possible computer version of the model. Various approaches are possible and one of the challenges was to use mathematics knowledge, which was accessible for younger students. Another goal was to motivate students to create their own informatics tools e.g. filled-in polygons. Once a geometric shape participates in more models, the procedure was generalized so as to produce shapes of various sizes. By means of recursion some students turned the original triangles into Sierpinski gasket (the first model above).

Products of the visual modeling should not onlybe judged based on the closeness between the original and the generated works, but also on their potential to generate works bringing the spirit of the original together with new, unexpected ideas. After leaving the frames of the strict imitation we could be inspired by new combinations of forms and colors to get a new insight. As Hofstadter claims in, the crux of creativity resides in the ability to manufacture variations on a theme.

### When working with children

The creative aspect of making sense of mathematics turned out to be a real confidence builder for young students. When working with 10-12 year old children we witnessed their great creativity in making compositions out of geometric figures. In a lot of situations they had to apply geometric transformations, to calculate angles and length of segments (often going ahead of the curriculum for the corresponding grade). They were highly motivated to bring to life their own project and even refused hints from their teachers murmuring: I prefer to use MY mind…

When building their compositions the children used two typical programming style – top-down (with a preliminary designed model for whose accomplishment they made procedures for the necessary elements) and bottom-up – trying out various combinations of preliminary given geometric elements. In order to get the desired figure they had to harness many properties of the geometric nature. Turning the turtle to angles with different sign brought quite naturally to a new definition of symmetry with respect to an axis. It is interesting to note that lead by their own aesthetics they tended to reduce the number of different shapes used as building blocks. The first two figures below are designed by an 11-year-old girl and a boy from the *School Academy 21 century* in Plovdiv when given the task of creating the image of a person by geometric shapes. The other three are computer variations of a painting by Nenko Balkanski. Their young authors worked under the guidance of Ivaylo Ivanov in the *Sts. Cyril and Methodius School* (Sofia). It is worth mentioning that what was started as a project for a small group of children was later extended to an open contest for students from the whole country for the best computer model *à la Balkanski* organized by the *Mathematics and Informatics* journal.
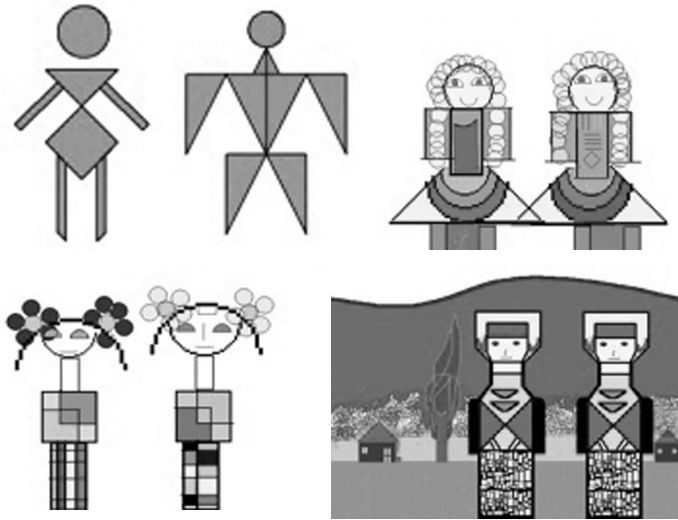
**Microworlds for algorithmic composing of tunes**

Similarly to the explorations in visual modeling context, it is important for students to see that the beauty of music is related to specific structures behind it – rhythmic, melodic, harmonic ones. Thus, they wouldn't call "composition" any sequence of randomly generated notes (something I have witnessed in some Logo classes in the RGE schools, e.g. every student would enter the code of a single note and the resulting sequence was called "the composition of the class").

I had previous experience with writing programs for algorithmic compositions (8-bar tunes) for my MS thesis based on the work of Zaripov. The program was written on a machine language for the Minsk-2 computer and the generated tunes appeared on a punched tape. Thus, I was often found humming with a punched tape against the light.

Later on I worked on a tune-generation project with an American music teacher in the context of a teacher training workshop on Logo writer. This gave me the idea of developing an appropriate microworld for interactive composition of tunes based on different sets of rules. The rules were formed after simple analysis of popular children and folk songs and could be performed by the students assisted by the teacher.

If we assume that music is extracting the order of the chaos in the system of music elements, it would be natural to model this process by step-wise refinement and enrichment of the composing algorithm, i.e. by consecutive approximations of the set of rules.

The first approximation dealt was with the notion of the so called white music. In this model, the chaos of sounds is the biggest possible – sounds are generated so that the frequency and the duration of each one are random numbers in a given interval. The model illustrated that although the human ear can distinguish among sounds in a quite large range, not all of those sounds are used in music.

The next approximation was to generate random tones from the chromatic scale. The notion of well-tempered music was illustrated. Still there was no internal structure required for every musical form. Thus, the next step was to formulate a set of rules for the internal structure. This set was evaluated and modified depending on the characteristics of the generated tunes. The set of rules we started with was as follows:

- the generated tunes are 8-bar periods in do major
- the measure is 4/4
- the first tone belongs to the tonic triad
- the last tone is the tonic (the first one of the scale)
- the tone range is ten tones starting from D of the first octave
- four rhythmic groups are envisaged:

The tunes generated according to the above set of rules sounded still very chaotic with exception of the beginning and the ending of the tune. The next step was to add some more rules, e.g.:

- The tune will end with cadenza (the 3 last tones - to be selected among a set of possible cadenzas)
- The neighboring tones should be close. (The definition of this notion could vary, e.g. close are tones the interval between which is a second at most (alternatively - third at most).

The tunes generated according to this set of rules were more ordered but, when the close tones were defined as distant at a second, they sounded very monotone. This demonstrated the fact that the full chaos and the full order are equally dull for the human ear. The following modification of rules was proposed as reasonable:
- the 8-bar period is divided into two phrases
- each phrase ends with an appropriate type of cadenza (the first phrase ends with a half-cadenza)
- the measure includes 7/8 (typical for the Bulgarian folk music)
- the biggest possible interval between neighboring notes is a third
- the above rule is possibly broken in the frames of the cadenza
- the user can interact with the program and accept or reject the generated phrases

Further enrichment of the set of rules could take into account the macro-structure of a musical form including its measure, melodic and harmonic patterns.

Again, as with the experiments of computer poetry, the idea of algorithmic compositions is not to replace the composers but to motivate students to study and understand better the structure behind a musical piece by materializing their hypotheses about the patterns they observe. In making problems concrete, deciding what is essential and what is not, and moving knowledge and understanding from being implicit to being explicit, problems become objects that facilitate thinking about them. In this game between order and chaos, between the predictable and the unpredictable, the students could experience the creativity as something tangible, and the computer – as helping them to see their imagination.

So what we can claim without the danger of over-generalizing is that certain computer environments that teachers use have shown tremendous potential for promoting deep understanding of certain ideas in mathematics, informatics, languages, fine arts, and music. But let us see how the RGE experiment looked from outside.

**Visits of experts**

The experimental RGE schools were often visited by educators from abroad (Russia, US, UK, Israel). I would like to share my memories of several of those visits.

While visiting the School #119 in Sofia, a Russian psychologist asked me to describe the RGE experiment in one sentence without using the word computer. Then I said: Our children like going to school. The immediate answer was: Thank you, this is absolutely sufficient. Indeed, my statement embodied the whole atmosphere of creativity that teachers and students have, and the computers being only part of the environment (but a natural means of expressing oneself in an integrated learning process).

Another Russian educator visited a school in the country (in Blagoevgrad), a day earlier than he announced. When entering the school he smiled and said: I know that you would show a guest the best you have, but I want a realistic picture. The teacher looked at me slightly embarrassed but I encouraged him to carry out his plan for the day – the lesson was exploring procedures for drawing spirals with parameters (for the angle of the turtle turn and the size of the initial segment). The self-similarity of the construction naturally leads the 5th graders to write a recursive procedure:
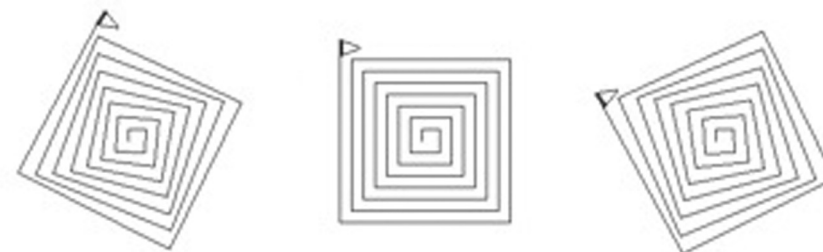


To spiral :size :angle
Forward size
Right :angle
Spiral :size+5 :angle
End

By experimenting with various values for the ANGLE parameter, the students found interesting patterns, were able to create spirals with the shape of regular polygons, and to produce switching spirals with a fixed number and direction of branches. They introduced a parameter for the increment of SIZE and explored another rule of augmenting it (SIZE*2). (Although they didn't know at the time that they were getting the graphical representations of arithmetic and geometric sequences, this was an excellent propedeutics for a better understanding of these notions…).

Then the students decided to check what would happen if they fix the first parameter (SIZE) and increase the ANGLE. The latter idea was born with the help of the teacher who was thus preparing the ground for experiments in science with processes depending on several parameters. The visitor was genuinely surprised, and the teacher and I felt happy that he could experience the creative atmosphere typical for the Language and Mathematics classes without doubts about a preliminary setting.

Paul Goldenberg was another visitor (from Educational Development Center, USA) who was invited in 1989 as an expert to evaluate the strategy of integrating informatics in the RGE curriculum. During his visit he worked with 4th and 5th graders (from the Sofia school #119). Ten years later, at a Eurologo conference in Sofia, he expressed the following views:

Ideally, this power should build from grade to grade and allow high school students to use the tools easily and appropriately to solve non-routine problems that match their intellectual and mathematical development. Such an approach is strongly at odds with the common tendency to treat Logo as an elementary school toy, and then to drop it altogether (or, for the very few who continue the program, drop it only to replace it with some other language, which is a bit like using a semester of Spanish as preparation for French). As a toy, any computer language, even Logo, is not worth the investment.when considering the time. As a fluent language, it rounds out students' repertoire of expressive means: one's own natural language is best used for conveying the semantics of a mathematical idea or situation; algebraic language is best at expressing and transforming quantitative or structural relationships; and computational language is optimal for describing processes and algorithms. That -- especially the last two paragraphs -- I feel like I learned in Sofia!

The visit of Seymour Papert in the Sofia School #2 offered a different kind of emotions. The father of Logo could easily figure out the key for Logo commands in Bulgarian and communicate in a friendly way with the 5th graders working on a standard Logo procedure for drawing a polygon. The teacher (Miroslava Bekyarova) had left the kids to work independently and everybody was in good shape, except for a boy whose Logo turtle didn't operate properly. He did not ask the teacher for help but neither she inquire, and I could not see any error. So, I took the gauntlet down to Papert. He enthusiastically rolled his sleeves and started trying out the commands in the command center – no effect. Finally, he reduced the procedure's body of commands to the simplest possible command – FORWARD 100. Again – no effect. Then he said: A hardware problem!!! The class ended with a question from a student to Papert: Do you, in the US, have such a good teacher as Ms. Bekyarova? You could guess the obvious answer.


**Educational materials influenced by the RGE principles**
The good experience of the RGE project was extended by a team of mathematicians and informaticians (I was part of) who wrote the textbooks *Mathematics and informatics* (8th –12th grade) for the general educational system.

**Mathematics and Informatics from 8th to 10th grade**
These textbooks have been in use since 1988 in many regular secondary schools. Here are some general ideas adopted by the authors:
• integrating informatics with other school subjects has been expected to be very useful for both informatics and the specific subject matter since;
• informatics offers a means to clarify and extend the mathematical concepts studied;

- informatics offers appropriate tools for obtaining a great variety of solutions;
- the microworld of exploratory type contributes to anticipating school mathematics as a field for investigations;
- using problem solving scenarios developed both vertically and horizontally;
- specifying branches in mathematics, informatics, linguistics and arts which students could choose from according to their own interest and what best express about themselves;
- offering the transparent software approach through the glass-box toy system.

Most of the lessons were accompanied by additional resources: pre-developed projects and configuration files for the students to run, explore, modify and extend. Exploration activities were introduced even at the beginning of the course.

With the smallest number of pilot schools, and highly motivated teachers and researchers, this idea worked reasonably well. But when tried on a larger scale, the problems to be faced were various – for the sake of better integration, some mathematical lessons were rearranged unlike the tradition making the novelty too big for the mathematics teachers. As a result, the informatics topics were left to the informatics teacher reducing the chance for a real integration. The informatics teachers, on their part, did not like the limitations imposed by the subject or by the project scenarios – they preferred a more systematic introduction of the informatics topics. Besides, the exploratory spirit of Logo confronted with the rigid timetable of the classes in informatics. Last but not least, there was still prejudice among a significant part of the education society (including some parents), who stated that Logo was a children's language and that students in the secondary school should learn something more professional. Despite the technical and organizational problems, mathematics and informatics textbooks became popular and have been in use until these days.

### *Informatics in Logo style*

Based on their experience and recommendations, a new Informatics textbook in Logo style was developed. It was meant as an introduction to the informatics bringing the spirit of the educational philosophy and the culture of the Logo community. The authors pursued two main goals:

to introduce the basic concepts, formal structures and methods of informatics;

to acquaint the students with various computer applications in the real life.

An elegant way to achieve these goals was to bridge the gap between the two extreme approaches; programmers vs. users.

The textbook was structured in three modules corresponding to the considered stages of studying informatics:

Introduction to programming – this module introduces some basic concepts such as commands, loops, variables, procedures, recursion, conditional and Boolean expressions;

More informatics and applications – this module contains three branches to be used as preferred: informatics; arts and design applications; linguistic and natural language applications.

In the first branch, we gave high priority to the approach of using glass-box toy systems. These were simplified models of computer systems such as data base systems, electronic dictionaries, spreadsheets, etc. Students used such systems as a black box to experiment with and thus got an idea about their functions.

The remaining two branches were meant to those who did not like the first subject. Working in a field of their own interest (arts, design, and linguistics) motivated pupils and made them realize that informatics enriched their means for self-expression.

### Enhancing teachers' creativity

The positive experience of the early Logo days was later transferred to the university level. Being aware of the importance of the teacher's role for any educational reform, the participants in the RGE experiment developed

new university courses in which the spirit and the philosophy of Logo were included in a natural way. Since 1989, the traditional core of mathematical disciplines taught at the Faculty of Mathematics and Informatics at Sofia University has been enriched by a series of Logo based courses: Logo Programming, Teaching Mathematics in a Laboratory Type Environment, Working in a Lego-Logo Environment, Informatics in the secondary school with a mathematics curriculum, Problem-oriented languages.

We, the lecturers of these courses, would give the students the freedom to choose the topic of their projects: logical games; computer puzzles; graphical representation of program structure; and projects related to anatomy, astronomy, mathematics, arts, and language. The final exams were to represent a "project show" – demonstration and defense in a friendly atmosphere.

In the case of Teaching Mathematics in a Laboratory Type Environment, the students experienced the feeling of "doing mathematics" as opposed to the "correct" reproductive activities, which made the future teachers be more self-confident. After years of studying (and often just memorizing) very sophisticated mathematical facts, they were put into situations where they could say: "Look at my construction!"; "What about my procedure?" "Can you prove my theorem?" "Look at what I got!" Thus, we expected that the wish to act independently with a spirit of discovery would hopefully be transferred to their pupils...

The best students in mathematics saw new horizons and created bridges between informatics and mechanics, physics, geometry. They created models of different crank mechanisms, of the Riemann geometry, of optical phenomena, etc.

Developing worthwhile problems for teaching and learning became a challenging task for the future teachers and was often part of their course projects or diploma works. Some good examples of such challenges were related to the geometric transformation inversion, which although was very beautiful, it had not been achievable at the secondary level. This gave the future teachers the self-confidence to have some influence in the curriculum and to be responsible for a new classroom culture.

Future teachers became convinced that studying mathematics is not an end in itself (nor is it merely the content of the math curriculum), but it is rather a mode of learning, how to think and express oneself, and how to behave cognitively and socially. They realized that it is their responsibility to organize successfully pupils' own experience in order to help them construct their own knowledge. As a result, they felt better prepared (not trained) for the new role of the teacher in mathematics - of an advisor, consultant, stimulator, sometimes a partner, sometimes a therapist, but always a participant into the creative process.

In other words – teachers who combine Columbus' investigatory spirit together with Da Vinci's universality and Prometheus' love for people.

Looking back at the challenges my trainee-teachers have overcome, I feel proud of their newly gained self-confidence, and their readiness to teach in a guided discovery style. Good examples of teachers' creativity can be found in most of the schools today. Our duty is to spread their achievements through journals and conferences for teachers in order to enrich the in-service and pre-service teacher training.

The main lesson for me as an educator could be summarized as follows: if we hope for a real positive change in education, we should bring teachers of today and tomorrow in situations in which they would stop thinking about the future in terms of tests, exams or only teaching pupils. We should rather give them the opportunity to experience what they are doing as something intellectually exciting and joyful on its own right.

Further on, we cannot teach the guided discovery learning without engaging ourselves in assisting the art of discovery, without acting as research partners to the people we teach, and without demonstrating how we try to solve the problems occurring during the research process.

I was lucky to be involved in several programs in which students were able to enter the world of scientific investigations.

## Internet Links for Real-Time Investigations

An innovative way to bring inquiry-based learning to elementary and secondary school has been promoted by Prof. Edward Friedman and his staff at CIESE, Stevens Institute of Technology (NJ). The complex program was designed to assist teachers in bringing Internet applications to math and science classes. The project's goal was to create and diffuse compelling, content-rich applications of telecommunications and the Internet in K-12 science and mathematics and to create community of learners who use telecommunications effectively to enrich their learning process. Since the fall of 1994, when the project started, I coordinated the implementation of the CIESE projects in several Bulgarian schools.

The students performed experiments ontopics such as acid rain, water quality, boiling water temperature etc. They gathered data, analyzed trends and patterns on topics of current scientific, social and geographic interest, and communicated with each other and with practicing scientists via Internet. They sent the results of their local experiments to be combined with national and international results. The teachers participating in these projects reported that students' interest in science significantly increased.

Several curricular units based on the concept of real-time data have been created with the relevant mathematical component. An important goal of the project was to help students understand how measurements are made and how data can and should be analyzed.

Teachers acted as consultants rather than lecturers. Scientists encouraged students and teachers to discuss real problems with them and to use resources that were not previously availablein the classroom. Thus, a global classroom and a new alternative infrastructure for education with a social significance had started functioning embracing teachers and students from more than 350 schools all over the world.

Teachers and pupils in a similar way felt that they were part of a big international research team when they participated in these Internet projects. Even the parents got excited, which helped to transform schools into a place where students could enjoy science. There was a case in Sofia where the father of one of the students brought a water sample from Antarctica to be compared with the water they drink at school. Students liked the fact that their work was not just an "imitation" but something that may be used by real scientists.

## Educational programs outside the school

To appreciate the real beauty and meaning of mathematics and science and to choose it possibly as their future profession, the students should be enabled to participate in forms in which they use mathematics in daily life activities; apply mathematical thinking and modeling so as to solve problems that arise in other fields; use mathematical methods as an integrated whole; formulate their own hypotheses and problems, and approach open problems.

To give students at school age the opportunity to experience at least partially these sides of the math research process, there are various forms such as: specialized research programs, school sections in the frames of professional conferences, and symposia and fairs for young scientists. Many researchers in gifted education express their belief that educational programs outside of schools are absolutely necessary for gifted children because they meet their special learning needs by providing more opportunities for independent inquiry, in-depth study, and accelerated learning. In addition, a summer program is a great chance to meet other bright kids who are fascinated by learning. These are their true intellectual peers. Courses in these programs combine the best of both worlds: accelerated content and bright age-peers. Summer programs vary in terms of content, duration, intensity, sponsorship, and overall purpose. Still some general benefits include the following:

- Perceptions of increased social support for learning and achievements due to homogeneous grouping and support from counselors, tutors, and mentors;
- Positive feeling resulting from a more appropriate match between the student's academic potential and the challenge of the research projects;

- Development of skills for intensive study and for doing scientific research;
- Reinforcement for risk taking as a result of extending oneself intellectually and socially;
- Growth in acceptance of others and (in the case of international component) knowledge of different cultures.

Below I am focusing on ways (outside a traditional school context) to raise student's mathematics and science curiosity in order to develop their scientific competence and thus, they would get a feeling that the work was made by a scientist. When working on research projects with secondary school students, it is a good idea to group the activities in several main phases:

- Preparation phase – motivating the students to explore a topic of their interest by delivering short lectures and appropriate warm-up problems
- Research phase – engaging the students in research activities by formulating appropriate:
- short-term projects (expected to be developed at the most in two weeks during a summer course or during the school year)
- long-term projects (lasting from 6 weeks to 4-5 months, in some cases – up to 2 years); such projects may be published, developed in a thesis, etc.
- Presentation phase – building up skills for a written and oral presentation of the project
- Passing on the torch – teaching students to act like mentors

To put the students with special interests in math and science in more realistic research situation we, in Bulgaria, have founded the High School Institute in mathematics and Informatics (HSSI). This institute inherited the good traditions of an earlier movement of the technically creative youth in Bulgaria and an international research program held in USA – the Research Science Institute (RSI). Sponsored jointly by the center of Excellence in Education (CEE), and the Massachusetts Institute of Technology (MIT). Below I describe in short my involvement in these programs.

What is RSI? (or, How did I become "richer than Bill Gates" ?)

In 1997 I was invited by Dr. Mark Saul, then the RSI director, to participate in the program as a tutor. At the time I did not expect that RSI would become an essential part of my life. Having been working for RSI for 13 years now as a tutor, and several times as a coordinator (matching students and mentors), I feel now part of the RSI community.

If I have to describe this program with one sentence that would be: "the place where to be extraordinary is the most ordinary one". This applies to the students, to the mentors, to the morning and evening lecturers and to all the rest who are officially and unofficially involved. There are several statements about the RSI founding and principles:

The Research Science Institute was established in 1984 by Admiral H. G. Rickover, the founder of the Center for Excellence in Education. Toward the end of his life, he began bringing together high school students from across the United States and other nations who showed a high interest and ability in science and mathematics. His idea was to createa community of exceptional scholars in six weeks. Apart from these students, also noted high school teachers, university professors, and working research scientists were included. Admiral Rickover and Co-founder Joann DiGennaro created a program successfully implementing this idea.

Approximately 80 high-school students from US and other nations including Bulgaria, China, France, Germany, Greece, Hungary, Israel, Lebanon, Poland, Singapore, Saudi Arabia and the United Kingdom attend RSI. Once the students are selected, they come to MIT and work on a research project under the guidance of the faculty, postdocs, and graduate students from MIT, Harvard, Boston University, and other research institutions from the Boston area. All the students chosen for the Institute will acquire a deep interest in a scientific field of inquiry, and find opportunities to acquire some form of field experience. The Institute begins with four days of formal classes. Professors of physics, biology, chemistry and mathematics give lectures on important aspects of their field and about their own research. The students also attend lectures in humanities. The

internships that follow these classes comprise the main component of the Institute. Students work in their mentors' research laboratories on weekdays for five weeks. At the end of the internship, they write a document summarizing their results and give an oral presentation of their work in front of a large audience at the RSI Symposium.

In order to make it a continuous intellectual process, it is best to characterize the RSI research paper as a progress report for a continuing research effort. As expressed Dr. John Dell, the RSI Director from 2001 to 2002, it is more useful to think of the RSI paper in this way than as a paper about a finished research project because this model allows students to write progressive versions of the paper and to prepare presentations of their work throughout the program using a consistent intellectual template to which the tutoring staff can target their support. Progress reports essencially focus more on methods and process than a final research paper does, but they naturally evolve into final reports as some original results are obtained. The transition from progress report to final research paper is in editing an existing text with the perspective of the final results in mind. RSI is well structured for thisprocess as teaching assistants and *nobodies* (RSI alumni with no formal duties) supply great quantities of quality editing advice in the week before the papers are due.

Especially important in the process of preparation are the *milestones* – intermediate steps in the process. Typical milestones for the written presentation are: writing about a mini project using the same sample as the one for the final paper; gradually filling the proposed sample starting with the background of the project, the literature studied and the methods used; considering partial cases and possible generalizations; classifying the cases of failure, etc. Possible milestones for the oral presentation are: speaking for 3 minutes about a freely chosen topic, presenting the introductory part of the project in 5 minutes, etc.

All the milestones are accompanied by feedback we, the tutors, who work closely with the students, provide. We read and make comments on the draft papers, provide editorial remarks, suggest means of approach

for research and areas of additional background reading, give them ideas to improve their oral presentations, etc. In general, we motivate students when they experience problems and lack of self-confidence.

To get an idea of the variety of topics of projects performed at RSI, you can take a look at the compendiums of three consecutive years containing the abstracts of all the written reports with five selected as representatives, which are published in full.

I feel privileged to have experienced an inspirational atmosphere of nurturing young talents in science, an atmosphere of removing what impedes their intellectual growth, and supporting their natural desire to explore and create. Here, the students learn about research by doing research under the guidance of experienced mentors. The role of us, the tutors, is to help them present their "journey of explorations" in a *suitable* written and oral form. Also to cope with the anxieties of these gifted students, to help them tune to the requirements of research, to encourage them when feeling "stuck" without depriving them from the joy of the ownership of their work, to help them enjoy working in teams, to help them distribute their time between "pure research" and documenting it. All these are the components of a collective work in which tutors are expected toimprove and spreadthe development of the novice tutors.

The transforming process of the RSI summer program occurs at a critical time in the lives of the students. It's when they begin making decisions for themselves, which will define the course of their lives. It is an emotional time when friendships that last a lifetime are made.

Even though the summer program has finished, Rickoids (as the students are called after Admiral Rickover) stay in contact with each other and with us; the staff, via email. And many continue working with their mentors on research projects.

I have been deeply amazed with the contribution, devotion, and intellectual strength that the whole RSI community brings to the program year after year. I saw the tremendous positive impact that RSI had on the students who went through this program. It was a special joy for me to see

so many RSI alumni coming together at the end of the program for the paper reading and judging. Many people have been giving me significant guidance and insights into the structure and function of RSI including Joann P. DiGennaro and Maite Ballestero, who have built and maintained the program over these many years. Also the program directors - Dr. Mark Saul, Dr. Bill Stuart, Dr. John Dell, Dr. Inouye, Dr. Matt Paschke, Prof. Dennis Ugolini, Dr. Cliff Bowman, Dr. Amy Sczepanski, and, of course, a large number of the *nobodies*.

Nothing can be compared with the feeling of sitting in front of the Student center at the MIT Campus with your laptop on the grass and young people from different RSI years are passing by – walking, rushing, on a bicycle or on rollers and stop to say hello and share their most recent adventures in science and life. I feel blessed!

Once the course was over, I shared with some of my RSI students that being among them makes me feel the richest person in the world. Years later in my summer book I read a dedication made by a Bulgarian student: *You are richer than Bill Gates, Jenny, and you know that!*

There are many wonderful dedications made by the RSI students about the meaning of the program for them. I would like to quote one of them, Daniel Vitek (RSI'08), who wrote the following while flying back home:

**RSI through the eyes of a student**
RSI means acceptance. Back in our homes, we may alternately be shunned or worshipped for our intellectual abilities. Here at RSI, every one of us realized that there is, in fact, a sizable community of peers with whom we can interact with as equals, and just how powerful such an interaction can be. It is an interaction that is stronger than graphene, an interaction that is more powerful than any nuclear process, inexpressible as a continuum of energy states of a transition compound - it is an interaction that redefines our perception of who we are. And that redefinition really does matter because it changes who we are as a human beings.

RSI means excitement. We didn't tread on the gray halls of intellectual wisdom anymore, learning more and more of what others before us had done. Here, rather, we were the builders, not the tourists. Here we set off our own track, adding new structures to the total sum of human wisdom in our own distinct areas of expertise and with our own distinct styles. And such an unbounded discovery of course brings exuberance. With every new result, whether experimental or theoretical, there is that joy of seeing something that nobody else has ever seen, and with it comes a feeling that only a few ever truly feel. It is a sort of euphoria, this temporary high that one experiences when knowledge comes within one's grasp. But it is a thousand times purer when that knowledge itself is purer, unsullied by the tired hands of many students, unrecorded by the dreary pens of flocks of writers, and unknown to any of the myriads of great thinkers of our species. This excitement pervaded RSI from day one, as we all knew that within these six weeks we would be doing something that had not been done before.

RSI means work. Undoubtedly, with the pleasures associated with the discovery of new knowledge, the corresponding toil required to get there must come. No great thinker ever discovered something new without burying it within his mind and letting the subconscious take its course. No great doer ever succeeded without first failing multiple times over. And understanding such a relationship is critical to success at RSI. As a math student, I admired the ability of some of my fellow Rickoids to get up every weekday at a ridiculously early hour of the morning and put in the hours on a lab, working on new discoveries. At the same time, there were days at RSI when I knew I would do no more thinking that day, when my brain said "I've put in my hours - now you can go write this up." And that's part of the reason why we're even here at RSI - because we will, when given an opportunity that truly means something to us, take it and work on it to the fullest of our abilities. That's why we achieved getting into RSI, that's why we achieved what we did at RSI, and that's why we'll achieve great things after RSI.

RSI means friendships. Here I know that I developed something that I will never forget, and I hope that all of you won't either. It seems strange that in just six short weeks we were able to form lasting friendships, whereas we have known our friends back home for years on end. Again in the Socratic tradition, why? Because here, we met people with whom we shared our most fundamental characteristics. Our nerdy jokes weren't the nerdiest. We were in close quarters with everybody for six weeks on end. Here, especially after Assassins started, we never walked alone a lot. And a constant conjunction, according to Hume, leads to association. And friendship is an association with one another.

RSI means fun. Because smart kids are intelligent enough to know to (i) always wear LaTeX (sorry, I couldn't resist the multiple levels of humor), and (ii) stay smart, you can't overwork yourself constantly. So to those responsible for all of the games - Frisbee, ping-pong, Assassins, Mafia, CTF, and more, - the films - namely Hot Fuzz, The Matrix, Dark Knight, Proof, Eurotrip, and whatever movies I didn't see or didn't name, - the trips, which were so many to even begin to list, and everything else we did to keep ourselves from going completely insane, we wholeheartedly thank you. The times that we didn't spend working were the times in which we really understood what RSI is about.

RSI means people. Bassically, you can't do science by yourself these days. Through coauthoring, peer-reviewed journals, conferences, talks, laboratory or corporate facilities, or even government work, you have to interact with people who are as smart as yourself. And RSI is a way to do that, while still carrying out your research. Here at RSI, we plumb the depths of the physical world with our research, yet we create relationships that will transcend this mundane world. We do research because we can. We make friends because we must. The research is there to challenge you to truly know yourself. The program is there to getting to know others. That's what RSI means; people.

One of the main ideas behind establishing the High School Students Institute of Mathematics and Informatics (HSSI) in Bulgaria, was to implement RSI-like activities in our country, taking into account the local conditions and traditions. One of the crucial factors for making this possible was the long-term collaboration among the Center for Excellence in Education, the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, and the St. Cyril and St. Methodius International Foundation.

**High School Students Institute (HSSI)**

The High School Students' Institute of Mathematics and Informatics (HSSI) was established in 2000. This was one of the projects undertaken by the Bulgarian mathematical community in response to the decision of UNESCO to declare year 2000 as the "World Year of Mathematics". The name "Institute" reflects the endeavor to have an organization that functions like a research organization and based on the principles of scientific life.

The founders of HSSI were the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, the Union of Bulgarian Mathematicians, St. Cyril and St. Methodius International Foundation, and Evrika Foundation.

The infrastructure of the HSSI has been adapted to the needs of the local conditions – its activities are focused on projects in mathematics, informatics and information technologies. Thanks to the well-developed network of competitions in mathematics, informatics, and linguistics for secondary school students in Bulgaria, the young people can exhibit their abilities and gifts. For more than 20 years, Bulgarian high school students have successfully participated in the International Mathematics and Informatics Olympiads. However, there are many students who are highly creative only if they are not limited by a short fixed time to complete a mathematical problem. The mission of HSSI is to identify such students and to take care of their development as future scientists.

The local conditions included as an essential factor the infrastructure and the activities held by the Union of the Bulgarian Mathematicians, which has long-standing traditions in early identification and proper

enhancement of talents. Since 1980, School Sections in the framework of the annual Spring Conferences of UBM have been organized, where high school students presented their papers. The interest in these Sections shown by teachers and students was great. This contributed naturally to the mission of HSSI to keep the traditions alive giving them new spirit and new content.

Another important component of the local conditions is the environment provided by the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences stimulating the growth and the progress of HSSI – library, internet, rooms and equipment. Many researchers at the Institute devote significant part of their free time to keep a high level of extra-curricular work with talented students. Their work supports and enables HSSI to assist the intellectual and professional growth of the high school students.

### The participants
The participants in HSSI are high school students between 8th and 12th grade, usually aged from 15 to 18, mainly from specialized Science and Mathematics Secondary Schools in the country. Every participant in HSSI works individually (or in a team) on a freely chosen topic in mathematics, informatics and/or information technologies (IT) under the guidance of a teacher or another specialist. A written presentation of the project (a paper) is sent to HSSI. All papers are refereed by specialists and the reviews are given to back to the authors. Papers involving creativity elements are given a special credit. The best projects are accepted for a presentation in the conference sessions of HSSI. The distribution of participants shows that big and small towns are equally involved in sending their representative to the HSSI.

### The events
During one school year, HSSI organizes three events - two conference sessions and a research summer course. The High School Students' Conference is usually held in January at the Plovdiv branch of the HSSI (the Faculty of Mathematics and Informatics at Plovdiv University) and is attended by more than 200 students, teachers, researchers in mathematics and informatics, parents, and journalists. The conference is held in two streams – mathematics and informatics/IT. The authors present their work in front of a Jury of specialists in the field and in the presence of the general audience. The jury can ask the students various questions at the end of their presentations in order to check the level of their understanding and creativity. The projects in informatics and IT are additionally run on computers to be judged by a specialist from a technical point of view before being presented to the audience and the jury. When these two streams are being held, so is a poster session.

Based on the merits of the paper and the style of presentation, the works are judged and then the best ones are selected. Their authors receive Certificates for Excellence and all other participants are given Diplomas for participation in the event, which is a kind of recognition.

The authors of the best projects in the High School Students' Conference are invited to take part in an interview for selecting two Bulgarian participants in RSI to participate in the School Section paid for by HSSI.

The School Section is an independent event which can be attended by students who want to present their research for the first time. The process of reviewing and selecting papers for the School Section is the same as above. The authors of the best projects from this section are invited to participate in the Research Summer School paid for by HSSI.

The HSSI have selected the Bulgarian representatives for RSI since 2000. The interviewers include researchers from IMI (possibly from some other research institutions), representatives from St. Cyril and St. Methodius Foundation and most importantly; RSI alumni. The questions aim at checking the fluency of the candidates in English, their general and professional culture, talents in other fields (sports, music, etc.), and social skills. The questions by their peers help the candidates realize that participating in RSI is not only a great honor, but a challenge and a responsibility to pass to the rest what they have learned. The selection process is difficult – two RSI participants and two alternates are chosen among

about 20 excellent candidates based on their overall performance (their work on the projects, their presentations, achievements in mathematics and informatics events, and the interview.)

My specific function in the selection process in HSSI is to contribute to the connections between RSI and HSSI. To prepare joint activities during and after the summer courses, to help with the selection of the Bulgarian representatives for RSI, to assists with establishing a good transmission of what has been learned and achieved at RSI by the students of HSSI at student-to-student and teacher-to-students levels.

To grasp the atmosphere of these interviews, I will share some memorable moments I've had from the most recent selection process. Not only did the 13 candidates demonstrated their general culture and knowledge in mathematics and informatics (we, the jury, already had an idea about their research potential), but also their various talents in singing and dancing, poetry, fine arts and even magic performances.

A challenge from a member of the Jury was to state a fundamental theorem proved in the last 50 years which is not the Fermat Great Theorem. The student formulated (with no hesitation) a result presented by two of his HSSM peers, also applying results of their RSI peers. One of the tasks I claimed as a necessary condition was to teach a member of the Jury to dance a Bulgarian folk dance, horo, with verbal explanations in English. An interesting answer was given to the question: What is the next line in the monolog? "To be or not to be; that is the question". The student immediately responded: The question is not "To be or not to be", the question is "What to be."

The jury smiled at the ambitions of another participant. He expressed his regrets that Grigori Perelman has already turned the Poincaré conjecture into a theorem and thus has solved a problem which is both among Hilbert problems and the Millennium problems – something that deprived our hero of achieving the same.

However, attending RSI (no matter how tempting it sounds) means that one would miss another great event – the Research Summer School!

The three-week Research Summer School takes place from July to August in two locations – at the sea coast and in the mountains. During the first two weeks, lectures and practical courses in mathematics and informatics are delivered by eminent specialists from universities, academic institutions and software companies. Then the students start working on a short-term project. The main goal of the training is to extend the students' knowledge in topics related to their interests, and to offer new problems to be studied and solved in future projects.

The third week is devoted to a High School Students Workshop, where the participants report their results and exchange ideas for future studies. The presentations are presented in front of specialists, whose role is to advise the students how to find the right topics and problems to be studied, and to recommend methods and tools to be used in order to achieve high quality results.

To help teachers improve their mentoring skills, a High School Teachers Workshop is organized during the third week of the Research Summer School. Participants are the research advisors of the students' projects presented at the events of HSSI during the school year.

Another important activity of the HSSI is its monthly seminar at the Institute of Mathematics and Informatics. The aim of the seminar is to bring together high school students, teachers, and scientists to present and discuss problems of common interest.

On the 10th anniversary of HSSI, I interviewed for the readers of Mathematics and Informatics Journal (meant mainly for Bulgarian teachers) several people closely involved in the activities carried out at the seminar. Here are some of their thoughts:

Petar Kenderov (President of the St. Cyril and St. Methodius International Foundation): "Talent is a resource which, unlike the ores, could vanish if it's not discovered early enough. The most important result of HSSI is the qualitative difference between the knowledge acquired by ordinary students and the knowledge acquired by the students of HSSI. In order to work successfully on a given project, HSSI students learn a lot

from additional material, often going far beyond the obligatory syllabus. They have a much deeper understanding of what they learn and are able to apply their knowledge to find answers for questions and conjectures they formulate. This is what happens in real research. The opportunity to present their results to their peers makes the science experience even stronger. In fact, the students of HSSI get aclear idea of what science is and acquire practical habits in doing research. What happens in HSSI is an example of Inquiry Based Learning (IBL) where the students discover the knowledge themselves by searching the existing classical literature and Internet resources, combining known facts in an original way, and, sometimes, obtaining new information about the studied topic. The teacher (supervisor in our case) does not provide the knowledge in terms of direct instruction. He or she helps the students develop the necessary research skills (analytical thinking, formulation of conjectures, experimental check of the conjectures, etc.) and guides the overall process of work."

Boriana Kadmonova (President of Evrika Foundation): "To me the founding of HSSI was a very significant event, organized by people who have dedicated their professional life to the young people so that they can surpass their teachers and achieve their dreams for a life realization. Unifying our knowledge and experience, the elder people, with the motivation and the scientific endeavor of the youngsters, creates the magic. This magic attracts every year a new crowd of students from all over the country, ready for new ideas and projects. It makes me feel happy that I am part of this magic, that I am part of something useful, of something that is a symbol of youth, creativity, future, and a lot more."

Stefan Dodunekov (President of the Union of the Bulgarian Mathematicians and Director of the Institute of Mathematics and Informatics-BAS): "Even if HSSI would be the only thing left for us as educators, I would be endlessly happy. I feel very proud to have the chance to contribute to the founding of this Institute. Nurturing and stimulating young talents as well as the development of mentoring skills of the mathematics and informatics teachers are extremely important."

Oleg Muskarov (Director of the HSSI): "The activities of the Institute were acknowledged by the European projects Meeting in mathematics (2006-2008) and Math2Earth (2009-2010) as the best practices with gifted high school students in mathematics and informatics. In the last three years, the best five informatics students from HSSI were admitted to participate in the International Conference CompSysTech, which is conducted every year in Bulgaria and comprises scientists from all over Europe. The students selected each year by HSSI to participate in RSI performed really well. The projects of Kaloyan Slavov (2001), Vesselin Dimitrov (2003), Antony Rangachev (2004), Galin Statev (2008), and George Kerchev (2009) were ranked among the best five in RSI in their respective years. Several articles with results obtained by HSSI students were published in regular scientific journals. During 2009 an international commission of about 40 scientists from more than 15 countries evaluated the activities of every institute of the Bulgarian Academy of Sciences. The achievements of the Institute of Mathematics and Informatics related to the identification and nurturing of young talents were highly evaluated. The evaluating commission was impressed by the fact that eminent Bulgarian scientists in various fields of mathematics and informatics work directly with gifted students and are involved in their development at a level comparable with the most developed countries."

Neli Dimitrova (Coordinator of HSSI until 2006): "I started working as a coordinator of HSSI from its very founding. The first years were the most difficult ones, but exciting at the same time. These were the years in which the goals, mission, structure, and activities of the Institute were taking shape. There was a lot of work – organizational, administrative, financial, and coordination of the scientific support of the HSSI conferences and summer schools. How could someone embrace so much and so versatile activities? There is a single answer – someone who has a lot of love, devotion, and dedication – like a mother (and only she) could dedicate herself to her children."

Borka Parakozova (Coordinator of HSSI since 2006): "The ongoing contact with the young people is a very enriching experience. I am always moved by the expressions on the faces of the candidates for RSI immediately after they have been interviewed. And I make a comparison with how they look like after the results have been announced. Some are happy, and others are so disappointed that there are even tears. I would like to see a greater number of happy faces but the number of the lucky winners is fixed. I hope that the HSSI alumni do not forget us after their graduation in prestigious universities around the world, and pass the torch to the next generations of young talents."

### What do HSSI students think about scientific research?

Anita Georgieva (HSSI 2001)

No matter how well you have done something, there is always someone (or something) whispering to you: You could do better…

Iva Rashkova (HSSI and RSI 2002)

You have to understand the potential of your thinking as a researcher and to find out your unique place in it. HSSI showed me what is in mathematics that really matters!

Todor Bilarev (HSSI and RSI 2006)

My participation in the HSSI summer school entirely changed my impression of math. Before that I thought that the math profession was monotone and boring. But it turned out that in addition to doing research, the mathematicians have the responsibility to teach young people with high interests in mathematics to love it, appreciate it, and strive for doing real math. I realized that being a mathematician means to have a rich personality. I met people who have proved an Euler conjecture to be wrong while being world champions in chess compositions and composers of music based on $\pi$. Mathematics teaches you to think and reason - a necessary condition in each field…

Galin Statev (HSSI and RSI 2008)

HSSI marked the beginning of my science research activity. Before I took part in HSSI, for me mathematics was only solving problems. Here

I learnt to examine the problems in more detail, to use specialized mathematical literature, and to work in a team with my mentors and the scientist from the institute. My participation helped me improve my style in expressing and presenting the examined problems. But undoubtedly what I liked best was the great creative atmosphere during the conferences and the friendly relationships during the free time.

Katrina Evtimova (HSSI and RSI 2008)

HSSI gave me a chance to look at mathematics from a different point of view. It was a new experience – not the routine math competitions, but the research work which I find very exciting. I like the idea of concentrating on and being absorbed by a single problem, analyzing issues that stir up my interest. I gained a lot of knowledge while working on my project and during the HSSI sessions. I met many like-minded people and learned a lot from the scientists working in IMI, and from the other participants. All this has inspired me to keep on improving my skills in mathematics and I am deeply grateful for having been selected to attend the Research Science Institute 2008.

George Kerchev (HSSI and RSI 2009)

I will always remember the night of the RSI "hell week" before submitting our papers when all of us had worked hard and had motivated each other to achieve our best. Even those who were ready with their papers didn't go to bed but stayed and helped the rest of us. It was this incredible solidarity that made what was called a "hell week" the most unforgettable experience for me. As for my project, I didn't know what I was expected to prove during the first two weeks. Then I had great fun since I felt I was doing something interesting and beautiful. Also, I got used to the feeling that there would always be part of the theory that I wouldn't understand. But my mentor, Prof. Etingof would say: "One of the most valuable things is not to know something. Thus you have the unique chance of learning it..." And the most emotional moment for me was at the official fairwell dinner after the first four of the top five papers had been announced. It struck my attention that their authors were all girls. And in a moment which seems

to have lasted forever, I thought to myself: O-h-h-h, four young ladies! I wonder who the lucky guy will be." It turned out the lucky guy was me!

Rafael Rafailov (HSSI and RSI 2010)

I think that RSI was a great experience for me, even with all the problems I encountered. I had the chance to work on a problem proposed by a mathematician of the rank of Prof. McMullen who gave me a problem to work on in the future. The RSI program taught me that things don't always go the way you expect them to go, and that one should always try to get the maximum out of every situation and not to regret about anything, a lesson I think would be very useful.

Katerina Velcheva (HSSI and RSI 2010)

Before participating in RSI, an interesting project for me were those dealing with ordinary IT applications. Now I consider a project interesting if it is challenging enough, if it is related to science, theory, something new, undiscovered, or something nobody has done before. My wish to do science became stronger than ever. RSI was a place where I met people from all over the world sharing my interests and I'll be eternally grateful for that.

All my professional experience confirms the belief that learning could be made more appealing to students of all ages if we, their teachers, try to involve them in the art of discovery as early as possible. And we should realize that *creativity occurs at all levels of giftedness, from the lowest to the highest, and we need to foster and value creativity where we find it* – something which Dr. Mark Saul shared with the Bulgarian educators at a recent visit to the Education in Mathematics and Informatics Department at IMI-BAS.

## A family of gifted educators

Bulgaria is a small country which is proud of few things – its music, its alphabet, its soccer (mainly before 1994), its math talents, and its hospitality. Although this was before I saw what hospitality means for the staff of Belin Blank Center and the Templeton Foundation in the context of the Templeton International Fellowship Program. A smiling young woman handed me a Welcome bag on behalf of the organizers – it contained a welcome card, a bottle of water, a bottle of juice, a piece of chocolate, an apple, and a friendly guide to interpret how one and the same gesture is performed by representatives of different nations. This was just the beginning of entering a big new family – the Templeton Fellows program. It was led by the wonderful team of Dr. Nicholas Colangelo – soon becoming Dr. Nick for all of us. Every participant remembers very well the vibrant time that all of us spent together at the Wallace Research Symposium in 2008 and in 2010, learning a lot, and sharing a lot. But we knew that there was still a lot to do! We were inspired by the great metaphors - the box that became the Belin-Blank Center and the tree that was saved for one million dollars.

The beauty of the Templeton Fellows program is that we have so many wonderful, personal connections around the world.

Recently Dr Colangelo shared with us his pride and joy of being a teacher and congratulated us on being teachers ourselves. He wrote to us: "Teacher" is one of the finest labels that any of us can carry. One thing we all have in common is that we have been positively impacted by some special teachers in our lives. Now you are in the position to impact, in meaningful ways, the lives of others….

Yes, I feel the richest person in the world for having hundreds of gifted students from all over the world and fellow teachers having dedicated their life to gifted education.

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## CHAPTER FOUR
### Gifted and Talented in Ireland
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### Introduction

There are many different terms and definitions for what is known as 'talent' and or 'giftedness'. There is also some variation within cultural contexts on what may be perceived as such. In Iowa, when our group talked about this project, we said that each of us would try and write something about their own perceptions in regard to gifted issues and its management within our own countries. This paper will deal with my perceptions and thoughts, with particular regard to the country of Ireland. With this spirit in mind, I have chosen not to write a deeply researched article with all kinds of referenced works, but to write as someone living this experience and providing information to someone who may not know very much about it. I know that most people who may read this paper have probably already done a fair bit of research and study in the area of giftedness, so I have chosen not to go into too much depth. Within this context, I feel it important to note right from the onset that I am aware my reading of these perceptions and meanings are my own and may not coincide with that of others. Another limitation may be that although I have lived in Ireland as an adult in the country for a long period, and negotiated the educational system for my children, I was not born here, nor do I carry the cultural memories of a native born individual. It is entirely possible that these, my perceptions and meanings, may be very different from those of other individuals who may live in this country or abroad. It should be read in that context, and apologies in advance to anyone who's views may differ.

So, what does it mean to be gifted, to be exceptionally able, or talented? How do we perceive this? Does it have different meanings to individuals, to groups, or to diverse cultures? These are good questions, and at times they may be difficult to answer. They are questions that have been around for a long, long time, centuries in fact. However, one aspect that most seem to agree on is that giftedness is not so much a question of 'being able to do something' (although many can), as much as a state of 'being'.



Figure 4.1 An Irish Island

Gifted and Talented "is not something you can take up lightly on free weekends. This is something that's going to affect everything about your life 24/7. It's something that can force you into being mature before you might be ready. It's something that can go all wrong on you and leave you torn apart" (in *A Parents Guide to Gifted Children*, 2007, pg. xiv, Webb J. et al.)

Ireland is a country that until recently was considered a real phenomenon in terms of its economic growth. During the recent economic 'boom' years and from a high unemployment rate from the early to mid-1990's, the country moved quickly up the ladder of wealth and political influence. In fact, within the European Union, and during the first decade of this century, it became known as 'The Celtic Tiger'. Stephanie Tolan stated that gifted children likened to another big cat, the Cheetah, in her

famous paper called 'Is it a Cheetah?' (1996). A widely agreed estimate for the number of exceptionally able or gifted and talented students in Ireland hovers roughly around the 23000-27000 mark. We have a lot of Celtic cheetahs in Ireland.

The Irish Population in 2010, according to the National Census estimate, numbered around 4,470,700 people. The country is an island that is part of the European Union and is located in the Northern Hemisphere. In the past years, while the country enjoyed economic prosperity, it received a great influx of immigrants which have served to diversify the nation. Perversely, due to the very recent economic crash, the nation may soon be suffering from a mass emigration. Ireland is a country that is steeped in a history stretching far back through the mists (figuratively and literally) of time. Perpetually green, dripping with dewdrops, tumbling castles and round towers, old harbors, woolly sheep, politicians, pubs, and enchanting mystical and magical coastlines; it is located to the west of Great Britain, far out into the Atlantic Ocean.

**A bit of History**
There is evidence of human occupation in Ireland dating roughly from about 8000bc. They are thought to have arrived from Scotland. The country was settled slightly later than the rest of Europe due to its geographical location. Hence, their presence may only be around 10,000 years old. That being said, with the influx of people from Europe and beyond, the result was the Celtic people of Ireland. That is how a culture with rich and deep affinity to nature, storytelling, art and music began. They remained somewhat culturally distinct, even perhaps among other European Celtic groups, as is often the case of people who develop within Island land masses.

On the *Library Ireland website* is found a fascinating copy of Speranza Lady Jane Francesa Wilde's, who was Oscar Wilde's mother, amazing book entitled the 'Ancient Legends, Mystic Charms and superstitions of Ireland' (1888). The chapters 'Antiquities of Ireland' and 'Early Irish Art'

describe how, unlike Celtic cultures in other parts of Europe, who were overthrown, and suffered a watering down, mixing of cultures, loss of language and identity throughout Roman conquests and occupation, Ireland remained undisturbed. This allowed for the retention of its distinct language for a long period of time and the incubation of unique cultural traditions and talent.

The book describes how music was an intrinsic piece of their puzzle, which is particularly evidenced by findings of ancient pieces of the traditional Irish harp in caves. *The Annals of Wales* confirm that the Irish surpassed all nations in their proficiency on the harp. It discusses the incredible variety and fine workmanship of bronze implements that were crafted by Celtic craftsmen. Not dark and dingy, but fine, golden and dazzling. In its pages we can read about the unique symbols that grace the stones in our country, and also the later and much lauded Irish artists who spent painstaking lifetimes illuminating manuscripts. Much of the wonderful Irish mythology and tales, that many in the world are familiar with, are the product of people who, originally without a written language, kept much of their history alive through the ages by remembering the past through the tradition of storytelling. The storyteller within the communities was a very important person who had to have a fine mind for remembering details and large chunks of information, and a creative and lively intelligence for retelling.

*'Dancing with Tigers and flying with Celtic Cheetahs'*
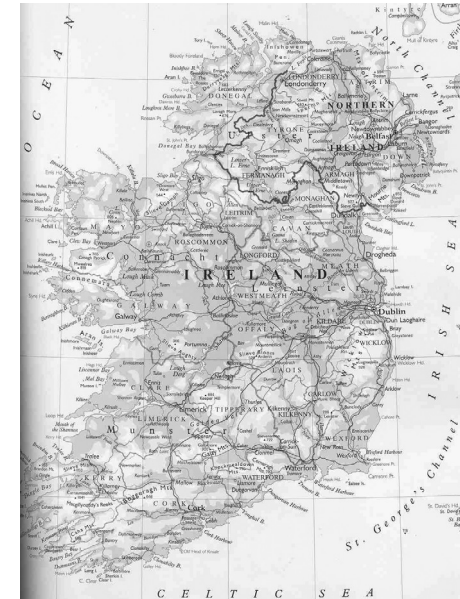
There have been a few other influences from cultures which have come to these shores, such as the Danish Norsemen or Vikings. They intermarried and became integrated within the Irish culture. Their legacy is also evident in some place names, such as Wexford, Waterford and Carlingford, there are around the Island, and became an added influence on historical Irish populations.

As Christianity, and in particular the Catholic Church, influences became widespread and took hold in the country; the use of the native Irish language began to recede. This was further influenced later on by British occupation, mass emigration during the famine, and religious control over educational institutions and schools. Unfortunately, today there are few pockets where the native Irish language is actually spoken, despite numerous programs and attempts to keep it alive. Irish language is still taught, both in a small number of 'all Irish Language schools' and as a mandatory single subject in all other English speaking national schools. However, this mandate is not without its critics, and there have been recent suggestions to make it an elective subject after the 'Jr. Cert.' level exams (comparable to USA PSAT in timescale, a sort of pre final exam). The majority of schools are still denominational, with many being into the Catholic persuasion.

**Education System**
The education system in Ireland is based on three levels. These include Primary, Secondary and Tertiary levels. The majority of schools are national, or non-fee paying schools, with a number of semi-private and private institutions also operating within the country. National schools at both primary and secondary level are state funded, and include a majority of religious schools, non-denominational schools, multi-denominational schools and Gaelscoileanna (or 'Irish speaking schools). There are both single-gender schools and dual-gender schools. National colleges and universities have an entry level registration fee, however, at least for the time being, are still operated on a no-fee basis for those students with Irish

Citizenship. School year generally starts in early September and ends at the end of June for National schools. Private and semi-private pay schools may have slightly shorter school years.

Primary schools in Ireland run for 8 years. These include 2 (Jr. and Sr.) Infant years (Pre K and K equivalent), and then from 1st to 6th 'Class' (rather than 'Grade'). Children start school from around the age of 4 or 5 and leave when they are 12 or 13. The schools are run on an 'Inclusive' system, with multi-ability classrooms managed through differentiation. National school class sizes average around 30 pupils per teacher. Due to the inclusive system, as well as potentially containing one or two highly able students, many classes may also contain a number of students with disabilities and or SEN. In this case, there may also be a special needs assistant attending in the classroom as well. Most schools have a resource and or learning support teacher or team depending on the size. In Ireland there is a wide range of school sizes, ranging from a two teacher rural school in which all 6 primary classes are taught in two classrooms, to very large primary schools with a large number of students. Due to the large influx of other non-English speaking immigrants over the economic boom years, there may be a language support element as well.

Secondary schools run for 6 years. These go from 1st to 6th 'Year' (rather than 'Grade'). The first three years of secondary school is taught as an academic progression that culminates in the 'Junior Certificate Exam'. The 4th Year, being semi-optional and called 'Transition Year', is intended to be less pressurized academically, with more project work and a wider choice of subject options which students may avail of. Fifth and Sixth Year, or the last years of Secondary school, are focused solely on a progressive preparation toward the 'Leaving Certificate Exam' which is taken at the end of Secondary school. Secondary may often stream or set students at foundation, ordinary or higher levels within a year.

Entering the Tertiary Level or University depends upon the number of 'points' students get on their Leaving Certificate Exam. The higher the grade achieved in a subject, the higher points are awarded. Students

must take a minimum of 6 subjects, or more as exam subjects. Only the top six subject scores are added together to get the final number of points awarded to an individual student. These points determine entering the desired career paths at University level. To enter degree programs such as Law and Medicine, students are required to have awarded a very high number of points in the exam. Other career choices have other predetermined point amounts. If a student wishes to pursue a career path and he did not get the required number of points, he may need to go back and do an extra year of secondary school, and do the Leaving Certificate Exam again. This puts a great deal of pressure on students, and makes it a very stressful period in their lives.

Provision for exceptionally able (gifted) students is generally patchy. Schools are meant to have a policy; however, due to the unclear legislation in this area, many do not. Others may just make a passing reference to them within their SEN policies. Differentiation would be the provisional method of choice, although most teachers do not have training in differentiating for highly able pupils. In primary, pull-out groups can be seen, although it is not common. Individual pull-outs for specialized work are not frequently used, unless the student carries another diagnosis. Twice exceptional students, if identified, and is lucky enough to be given some individual time, often find that the second exceptionality is targeted over their gifted side, and may receive little attention. Acceleration is not a provisional method of choice as there is a widespread belief that students should remain within their age group for social and emotional reasons.

Very recently, however, there have been a small, but growing number of very forward thinking schools that have put policies in place and appear to be working well with their students. The publication of the 'Draft Guidelines for Teaching Exceptionally Able Students' (2007), and advocacy efforts from parent and educator groups in favor of awareness raising, may have had a part to play in this. The current governmental and economic view of the need for innovation and knowledge may provide further impetus to change. I also feel that it should be important to go back and revisit Irish studies that have been done in the area of gifted or exceptionally able students. For example, it needs to be acknowledged that there have been successful cases of acceleration in Ireland, as evidenced in Malone's (UCD, 2006) unpublished thesis –'Gifted Students Experience and Adjustment to, Acceleration in the Republic of Ireland'. In her summary of this subjective study on ten students' experiences, she found that students generally experienced a positive academic and social adjustment to acceleration. Acceleration was reported to have provided more challenge for the students, alleviated boredom, and provided social and emotional benefits, such as increased self-esteem, and reduced behavioral difficulties. However, a lack of accelerative options and additional supports available to students at both primary and secondary level indicates that there is an urgent need to raise awareness of the educational needs of gifted learners in the Irish Educational System.

The overall view seems to be that, although there is awareness in the needs of these students and that there are attempts to accomplish them within the educational system, there is a greater need for educational psychologists and teachers to receive concentrated training. They need information about giftedness and opportunities for hands on trial of the same. Basic, background knowledge of past and present legislation, along with exposure to specific research studies and their recommendations could also be important and enlightening. Most importantly, the development and implementation of structured, mandated policy both at governmental and school level. Only in this way can the country ensure the application and delivery of consistent and effective methodologies and provision.

## Screening for the gifted and talented
Although Ireland is a country that does not have any formal state programs or mandated provision for the gifted and talented, there is an awareness of their existence, and a cautious acknowledgment of the need to identify, and provide for students within this population.

Again, Education in Ireland is operated on an 'inclusive' system, meaning that in as much as possible, the needs of all students are to be met, regardless of their ability or special needs, within the mainstream classroom. Provision for this wide and diverse multi ability grouping is to be met primarily through differentiation. That being said, there are a small number of specialist schools, for the more moderate to severely academically challenging, and geared toward students with particular needs that may need specialist attention or may be too severe for adequate provision in mainstream. There are no specialist schools serving the needs of the gifted with second exceptionalities (2E) or otherwise. Generally, there is no formal mandated screening for gifted and talented students within the National school system; however, identification may come from a number of avenues.

*Guidelines for teaching exceptionally able students*
In 2007 'The Draft Guidelines for Teaching Exceptionally Able Students' (DGTEAS, 2007) were states. They advise that teachers should use a variety of methods to identify potential giftedness in students. These include:
• Observation
• Parent and guardian referral
• Self-referral
• Peer-referral
• Referral by others
• Identification by psychologists
• Teacher referral

It includes general checklists across curriculum and subject specific checklists, as well as whole school identification processes (DGTEA, 2007:02)

However, it must be stressed that teachers do not receive any mandated training in gifted education or in identification of the gifted, and they receive very little training if there's any exposure to the same throughout the initial teacher training courses in colleges (a mention during their SEN modules) from which the nation's educators graduate. Only on the Post

Graduate and Masters courses in SEN and on the Masters in Educational Psychology at University College Dublin (UCD) there is a specific, but limited contribution in the area of the gifted, and this varies between 1.5 to 3.0 hours per course. It is an exciting and hopeful development.

This year a lecturer from the Connie Belin and Jacqueline Blank International Center for Gifted Education and Talent Development's New National Institute for Twice Exceptionality is visiting the university, a Dr. Meghan Nipon, who will be giving MAEP students training sessions in assessment this spring. I see this as a positive development which may have potential for further collaboration between institutions.

In recent years, a short on-line course in gifted education has been offered by an independent company, ICEP Europe. However, teachers who are interested must enroll themselves in this semi-private paid course, which is only partially subsidized by the government.

All schools are meant to have a copy of the guidelines, which offer methods on initial identification and screening (see DGTEAS, 2007:pg. 17). However, they are not required to be read, and these are only seen as guidelines and not as a mandated provision. Without a mandate, lack of educator exposure to the guidelines may mean that many of them will fail in using the suggested methods of initial classroom identification. Hence, students may remain unidentified. This may be especially true when looking for non-academic characteristics inherent in the gifted or potentially gifted. Non-academic characteristics such as intensity, sensitivity, kinesthetic, attention and passion may occasionally be misidentified as other, possibly more negative conditions, or missed all together as educators may be unaware of these as 'gifted' traits. Especially if, due to an educational mismatch, these traits present themselves in a negative context; for example, focus as passion or stubbornness, sensitivity as emotional problems, and high energy as hyperactivity.

Having said that, and apart from observable inherent traits, academic testing/screening, identification as an example, on a school level might typically (and simply) look like this:

### Primary

At primary level there are two tests; one in English reading comprehension and another one which is math based. These tests are given every year to monitor students' academic progress, and possible difficulties. There is the Micra-T which tests reading skills, and for math is the Sigma-T.

Although it is not a mandated measure in Ireland, the Draft Guidelines for Teaching Exceptionally Able Students state that 5-10% of children in school may be gifted (2005:pg 8). Knowing this, a child achieving within the 90th percentile or above on the tests, may be potentially within this category. If a child does fit within this range, their parents may be advised to either seek further assessment through a private educational psychologist, or referred to the Center for Talented Youth in Ireland (CTYI), where the child has an off-level testing in order to gain entry into the CTYI primary student program. Theoretically, gifted students should also have access to the state funded NEPS educational psychologists for assessment (DGTEAS 2007: pg. 17); however, realistically, approval for a free assessment of this type strictly for giftedness is generally not given, unless the student presents another identifiable deficit.

### Secondary

At secondary level some schools, although not all, may use an entry exam to determine roughly where a student may be in terms of ability as the majority use a 'streaming' or 'setting' system by choice. This means that students may be taking courses at 'higher ', 'ordinary ', or 'lower' levels, with some schools adding several streams within these same categories. Those who achieve within the top 10 may be streamed cross grade, or 'set' by subject within a faster paced class or classes than those of other students in the school. Secondary schools may have students that are sent to the Center for Talented Youth (CTYI) Talent Search using off level testing. This testing is conducted by the center in different parts of the country, and generally in the spring. Students who achieve a certain level on this test (top 5) are considered to have high ability (to be gifted) and

may gain access to the CTYI challenging, college level summer programs that are specifically geared for 12-16 year olds.

### Assessment for giftedness

There appears to be two ways in Ireland to receive what might be accepted as a formal 'gifted' label. One is through a test from an Educational Psychologist and the second is through off level testing from the Centre for Talented Youth in Ireland (CTYI). There are two official bodies within Ireland that perform full educational assessment that can be accepted by schools.

### The National Educational Psychological Service (NEPS)

NEPS is an agency run by the government. It is potentially free to all SEN students; however, schools are only allocated a small number of assessments per year. This is due to the inadequate number and severe shortage of psychologists in this system. To get a free assessment, first, a request must be made to the child's school. Then, the school must make the application to the NEPS. Students are then put on a long waiting list with generally the most 'urgent needs' at the top. Schools are usually faced with making tough decisions. The gifted, unless identified as having an urgent second exceptionality (emotional-behavioral difficulties, for example), are in general seen as a low priority. Parents are often advised to either use a private educational psychologist or to access the CTYI off level testing.

### Psychological Society of Ireland (PSI)

Schools may also accept assessment from private educational psychologists that are part of this body. There are usually waiting lists; however, these are not as long as the NEPS. Private assessment is quite expensive, with costs ranging anywhere from 500 to 1000 Euros.

In general, and in both cases, the WISC-4 is used; however, the British Ability Scale or BAS is also quite common. The Stanford Binet 5 is also used, but not as often.

In both cases, it is not easy accessing professionals that have experience of, or a good grounding in gifted and talented issues and giftedness. This may also raise concerns around the issue of misdiagnosis. Also, anecdotal evidence suggests that where a student may test in the gifted range in one area, but not quite in others, or show a discrepancy, the gifted label was not applied. There seemed to be a trend toward looking for 'cross the board' achievement on the assessment in regards to applying the 'gifted' label. Greater awareness of the diversity within the gifted population may hopefully have an impact on this.

CTYI is a non-profit organization run out of the campus of Dublin City University (DCU). It is run on the John Hopkins CTY model, and is affiliated to it. The organization runs challenging out of school and on-line courses for identified gifted and talented students, both at primary and secondary levels. Every year they run several assessment days on which students of primary from 6 to 12 may take an off level test. Secondary level students from 12 to 16 may take an off level test using the Pre-Scholastic Achievement Test (PSAT), which is normally given to students around the age of 16 in the USA. Students scoring at a certain level, in consideration of their 'real' age, may gain access to CTYI programs. Students who do gain access to the programs through these scores may also gain an official 'gifted' label, although some schools have been known to request a second full Education Psychological assessment in view of attaining a more comprehensive view of strengths and weaknesses.

### Other sources of identification

Although not always given credit, it goes without saying that parents are often the first identifiers of high ability or talent in their children. Initial identification may also happen through observation of high level skill in areas such as Music, Art, Performing Arts or Chess, which may be engaged in outside of school. There are some high level competitions, such as the Math and Science Olympiads, which may also draw highly able, and in which they may shine. There are also many avenues for the kinesthetically gifted in which they may come to light. These include activities such as sport, dancing, horseback riding, swimming, hockey, soccer, rugby, among others. There are a number of students who may avail of Mensa testing for initial indications and assessment.

### Talent Development Programs and Educational Services

Not having any real talent development programs run by the government, or educational services for gifted and talented students in Ireland, most of the gifted community relies on a non-profit organization called The Centre for Talented Youth in Ireland (CTYI). This center has close ties with the Center for Talented Youth (CTY) out of John Hopkins University in the USA, and is run in a similar format. It is located on the Dublin City University or DCU Campus, in Dublin, Ireland, and runs a number of satellite programs in other locations within the country, usually other university campuses.

Established in 1992, CTYI is the only dedicated center in Ireland that is geared toward academically able (gifted) youth in and around the 5% of the population. Up until 2008, the center was receiving a government grant of 97,000.00 Euros a year. This grant had been targeted at making the center accessible to disadvantaged able learners. Unfortunately, due to the global economic downturn, the grant was withdrawn, and with it also went the hope that the center might finally achieve a mandated status.

Some of the biggest priorities and benefits that are associated with the center revolve around the provision of an engaging, motivating and challenging environment. This is provided at a level that encourages the learning of important scholarly tools and skills. This also includes the important realization that not all learning is easy, and that some of the learning we do takes time and devotion, if we are to get the most out of a subject. Also, of extreme importance to the center is accepting, nurturing, and making an inclusive environment amongst the staff, teachers, and other students who foster much needed and appreciated social networking

opportunities for the students. It is during these programs where, for the first time in their lives, many of the students find and form lifelong friendships that may have otherwise not occurred.

### The Centre

As previously stated, the center is located in a University Campus (DCU). The centre is run by a small number of permanent staff composed by the Director Dr. Colm O'Rielly, Catriona Fitzgerald, and Eleanor Cooke. The three of them engage in research in the area of gifted from time to time. The center has catered for over 35,000 students since 1992. The center uses the Universities facilities, lecture halls, and in the summer, their residential units to provide its students with their learning environment. Experts and professors in specific fields, from both outside the University and from the University itself, often provide instruction to the students in diverse areas, such as Forensic Medicine, Novel writing, Experimental Science, Criminal Psychology and Engineering.

The Programs. CTYI recognizes that some students may be very strong in one area, but very weak in another. For this reason, although they are tested on numeric and verbal areas, it is not necessary to show a great strength in both. A student is accepted if he falls into or around the 95% in either category, or in both.

Acknowledging the current and broader understanding and definition of what means high ability (giftedness), and the diversity of the population in which high ability might be found, CTYI has expanded its functions to run a number of secondary programs alongside the original ones. These programs are:

### Centre for Academic Achievement (CAA)

This programme started in 2006 in conjunction with ACCESS/DCU. Its aim is to give bright primary students from poor socio-economic backgrounds the opportinuty to study courses they would not normally be exposed to.

### Centre for Academic Talent (CAT)

This programme is accessible to bright students coming in within the top 10th percentile. It consists of the primary programme for students in the 8-12 age groups that takes place on Saturdays; and the secondary student programme for the 12-16 age groups which takes place over a two week period in the summer, which may be residential or commuter and runs alongside the main CTYI programme. These may be students who just missed the cut-off score on the Psat for the main programme, or perhaps for those who two weeks are enough rather than three weeks. CAT students occasionally do move up into the main programme, usually by retaking the Psat and gaining a higher score.

### Summer Scholars Programme

This programme is run in conjunction with DCU. There is no assessment test to get into this programme. Students generally attend during their 'Transition Year' (4th year in secondary), or their 5th year in the summer. It lasts two weeks and is offered as a residential or commuter programme. The students have the opportunity to experience what University life is like, and to take college courses they would not normally take in their Secondary schools.

The Centre for Talented Youth Irelands' main programe supports students who are within the 5%. Primary students from 6 to 12 may attend classes on Saturday and after school on Wednesday, and week long, non-residential intensive classes during part of the summer. It also supports adolescents, or secondary students from the ages of 12 to 16 (sometimes 17), through on-line courses over the school year. Also with a very popular, three week residential or commuter intensive 1st year of college level courses in a variety of subjects that take place during the summer months. These courses take place not only at DCU, but also in other centers around the country, which are usually located in other University campus. Some sample courses that were offered in the 2010 year included Novel writing, Veterinary Science and Astronomy. Other recent activities undertaken by the center include:

- Discovery Days: For students who have not attended CTYI programmes before, Discovery Days are run on a periodic basis. On these days students can experience sample subjects.
- Early Entry/Concurrent University Programme: In 2008-9 and 2009-2010 CTYI ran a pilot called 'Early Entry/Concurrent University Programme' for a semester during the school year with a small number of students as part of a PhD study research project. No university credits were assigned to the course; however, students on the programme did attend both, their full secondary school programmes as well as the scheduled university modules. They completed both. The courses taken included Legal studies, Engineering, and Physics, and by all accounts the program appeared to be very successful.
- Research – Members of the center's staff also engage in research, such as the 'Early Entry to University' program. There are usually several ongoing projects. Descriptions of these other projects can be found on the CTYI website.

### Entry into the program (assessment)

Getting access onto the standard programs generally takes the form of either an off-level test through the center, or the availability of an educational assessment by an educational psychologist. CTYI are groups of assessment that are not given on an individual basis. The following age ranges generally apply:
- 6-7 year olds
- 8-12 year olds
- 12-16(17) year olds

There are several centers around the country where students can be assessed. There are several dates throughout the year in which primary students can take the test. However, secondary students are usually offered a testing in the springtime, usually at a local center, and then a second date usually at the main center. Participation in the secondary test is conducted by the 'Talent Search', and any student who has been nominated either by a teacher, parent or psychologist can take part in.

### Contributions and Impact

In my view, CTYI's impact on the gifted sector in Ireland is huge, being the only dedicated center in the country. It is a life line for many families. Without a doubt, the biggest contribution may be that it plays a big part in keeping children's moral up, increasing their knowledge of self and their self-esteem. It goes without saying that if the center were to close the gifted; the community would be in real trouble. That is considering that there does not appear at this time to be a concerted move by the national government bodies to implement mandated provision or programs within mainstream schools for the gifted and talented.

It is also important to acknowledge that where there have been opportunities to advocate and work at times with government bodies, the staff at CTYI have contributed greatly. The recent Guidelines for Teaching Exceptionally Able Students (2007), from the National Council for Curriculum and Assessment (NCCA), and the work done by the National Council for Technology in Education (NCTE) and the Special Educational Support Services (SESS), have all seen inputs from members of CTYI. There have also been inputs in teacher training, which have taken place at Education Centers over the years. CTYI staff has also collaborated with Ireland's main parent and teacher support website group (www.giftedkids.ie) by contributing a session to the websites' series of webinars. Also important are the contributions from the center's director, Dr. Colm O'Rielly, who has also worked to maintain international ties with other organizations with an interest in High Ability studies and provision. He has contributed published material in a number of articles, journals and books. Over many years, he has remained a committed and dedicated advocate and supporter of the exceptionally able and gifted population in Ireland, working tirelessly on their behalf. More information about the center and its staff can be accessed from the CTYI website.

There is a second educational Irish initiative, which can be accessed from www.giftedkids.ie/, that has recently been endorsed by the National

Council for Technology in Education (NCTE). This iniciative may soon be seen as providing for gifted students in schools.

**Mission V and Gifted kids**

Giftedkids.ie is a website in support of the gifted that was created by a parent with IT and communication skills, Ms Margaret Keane, around 3 years ago. The need for this type of support platform, and its reach within the Irish gifted community, is most evident by its phenomenal growth over this short period of time. It is now a vast repository of information and a focal point for social networking and community support through its active forums, frequented by both parents and teachers.. Run on a totally voluntary basis, it is non-profit and receives no government funding. Over the last year it has branched out into some very new and interesting directions. A live webinar series with guest speakers on a variety of gifted issues and subjects that are of interest to educators and parents has been developed. These are free, and may be watched at anytime. They have both a National and International following.

Nevertheless, the project that has the most interesting future potential in education is a collaborative project between giftedkids.ie and daynuv.com called Mission V. It is a 3D Virtual environment along the lines of Second Life. It has been piloted very successfully as a way of providing for gifted students in a primary school, and used to teach a number of curricular subjects within the same. At present, the same program is due to be piloted in a larger number of schools (around 20) this year. It has enormous potential from many perspectives, from cluster grouping in schools to cluster grouping students from many individual schools, as students may access the environment from a laptop or computer, no matter where they are.

The only drawback of a program like this may be that there are vastly different levels between schools and their staff in terms of IT equipment, skills, understanding and knowledge, which could be a hurdle that may

possibly need addressing. However, this is not insurmountable considering the dedication, support, and excellent personal and IT skills level of the partners in this program.

As previously stated, this is especially true now that the Mission V Project has just received support from the Department of Education through the National Centre for Technology in Education (NCTE). It will be an exciting and interesting program to watch as it develops.

**Perceptions and Meanings**

As previously mentioned, historically, Ireland is rich in talent. Many Irish people have demonstrated exceptional potential in a broad and far reaching way. The diversity, when one looks, is actually quite astounding and would lend one to believe that, as a nation, there should be huge potential to be nurtured within its population. One would also expect that the nation would have a positive attitude and willingness to keep it.

From the incredible and painstakingly beautiful hand that illuminated ancient religious manuscripts, painters along the lines of William Orphan, and Jack Yates and his brother William Yates, who rubes shoulders with other literary giants such as James Joyce and Oscar Wilde. Great astronomers, mathematicians such as William Rowen Hamilton, scientists including Kathlieen Lonsdale, Jocelyn Brunel and Frances Beaufort (of Beaufort Wind scale fame), peacemakers (Maraid Corrigan) and numerous politicians, world famous athletes such as rugbys' Brian O'Driscal and Sonia O'Sullivan (athlete). Not to mention their exquisite musical heritage, which include both, the traditional like the great Irish harpists, and the more modern like Clannad and The Chieftains. It also includes classic music, such as Thomas Moore, Michael William Balfe, as well as contemporary musicians such as U2 and Enya. It has to be said that 'Ireland's got Talent' and by the bucketful.

Those students who excel at sport seem to be well catered for, supported and given the opportunities to advance in a manner which does

not lockstep them into groups with participants of the same age. It also appears that participants 'feel good about being good' at their sporting talent, as well as when others sing praises and make much of their success. However, it is a different story in many other areas of talent or high ability, particularly the academic. Dr. Joyce Senior (UCD), Director of MA in SEN (UCD), on her 2005 Thesis 'Don't Call Me Gifted The Socio-Emotional Experiences of a small sample of Gifted Students' (UCD, 2005), noted that students in her sample seemed not to want ownership of the term 'gifted' in relation to themselves and to associate it with being elitist. She noted that this perception might be due to a societal perception in general picked up by the students.

My view is that the above is not an uncommon mindset in a number of cultures. In many cases, not only is self-esteem affected, but also a sense of self deserving. The perception that if you have a gift, talent or high potential ability in an area, you should almost feel bad about having it, or undeserving of it, or possibly hide it. The feeling that if others find out, they may either, ridicule you, or make you feel it is not as wonderful as it is, or, alternatively, dislike you. That they may feel jealous of you for owning something they may not have, and seek to damage or cast you out of the social group, as in their view you'd be thinking 'you were to good for them' (elite).

Teachers may sometimes feel like 'breaking ranks' by giving time to someone who 'already has talent', and, because of this, is 'undeserving' of extra support that should be given to 'more deserving' students who may be struggling. The idea of being a gifted and/or talented student can make on their own that they don't need help. Students pick this up, and own it too.

These mindsets can often take a long time to work themselves out. They are particularly more prevalent in areas such as academics, and to a lesser degree in visual or performing arts. It does seem to be less noticeable in physical type activities and sports. This may be possibly because they have to do with physical prowess and are acceptable, both for recreation and for watching as a sports spectator.

**Perceiving Talent/Giftedness through an Irish Legislative Context**
The following gives a brief overview of the recent legislative history in relation to provision for Exceptionally Able as talented and gifted students are known in Ireland, and how perceptions of the same have evolved.

Irelands' gifted children and legislation have had a somewhat uncertain history, with 'gifted' being defined as special needs, and then subsequently excluded from the definition. However, it is officially taken that in Ireland gifted and talented children will be referred to as 'exceptionally able'. This term is brought forward from the definition that was used in the Education Act of 1998, and its predecessor, the Special Education Report Committee (SERC) in 1993. In fact, it may have even had its roots in the Report of the Primary Review Committee (RPRC) of 1990, in which this group of children was described as follows:

—While it is generally recognized that some children are exceptionally gifted, their identification may present some difficulties. Giftedness is not a clearly defined entity and the extent to which it is recognized depends on the criteria used to identify it. There are forms of gift-edness, such as unusual creativity in music or art, which is not be necessarily revealed by intelligence tests or by other forms of assessment ordinarily used." (RPRC, 1990:68)

If there seemed to be a bit of discomfort, an insecurity with which the Irish culture approached (s) the term in the report, it was well balanced with suggested strategies that, although short and brief, would not be out of place in twenty years. It stated they should be treated 'sympathetically', 'as needing as much help, though of a different kind, as a slow learner', and 'that talents of such children should be fostered'. It stated that appropriate teaching strategies should be employed, and that 'gifted children need not be confined to one class or one teacher, but rather, should be able to spend part of the day with older children who are closer to their intel-lectual level' (RPRC, 1990:68). It even recommended schools to have a gifted policy.

However, the key phrase here is that 'giftedness is not a clearly defined entity' as in itself since it envisions a certain kind of murkiness around the term. A probable reason as to why Irelands' gifted, as in a number of other countries, remain in a grey area in regards to educational provision today. Fortunately, this murkiness is vulnerable, and lends itself to exploitation.

In 1993, in the SERC Report, there was an attempt to put in place a clear definition, whilst also bringing exceptionally able (gifted) children under the umbrella of the category of 'other special educational needs'. In this chapter, shared by the traveller community and educationally disadvantaged, pupils who are Exceptionally Able or Talented were defined as: (SERC Report 1993:160)

"Pupils who are exceptionally able or talented are those who demonstrated their capacity to achieve high performance in one or more of the following areas:
• General intellectual ability;
• Specific academic aptitude;
• Creative or productive thinking;
• Leadership ability;
• Visual and performing arts;
• Mechanical aptitude;
• Psychomotor ability, e.g. in athletics, gymnastics.

The chapter goes on to note that —insofar as a score on an intelligence test can be regarded as an indicator, we suggest that the description "exceptionally able" is used to denote pupils with an IQ score in the range of 130 and above— (SERC Report 1993:160-161). Under the heading Special Educational Needs (SERC 1993), it is stated that:

"The more exceptional the ability or talent of an individual pupil, the greater the need is for some form of special or supplementary arrangements to assist him in developing educationally at a pace. To such extent in breadth of functioning within the range of exceptionally able as defined above will require special arrangements in addition to the range of educational activities which can usually be provided in the ordinary classroom (section 6.3.2)."

Recognizing the need for pupils who may be exceptionally able or talented, the report offered no less than 8 recommendations in respect to these children. These include a school plan for special needs which describes arrangements for exceptionally able students, acceleration depending on students' readiness, guidelines as a positive option, and financial aid for schools, support and other organizations providing for these children. (SERC, 1993:164-165).

The Education Act of 1998, following on from the SERC Report, recognized the exceptionally able under the section on special educational needs, defining the term as 'special educational needs of those with disabilities and those with exceptional abilities' (section 2). This Act was voted into law in 1998, and it was thought at the time that this group of students would now have a legal leg to stand on. The revised curriculum from around the same time also mentioned the need to provide for 'students for whom the curriculum is not challenging enough'.

Unfortunately, over the next decade or so, interest in the area dwindled somewhat as the economy flourished and a greater interest in providing for students with learning difficulties/disabilities blossomed. In this environment, Ireland's inclusive educational system meant that trends moved toward doing away with many special schools and an influx into the mainstream classroom of children with a broad spectrum of needs which had to be met alongside those of students already being attended to. This meant that legislation, policy, training and resources would need to be focused on this area. The development of a new Act on Special Educational Needs was on the cards. It eventually culminated in what is known here as the EPSEN (2004) and Disabilities ACT (2005), or the Education of Persons with Special Educational Needs Act (2004). As educational acts go, it is a good one and does much to protect the rights of students with disabilities and special educational needs. However, lamentably it did not carry over the SEN

definition from the earlier education act, instead choosing to create a new one. The new one does not, in fact, specifically mention the exceptionally able, although it does mention 'children who learn differently' (which is open to any interpretation). The new definition (EPSEN 2004) states:

"a restriction in the capacity of the person to participate in and benefit from education on account of an enduring physical, sensory, mental health, learning disability, or any other condition which results in a person learning differently from a person without that condition. Cognate words shall be construed accordingly" (section 1)

The specific difficulty this author and others have in their report for The National Council for Special Education (NCSE), a recently commissioned report: Policy, Legislation and Resource Allocation Models: A Review of National and International Practice (Senior & Kinsella (UCD, 2008), which reviews the latest information on Special Educational Needs provision in Ireland, is to state one of their definitions. Since the definition for 'disability' in the ESPEN (2004) act (replacing that of the Education Act 1998) is exactly the same as the new definition used for 'SEN' (with no specific mention of exceptionally able), it puts the exceptionally able (gifted) in a very grey area indeed in terms of rights for provision, at least under the umbrella term of SEN. Senior & Kinsella (2008) go on to make the following statement and observations:

Exceptionally able children are a group who were recognized within the Education Act 1998 as possibly requiring specialist provision. Likewise, it is not automatically clear whether these children will be included in the current definition. As a consequence of the Education for Persons with Special Educational Needs Act 2004, the Education Act 1998 has been amended so that this recent definition will now replace the definition of disability contained in the earlier Act. There has been considerable variation in the definition of disability contained in the earlier Act. There has been considerable variation in the definitions of disabilities and special educational needs used in the different pieces of Irish legislation (Senior & Kinsella, 2008:24-25).

An indication that perhaps the needs of gifted and talented or exceptionally able students are not perceived as important as those of some other sectors of the population. It must be noted here that the EPSEN (2004) and Disability Act (2005) have not been implemented yet, and was deferred due to the Economic Downturn.

**Current Perceptions**
Notwithstanding the previously mentioned legislative situation, it is important to note that there has certainly been acknowledgement from a number of sectors who have perceived the need to provide for gifted and talented students. Among these, several government agencies can be counted.

The National Council for Curriculum and Assessment (NCCA), as a cross border project with the Council for Curriculum Examination and Assessment (CCEA) in Northern Ireland, produced two versions of a guideline document. These include the 'Draft Guidelines for Teaching Exceptionally Able Students (2007-RI)' and 'Gifted and Talented Pupils-Teachers Guidelines' (2007-NI), with the latter being somewhat greater in length. This was published in 2007, and distributed to all schools; however, sadly, there has been no mandate for its use (see NCCA website and ref.). Recently, in collaboration with a few other European nations, The Consortium of Institutions for Development and Research in Education in Europe (CIDREE) contributed to a report called 'Curriculum Provision for Exceptionally Able Students' (2010), a hopeful sign of their continued interested in the area.

The Special Education Support Service or the SESS has maintained a page on its website with information on the special needs of exceptionally able students. The agency, perceiving a need for additional provision for exceptionally able students at secondary level, ran a pilot program in two Secondary Schools (2008-2009). This program was called 'The Equality of Challenge Initiative' and was used for assessing the feasibility of running a program based on metacognition and differentiation in Irish secondary schools. The program lead to the development of a resource

called Metacognition for the classroom and beyond. Differentiation and support for learners (2009) is another program, which was developed with the input of Dr. Sarah McAlwee of the University of Oxford. The program was further piloted from 2009 to 2010 and it will run again in a larger number of schools over the period 2010-2011 (see SESS website and ref.).

The National Council for Technology in Education (NCTE) also provides some information on their website about exceptionally able students and the benefits of using ICT with this group. In 2008/9, perceiving a need for more resources for use with exceptionally able on their 'Sciolnet' site (resource website for teachers and parents), they commissioned work involved harvesting the worldwide web or internet for suitable websites and other resources that would be of use. These resources were collected in an area on the website dedicated to exceptionally able student resources (see Sciolnet site and ref.). Recently the NCTE has supported an ongoing webinar initiative in order to raise national awareness on gifted issues and to provide training for educators and parents. This is being run by www.giftedkids.ie, the major Irish website for supporting exceptionally able students.

As previously mentioned, the exceptionally able, or gifted and talented are in a grey area in Ireland in terms of where they actually fit into the educational system; however, all three of the above agencies clearly appear to see them as still coming in under the SEN label.

Although there are many schools and educators in the country that make attempts at providing for this group, they are often not on a consistent basis. This is not really due to an unwillingness to provide, but to a general lack of awareness, support, direction and access to resources and training which should/could be provided through the Department of Education. This leads parents into situations in which they have to find other ways of providing enrichment out of school time, causing at times great financial strain and sometimes hardship. In the absence of procedural structures, it puts teachers and parents into situations of friction. Parents' perceptions do not generally see the system as adequate in regards

to proper provision for exceptionally able or gifted and talented learners. In addition, there is a definite perception of the need for clearer mandated legislation, policy and training as the only satisfactory way forward, if there is to be a real change and improvement in the system.

**Dancing with Tigers and Flying with Cheetahs-Voluntary Support in Ireland**
"An experience and exposure to different cultures, intelligences and perspectives lends color to journeys of potential that might otherwise not be taken. This has been my privilege." (Graves, 2011).



After moving to Ireland from Mexico in the late 1980's and early 1990's, it was my experience that the economy in this country was in crisis. Sound familiar? Well it was. I found myself part of a dual culture family, in a society that, although friendly on the surface, was not always as understanding of outsiders as they might have appeared. There was very little cultural diversity, and a lot of emigrating young people. Jobs were scarce, choice of employment was not always there, and there were generally many applicants per vacancy. It was in this environment that I first became aware of the advocacy efforts of an organization called the Irish Association for Gifted Children. It was an organization that had been working within the country for a period of

almost 20 years. It was an organization that I would be involved in for another decade and a half.

The Celtic Tiger was not a very healthy animal at this time, and in fact, it was really in its infancy, quite definitely asleep. Difficulties or low points such as these, as has been the case in other times and countries, 'Sputnik', comes to mind, can often spell more attention or open avenues for support in relation to the gifted. In 1992, initiatives such as the Centre for Talented Youth in Ireland (CTYI) came into being. Several Explorers groups for gifted kids were flourishing and a yearly adventure camp for gifted was happening too. With an organized, purposeful and strong committee, the IAGC had coffee evenings, speakers' nights, and newsletters, and was very active in lobbying and raising awareness in government circles. This advocacy eventually resulted in evidenced steps forward and was responsible for the inclusion of exceptionally able (gifted) children in the Education Act of 1998, and in the revised curriculum (1999). Several small but international conferences were also organized, broadening the learning opportunities for those involved parenting and teaching. One of the teaching colleges even developed a SEN course on which there was a 6 module course in Gifted. A TV production company produced a full length TV documentary on Gifted in Ireland called 'Ahead of the Class'. The Celtic Cheetahs (or rather their parents, teachers and supporters) seemed to be on a roll, they were flying.

However, as the economy started to pick up, interest in other areas of special needs became more prominent. A phenomenal amount of immigration was noted, with a huge diversity of cultures bringing with it the added need, by government, to supply funds for the language needs in schools. Interest in the area of giftedness seemed to dwindle since volunteers and supporters had less time and energy. As the population all seemed to be employed, many did have less time. As The Celtic Tiger danced and became stronger, support for the Cheetahs began to fade into the woodwork. Cracks also began to show in the support network, and also in the interest shown by government bodies. The next decade would prove to be challenging.

On reflection, though, it has to be said that there was still pretty notable and important work being done. CTYI continued to flourish and provide out of school programs for highly able students, and began to host a yearly conference. Although there were no longer any explorers groups running, there was evidence of parents in many areas of the country trying to put together parent groups and holding their own activity days for the kids. Those with access to international supports worked hard to keep them strong. Others used this time to try and seek out and take courses in the hope that more formal accreditation would help make any bids for input on any training and or policy initiatives that could come down the line by the powers that are more credible. Those with access to teachers' organizations college courses sought opportunities to share information through conference presentations and/or lectures if opportunities allowed. The coffee evenings disappeared; however, there were a fair few speakers nights organized in an attempt to keep working on awareness raising and also to keep contact between IAGC members alive. Newsletters continued to be produced. Acknowledgment has to be made to the many parents who continued over these years in their advocacy efforts, writing letters to government bodies and keeping the term exceptionally able and/or gifted alive and not forgotten. Eventually; however, toward the end of the decade, the IAGC was finally dissolved.

However, two very significant events happened during that last decade that have continued having a lasting impact on advocacy and support today. In 2004/2005 the NCCA, in a cross border project with the CCEA in Northern Ireland, began work on the Exceptionally Able Students-Draft Guidelines for Teachers (2007), with input from several sources. As it neared its completion, the IAGC also submitted a number of recommendations from its members. The guidelines were published in 2007 and were part of the NCCA's remit. When the NCCA was established, following the Education Act in 1998, part of its purpose was to produce guidelines for teachers to include those of students with special needs. The definition of special needs in the Education act of 1998 included both the needs

of students with disabilities and those with Exceptional Abilities. In publishing the Exceptionally Able Student Draft Guidelines, it was fulfilling this purpose in regards to the special needs of the gifted. It follows that these guidelines are a direct result of the work done by the IAGC (and personnel from CTYI) during the 1990's as it had not been for the advocacy and lobbying during that period, which resulted in exceptionally able children being included in the Education Act of 1998. The remit of the NCCA to produce them as students with special needs would not have existed. The guidelines are important since, although their use is not compulsory, their very existence means the potential for a mandate, and any following structures, policy, provision, training and resources is there.

A second was the establishment of the website www.giftedkids.ie, which was founded in 2008 by a parent with communication and ICT skills as a support for parents and teachers. Its establishment came along just in time as the national organization, the IAGC, was floundering. It has grown into a vast resource for support and advocacy, and become extremely important to both the parent and teacher community with an interest in giftedness. A wonderful accomplishment that models what can be achieved when a determined parent has a certain skill.

As the Celtic Tiger falls back to sleep again, and the Irish economy is in tatters, it has been interesting to note the rise of language referring to the need for a 'smart economy', a 'knowledge economy' and 'holding onto our brightest and best' within the media and from government. There has also been acknowledgement and moves, as in other economically challenged nations at this time, within the Irish education sector that the teaching of STEM and other subjects must be improved. A second, more recent full length TV documentary on giftedness in Ireland was produced called 'Bright Young Things-Growing up in Ireland'. Although there has not been the establishment of a new National support organization for the gifted, there has been a resurgence of voluntary (both parent and teacher) individuals and groups with focus and determination, with a number of different initiatives happening. This new focus on advocacy, and the

recent new government election, resulted in the first ever political party with the word 'gifted' under Education in their party Manifesto. There is hope that, as this was one of two parties which has been voted into government, there may be more room for movement forward in respect of gifted children.

I wanted to show that voluntary groups, both parents and teachers, are really important and that their power should not be underestimated. Their cumulative effect over time does have potential to create change. As an educator and parent, I wanted to include this information as sometimes the work of these types of groups and the individuals involved in is not always highlighted or acknowledged. In truth, quite often they are the ones who many times, and in the background, set the ball rolling for changes to happen. It is early days in our country, but there are some encouraging signs. Maybe with a little luck, coordination and patience, they could be responsible for giving our Celtic Cheetahs some Wings.

More information on these groups or/and their initiatives may be accessed through links provided.


**Perspectives and the Future**
The life cycles of both, the Celtic tiger and Celtic cheetahs, have recently been at odds with each other. While the economy boomed, there seemed to be no need to pay serious attention to exceptional potential. Now, in economic crisis, bereft of funds, and its best and brightest minds seeking to flee its shores, the country is seeking ways to retain them.

The recent economic downturn and Ireland's bleak economic outlook for the foreseeable future have made it appear unlikely that there will be access to added financial input or support in the area of gifted education. At least not coming from government departments as all educational sectors have seen cutbacks. Class sizes have been increased in schools. Teacher numbers within schools have been reduced. Special educational need, resource, and learning support personnel have been severely curtailed, with

massive reductions in special needs. Assistants and hours allocated to same. The educational system is struggling.

Inside all the doom and gloom, there is a perceived, urgent need, expressed both publically and privately by government, industry and academia of the need to foster a 'knowledge' economy, also called a 'smart' economy. There is also money being thrown at research innovation. Science and technology, STEM subjects, are buzz words and young students are told of these as being the 'smart' career paths to choose. This while removing the CTYI grant from the one organization in the country from which many of these possible critical and innovative thinkers might come.

The above situation may actually contain a ray of hope, a lighthouse shinning from the shore for the gifted community in Ireland. There is gathering evidence of good work being done behind the scenes by folk connected to government and semi-government agencies, academia and at grass roots level through some parent – industry partnerships and educator/teacher initiatives. New technology, websites and social networking, and access to international connections has broadened access to information and swelled the ranks of gifted and talent supporters.

The rich, fruitful relationship with social networks, such as twitter, facebook and blogs has served, without a doubt, to broaden both national and international connections and exposure to learning for Irish gifted community members. This can only be beneficial to all now and into the future. There is great energy being put into each of these initiatives, and a lot of potential for advocacy and innovative provision. In a small, but growing way, the reality may be that the difficult economic situation and the need for the country to move forward may have created a truly fertile ground for fruitful advocacy, which, if all parties can find a way of pulling together as partners, has real potential to create change.

At this moment in time, our country has experienced the election of a new government, which is also serving as a focal point for communal advocacy efforts, and a possible renewal of hope.

So, what are my own final thoughts and hope for the future in Ireland?

That we can all find some common ground to work with each other, that we beware of any political and competitive tensions that have potential to divide within us as well as without and that we may keep close the awareness that we are all working toward a brighter future for gifted and talented kids. For the moment at least, things are looking good. Here's hoping the beacon on the shore shines bright enough to lead this ship home.

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Web links of interest on Ancient Ireland:

Travel through the Irish Story

http://www.wesleyjohnston.com/users/ireland/past/pre_norman_history/mesolithic_age.html

The Johnston Galleries

http://www.howarddavidjohnson.com/celticmythology.htm

Web links of interest on Gifted support sites in Ireland Center for Talented Youth in Ireland

http://www.dcu.ie/ctyi/

Giftedkidsie -Parent and Teacher Support/Resource Website

www.giftedkids.ie

Daynuv- Immersive 3D Technology Organization involved with giftedkids.ie in Mission V

http://www.daynuv.com/?p=498

Innreach's Blog – Leslinks Ireland- Gifted, Talented and Creative Edu Page (my site, where I share thoughts and a collection of good educational links)

http://innreach.wordpress.com/

Irish Gifted Education Blog – a parent run support blog

http://www.dazzledandfrazzled.com/

Gifted and Talented Ireland Blog – a teacher run support blog

http://www.giftedandtalented.ie/

**CHAPTER FIVE**
**Gifted Education in the Netherlands**
*Lianne Hoogeveen, University Nijmegen,*
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**Mark, a gifted student in the Netherlands**

Mark is a seven year old Dutch boy who writes poems about nature and about life. His poems move people who read them. Mark also plays music and draws in an almost surrealistic way. Mark has a scientific curiousness; he is interested in stones and minerals, and speculates about the origin of shards of old pots and animal bones he finds in the woods. Mark is a special child, which sometimes is inconvenient since being special and very creative may turn a man into an artist, which is something that we do not always appreciate in our educational system.

In preschool Mark does not play like the other children. The other children think that is funny, the teacher thinks it is noticeable. In Kindergarten Mark does not draw like other children. Other children think it is strange, the teacher thinks it is inconvenient. In first grade Mark does not do arithmetic like other children do. The other children think he is stupid, the teachers think it is wrong.

Mark does the best he can: his drawings in school resemble more and more the drawings of other children and less his own. His poems are hidden in a drawer. When did he write his last one? When Mark is in second grade his teachers are pleased because he is a quiet student with above average performance. But then, in fourth grade, Mark develops behavioral problems. He has a negative attitude in the classroom and is aggressive to other children. His attitude toward his parents is hostile as well. His scores decrease. The teacher thinks school is too difficult for him since Mark seems to be pushed to the limit. Mark writes one last poem, an ode to death, because "… then, I never have to go to school again".

## Giftedness in the Netherlands

Is Mark gifted? In the Netherlands, there are different opinions about when you call a child gifted. This is not strange since there are many definitions of giftedness (Borland, 2003; Hany, 1987; Mönks & Mason, 2000) mentioning different combinations of characteristics that combined indicate giftedness. Few people in the Netherlands support the traditional view that giftedness is something you are born with and that will be stable over the lifespan. People working in the field generally use modern developmental models that show the interaction between innate, stable possibilities, and other factors such as personal and environmental.

The three-ring model of Renzulli (1978), the multidimensional model of Mönks (1985), the Munich Model of Giftedness and Talent (Heller, 1990; Ziegler & Heller, 2000) and the Developmental Model of Giftedness and Talent (DMGT) of Gagné (2003; 2008) are examples of this multidimensional hierarchic vision of giftedness. Several Dutch scientists and practitioners base their work on the theory of Sternberg (1997; 2002; 2003) as well. They consider intelligence as the ability to succeed in life, in terms of one's personal norm within one's social-cultural context. They also believe that the ability to be successful depends on the possibility to use strong characteristics and compensate for the weak ones, and that success depends on the ability to adapt to a situation, change it or choose a more suitable situation. Following Sternberg, their aim is that gifted students find a balance of analytical, creative and practical abilities.

For Dutch teachers, the profiles of gifted and talented students (Betts & Neihart, 1988) can be helpful in recognizing a gifted student, especially when the giftedness is less obvious. Every teacher will recognize the challenging students, who are so enthusiastic to demonstrate their (huge) knowledge, something that other students do not get a chance to. Mark, for example, takes something with him to school every day; a little bone he found in the woods, of which he can tell what part it is from which animal. Or he wants to share his experience of a museum visit. His teacher likes that, but sometimes it is too much. More and more she has to tell him: "No, Mark, not now". The result is that Mark feels the need to insist and to shout louder, and, of course, that is something the teacher can not accept. If a situation like this goes on and on, the moment comes when a child's knowledge is less visible and irritation about his or her behavior grows.

Successful students make most Dutch teachers happy since they do whatever the teacher asks them to. Successful students are polite, have good notes, so, there seems to be no problem. Betts en Neihart call a student successful when (s) he shows good results; however, not on the level (s) he could perform. These students do use their abilities, but only partly, and sometimes hardly, to develop themselves. They have another goal, viz. pleasing everybody else. Mark, for example, starts to draw the way his teacher expects him to and does not write poems anymore (What boy in second grade does?). A successful student dent is a perfectionist, needs teachers' confirmation, avoids taking risks, accepts and conforms, and is dependent.

The combination of the personality of a student and the environment (s) he lives in create the way (s) he behaves. Every form of unwanted behavior can be considered to be a student's attempt to improve his or her situation. If that does not happen, there is a risk that the student shows signs of drop-out behavior; playing truant, or not participating in what is happening in the classroom. If we do not intervene, Mark will be a drop-out student.

Let it be clear; not all gifted students in the Netherlands have this problem. Those who receive the education they need are more likely to be independent students, the sixth profile described by Betts and Neihard (1988). They have high social abilities, work independently, develop their own goals, participate, and do not need constant confirmation. They are enthusiastic, creative, and not afraid to stand for their own convictions or to take a risk. Mark entered school as an independent student.

## Screening for the gifted and talented

### School performance

One way Dutch teachers try to assess the intellectual abilities of a student is through evaluating their school performance. Independent students, as well as successful students, show high performance. However, a high performing student can also be a hard working student with above average abilities. And, for that matter, it is possible that a student with high intellectual abilities performs on an average level or below. Fear of failure or frustration can hinder performance on a level that fits the abilities. So, while school performance can be an indication of giftedness, it does not give enough information to draw conclusions about the giftedness of a student.

### Test performance

In almost all Dutch primary schools, students take national tests twice a year (student tracking system). The last test, in the final year of primary school, carries a lot of weight in the decision for which level of secondary school a student can go to. Educators assume that gifted students have high scores on this test and automatically go to the right level of secondary school. The question is what will Mark's score be?

Experience from the CBO shows that some students may surprise you; for example, by getting very high scores on the national test after years of average performance in school. This should ring a bell for parents and teachers: why doesn't this student show his or her abilities on a daily basis? Does this mean that an ability test, instead of school performance, does reveal giftedness? This test also gives the right information for independent students, probably also for successful students, and sometimes for an underground student who all of a sudden, maybe because the test is unknown, and reveals his or her high abilities. Unfortunately, an ability test isn't the perfect way to recognize every gifted student. A very motivated, above average, but not gifted student can have good results, while some gifted students, for different reasons, are not able to show their possibilities on this test. Like school performance, ability tests do give information, but not enough to be sure we have found all gifted students.

### Observation lists

In the Netherlands, there are three commonly used observation lists: the Digitaal Handelingsprotocol Hoogbegaafdheid (Digital Action protocol of Giftedness (van Gerven & Drent, 2007); Begaafdheid in beweging (Giftedness in Motion) (Surplus Begaafdencentrum, MHR, 2005), and the Sidi-R protocol (de Bruin-de Boer & Kuipers, 2004). These observation lists help teachers to collect data that could indicate giftedness. To interpret and apply the findings, it is necessary to have sufficient knowledge of and experience with giftedness. Again, this instrument can give you (much) information about the presence or absence of giftedness, but it is not enough to be sure we find all gifted students.

### Intelligence tests

An intelligence or IQ tests aims to predict the intellectual performance of the person that is evaluated. In the Netherlands, we use various IQ tests, including the Wechsler intelligence scales (translated in Dutch and validated for the Netherlands). A lot of people in the Netherlands think that a high IQ is the only hard evidence of being gifted. Others think it is just a random indication, a senseless intent to improve a child's situation. Dutch experts in the field agree that IQ tests do not give all the information about a child's (intellectual) possibilities. However, it is a source of information that helps to get more clarity about the (possible) performance of a child. An advantage is that a child's performance on an IQ test is less dependent of what (s) he learned in school; it makes an appeal to the possibilities of a child, less to his or her knowledge.

Mark showed different performances doing an IQ test. When he was interested in a task, he forgot his anger and performed well, if he was not, he didn't try at all.

Although it is more likely that a child shows his or her real possibilities in an IQ test, we still have to be careful. It is still possible that a child is not willing or not able to show his or her abilities. Having a multidimensional vision of giftedness, it is clear that personality and/or environmental

factors prevent a child from performing. Or, as Sternberg states, a bad performance on an intelligence test can be a reflection of bad information processing, but it can also be a reflection of fear of failure, a lack of motivation, inattention, or another variable. The person that administers the test plays an important role; (s) he interprets not only the scores of the child, but also the behavior. It is not only important if an answer is right or wrong, but also the way a child behaves; does (s) he give the answers very quickly or does (s) he think for a long time? How does the child formulate the answers? Does (s) he say very quickly that (s) he doesn't know, without really making an effort? Is the child relaxed or tensed? What kind of errors does (s) he make? These are all questions a good psychologist asks him or herself. To be able to do that, one has to observe very well, and analyze the answers. Considering this, one can understand that taking only an IQ test is not enough. Unfortunately, there are still Dutch psychologists doing just this.

*Tests in addition to IQ tests*
Following a multidimensional dynamic approach of giftedness, psychologists should not only observe very well, apart from putting a child to the IQ test, but also use additional tests and questionnaires. In the Center of the Study of Giftedness (CBO) we take an entire day to evaluate a child, assuming that this is the time it takes to give a realistic view about the (possible) performance of a child. Apart from the functional development (intelligence, memory, concentration) we look at the social and personality development (social abilities, motivation).

Another important variable is creativity, a very broad concept. By listening carefully to the answers a child gives you, as well as looking at drawings and evaluating stories (s) he tells you, you can find out if a child keeps her or himself to the beaten tracks or if (s) he (also) has less obvious solutions. There are tests that measure creativity, like the Test for Creative Thinking-Drawing Production (TCT-DP) (Urban & Jellen, 1986) or the Torrance Tests of Creative Thinking (Torrance, 1974). Both tests are used in the

Netherlands. Dynamic assessment is a form of testing that is more and more used beside the quantitative data of tests and questionnaires that can provide a lot of information (Verschueren & Koomen, 2007). Remarks, drawings and answers of a child between tests reflect the behavior and mood of a child during the assessment. Open or projective assignments, like making a picture of the family, pretending they are animals, making three wishes, or answering questions about family, friends and school can give a lot of information. Still, it is not enough to look at the performance of a child on only one day. One must also consider earlier work, especially if a child is no longer able to perform optimally. Looking back, something can reveal the cause or causes of the problems a child has. When did it go wrong? Did this happen gradually, or all of a sudden? What might have caused that? For Mark, looking back was important to understand his behavior. We also have to look at out-of-school situations. How does the child behave practicing her favorite sport, or playing a musical instrument, or in his chess club? The advantage of out-of-school activities is not only that a child chooses to do them, but also that they are less likely to be with same-age peers, something many people expect to be good for every child. Some gifted children, in fact, feel much better when they are with older children. Sometimes the out-of-school situation can be an example for how it should be in school for this child. Finally, people around a child can help to complete the image of the child; the former teacher, the older brother, the neighbor. "What you see is what you get" does not always apply for everyone. Sometimes it is more important what others see, or have seen in the past.

Dutch experts in giftedness, like the psychologists of the CBO, try to convince other psychologists that giftedness is too complex to indicate in a simple way. Twice a year, a group of psychologists experienced in the area of giftedness comes together for mutual consultation, in which we try to continue to improve the quality of assessment.

An important item to date in the Netherlands is the group of gifted students who (seem to) have a disability or disorder, like ADHD, ADD, Dyslexia, Asperger Syndrome, ODD (Oppositional Defiant Disorder) or

NLD (Nonverbal Learning Disorder). It is important to know that high abilities can mask the disorder, and the other way around. One also has to be careful with misdiagnoses, described so well by Webb et al. (2005). Although there is more and more knowledge in the Netherlands about the existence of this 'twice exceptionality', there is still a lot to learn about assessing it and to give the right education and guidance to these children.

**What do we do with our gifted students?**

In the Netherlands, it is not always likely to intervene when a student is gifted. For example, some teachers think that you should leave a "successful" student, who does not take risks and consequently does not develop her or himself, think that that is the best you can do for him or her. Of course, when Mark decided to adapt himself to what he was expected to, things calmed down, but was he all right? Apparently yes, but his enthusiasm disappeared. Mark could not stand anymore that teachers looked at him surprised and annoyed. There are many reasons why teachers should adapt the program for gifted students, even when they seem to be happy and satisfied. First of all, they only seem to be happy, but they are not, and second, because of the lack of challenges, they do not learn to face them, which will cause problems later on when these do appear, for example in secondary school.

Dutch experts in the field try to convince teachers to always adapt the educational program if a child is gifted. More and more teachers understand that, and there are more programs for these students every year.

**Educational programs for gifted students**
*In-class enrichment*
Most Dutch teachers prefer in-class enrichment as a special program for gifted students because it seems to be less radical than other measures. That does not mean that it always works out well. It is important for in-class enrichment to compact the regular program first. This hasn't been

the case until recently. It is also important that teachers consider what has to be learned. It is not enough to 'kill time' with the enriching material.

There is a lot of material available in the Netherlands. The Dutch Expertise Center for Curriculum Development SLO offers a catalogue with a wide variety of material that can be used for gifted students. Apart from the fact that children who receive in-class enrichment do not need to leave their own classroom, which is considered to be an advantage by many teachers and parents, it also encourages a more cooperative atmosphere in the classroom. At the same time there is a risk: does the gifted student find peers in his own classroom? Is (s) he not the outcast of the class doing other work? These are questions teachers need to consider.

*Pull-out program*
There are from 600 to 700 in-school and meta-school pull-out programs in the Netherlands (source: SLO, 2010). In addition, there are independent pull-out programs, like the enrichment class Vooruitwerklab, mentioned before. In a pull-out program, children go every week for some hours to a class with other gifted students. In this class, they receive assignments that meet the special intellectual and academic needs of gifted students (Moon & Feldhusen, 1995). An important characteristic of the pull-out program is that there is the possibility to meet intellectual peers. In the Netherlands, there are very high-quality pull-out programs, but there are others that need improvement. Sometimes there is no match with the regular program in which the student participates the rest of the week, which makes it confusing for him or her.

A disadvantage of this program is that students may feel isolated sometimes because they leave their regular classroom. This can be solved by effective organization in order to prevent the student from considering his or her absence from the classroom as something negative. However, not all teachers are able to organize this kind of special adaptation well. Sometimes they even feel bad because their 'best' student is leaving the classroom.

Pull-out programs that work well are always properly integrated in the complete educational program. Clear communication between the teacher of the regular class and the teacher of the pull-out program is vital to make this educational program work.

### Acceleration programs

In the Netherlands, students can be accelerated after they enter school, when they are four years old. Southern en Jones (2004) mentions 18 ways to accelerate, varying from the acceleration of one subject to skipping one or more grades. Although acceleration is not as rare in Dutch education as it was before, there are still people who worry about the social emotional consequences of academic acceleration (Hoogeveen, van Hell, & Verhoeven, 2005). However, national and international research show that accelerated students function well, cognitively and social emotionally (see for example the literature reviews of Rimm & Lovance, 1992; Robinson, 2004; van Tassel-Baska, 1986; and the Dutch research of Hoogeveen, van Hell, en Verhoeven, (2008; 2009).

### Special class/school for gifted students

For some years there have been special classes for gifted children in the Netherlands, and one gifted school. An advantage of this form of education is that the full week program can be adapted to the level of the gifted students. Some people worry about the fact that children do not learn to socialize with non-gifted children. However, experience shows that many children improve their social behavior after changing from a regular school to a special class for gifted children. Actually, the children in the Dutch gifted classes and school have joint activities with children from regular classes.

As is the case in every country, there is no one educational program better than another. The most important thing is that the program is adapted for the gifted student. What the best educational program will be depends on the child, the moment the program is applied and other circumstances.

Hoogeveen, van Hell, Mooij, and Verhoeven (2004) studied the effects of educational programs for gifted students. Results showed the conditions for successful educational programs for gifted students to be complex and multidimensional. All programs seemed to affect in a positive way the academic performance of the gifted students. Both positive and negative effects on the social-emotional characteristics of the students, including their self-concepts, were found. There were varying effects of the gifted programs on the academic and nonacademic self-concepts of the students, which can be explained in part by the initial occurrence of the "BIG-FISH-LITTLE-POND" phenomenon (Marsh, 1987): placement of a highly gifted student in a class with nongifted students often leads to a very positive academic self-concept on the part of the gifted students while placement in a class with all or mostly gifted students makes the gifted student no longer unique and can lead to a decline of academic self-concept. It was concluded that more systematic research about the multidimensionality of the conditions for successful educational programs for gifted children is needed.

The results of continuing research (Mooij, Hoogeveen, Driesen, van Hell & Verhoeven, 2006), in a longitudinal study of Dutch students in educational programs for gifted students, were surprising. Assuming a multidimensional model of giftedness, not only were the educational programs studied, but also other variables.

Results showed that the home situation – parent-child interaction, interest of the parents, family coherence, and family expressiveness – was important for school perception, motivation and results. Having participated in a pull-out or in-class enrichment program in primary school had, surprisingly, a negative effect on the school results and academic self-concept in secondary school. It seems, then, that these educational adaptations did not positively influence the final performance of the students. The researchers explain these findings by the fact that adaptations in Dutch education are introduced too late and that they are not sufficient for gifted students in primary school. Mostly, the educational program is

adapted as a result of evidently problematic behavior in school, not – as it should be – as a reaction to gifted behavior (Mooij, Hoogeven, van Hell, & Verhoeven, 2006).

In a study of the social emotional effects of academic acceleration Hoogeveen, van Hell, and Verhoeven (2005) found that, apart from high intelligence and the educational program (in this case acceleration) other factors, like intrapersonal and environmental, influence the performance of a student. Research carried on accelerated students in the Netherlands (Hoogeveen, van Hell, & Verhoeven, 2008; 2009) shows that accelerated students barely differ from their classmates concerning their selfconcepts. They seem to be less popular than their classmates in the first two years of secondary school. Comparing accelerated gifted students with non-accelerated gifted students, only minor differences appear in favor of the accelerated students. They seem to show less 'underground' and risk-avoiding behavior.

### Counseling the gifted in the Netherlands

Sometimes, offering a modified educational program is not enough to help a gifted student to perform well. In this case, counseling or coaching is required. When a student is extremely intelligent, for example, no possible adjustment of the educational program is enough. It is also possible that specific factors in a student's personality prevent the educational adjustment from being sufficient. In this case, counseling is also advisable, individually or in a group.

#### *Group counseling, emphasizing learning strategies*

Many gifted students get good scores without making any effort. As a result, these students do not learn to use learning strategies. At the moment, more challenging material is offered and now they do not know what to do because they lack those strategies. Sometimes, a teacher can help a student to become skilled at these strategies, but sometimes this takes more time and energy than a teacher can offer. Then, specific consideration is necessary.

The 'CBO-Vooruitwerklab', mentioned before, offers a combination of psychological counseling and education in a special enrichment class. Assuming the theory of successful intelligence, students learn, within a small group of gifted students, learning strategies which they had learned insufficiently or not at all in school. A teacher and a psychologist, working together, counsel the students using concrete assignments, for which in order to complete it is necessary to plan, cooperate and think hard.

You might think that everybody is able to make a marble alley, but how do you manage that when you have little time, limited material, and you need to prevent it from breaking down and make sure that the marble goes the right way and as slow as possible? Also important, how do you manage to get everyone in your group to participate in the planning and realization of the plan? To accomplish this you need to think analytically, creatively and practically. The 'CBO-Vooruitwerklab' intervenes in the environment, influencing the learning attitude of students and thus, eventually, their achievement.

#### *Individual coaching or counseling emphasizing learning strategies*

Sometimes it is not convenient for a child to learn in a group, even if it is a small one like the 'CBO-Vooruitwerklab'. Maybe the child is terrified of failing, or has behavioral problems caused by his or her high intelligence or from being twice exceptional.

By hook or by crook, individual help is indicated. Next to the 'CBO-Vooruitwerklab', the CBO offers individual strategy training. In this training children are deliberately confronted with difficult learning situations. They are trained to consider these situations, which they experience as frustrating learning moments, only when they have to struggle to carry out an assignment they are learning. For many gifted students this is a new, and therefore, very important experience.

In the Netherlands, there is a network of teachers who have all obtained their ECHA certificate of 'Specialist in Gifted Education'. Members of this network continue specializing themselves to coach individual students who

need additional support. The aim of the coaching is to make students responsible (again) of their own functioning. To reach that goal, coach and student meet with each other various times to discuss the goals of the student and the issues that hinder reaching that goal. It is of great importance the mutual trust between coach and student since the coach guides the student to solve his or her own problems. The ten-step program of Michael Whitley (2001) is frequently used by Dutch coaches of gifted students.

*Group counseling emphasizing social-emotional functioning*
Gifted students often develop faster than their peer group, especially social emotionally. Despite (or because of) this, they sometimes have social problems. A 'regular' training of social skills might overlook the cause of the social problem(s). It is advisable to offer a social training with intellectual peers. An example of a training in the Netherlands is "Learning to cope with giftedness together", offered by a private practice in Vught (the Netherlands) by Mia Frumau. Based on the solution-focused therapy, children learn all kinds of abilities. They do so in groups of about eight children, learning from each other in a playful, non-threatening situation. They are trained, for example, to 'manage situations of failure', 'relax in difficult situations', 'trust yourself', and 'relate to other (gifted) children'.

*Individual therapy emphasizing social emotional functioning*
As mentioned before, not every child is able to function in a group, even if it is small and safe. If the fear of failure or a negative self-concept is predominating and hindering the social contact with other children, individual therapy is indicated. Most important in this situation is that the therapist has enough knowledge about giftedness. Cognitive Behavioral Therapy, as offered by the CBO, has proven to lead to positive results when offered to gifted children. This therapy puts more emphasis on present problems and less on problems of the past. The therapy is solution-focused and of short duration. The central idea in cognitive therapy is that our perception of an event or experience has a strong effect on our emotional, behavioral and physiological reactions to this event or experience. People with emotional problems are often locked up in a negative, unhelpful way of looking at a certain situation, which leads to complaints of fear or tension, depression, unwanted habits, social dysfunction, etc. In the cognitive (behavioral) therapy, the therapist and the client search together if the negative thinking is realistic. When it appears that the client is used for judging all situations negatively, the therapist and the client will both look for a more satisfactory way of thinking. Specific cognitive exercises and assignments are used to elaborate more realistic attitudes and thoughts.

Mark appears to be gifted, but changing the educational program is, although necessary, not enough. Mark needs more support. His anger and despondency hinder his performance, even when his educational program is adapted to his abilities. Cognitive therapy is offered to him in order to help him understand his own anger and despondency, and get a handle on his own life again.

**Twice exceptional children**
As mentioned before, gifted children may have a disorder as well, like ADHD, ADD, and dyslexia, ASS, NLD or ODD. Intensive therapy or counseling, factoring in both diagnoses, is a prerequisite in these cases. Cooperation between experts in both fields lead to the best results. In the Netherlands, some psychiatrists acknowledge this, and there is some cooperation between them and the Center for the Study of Giftedness (CBO).

**What happens to Mark?**
The cognitive therapy helps Mark to understand his own thoughts, feelings and behavior, and the connection between the three of them. Meanwhile, his parents look for a more suitable school, and find out that there is a special school for gifted students, not very far away. They talk with Mark and together they decide that he will change schools. This new school meets

Marks intellectual needs and he gets acquainted with children with similar fascinations. Not everything is perfect all at once; Mark still needs extra care. But he is strong and understands the source of his negative feelings. An adequate educational program and an environment that understands him will support him in becoming a great scientist, poet or author.

**Perspectives and future of talent development in the Netherlands**
Until the mid-eighties of the last century, giftedness and gifted education were barely educational topics in the Netherlands. A lot has changed since then. In 1983 the Hugo the Groot Foundation was founded by Prof Dr. Franz Mönks, professor of developmental psychology of the Radboud University in Nijmegen. In 1988, this foundation became the Center for the Study of Giftedness, part of the Radboud University Nijmegen. This received a lot of attention from parents, who recognized their child in the description of giftedness. Later on, teachers joined them and asked for advice. In the early nineties, the CBO developed, in cooperation with the European Council of Gifted Education (ECHA), an Advanced Training in Gifted Education for teachers, a biennial training, resulting in the diploma "Specialist in Gifted Education". This training is now offered in many European countries and there are thousands of European 'Specialists in Gifted Education'.

At this moment, almost all schools in the Netherlands understand that they have to factor in their gifted students. However, not all do, but things are certainly improving. Dutch government has an active role now in gifted education. It founded two national information points, one for primary and one for secondary education. In 2008, the Ministry of Education started the 'Excellence Program'; regular schools for primary education receive financial support for innovative projects that create possibilities for gifted students. The goal of this project is to create opportunities for gifted students to turn in a top performance and to create a culture in which those performances are appreciated.

Another goal of this program is to prevent behavioral problems caused by a lack of challenge in school. The government supported the development of The Platform Bètatechniek with the aim of achieving a structural increase of 15 percent more pupils and students in scientific and technical education, and to use existing talent more effectively in businesses and research institutes. The aim is not just to make careers in science more appealing, but also to introduce educational innovations that inspire and challenge young people.

Dutch pedagogical centers (LPC) and the National Expertise Center Curriculum Development (SLO) also develop instruments and know-how for teachers and schools. In all, the government will have invested from 2008 until 2012 over €10 million in top talents in primary schools. With this impulse they intend to meet the wishes from the Dutch world of education to offer more challenges to gifted students.

Apart from governmental institutes and initiatives, universities are more interested in this topic. They do research on the effectiveness of educational programs for gifted students, and train students as well. The Radboud University in Nijmegen, for example, offers different courses in giftedness for students of pedagogical and educational sciences. There are various trainings about giftedness for teachers and social workers. There is cooperation with other European universities, in Germany, Scotland and Italy, for example. The CBO is participating in the development of a European masters in gifted education, which will be offered in the University of Münster (Germany).

More and more Dutch psychologists and remedial educationalists can diagnose giftedness and offer adequate support. Twice a year, a group of psychologists and remedial educationalists meet each other to exchange information and discuss cases.

So, in the Netherlands, we seem to be on the right track considering gifted education. However, there is still a lot to do. Despite all the possibilities, there are even now Dutch teachers who lack knowledge of and experience with gifted children. Only if teachers gain more knowledge on

giftedness, will this lead to the adequate and early identification of gifted students. Earlier identification and intervention will prevent later problems for these students.

Researchers found that schools need a variety of educational adaptations, like in-and out-of class enrichment and acceleration possibilities (Hoogeveen, van Hell, and Verhoeven, 2004; Mönks, Heller & Passow, 2000). Looking for good education for gifted students, we should ask the questions: "When is it more appropriate to alter the tempo or pace of instruction and learning? When is it more appropriate to alter the breadth or depth of experience? And how shall this be accomplished?" (Mönks, et al., 2000, p. 847). Teachers who identify the gifted students in their classroom, and also acknowledge that these students need adjusted education, just need the time and the means to teach them in an effective way. From this vision, educating the gifted will only be possible with support from (local and international) governments to provide schools for teacher training and adequate educational provisions.

Although a good teacher and a sufficient educational program are not enough to support a gifted student. Mooij et al. (2006) and Peters et al. (2000) show the importance of the relationship between gifted children and their parents, and mention some risks stemming from family factors, like rejection, or too low or too high of expectations. They consider good modeling as the best strategy parents can use. Parents also can offer supplementary activities to their gifted children (Campbell, Wagner, & Walberg, 2000). This might cause tension in parents: wanting to support their child on the one hand, and not wanting to be seen as a pushing parent on the other hand. This tension is one of the reasons why organizations of parents of gifted children are so popular (Campbell et al., 2000). In the Netherlands, there are various parent organizations joined together in an umbrella organization 'De Koepel'.

Although gifted education has grown in the last decades in the Netherlands, there is still much ignorance and prejudice toward gifted education, gifted students and their parents. This causes unnecessary suffering and a loss of intellectual potential. The challenge, if not the obligation of Dutch scientists, governments, teachers and parents, is to cooperate in order to offer optimal education to all students, including the gifted ones.

**Technical information**

In the Netherlands there are many institutions engaged in giftedness and gifted education. A short list is presented:

National Information point (highly) giftedness www.infohoogbegaafdheid.nl Information about educational material for gifted students, pull-out programs, (profile) schools for gifted student.

Center for the Study of Giftedness (CBO), Radboud University Nijmegen: www.ru.nl/socialewetenschappen/cbo

Scientific research about giftedness, Education (initial and post-initial), Patient care (psychodiagnostics, consultation, therapy).

Psychological Consultancy for Giftedness Utrecht (PABU)
http://www.hoogbegaafdheid.com/index_pabu.htm

Consultation and counseling concerning giftedness

De Koepel Giftedness. www.koepelhb.nl Coordination organization of different associations of parents of gifted children and the association Mensa (for gifted adults).

Platform Bètatechniek
(http://www.platformbetatechniek.nl/?pid=49&page=About%20 Platform%20Beta%2 0Techniek)

Structural increase of 15 percent more pupils and students in scientific and technical education and to use existing talent more effectively in businesses and research institutes.

Magazines

Talent. http://www.vangorcum.nl?NL_toonTijdschrift.asp?ID=4190 Vooruit (lessons for gifted students). http://www.kluwershop.nl/details.asp?pr=8277

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CHAPTER SIX
## Development of Gifted Children's Education in Lithuania
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**Introduction**

The aim of this article is to show the development of gifted children's education in Lithuania. An analysis of literature and documents of educational politics allows noting three historical phases:

The stage of Lithuania's Independence: 1918 – 1940 years;

The stage of occupation of Soviet Russia, period of Soviet Union: 1940-1990 years;

The stage of rebuilt Independent State of Lithuania: from 1990 year.

Every stage is different in few points of view: tasks of education, structure of educational system, approach to the giftedness, gifted children's identification and education. The comparison of these stages is made in following levels of educational reality: state, society, and institution.

**Historical Highlights**

In 2009, the name of Lithuania was mentioned in the sourcebook of the annals of Quedlinburg for the first time.

In 1570, Jesuits established a college in Vilnius. From the year of 1579, it has been known as Vilnius University.

In 1773, worldly organization, the Commission of National Education was established. It was concerned about Lithuanian education.

1864 - 1904 the year of prohibition of Lithuanian press.

In1890, G. Petkevičaitė – Bitė established the first charity organization

"Žiburėlis", which aim was to teach and support gifted children (Jurėnienė, 2003).

In the 16th of February, 1918, the Independence of Lithuanian republic was proclaimed.

**The stage of Lithuania's Independence: 1918 – 1940 years**

The first goal of the Independent Lithuania was to establish a united system of education. In 1922, the law of general obligatory primary education was legislated. Comprehensive school was made of four-year primary school, four-year pro-gymnasium and four-year gymnasium. From the year of 1936, four-year primary school was replaced by six-year primary school and three-year pro-gymnasium. Gymnasiums were of different types: humanitarian, real, and commercial. Qualified teachers worked in those schools. A person could teach only if he had graduated from Teachers' seminary. The work of pedagogue was prestigious and well paid. (Bukauskienė, 1990; Lietuvos mokykla ir pedagoginė mintis 1918-1940 m.: antologija, 1996).

In Lithuania of those years, 77% of population was engaged in agriculture. Influenced by such situation, parents allowed only very talented children to learn in gymnasiums (Zaborskaitė, 1995). Therefore, it can be said that the selection of gifted children was made by the social environment of Lithuania. Some of pedagogical society of those days did not want to agree with such selection of children.

During the last year of Lithuania's Independence, a Board of pedagogues appeared in Kaunas, which aim was, as Pašiliškis in journal "Tremtinių mokykla" ("The school of exile"), (1946, Nr. 3 – 4, p. 52) stated, "to do the policy of school talents' selection". The Board of pedagogues had sent a circular note with instructions to all types of schools announced about the aims of their work. This organization prescribed two searching stages of gifted children, observation and encouragement. In the first stage the teacher watches the soul of each student, his tendencies, and aspirations.

In the second, as Pašiliškis (1946) says, the help of the teacher is of paramount importance and this encouragement in the beginning must be very careful because the child in the first grade had not completely found his talents and propensities. "Completely clarified the talent of the child, the aim of the teacher is to become a personal friend of such talent and to guide giftedness of the child through the world of his sphere" (ibid, p.53).

However, this Board of pedagogues did not have proper support and approval from administrators of education. As Pašiliškis states, the beginning of the movement of searching gifted children was aggravated by predominant view that talents will "beat through". In author's opinion, such proposition is not true because not all talents have "additional" talent to "beat through". Such misguided attitude, according to Pašiliškis, provoked negative reaction against organized systematic policy of gifted children.

The most famous scientists of those times, who paid attention to gifted children, are: Stasys Šalkauskis, Jonas Vabalas – Gudaitis and Antanas Maceina.

Šalkauskis (1936) spoke up for grouping schoolchildren based on their individual differences, teaching individualization and differentiation. Such differences of gifted schoolchildren are age, gender, heredity, emotional singularity, intellect, and physical and psychical deviations. In his opinion, individualization of teaching is a principle; for this reason, it is obligatory for all pedagogues. Differences, which show up among gifted schoolchildren because of different age, form the basis of vertical teaching differentiation; all other differences form the basis of horizontal teaching differentiation.

The importance of gifted children education was highlighted by philosopher Maceina. In his 1934 book "Tautinis auklėjimas" ("National Nurture"), he stated "Genius dies if they do not find appropriate conditions for developing their giftedness. Genius and talent suggestions also requires education, as well as any other data from the nature (…) national education should watch out that none talent of nature dies, is destitute and disappears" (Maceina, 1934 (second edition 1991, p. 310)). The first condition to show "developed and matured giftedness of nature", according to Maceina, is the selection of gifted schoolchildren. His statement "today

schools have classes of several dozen of schoolchildren and these children steep in hundreds of other people. It should be taken into consideration that in this mass, children, who were given by nature some special tasks, would not 'die'", (ibid) is acute and relevant nowadays. Maceina states that "school that cares about the future of the nation cannot quietly pass through those who show special talents (ibid, p. 311). In his opinion, gifted children should be supported in every possible way, helping them to rise to such heights, which only their talents of nature let. For this reason, competitions, scholarships, bonuses, allowances, etc. are needed. As Maceina says "schools can be divided based on children's giftedness, specialty, age, gender, but schools cannot be divided according to children's estate" (ibid, p. 313). Therefore, he called for external differentiation of teaching, which criteria is the level of abilities. As Šalkauskis, Maceina also acknowledged the importance of gifted people to the nation: "Without such selective people (keeping in mind scientists, artists – author's note), nation would never reach the tops of nation and would always stay as an observer in the crusades of other nations" (ibid, p. 333). The selection of appropriate people, education, interest in separate people and protection of them, are the implements, which were indicated by Maceina in the education of gifted children.

Jonas Vabalas – Gudaitis was interested in problems of gifted children. When he was working in the laboratory of psychology, he applied Binet and Simon intelligence tests to population of Lithuania. When he improved prepared intelligence tests, he stated that such tests let to differentiate inborn giftedness of testing people (Vabalas – Gudaitis, second edition 1983). Understanding teaching as "educating intellect or increasing intellectual efficiency" (ibid, p.154), he required that teaching would be differentiated. "The life itself requires differentiation because there will not be progress without it", emphasized the scientist (ibid, p.123).

Alongside giftedness, Vabalas-Gudaitis emphasized particular intellectual efficiency. He indicated: "Work for giftedness is psychophysical food because giftedness increases while working and a person experiences success and delight. For this reason, the call of talent is like a cry of starving people asking for food, internal requirement for appropriate work would enable people to bring up their innate talents and thus to achieve maximum performance and creativity in social life (ibid, p. 141).

**The stage of occupation of Soviet Russia, period of Soviet Union: 1940-1990 years**

In 1940, Lithuania was forced to be a part of USSR. Historians' data (Burauskaitė, 2008, Strods, 2008, Anušauskas, 2004), shows that during 1940 – 1953, Lithuania lost 400000-500000 civilians as they were exiled to Siberia, sentenced to jail, killed. There were a lot of farmers, priests and teachers among them. Alone in 22-23th of May, 1948, 11965 children up to 16 years were exiled (Burauskaitė, 2008). Organized and elemental colonization had started: from 1944 to 1989, 7.4 million migrants arrived in the Baltic countries; most of them were Russian peasants from the villages of USSR. 2.2 million people came to Lithuania and 900 thousand of them stayed to live permanently. To compare, in 1939, 2.9 million people lived in Lithuania (Strods, 2008).

Lithuanian Education System was changed under the model of Soviet Union. Gymnasiums were closed, and high schools were introduced. Primary school was a four-year, after it – high seven-year school. Learning Russian language was compulsory since primary school. In the high schools from the major cities foreign languages (English, German) or mathematics, physics, chemistry was strengthened. However, schoolchildren entered the school referring not only to their study results, but also to their relation with party members and public figures. Therefore, during the Soviet period, and even longer after the restoration of Independence, there was a strong attitude in the society that better education is identical to elitism and to certain stratum of society benefits.

During occupation, the work of the teacher was oriented to average school children since a lot of attention was needed to be paid to weak

children because the quality of teacher's work was valuated according to the average progress. The time of overkill, when it was proclaimed that "there are no bad schoolchildren, there are only bad teachers", was certainly not favorable for educating gifted children in heterogeneous classes. Theoretical and practical ideas of Lithuanian pedagogy researchers were restricted by the claims Soviet pedagogy made stating that the plan of schools is the same, compulsory to everybody, and that only in socialistic countries the system of education have its own spirit of progress to which the minds and experience of pedagogues of Western Europe or USA is unacceptable. As well as throughout Soviet Union, in those days, Lithuania dominated ambivalent approach to gifted children. On one hand, numerous Olympiads and competitions were organized (separate subjects, music, sports, etc.) (Babaeva, 1999); additional teaching was popular as well (for instance, "Extramural School of Young Programmer's" functions in Vilnius from 1981). On the other hand, there operated an ideology of total general equality. There was nothing mentioned about educating gifted children in the documents of Education Policy.

Despite the emerged obstacle on the basis of ideology and the forms of state censorship to present freely pedagogic attitude, pedagogues of Lithuania paid attention to gifted children education. It can be clearly seen in the work of different teaching specialists.

It should be noted that in 1974 the book "Mokinių pažinimas ir mokymo diferencijavimas" ("Cognition of Students and differentiation of Education") by Jonas Laužikas was published. In this book, it is prescribed a necessity to take into consideration the individuality of a child, his different talents, not to let grades impact him, and to use in the class certain teaching forms of individualization and differentiation. As an effective tool at that time to educate an individual predisposition and talents in the schoolchildren, Laužikas states that "mass school, on the basis of individual principle of approach, has certain opportunities to promote the development of talents, to involve children into arts, subject clusters, etc. However, it has more

random nature without a precise system required" (Laužikas, 1974, p.136).

Laužikas (1974) and Jovaiša (1975) state that one of the obstacles limiting to group schoolchildren based on their talents and abilities is the lack of exact psycho diagnostic methods and tests, which lets to evaluate already mentioned personal characteristics. Many authors pointed out the importance of schoolchildren's knowledge and teaching considering individual characteristics (Laužikas, 1974; Gučas, 1959; Jovaiša, 1975; Dzikarienė, Kregždė, 1986; Jovaiša, Vaitkevičius, 1989, etc.).

**The stage of rebuilt Independent State of Lithuania: from 1990 year**
When the reformation ("Perestroika") in the Soviet Union began, the Independence of Lithuania was rebuilt. Pedagogic society expressed their consideration about educating gifted children, establishing and rebuilding gymnasiums since they were concerned with education of gifted children in prewar Lithuania. Gymnasiums of Independent Lithuania aspired to be called gymnasiums again. In such schools (Kaunas "Saulės" gymnasium, Panevėžys Juozas Balčikonis gymnasium, Šilalė region Laukuva gymnasium, etc.) an initiative group to reestablish gymnasiums appeared.

There were new initiatives:

With initiatives of scientists from Šiauliai Pedagogical Institute, primary school for gifted children was established in Šiauliai (Ališauskas, A., Karvelis, V., Kašys, J., 1992);

In 1989, Kaunas Institute of Politechnic (now known as Kaunas University of Technology) with the initiative of the head of applied mathematics V.Vėteris established KPI's Experimental high school (now known as Gymnasium of Kaunas University of Technology) for able children, who are interested in mathematics, and physics;

In 1990 the municipality of Vilnius established Vilnius Lyceum of Exact, Natural and Technology sciences (now known as Vilnius Lyceum; from the year of 1997, the International Baccalaureate diploma programme was introduced).

The establishment of such new schools, which seeks to offer new quality of teaching for gifted children, showed that educational society was not satisfied with the current situation in this area.

Scientists from Lithuania's Universities, who during the Soviet period organized Republican Olympiads (first republican Olympiad in Lithuania was organized for mathematics in 1952 (Stričkienė, 2007), began to organize teams of schoolchildren, which now can represent Lithuania in international mathematics, chemistry, informatics and physics Olympiads. When Lithuania was occupied, Lithuanian gifted children did not have such possibility.

In 1992, the first Education Policy decisions were made:

In the Lithuanian Education concept (Lietuvos švietimo koncepcija (1992)), gymnasium is named as higher requirements that a school has. "Gymnasium is a higher requirements having school, which provides profiled general education; it usually consists of IX-XII classes";

The status of gymnasium is given to first schools.

While preparing to accept the first concept of gymnasium, a lot of discussions about gymnasium topicality among pedagogic and scientific society appeared.

Zaborskaitė (1995) stated that gymnasiums are firmly related to idea of perfection.

Jackūnas (1995) acknowledged that a gymnasium is a distinctive link of Educational system, emphasizing that "the establishment of gymnasiums in Lithuania suggests some questions, and that different decisions will have an influence on further alternation direction of our education" (Jackūnas, 1995, p.30). As one of the dilemmas of the expansion of gymnasiums, he showed internal and external differentiation. The author stated that the establishment of gymnasiums requires considering which art of educational differentiation we tend to give priority. Internal differentiation in every school and gymnasium or institutional structural differentiation of all education system; and maybe to a third path, when looking for tune of both already mentioned arts of differentiation.

Soon, the ideas that have risen with the initiative of schools were validated by educational document; the first Concept of Gymnasium in 1995 (Gimnazijos koncepcija, 1995). In this concept, gymnasium is understood as a school for gifted children: "a gymnasium is a general education institution for schoolchildren who are gifted in any area of activity (humanitarian or natural sciences, arts, technology, etc.) and who have early matured learning motivation". Gymnasiums organize entrance examination, which consists of the selection of gifted children, using the tests of achievements, and conversations with children and their parents. Psychologists rarely participate in the selections (Narkevičienė, Šiaučiukėnienė, 1998).

However, an ideology of general Soviet unification was still very rooted. The concept of gifted children and consideration to its education was hardly penetrating through. This situation is reflected in the consequence of education policy to gifted children; in 1999 a new, second "Concept of Gymnasium" (Gimnazijos koncepcija, 1999) was validated. In this concept, gymnasium was defined as "an educational institution that provides general profile in high education to all children and gives them a wide range of possibilities". In the second Concept of Gymnasium, it is emphasized that the selection to gymnasium should be applied only in special cases; especially unacceptable selection is to I and II classes.

As Dukynaitė (2008) states, two "Concepts of Gymnasiums" were validated, which gave disparate purposes for such schools (gymnasium for gifted and motivated children, and gymnasium for everyone). According to the data of Dukynaitė's research, experts of Lithuanian Education, after more than a decade of gymnasiums' reconstruction, do not have a general opinion about the purposes of gymnasiums. To the opinion that a gymnasium should be for gifted and for high learning motivated schoolchildren, 51 percent of experts approve, and 44 percent of experts do not agree with such opinion. More than a half (58%) of experts agrees with the definition of the second Concept of Gymnasium, which is "gymnasium is for all schoolchildren's age", and a third (32 %) does not agree.

The Regulations of the status of gymnasiums (Gimnazijos statuso teikimo nuostatai, 1998) indicates that the headmaster of school should have 2nd or 3rd category of management. No less than 40 percent pedagogues who give classes in gymnasium should have highest (experts) or second highest ("metodininkas") qualification. Doctors and pedagogues should be able to teach two or three subjects, should know foreign languages and should use foreign literature. Thus higher requirements are suggested to gymnasiums than to secondary school. Forasmuch in reconstructed education system, from 9th to 12th grades parallel to gymnasium is in secondary, youth and professional schools. The problem arises when gifted children who study in gymnasiums expect to get a higher requirement corresponding to his education. However, open questions stays, what kind of consideration for its own demands in education could expect a gifted schoolchild of 1st – 8th grade? What kinds of requirements to education are suggested in other schools generally up to 8th grade from the viewpoint of gifted children? Whether or not a gifted child will receive a proper education in school depends on the view of the founder, council, managers and individual teachers' view to the problem's significance and importance of a specific school. This fact highlighted the importance of information about special educational needs and identification of gifted children, appropriate preparation of educational employee, and beneficial attitude of the society. The research on educational situation of gifted children and youngsters showed that teachers particularly highlight the importance of Education policy (Narkevičienė, Almonaitienė, Janilionis, 2002).

Maybe such situation, the lack of brave decisions of Education Policy, made the society to be actively concerned about gifted children:

In 1998, a group of teachers and scientists established the educational school "Olympus of Physics". School called itself as "additional education school of particularly gifted children", although, in the documents of school, it was not described what kind of child a "particularly gifted child" should be, so every child who had a deeper interest into physics could study in this school;

During the same year, Lithuanian society of Mathematics, together with Lithuanian association of Mathematics' teachers, reestablished long acting Extramural School for Young Mathematics**;**

In April of 2003, Mstislav Rostropovich Charity and Support Foundation, "Support to Lithuanian Children with maestro own initiative" was created (Chairman of the Foundation - Rasa Kubilienė). The objective of the Foundation is to promote the education of phenomenal talents in Lithuania, especially of gifted children, by creating conditions for them to become world-famous stars.

In 2004, the first "Students' summer academy" in Lithuania was organized (author of the idea is the author of these lines), where very high achieved children, who were interested in mathematics, economics, Lithuanian philology, informatics and chemistry, learned together. Later, this project was developed into European Union 2005-2007 as a funded project (author and head of project is Bronė Narkevičienė). During the period in which this project was run, there was not only training for students, but there were also held qualification courses for teachers; and 6 educational books for educating gifted children were published. Currently, the project is growing up into the constantly working educational institution "National Students' Academy", where children from Lithuania are offered distance learning sessions. There are 8 sections in the Academy: biochemistry, chemistry, physics, informatics, Lithuanian philology, economics, mathematics and music (Narkevičienė, 2008).

In 2004, support foundations for gifted children were established in some municipalities (Anykščiai, Akmenė, Skuodas, Telšiai, Varėna and Zarasai) (Narkevičienė, 2007).

Politician of Education and public official also made changes. In 2003, Guidelines of Strategy of National Education for 2003-2012 (Valstybinės švietimo strategijos 2003-2012 metų nuostatos, 2003) stated "implementing the strategy, so that the accessibility of educational development, succession and social justice would be granted, support system for gifted children and youngsters is created and explicated." This document clearly

names the concept "gifted child" and shows the necessity to create a support system for such children and youngsters. And, apparently, implementing this document can be considered as a turning-point in Lithuanian Education Policy in respect of gifted children in Lithuania, but it cannot be done until the recognition of "Strategy of education of gifted children and youngsters" that has taken two and a half year.

In 2004, in the Ministry of Education and Science a work group was organized (the author of these lines was appointed as a head), which created the "Strategy of education of gifted children and youngsters" (Gabių vaikų ir jaunuolių ugdymo strategija, 2005). The Strategy was validated in December of 2005. The main aim of this Strategy is to create an effective educational system for gifted children and youngsters, forming educational, psychological, social and financial conditions for gifted children and youngsters independently of their social status, residence, school type, age, gender, linguistic surrounding, etc. It also aims to choose the education of the students' demands and concerns, and equal self-help possibilities. For the first time in Lithuanian education policy document, the concepts of giftedness and gifted child are introduced in this strategy. Considering the "Strategy" in General Education Service, many discussions have arisen because of these concepts. This also showed that the irony wall, which restricted Lithuania for 50 years, is not completely destroyed because the specialist in psychology hardly accepts the experience from the West; the definition of gifted children, which suggested that this concept should be modified. But essentially, the announcement of "gifted child" in the document of Education Policy is progressive thing.

The last-mentioned strategic document made assumptions to expect that, Lithuanian Education Politics will avoid inconsistency, which was observable in educational documents, by regulating the process of education from the restoration of Independence until 2005. To implement the Strategy in further years, the Ministry of Education and Science prepared and implemented "a program of education for gifted children and youngsters" (2006 and 2009). Implemented the program, a department

of Olympiads in the Lithuanian Information Centre for Students was established. The program gives funding to organize the Olympiads and for the teams to participate in international Olympiads. To receive funding for another type of work with gifted children, projects should be prepared, which would participate in an annually announced contest by the Ministry of Education and Science.

In 2007, the Ministry of Education and Science of Lithuania together with Kaunas University of Technology, National Students' Academy and Mstislav Rostropovich Charity and Support Foundation organized the first international scientific conference, which aimed at analyzing themes related to giftedness and education for gifted children (Gifted Children: Challenges and Possibilities, 2007).

In 2008, National Students' Academy organized a gifted children search program for the first time in the country. In this search, intelligence tests were used for the first time, professionally and appropriately prepared by psychologists.

## Conclusions

The reality of education has hierarchic nature – decisions made by government have influence on the processes that happens in social, institutional, interpersonal, and personal level. The process of gifted children's education in Lithuania showed that the influence of decisions of national level could have and has processes that happen in society. Of course, if it is a democracy.

It has been three years now since the clear resolve by Lithuanian Education politics to pay particular attention to gifted children that has made assumptions to analyze whether the consistency of decisions has practical influence on the situation in regions and in schools. Advisable repeatedly perform situation analysis, which was done while creating the Strategy in 2004, and to check what and whether some changes occurred. While implementing the strategy, constant observation is necessary as well as the need of programs, devices, or even strategic aims' correction. If it

is not done, there will not be enough prepared documents in which such expected changes would occur in the country.

The current structure of education system creates preconditions to have a different level in the quality of education for children of the same level of giftedness depending on the type of school they are attending. There are several ways to solve this problem:

By differentiating and individualizing education in both types of school (gymnasium and secondary school),

By looking for gifted children, and offering and enabling them to choose education outside the school, which would correspond to their potential,

And by organizing educational programs for gifted children in both types of school.

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# CHAPTER SEVEN
## Care and support of intellectually gifted children in Slovakia
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### Introduction

The phenomenon called *talent* is the capacity to perform a specific kind of activity. In the ancient history of mankind, it was believed that the gift needed for an individual to perform some special activity was given by God. In various languages, the word "giftedness, talent" is derived from the base of "to donate" (gift) like in Slovak and Czech (nadanie, nadání, talent), or like in German (Begabung) that it's derived from the verb "to give".

The word "talent" was originally used for ancient Greek coinage and weight unit. In ancient times, that word was also used in Babylon, Egypt, Palestine and elsewhere. At the beginning of our era, a parable of the talents the Lord gave to his servants appeared in the text of the New Testament. Later, the word "talent" began to be used as a synonym for "gift of God" and was used to indicate the capabilities a man "was given" to carry out successfully certain activities. In Slovak the word used for "talent" is "nadanie."

At present, the concepts of giftedness and talent are often used as equivalent expressions of the same meaning, as synonyms. Both terms refer to human qualities and mostly reflect above average, or extremely high level of development. Many laymen and professionals use both terms as synonyms because it is difficult to establish a meaningful and practical criteria for their distinction. (Moenks and Mason (1993), Tannenbaum (2000), Moenks and Ypenburg (2002), and others.)

Gagné (1991) is the representative of the authors who see differences between these terms. He defines giftedness as biologically given natural skills, abilities and talent, as well as developed skills and acquired skills.

He considers environmental factors as catalysts that allow gift to develop into talent. Particular talent is then characterized by the productivity in an area which is socially beneficial and useful.

In Slovakia, Laznibatová (2001) argued the difference between these two concepts, and concluded that both terms talent and giftedness are defined as prerequisites for the personal traits as a condition for successful performance and productivity in a particular area. The terms are used to indicate the boundary in the normal distribution of assumptions and, most often they are related to skills and other attributes of personalities.

Quantitative and qualitative differences are set between these two concepts. The quantitative one lies in the fact that talent is usually defined as a high degree of giftedness, usually externally expressed. Qualitative differences are distinguished by:
- Genetic and developmental point of view (giftedness is considered as congenital, while talent is the result of developmental-environmental interactions),
- Content (giftedness is relevant to be used in relation to natural science, while the talent for the humanities and arts),
- Degree of universality (giftedness is considered as the general assumption that is often perceived as general intelligence, while talent is defined as narrowly defined skills).

Typical representative of the quantitative approach was W. Stern, who distinguished so-called special giftedness - called talent, from the general giftedness - called intelligence (1967, p.5). Writers like J. T. Feldhusen (1986, p. 122), distinguish special ability (talent) from the general ability (intelligence).

This method of discrimination between the terms of giftedness and talent is the most used method. Analyzing the term giftedness, H.J. Eisenack and P. T. Barret (1993) stated that the concept of giftedness is generally defined in three ways:
- this term is defined synonymously with high IQ,
- the concept of giftedness refers to creativity (it is seen as a personality trait),
- the concept of giftedness is seen as a high degree of development of special abilities.

The level of creativity does not have to be associated with high intellectual potential and highly specific or special abilities do not have to correlate with the high IQ. It is preferable and also logical to restrict the definition of giftedness to the first method of definition set out in paragraph a). It is evident that in the case of intellectual giftedness, which we deal with, it is necessary to state or identify the way of diagnosis by standard psychological tests to clearly confirm the general talent.

The term giftedness can be considered in the context of the potential for exceptional performance as the potential for learning, which is a relatively stable characteristic of an individual, is an inborn constant which affects cognition, learning and behavior.

We also consider giftedness as a certain potential, talent, and disposition; and talent as the expression of exceptional, especially a specific external capability (e.g. sports, music, arts, etc.). Therefore, when we talk about gifted children, we have in mind the population of children with general education, and some general assumptions for the performance in education, especially at school or in academic areas. This is more about intellectual giftedness, which must be confirmed by standardized psychological tests. Talking about gifted children, we take into account their assumptions, dispositions, abilities, and potential. Talking about talented children, we take into account non-intellectual areas, especially in the area of sport, art, music or others. In addition, we expect specific manifestations of talent are already evident in the external performance, especially in musculoskeletal and motor areas, like in sports such as athletics, gymnastics, swimming, skating, or in artistic activities such as singing, playing the piano, violin or other musical instruments, as well as in ballet, folk dance, etc. In summary, in our understanding:
- giftedness is the general potential for making great achievements,
- talent shows specific skills outward, e.g. in any kind of the above mentioned external performances.

- At the beginning of any work with gifted children there are three questions:
- How to identify a gifted child?
- Who should identify him?
- What is the most effective form of identification?
- The problem is more complicated because:
- there are more definitions of giftedness than of talent
- there are no unified views of their definition
- therefore identifying gifted children is not easy
- some laymen and professionals do not even want to learn about gifted children
- others claim that everyone has a talent for something

Two definitions of giftedness are used when working with intellectually gifted children: "A Gifted child is a child whose intellectual development is very superior compared to the normal development of children of the same age, while the affective, emotional, relational, social and psycho-motor development corresponds with the standard of his age". (J. Terrasiér, 2003). Based on our practical experience, we can stipulate that some of these aspects of development of gifted children can be even at a lower developmental level compared with their peers.

Based on our research, observations and findings about the real course of development of gifted children between the ages of 5-6 do 18 -19 years, i.e. the time horizon, which covers the care for gifted and talented children at School for Exceptionally Gifted Children and Grammar School in Bratislava. We follow the definition of giftedness as "asynchronous development in which early developed cognitive high level abilities combine and create the internal experience and consciousness, which is qualitatively different from the norm. This asynchrony increases with the higher intellectual capacity (Columbus Group, 1991) and it is necessary to stress that the "uniqueness of the gifted makes them particularly vulnerable" (M.J. Morelock, 1992).

These two definitions of giftedness are the most appropriate for understanding the intellectual giftedness and are the most adequate for the way we work with intellectually gifted children.

***Program for developing talent, giftedness and support of its education***
Exploration, research, promotion and education of gifted children in developed countries around the world have a tradition of almost a century.

Appreciation of high degree of giftedness largely depends on the society value system. It should be emphasized that care and support of gifted children, i.e. providing the conditions for developing their dispositions and potential, is a question of individual development, as well as the interest of the society. In general, it could be assumed that there are at least two reasons why it is necessary to promote and take care of the gifted children:
- Individual reason – each individual should achieve full development of his personality and abilities to realize his potential, giftedness and talent.
- Social reason – although the talent is personal, it is a human source and strategic wealth.

The prosperity of each society depends on the development of the potential of the young generation; therefore, no society can afford to ignore giftedness and talent of the individuals.

For a more detailed analysis, there are some characteristic features of the personality and ability of a gifted child, which can be summarized as follows:
- a significant developmental advantage in several areas
- significantly different pace of work
- different quality of performance
- different width and depth of interests
- high ability of concentration and interest in the task
- noticeable "own will",
- high degree of curiosity and independence to explore the world.

These dispositions and specific characteristics of the gifted and talented children appear in early childhood. Therefore, it is necessary to provide appropriate conditions for promotion, education and care for the gifted children. We clearly emphasize that we should give them a chance, and not

to repress their gift. Gifted children are still taken as an unknown minority because we do not know them very well, we do not know their needs and we are not willing to tolerate their specific needs, and we are not willing to accept them because they are different. Usually everything runs within the frame of "if they want to live with us, they must adapt". This is the tradition. In this context it is important to mention their representation in the population. Traditional statistical data by Gaussian distribution curves suggest that the percentage of gifted population ranges between 2 – 3%.

• Psychologists say: we have as many gifted as we can identify and diagnose.
• Economists and politicians say: we have as many gifted as we can financially support.
• The Council of Europe in the Declaration 1248states: "every fifth child in Europe is gifted", i.e. 20% of the population of gifted and talented are in the intellectual, artistic and sports areas.
• Some experts believe: if we create and maintain sufficient suitable conditions for promoting the development of their gift, talent and skills, up to 20-25% of individuals of the population would be able to achieve exceptional performance in educational activities, or in various fields of human activities (Freeman, 1996).

More detailed knowledge of talented and gifted children taken from several aspects, technical approaches, and research affects especially the area of education. For practice in general, but especially for school practice there are the following key issues:

1. How to search for gifted children?
2. How to develop their gift?

Searching for gifted and talented children is the first step in the systematic care of the gifted children. In connection with this, there is an important question of their age, which determines the possibility of exact search of gifted children.

There is a document of rights for talented and gifted (In: Laznibatová, J., 2001, p. 375-376) where the right of the child to be identified as gifted at the lowest possible age is placed on one of the first places. In connection with small children, the phrase "gifted or talented behavior", or expressions of "talented or gifted behavior" comes into use.

An important factor influencing the search for talented and gifted children is the kind of talent and gift. The oldest known psychological sources state that there are observable behaviors at pre-school age that indicate a mathematical genius, including the advanced stage of the development of verbal skills. The artistry in this age shows musical talent. Equally significantly, this age may already demonstrate talent and physical gifts, which manifest themselves in agility, flexibility, and good coordination of movements, i.e. with the "physical courage". These are specific prerequisites for gymnastics, dance, skating etc.

During the school year, there are more signs of allocation of particular language, science and organizational and leadership prerequisites. The artistic talent in the art area is intensively manifested around the ages of 13 and 14.

In terms of physical education and physical movement in general, talent for team sports and athletic talents are manifested in the older school age. This period is considered by some experts to be an optimal timing to implement the various search approaches of giftedness and talent.

In the adolescence period gradually stabilizing scientific exploratory approach to the world is observed as well as talents for social sciences.

The arrangement of the timeframe, which is manifested in various forms of giftedness and talent, is the basis for the search process and identification of gifted and talented children. However, it should be noted that the search and identification of gifted children makes sense only if we could offer an adequate education for these children after the process of searching.

After initial searches and nominations of gifted and talented children, there is a more exact procedure for identifying them. Based on our own experience, we incline to the pyramid scheme procedure for identifying and selecting gifted and talented children, referring to Cox, Daniel, Boston (1985), where gradually the natural and objective selection takes place and those who do not reach the pace or do not have the appropriate skills drop out.

The first level of the pyramid is a relatively large group of able pupils, students whose needs are satisfied by the acceptance and enrichment of the curriculum in regular classes.

The second part of the pyramid represents a smaller number of highly gifted students and students whose individual needs are more specialized and who require differentiated training in special classes for their optimal development.

At the third level, i.e. on the top of the pyramid, there is the minimum number of exceptionally gifted children with special interests, or students whose highly specific educational needs can be satisfied in special classes or in special schools only.

Gifted and talented children are defined as a specific group. They need to develop and implement their abilities and the specific conditions to do it. Therefore, to confirm their abilities or dispositions, talents and potential, an exact procedure for working with intellectually gifted children is needed. Psychological diagnosis is also necessary. If these conditions are met, it is also necessary to proceed with the development and promotion of giftedness. In our conditions in terms of legislation, there is a concept in the sense that talent must be developed on three levels, namely:

• The interest level: it is not subject to selection procedure. It is performed through elective courses, extracurricular education (clubs etc.)
• The performance level: it is subject to selection procedure. There are educational programs with extended teaching of particular subjects or subjects' competitions, Olympiads.
• The peak level: there is individual approach of class or school for intellectually gifted children, secondary schools with an artistic focus, sports schools, conservatories etc.

This clause applies to intellectual talents, artistic talents and sport talents.

The aim of all concerned individuals and institutions (school teachers, coaches, sports centers, art schools) is to ensure conditions for the development of talents and to take into account the special needs of the gifted and talented.

One of the most important institutions for the development of giftedness is school. In this context, there is always the question of whether to create schools for gifted, or is it better to integrate them into general population among its peers. While the lower classes of this school generally accept this procedure, the progression to a higher level of school often develops problems. Gradually there are shown some educational disadvantages in educating gifted students in mainstream schools. One of the disadvantages of keeping gifted pupils in mainstream schools is that relatively little attention is paid to them, which affects the development of their intellectual potential. To achieve very good or excellent school results (corresponding to average gifted students) they do not need fully development abilities. Up to 45 % of gifted children have problems at school. "One of the reasons is the fact that teachers are not properly prepared to work with gifted children. It has been confirmed that teachers need better knowledge and more information about educating gifted children". These are the results of research from British schools as alleged in monograph by J. Laznibatová (2001).

We support the idea that gifted and talented children should be educated in specialized schools and classes, which work in homogeneous groups, and where teachers can work more efficiently to transfer the knowledge, but also to take into account the particularities of their personality.

Our arguments for the education of gifted children in classes/schools for the gifted children are as follows:

• the possibility of a gifted child to interact with his/her peers
• reduced number of pupils per class (option of individual treatment)
• training methodology focuses on the needs of gifted children (reduction of routine, less repetition, acceptance of different solutions, sophisticated roles, various advanced courses)
• staff is ready to perceive, detect and solve possible risks in the development of gifted children as well as to identify and develop specific interests and talents of a child.

- reduce the risk of a child to be excluded from a class team (low number of pupils, the possibility to closely monitor the social events in the team, the presence of similarly oriented peers)
- activation of a gifted child (the intellectual potential, eliminate the boredom "of tasks being too easy or routine compared to the requirements of mainstream school).

Creation of such conditions for the development of the gifted children at school is followed by the effect in high optimization of this development, support, and overall quality of care for gifted and talented children.

The school that has to develop giftedness and take care of talent must have a flexible open system and atmosphere, a crucial determinant of the educational process. The school atmosphere is a very important factor demonstrated by the experts: "…when people feel good, their thinking becomes more creative, more integrated, and more adaptable and open to information. Positive emotions improve mental and physical agility and flexibility, and positively influence the welfare and human health" (Frederikson, 2003).

Therefore, it is necessary to create friendly, family atmosphere in each environment where talents are formed, encouraged and developed with positive motivation and evaluation. It is also very important to take into account their personal circumstances.

***Perception, importance and development***
***of talent and giftedness (ability)***
At the beginning of each individual development there is a specific genetic potential, which needs to be permanently fed in a specific environment. Ability as well as talent has certain common characteristics, which may be, according to E. Winner (1996), summarized into the triadic model:
- gifted children are prematurely mature (mentally or physically),
- they need minimum help, support or reinforcement from adults to manage the area in which their talent shows up,

- They want to excel in an area in which they are gifted in and tend to spend almost all their free time developing their gift without any external pressure.

Many characteristics and diagnostic descriptions of giftedness (ability) and talent are universal, but some others differentiate talented and gifted individuals. A talented person shows his above-average and highly specific skills particularly in music, dance and visual arts or sport area, but even today there are known theories on multidimensional model factors of giftedness. For example, Heller (1992) includes in multidimensional giftedness intelligence, creativity, social competencies, musical, and psychomotor skill or practical intelligence. However, we believe that it is essential for practical needs to clearly differentiate intellectual and non-intellectual forms of giftedness. We understand giftedness - like most professionals today (e.g. in USA, Canada, UK or Israel) - as an extraordinary common intellectual capability that can be proved in gifted individuals as an exceptional developmental level (by reliable diagnostic methods), which is constant at high rate for a longer period (Laznibatová, 1991). Basically, this includes individuals who, according to reliable tests of general intellectual abilities (or specific intellectual abilities), exceed internationally accepted boundaries of giftedness. Individuals can be considered talented if their giftedness is not academic and if, in these cases, their talent does not always correlate with high levels of intellectual abilities.

If we consider diverse intelligences according to H. Gardner (1999), which include about seven to eight types of intelligences, about 20% of the population would correspond with various forms of giftedness and talent. This number corresponds well with the declaration of the 1984 European Council. The 20% of the total population represents individuals with all kinds of gifts, talents and intelligences, including high level of sensorimotor skills (art, music, dance, and sport talent), but also leadership skills and social skills, i.e. interpersonal intelligence.

There is a difference between gift manifested in children and gift-talent in adolescents or adults. In children, this phenomenon is generally perceived as faster development in comparison with their peers, i.e. kids of the same age. In adults, the expression of gift-talent is comparable at high activities level based on many years of hard work in certain areas, particularly in areas of their specific concern. Experts confirm that in a given specific area a certain "force of personality" may be involved, which represents a driving force, a motivation, energy and need for action.

The issue of detection and identification of gifted individuals is very difficult. Many parents do not even want to admit it and are afraid if their child expresses himself differently from other children. They often restrain the child's symptoms, they do not want their child to lose "his childhood", they do not want to trigger any attention on themselves or on their children, and expect the school to take care of the child's optimal progress. Particularly in intellectual areas, parents do not want to accelerate their development so that they are not bored at school. Slightly different are their attitudes in general toward their talented expression in musical, artistic, dancing or sporting areas. These kinds of talents are socially highly evaluated. Gifted children are considered to have special educational needs and, therefore, appropriate conditions have to be set for their potential development. There is no doubt that to develop their gifts and talents they also need special forms of education which require well-trained teachers, educators, psychologists, trainers, etc.

The term education and support of exceptionally gifted and talented individuals implies the request of broadly prepared educational concept based on extensive special offers and opportunities, where an effort and exceptional performances are taken into consideration, and the individual potential and predispositions of each gifted and talented individual are encouraged. The support of exceptional giftedness and talent development is a transnational matter with global character regardless of individual countries. It is important at this stage until the support of giftedness and talent becomes an independent task separated from the school systems in general.

The findings of notorious experts in the U.S. and Australia show that attitudes toward gifted people are strongly distinguished, according to the areas in which they are dominant (Tannenbaum, 1962, Carrington, 1993). We have the same experience in our country. They confirm the fact that the physical predispositions and excellence in the form of sporting and athletic talent are clearly more tolerated than intellectual excellence.

According to some recent findings (Gross, 1999), children who are extremely good at sport and athletics, for example, can successfully and fully apply their potential, are generally happier, and have better opportunities. Gross believes that intellectually gifted children are less accepted in general education than their physically gifted peers, and that the development of their talent is often met with apathy, misunderstanding, or with a straight manifestation of hostility.

That is probably why it can be alleged that the level of care and support of gifted individuals is insufficient in European conditions. That is even despite the fact that in 1994, the European Council emphasized that every fifth child is gifted and; therefore, it is necessary to create conditions to support gifted in the wider global and closer regional context. But to carry out the support of gifted adequately, conditions at four levels must be ensured.

I. Political conditions: formal support of parliaments and congresses, agreement of official functionaries and their political parties, inclusion of promotion and care of the gifted individuals into the Government program, legislative enactment supporting gifted individuals.

II. Economic conditions: to set apart resources for the gifted with the official justification of economists and financiers, to support gifted in financial and material ways, to set apart by law resources for education of gifted and for creating programs and adequate conditions.

III. Social conditions: total acceptance of the gifted, degradation of ideological barriers, creating positive attitudes of professionals and the general

laic community to resolve the issue of gifted, creating conditions for implementation of all forms of gifted children care and their support, preparation of administrative and technical conditions for supporting gifted.

IV. Educational conditions: to ensure suitable conditions in the school system, to create optimal educational forms for gifted children: programs development to support gifted, creation of individualized differentiated curricula; alternative and supplementary textbooks, development of specific educational psychological methods to develop gifted children's personality with respect to their individuality; preparation of qualitative and competent teachers to work with gifted children.

According to opinions of renowned experts like N. Maier (1993), K. Urban (1993), F. Oswald (1993), F. Monks (1993), K. Clement (1994), J. Freeman (1996), J. Laznibatová (1995, 1999) and others in the field of giftedness, the social system must offer open chances to every individual and provide them with everything that is necessary to satisfy their individual needs and for their own implementation. Everyone dealing with the issue of giftedness and gifted children clearly agrees that it is only possible to resolve this problem at two levels, by two approaches: either we want to support gifted children, or we can ignore them. There is nothing else between.

To progress in the care of gifted individuals, we have to find a solution for basic aspects of gifted children support, namely:

• to help enlighten the nature of intellectual giftedness,
• to take into consideration the needs of intellectually gifted children,
• to find ways to move gifted children from potential to performance,
• to prepare appropriate conditions for giftedness development,
• to ensure quality preparation of professionals, especially teachers to encourage giftedness.

**The care and support of the gifted and talented in Slovakia**

From the period of 1900 – 1948, there are missing facts about anyone paying attention to the problem of the gifted. After the year 1948, not much was said about talents as having talent was considered as an unacceptable elitism. But some specialized schools existed anyway (e.g. conservatories), where the attention was aimed at the talented. The artistic talents were possible to develop outside the classroom – at various art schools - but those were focused only on the children with an artistic gift. Sports talents could be developed at physical, training centers or professional sport centers. Only at the beginning of the sixties, in reaction to the worldwide trend, people started to consider the society's need to support the development of talented and gifted students at schools and classrooms which should pay special attention to the exceptionally gifted. This issue was raised in the sixties when it was shown that many children showed high achievements above the average level when compared to their peers. At this time, specialized classes started to be open – for mathematics, languages or sports. But practically, the only method for this specialization was the so-called extended teaching. These were classes or schools with some extra lessons of mathematics or science starting in the fifth elementary grade and the classes with foreign language lessons starting in the third elementary grade. It was similar with sports classes and schools. The work in such a class was not based on any theory, but only on some pedagogical empirics. Except for this, a great variety of competitions existed to stimulate the talent. The most famous was The Olympiads in mathematics, physics, chemistry, geography, biology, Russian language, and later also in German, French and English languages. As the result of the specialized primary and secondary schools, our students were – and still are – receiving a notable international success in math, physics, chemistry and programming.

At present, the classes and schools with the extra math and science classes still continue their existence, as well as the sport classes. The system of foreign language teaching is more variable, so it is possible to enable

all the children – and not only those with a gift for languages – to learn a foreign language. This means that more and more students learn foreign languages in the first grade or even in nursery schools. More artistically talented students attend the art schools. The system of the competitions was kept preserved until now – pythagoriads, Olympiads, literature, poetry and prose or drawing competitions, etc. Nowadays, a special care about more types of gift is absent – especially that for the intellectually gifted children.

The amount of the pedagogical and psychological literature about this topic or any theoretical work-out for our conditions is minimal. There are some non-topical works (V. Dočkal, 1983, M. Musil, 1995) which do not come up to modern attitudes toward the gifted. This is the result of a long term effect of a unique school, which is why today we usually have only one type of teaching material (the same for everyone) and teachers who are not prepared for the specific work with the gifted. While the artistically talented students are well-cared by the professionals (musicians, painters, dramatists) and the sports talents by tennis or football players, figure skating or swimming coaches, the intellectually gifted children (except for the mathematics) have received only tiny attention.

The only exception was the Research department of Child Psychology and Pathopsychology in Bratislava as the resort of Ministry of Education in Slovakia, where the researchers have paid attention to the questions of talent and giftedness since 1979. They have analyzed the specific factors for mathematical, language, sport and artistic forms of giftedness. A team research was conducted and its results were summarized in a monograph called "The Psychology of Giftedness." (Dočkal and col., 1987).

A massive change came when The Association for Gifted Children was established in 1991. Based on the research and suggested activities for the gifted, The Project of Experimental Examination of the Alternative Care of Gifted Children at Elementary Schools (J. Laznibatová, 1993) was approved by The Ministry of Education. This project has been founded as a result of direct impulses from the parents whose children showed knowledge

above the average when compared to their contemporaries and a classical school did not have any developing programs prepared for them. We can say that this project was based on the real practical life. Six years later, The School for Extremely Gifted Children was open in Bratislava on the 1st January, 1998 as a separate legal subject and all the activities are unwound from this institution. In parallel, based on the same principles, similar classes were open in other towns in Slovakia (Nitra, Košice, Rimavská Sobota and since 2000 in Šaľa, since 2001 in Poprad and Trenčín) as the interest for this type of education was growing. In 1999, the first year of the eight-grade high-school was open, which means that this highly specific form of education and support of the gifted is complete now under the conditions of our educational system. Unfortunately, no official psychological service has been found for gifted. Also at present, our strongest aim is to establish such a service – The Center for Talent and Gift for the whole Slovakia which should contribute to the support of the gifted.

Between 1993 and 2007, a new educational model for intellectually gifted students was created; a program called APROGEN (The Alternative educational program for gifted children) came into use. The three sponsors of these new alternative working methods are: Comenius University Faculty of Education in Bratislava, The State Pedagogical Institute and The Research Institute of the Child Psychology and Pathopsychology in Bratislava.

This new program for intellectually gifted students accepts all the specifications and differences of the development of the intellectually gifted children with a remarkable amount of psychological approach to them. It is unique as it offers a complex continuous education – from the first elementary grade to the high school graduation – from 5 to 18 years. Today, this educational program APROGEN is followed throughout all elementary schools in Slovakia.

Since 1993 other schools have joined this form of education and at present, 29 elementary schools work according to this alternative model. More than 3500 students are being educated by more than 400 teachers and educators. The whole program is supported by psychologists from the

Centers of Psychological Advice. These prepare the primary identification and diagnosis of the intellectually gifted children according to the law.

Our school has become also professional, methodical, and research centered, and it cooperates with many organizations as The Research Institute of the Child Psychology and Pathopsychology in Bratislava, Comenius University Faculties of Philosophy, Education and Medicine, among others.

Our methods are more effective because they are based on a detailed knowledge of the origin of giftedness which is supported by many medical and psychological researches. New methods when working with gifted are verified within three Socrates Projects with our partner schools in Vienna, Wurzburg in Austria, Meissen in Germany, Nijmeegeen in Netherlands, Torun in Poland and Budapest in Hungary. Another partner school is also The High School for Gifted in Czech Republic in Prague. We cannot forget to mention the cooperation with the Faculty of Natural Sciences, Faculty of Mathematics and Physics, Faculty of Medicine and Faculty of Education at Comenius University in Bratislava, and with The Pedagogical Faculty in Hradec Králové (Czech Republic).

The innovative forms and methods used when working with the gifted in an alternative school are reflected in a high comfort of the students and parents in the possibility of self-realization of the teachers when applying some of the creative methods and in the exceptional results of the students. The effectiveness of this educational program was and is also shown in their good preparation for the university studies as well as in their self-actualization.

There are more forms of care for the gifted, but generally there are three main approaches: differentiating, separating and combining. The last one is used predominantly. In Slovakia, in 2008, a new school law was stated - the legislative conditions for the education of the talented and gifted were adapted. It is presumed that most of the gifted follow their education in the integrated form – it means that they attend classes in general schools. But to be able to provide the development of the gifted by this form, some conditions are needed to be set:

- Identification of the giftedness – the diagnostics
- Suggestions for proceedings in developing the gift, e.g. the individual educational program
- A competent teacher prepared for the work with the gifted
- Preparing alternative teaching plans and drafts
- Preparing additional teaching materials and educational programs
- Provide a differentiated access according to the specific dispositions of individuals
- Creating the system of evaluation
- Assigning the small number of students in a classroom (Laznibatová, 2001).

Despite the remarkably growing interest in the support of the talented and gifted students and even some kind of "boom", we have to admit that the schools are not prepared for working with the gifted. It is caused mainly by the fact that the universities and especially pedagogical faculties have not provided any adequate pedagogical and psychological preparation for the teachers of these students. Even if this problem is mentioned, it is only done in a broad theoretical context. Hence, the teachers deal with problems of how to work with gifted pupils, how to create new extra enriching programs for them, etc.

The second and even more serious problem is that there is absolutely not any system of the psychological preparation for working with gifted. Future teachers receive only some partial theoretical information, but they do not receive the information about the specific gifted student, about his personality specifications, his emotional and social development differences, about possible disproportions or developmental asynchronies, etc. The complex systematic preparation to this problem is missing. We consider this as a strong negative impact in the complex preparation of teachers for their work with the gifted and talented students in our country.

### Program APROGEN
### (The Alternative educational program for gifted children)

Each country takes care of its gifted children in its own special way. The technique of care is changing with growing experience. We believe that it is not appropriate to solve baseline issues, i.e. suitability for integration, differentiation, segregation, etc., but to prepare education for the gifted and talented pupils in order to provide optimal conditions within the meaning of "to everyone according to his needs". It means that we go from the theme "same to everyone", which was typical for the so-called unified school, and focus on the creation of such educational conditions, which would take into account their specific needs such as "pupils with special educational needs.

It is a process of alternative form of education, where educational approaches are emphasized in working with gifted and talented children, such as:
• differentiation - different types of schools with different orientations and different elements of education,
• individualisation - the greater variability in approaches to students, programs more "tailor-made" for groups of pupils or individual pupil,
• personalization - educational practices, which are personified to the individual pupil.

Education of intellectually gifted children in homogeneous and balanced groups proves more efficient in our conditions, which is more common in Slovakia. The program APROGEN is currently implemented throughout the network of schools in Slovakia, where classes are designed for gifted children in regular primary schools.

Professionally and methodically, the entire work with the intellectually gifted children depends on the conceptual and coordination work of the School for exceptionally gifted children and Grammar school in Bratislava, which was established on the basis of long-term verification (14 years) of the forms and methods of working with gifted pupils.

School for exceptionally gifted children and Grammar school in Bratislava is one of a kind in Slovakia that provides comprehensive and continuous education of generally gifted pupils from the ages of 5-6 to 18-19, i.e. from the first class at the primary school to graduation at the grammar school. As a state school, it has a unique form of all day-care for gifted pupils between 7 am to 6pm.

The process of verification of the project of alternative care for gifted pupils lasted from 1993 to 2007. According to the author of this educational program, Jolana Laznibatova, the hallmark of the school is providing an informal, peer tolerant, accepting and creative atmosphere for exceptionally gifted pupils in the intellectual field. Teachers and students are partners in this program toward acquiring knowledge and new information. Teaching is done via dialogue, which does not only develop verbalizing ability, reasoning and communication in general, but also logical, critical and creative thinking, as well as the abilities of problem solving, analysis, synthesis, induction, deduction and other approaches.

Specific aspect is a comprehensive, daily psychological service for pupils and teachers at school, involving five psychologists. The psychological aspect is important since the first phase of the selection of a child into the educational Program APROGEN. The entire program APROGEN is practically implemented on the principle and functionality of two basic components, pedagogical and psychological, which are equally represented and equally important for working with intellectually gifted children.

The implementation of the educational process starts on the basis of psychological examinations, namely: nominations, diagnosis and selection of pupils into the educational program APROGEN, which leads to an alternative educational program that is built on two basic levels. The first level is on the basis of enrichment, expansion and broadening of the curriculum that is implemented via teaching through dialogue, critical thinking and reasoning, autonomy in solving tasks, discovery and experimentation, non-traditional ways of thinking, and original own solutions. The second level is on the basis of intensive psychological care that involves taking into account the specificity of the development of gifted

children, applying psychological approaches in the educational process, accepting the individual performance and personality differences, taking into account the developmental disproportions and asynchronous characteristics of gifted individuals.

Our alternative system of working with gifted children has proved to be highly effective. Characteristic principles of the work, which are applied to education of gifted children in the Program APROGEN, can be summarized into the following points:

- dynamic system of teaching,
- acceptance of child's level,
- taking into account the specificities of development,
- differentiation of teaching,
- enriched and extended curriculum,
- creation of new teaching strategies,
- project teaching,
- new evaluation system,
- individual work with children,
- office hours for children,
- cooperation and internships at university faculties,
- workshops with tutors,

### Psychological care

Although in many countries there is emphasis on working with gifted children via integration, it is also necessary to accept the experience of these developed forms and methods of working in specialized schools and classes for intellectually gifted children. Although the arguments for the education of gifted children are based on the Program APROGEN, they can be used at schools or classes with sports or artistic talent.

Finally, we want to emphasize that an important principle is that any work with gifted pupils will not be successful nor effective without working with usual and conventional methods with regard to both fields communicative-personal and professional and subject-based. Teachers working with gifted children must work using other creative, original methods. They also have to take into account the psychological point of view.

These approaches and procedures ensure effectiveness of the Program APROGEN. It already has a unique place in education of gifted children.

### Prospects and future development of natural talent and giftedness

Appreciation of high degree of talent depends on the value systems of a society. However, it is only one of the important moments of actualization of individual talent. Openness of the system, thus openness and democracy in society, and in the shortlist of schools, families, peer groups and the like are significant aspects for optimal promotion of natural talent. Autonomy, the ability to relax, freedom, flexibility, sensibility, empathy and tolerance for gifted children are important characteristics of the open systems. Education of gifted population is different everywhere in the world; its level is different, as well as the legislative changes. Moreover, even the unifying principles are different. This is particularly true for developed countries where the issue of the gifted has been long dealt with. Knowledge of the systems of individual countries indicates that carrying for gifted children is based on the differentiated education system, which is either included or produced in parallel with the existing educational system. Relatively large amounts of school extracurricular activities carried out either based on the separated or integrated forms of care for the gifted emerge. In doing so, all options from full-scale integration to the absolute differentiation of gifted individuals are used.

Great success is that specialized offices (various counseling centers, specialized research institutes, etc.) are being developed to seek and address the problems of the gifted on both theoretical and practical level. We can now record increasing involvement of parents to create conditions for the promotion of the gifted children. However, we need to state that we lack of a comprehensive overhaul of the system, as well as of a concept education specialized on the gifted children.

It turns out that in the future of the care, education and talent development, two fundamental questions will be of crucial importance: (1) an issue of the search and identification of the gifted and talented, (2). an issue of creating optimal educational conditions for gifted and talented children.

Identification of giftedness and talent is not only a question of the methods, but has its dimension in the socio-psychological basis and context. It is also closely linked with other procedures concerning gifted children, such as their inclusion in educational programs based on psychological and pedagogical diagnostics. Nevertheless, the work with teaching materials as well as the high standards of development process together with development of the talent remains crucial. Greater sensitivity to the issue of the talent and the overall positive attitude of professionals to its development are important prerequisites for the overall improvement of the conditions of gifted children. When working with them, we need to consider the fact that talent is not only an intellectual ability a child has, but it applies to the entire spectrum of his or her personal qualities, traits, characteristics and expressions; thus involves the whole personality of a gifted individual.

Gifted and talented children, and pupils with special educational needs require an educational program different from the educational program of mainstream schools, especially in the acceptance of specification of the development, taking into account children's differences and applying psychological approaches and advisory services in the course of their development.

The European Union is currently emphasizing the support of gifted and talented in a global and regional way by encouraging the development of programs and projects for the gifted and talented children. "Action plan for the gifted and talented" has been established within its boundaries highlighting the following aspects:

- development of effective learning strategies for gifted children in order to increase the effectiveness of education,
- enhancing the international cooperation by exchanging experiences of the development of potentially gifted children,
- reliance on careful research,
- learning from the experience of different countries and accepting different forms of care for gifted children,
- improvement of the education and training of teachers and school administrators.

Particularly in the last decade, executive teams worldwide are dealing with the study of quality of life. They are searching for factors that contribute to a good, effective and meaningful life. Significance of life as well as happiness, are far more problematic phenomena among gifted children than among individuals in general population. The question is how a school can prepare them for the obstacles of the real life. It is crucial to focus on stimulation of their personal potential, emotional development, communication and social skills. It is also necessary to concentrate on the potential qualities which are unbeknownst to the pupil while teaching them to recognize their strengths, skills and improving their self-management.

We are obliged to prepare gifted children for today's world that is full of changes, stress and difficult situations, so that they would correctly estimate their strength and know how to set their objectives. Moreover, we should be mindful to teach them how to develop effective strategies to achieve those objectives. Nonetheless, we should also try to develop their ability to cope with their self-control. Flexibility, empathy, tolerance, and the ability to manage any change of time and stress are also our goals. Only then will such an individual be well prepared to tackle fundamental economic, environmental, ethical or religious problems of this world.

We believe that gifted and talented children should be encouraged because they are the strategic wealth of any developed society. One could say that the competitive and dynamic society based on equality thrives on the talents of its people. Promoting excellence of gifted and talented individuals could be the overarching aim of European or moreover, of global significance. Therefore, individual countries should develop educational systems to promote and develop exceptional abilities of each individual.

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**CHAPTER EIGHT**
**Gifted Education in Chile amidst Public Debate**
**on Excellence without Equity in Education**
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**Introduction**

Chile is a long and narrow country; the narrowest country in Latin America. Similarly, one could talk about narrow-mindedness when discussing Chile's provision for the gifted. Over the last fifty years, education for gifted and talented students has been developed in the middle of strong debates about social and academic segregation, and special complimentary services for the gifted.

Chile's educational system is, and has been, strongly segregated by social class. During the twentieth century, better-quality education was traditionally reserved for the economically advantaged, through private education. Public schooling was designed for the working class (Egaña, Núñez, & Salinas, 2003). Segregation has progressively deepened since 1980, an episode marked by a military regime that started in 1973, proposed a policy of modernization of the fundamental structures of the state.

Decentralization of education occupied a central role. The first actions were focused on the administrative decentralization of the Ministry of Education, leading to the implementation of Regional Ministerial Secretaries and a general trend of regionalization. The Secretaries were the entities responsible for implementing educational programs.

In 1981, a drastic reordering of the education system was carried out. Administration and infrastructure of all public schools–attended by more than 70% of the school going youth–were handed over to the municipalities. Mayors, who were appointed by the government and worked under the Ministry of the Interior, took up administration and had to assume maintenance as well (Raczynski & Salinas, 2008). Therefore, Administrative Departments of Municipal Education (Departamentos de Administración de la Educación Municipal, DAEM) were created.

Also, a General Education Law (Ley General de Educación, LGE) was implemented. The law created two types of public funded schools: those owned and administered by the municipalities (municipal schools) and those owned and administered by the private sector. Each type of school received an attendance-based, per pupil state subsidy. Today, students from lower socioeconomic backgrounds concentrate in municipal schools while those from low middle class mostly study in private-subsidized. Upper-class students most often attend private-paid schools.

Belfield and Levin (2002) argue that a segregated educational system may be inequitable, and that polarizing students undermines the public school system, producing schools that enter "spirals of decline" (p. 47). This phenomenon is observed in a vast number of Chile's municipal schools. The results of the national assessment of educational quality shows that over the last 20 years, the average scores of municipal schools have been lower than those of private subsidized and private paid schools (SIMCE, 2009). This difference in the performance has also been observed in international achievement tests such as PISA (2006), and in Latin-American studies conducted by UNESCO (Primer Estudio Internacional Comparativo en Lenguaje, Matemática y Factores Asociados, PEIC – Casassus,

2003-and Segundo Estudio Comparativo Explicativo de la Calidad de la Educación-SERCE, 2008).

### The 1990s and current education reforms

The democratic government that took office in March 1990 launched an education policy intended to improve the quality and equality of education, considering education fundamental to the processes of social change, economic development and production of knowledge.

A strategic decision was taken: not to undo the process of decentralization, and not to change the models and financing mechanisms that had been established in 1980. Instead, goals such as higher quality and socially equal public investments in education were set. Thus, the intervention focused on improving the quality of learning, and compensation programs for schools with lack of resources or low results were set up. In addition, enrollment of secondary schools was expanded and public spending on education was raised to 4.4 % of GDP. Mayors were to be elected and municipalities were given less authority in the allocation of education resources in their jurisdiction (OECD, 2004).

According to Contreras and Elacqua (2005), "this pattern of profound changes in the circumstances and educational processes-combined with the newfound strengthen the teaching profession, curriculum reforms in basic and secondary education, and lengthen the school day-has been called since 1996 the "Education Reform", given the multidimensional and complex agenda of progressing policies" (p. 2). The 2003 OECD emphasizes the fact that the main strength of the Education Reform in terms of equity is starting having the changes at the poorest schools and the most disadvantaged part of the population.

In 2004, a law that made 12 years of education compulsory was enacted. This measure was aimed directly at repairing inequity between students from different social groups. While 98.5% of children of families within the highest quintile of income were enrolled, only 82.3% of children from the lowest income quintile attended high school (Bitar, 2003 en Campos, 2010).

Improving quality is still a matter to be solved, as there remain gaps between students from the different socioeconomic groups that reveal the inequity of the system. Contreras and Elacqua (2005), stress that the current situation in education is not sustainable over time. Poverty indicators may reduce, but no social mobility or integration of society is taking place. Also, no quality work force will be generated, a condition that limits improvement in the levels of inequity" (p. 3). For these authors, a quality education enhances social integration and civic participation, which are the key elements for development and consolidation of modern democratic processes.

Casassus (2003, p. 27) notes that in Chile "equity or inequity in education came to be considered not in terms of equal opportunities for accessing and advancing, but in terms of results, of academic achievements". In this context, the current policies focus on improving results as the education system in itself may amplify inequity as well as maintain it or reduce it. This depends on what happens inside schools.

Various diagnoses of educational inequity have been produced in Chile in recent decades. Mostly, they focus on socioeconomic segmentation of students based on the dependence of schools they attend, and the links believed to exist between results at school and the socioeconomic origin of the students. As Brunner and Elacqua (2003) point out, "students from the (publicly funded) municipalized schools obtain the worst results; however, one must consider that the private-subsidized and private funded schools are able to select their students, either at the moment of admission, or later through the elimination of students with insufficient results" (p. 43). Therefore, these authors argue that the dependence of the school as a variable plays a smaller role compared to the socioeconomic level of the students.

### The current debate on quality and equality in education

For Chile, the return to democracy in 1990 involved advancing from a subsidizing State, spending as less as possible on education and taking responsibility only of the distribution of resources, to a State with responsibilities regarding the quality and equality of the education it designs

and provides, and that implements education improvement programs (Raczynski & Muñoz, 2007).

However, regardless of the actions, programs and measures developed by the Education Reform, in 2006 public education in Chile experienced a difficult moment when a general dissatisfaction mobilized students of the Municipal Education system. According to Raczynski and Muñoz (2007) the problems lies in the fact that Chilean education has not been able to generate opportunities for equitable development. Therefore, it "does not fulfill its fundamental promise: leveling opportunities making social mobility possible" (p. 40). They state that social segmentation of education services and the low quality of teaching are the reasons why our education currently is not a true engine of development.

The challenge is to achieve quality through equity. In order to explain this, a first distinction should be made between the terms of "equality" and "equity". As pointed out Casassus (2003), the terms of equality and inequality belong to the legal field and refer to the acknowledgement of citizen rights, in this case the right of education. In law, equality also may refer to the "equivalence of two quantities, or expressed in another way, the equivalence of results" (p. 67). On the other hand, the term "equity" belongs to the sphere of ethics and means that one is "guided by a sense of duty or conscience, rather than by the requirements of the law in order to give everyone what they deserve" (p. 68). While equality policies seek equal access to and equal results of education, equity-oriented educational policies look to provide all students with an education according to their needs, as related to their social conditions and cultural characteristics (Casassus, 2003).

Casassus (2003) examines the orientation of some educational policies, based on principles of legal equality: equal access to education and equal results. In the 1990s, many differences in educational outcomes generated significant reforms in Chile and in Latin America. These aimed at improving the quality (outcome) of education, seeking homogeneous result levels.

These policies focused on management issues, particularly those that introduce market measures, based on the principle that quality improves

when schools must compete in order to attract new students. This was the backbone of the education modernization of the 1990s (Casassus, 2003, p. 71). According to this author, the "modernizing" policies caused a separation of quality and inequality in education. In practice, it was assumed that an education quality policy does not need to be related to any equal opportunities policy.

In this chapter, we chose to use the definition of education quality as offered by the Education for All Global Monitoring Report of 2005, which defines it in two dimensions: cognitive development of learners, and shaping attitudes and values for civic education, emotional development, and creativity of those who teach (UNESCO, 2005).

### Standards and accountability: where do gifted students fit in?

The current system in Chile is based on high-stakes testing and accountability. It seeks to make stakeholders take responsibility for educational outcomes, and establishes a series of consequences for schools that do not meet the quality standards on a medium term. To measure the quality, a national standard test is used (SIMCE). This test is carried out by the Ministry of Education annually with children in their 4th year of basic education and in their 8th year of basic education, or 2nd year of middle school. The consequences for schools that do not achieve good results may be, among others: closing the school or adjusting (downwards) the number of enrolled students. The latter, as a result of parents deciding to enroll their children in other schools with higher (outcome) quality, are generally private-subsidized ones.

Currently, schools compete to obtain the best results. As a part of this competition, they attempt to select and retain outstanding students in order to obtain high SIMCE test results.

The perverseness of this system lies in the practice of recruitment of talented students by private and private-subsidized schools. For several decades, schools have applied rigorous selection processes, with selection criteria that include value choices of parents, social behavior of students,

and their learning outcome. Teachers and psychologists conduct these processes. Rather than looking for the "development of talent" as part of an educational process, following Gagné's model (2005), the whole operation becomes a search for the best students and the criteria to select them. The objective of the system has become the efficiency of the education business, through a single set goal: obtaining higher SIMCE scores than the national average score. This is of course not the same as to provide excellent learning for everyone.

The selection of students as a natural and accepted practice highlights the tension between quality and equity in the Chilean education–private, private-subsidized and public-. The General Law of Education (Ley General de Educación, LGE), enacted in September 2009 and replacing the Organical and Constitutional Law of Education (Ley Orgánica Constitucional de la Educación, LOCE) of 1990, is, according to Contreras, an "obvious fix" for the private sector regarding the selection of students, regulating and, therefore, legalizing their modus operandi. In Article 12, it is stated that "in the admission process of subsidized schools, or those schools that receive regular support from the State, that offer a broad range of education between first level transition and sixth year of general basic education, past or potential learning outcome may in no case be considered. Also, in those processes, socioeconomic documentation of the family will not be required". This article, therefore, allows schools to select students basing their decisions on "personal academic merit" from 7th year of basic education.

As pointed out by Contreras (2010), "it should be noted that it is inappropriate–and extremely complex-to try to "measure" merit when previous academic results are explained in a great deal by socioeconomic level. That is, instead of observing one's own efforts, the selection takes place, again, based on the characteristics of one's home. Besides, there is a huge "political" problem; the school rejects their education mission since it wishes to work only with "the best raw material" (pp. 321-322).

The practice of selection by academic results contributes to the segregation of education as schools are polarized into "good" and "bad" based on their

SIMCE scores, assuming that these scores are a result of the schools while they are actually a result of their selection processes. As noted by Belfied and Levin (2002), segregated educational systems may be inequitable, affecting the education system as a whole. In Chile, municipal schools have been suffering as a result; they receive students that other schools do not wish to enroll, or whose talented students are being brought to private-subsidized schools through "irresistible offers" such as free transport and free sports facilities (López, Montecinos, Calderón, Contreras and Rodríguez, in press).

The report by the Advisory Committee on Education of the Organization for Economic Cooperation and Development (OECD), following its visit to Chile in 2003, concludes that in our country "the educational system is consciously class structured. The rules of the game are different and unfair for municipal and private schools. Private schools can both select and expel. Municipal schools – with the exception of the few prestigious ones that are in high demand – are obliged to accept all students asking for access. Under these circumstances "results can be expected to differ in favor of private subsidized schools" (p. 255).

Regarding the debate on segregation of educational outcome, an interesting document was published in Chile in 2007 on the prohibition or limitation of selection in schools (Brunner and Peña, 2007). In this document, Jorge Manzi (2007), Director of Centro MIDE-UC, points out that international evidence shows that placing high-achieving students in learning environments together with lower scoring students benefits the learning of the latter, while it does not affect the results of the high-achieving students. Also, it provides integration experiences that reduce the risk of negative attitudes toward minorities. In this debate, a contrary position was taken by Harold Beyer, by then a principal research fellow of the Freedom and Development Institute (Instituto Libertad y Desarrollo, a conservative right-wing think tank), who stated that evidence from England shows that moving from a selective to an inclusive system "would have reduced learning outcome gaps in England increasing the performance of the less gifted, but only at expense of the most talented students".

As we can see, these differing positions and approaches to the question of what to do with gifted students is having, and has had in the past, effects on education policies in essentially two directions: placing the gifted in environments with similar capacity while also sharing activities with less gifted students (extracurricular programs at colleges, for example), or creating separate learning environments for the gifted (high schools of excellence).

This logic is the driving force behind the Chilean education system. While in need of positioning itself as a country close to achieve a development level similar to other OECD members, which Chile joined recently, education outcome levels are an important measure. This has meant that "quality" has been considered a synonym for "achievement", a very restricted interpretation of quality in education.

## Educational alternatives for gifted and talented learners in Chile

### High Schools of Excellence (Liceos de Excelencia)

Provision for the gifted first took form through within-school segregation. During the Colonial Period (1541-1810), the Jesuits opened the first schools, which were free for poor families. In these schools, classrooms were divided into: a) aulas de minoristas (minor classrooms), for small children learning to read and write; b) aulas de mayoristas (major classrooms), for children learning grammar, orthography, arithmetic and catechism; and c) aulas de latinidad (latin classrooms), which prepared children for higher education (Muñoz, 1918).

In every school, a strict division of roles was mandated for children, according to their perceived abilities. As one educational historian (Muñoz, 1918) portrays,

"Schools were run by one teacher. Hence, the need to select monitors among the most serious and intelligent students, so that they could help them achieve their duties. In order to

stimulate them, and to have authority over them until they were worthy of his confidence, honorable roles were created, and the distinguished pupils recognized their responsibility and came into rival in order to gain more merit. The most important roles were: emperor, general, captain, assistant, and sub-lieutenant. The emperor was selected through direct vote by the students. He replaced the teacher during his absence, sat in the baldachin beside him, tested on lessons, punished with appeal before the teacher, suspended the other chiefs if they were disrespectful or did not comply with their obligations. Commonly, he was the best student of the school" (pp. 18-19)

Within the class, children were also segregated according to social class. Children from wealthier families sat in front near the teacher, whereas children from poorer families sat at the back of the classroom. This privilege was considered a "right" since the former paid for school, whereas the latter studied for free (Muñoz, 1918).

In these conditions, it was evidently more difficult for gifted students from poorer families to achieve highly since not only were the social conditions uneven and unfair for the gifted poor, but also the educational.

After the Independence, it became evident that schools could not be left only in the hands of religious congregations. The newly founded State had to take part in education and education or "primary instruction", as it was called during the 19th century, since it was the banner of independence and progress.

The first emblematic public school for academically advanced boys was created in 1813. It was named Instituto Nacional and replaced the former Colegio Carolino. The initiative was proposed by Juan Egaña, a deputy of the nearby city of Melipilla and renowned founder of the Chilean State. During a session in Congress, he proposed "founding in Santiago a great school where all distinguished students from the metropolis and from provinces could gather; where the studies could be imprinted and

oriented in harmony with positivist tendencies, in a reasonable learning, in charge of the best teachers that could be found, and whose programs could include sciences not yet known in Chile" (Muñoz, 1918, p. 83).

The idea took form in the shape of the Instituto Nacional. Today, this public elementary and high school is considered "emblematic" since its creation represents the desire of a nation to achieve economic progress and social equity. Barros Arana, pedagogue and historian, commented:

> The work of Chile must be a great school of arts and sciences (…) and above all, of a civil and moral education capable of granting us habits and character (…) there will be public teaching for all citizens attending [this school], and [free] stews during lunch hours. All the villas and cities must have a right to a certain number of pupils (Barros Arana, 1902, p. 243).

In 1908, the Instituto Nacional was recognized as a cradle of national leaders:

"Since its foundation, the Instituto Nacional has formed most of the personnel directing the destiny of the country, from the positions of President of the Republic, Ministers of State, high positions in [public] administration, and Members of Congress" (Vargas, 1908, pp. 155-156).

After the Instituto Nacional, several more of these highly selective schools were created in Santiago, such as the Liceo Nº 1 de Niñas for girls (1894), the Internado Nacional Barros Arana (1907) for boys, and the Liceo Victorino Lastarria (1913), also for boys. All of these schools are still today recognized for their excellence. Since their creation, these institutions have been rigorously preserved by all local governments.

These schools were created exclusively for the academically talented, irrespective of their socioeconomic background: poor students received a grant, students from wealthier families paid. Therefore, in our history, the emblematic Liceos turned out to be the first educational policy for gifted

and talented students. The fact that this policy was highly segregated was not an issue. By 1848, only 3% of the population received schooling, so the need to expand coverage was considered far more important. On the other hand, the right for women to receive formal education was only granted in 1860. Last, facing an evident lack of resources for public education, gathering those students with academic potential was probably perceived as the most cost-effective solution.

As we can see, segregation due to academic achievement forms part of the history of public education in Chile. Historically, the emblematic secondary education in Liceos was perceived to be "the only hope" for gifted and talented learners from poor backgrounds. However, the enrollment capacity of these schools did not provide for what would be the expected amount of gifted and talented students, and was limited to the capital of Santiago, with only a few similar schools in regions.

**History repeating**
During the last two years, some changes have occurred in the field of gifted education in Chile. The new general education law (Ley General de Educación, LGE) does not prohibit (but neither encourages) acceleration. Considering that the previous law prohibited acceleration, this is an improvement for gifted education, since gifted and talented learners now have more opportunities, especially those who study in places where no enrichment programs or "emblematic" public schools are available nearby; or, even if they are, for those who are not selected.

One of the initiatives of the oncoming of the newly elected right-wing government was to provide more Liceos de Excelencia (Public elementary and high schools pursuing excellence) and distribute them along different regions. This was proposed as a means to solve the problem of "quality with equity":

During the year 2011, 15 of these highly-selective schools were installed in 15 cities. In each city, public municipal students with the highest grade point average, as well as some students with recommendations by their teachers, submitted their application and went through a selection process which included academic achievement tests. Approximately 20% of candidates are selected and grouped in one school. The students who previously attended that school and were not selected for this new school were transferred to other nearby public schools. The best teachers and school principals of the region were selected and hired in these schools. In Valparaíso, for example, the building of Liceo B-29 was used to install the new Liceo de Excelencia Bicentenario Valparaíso[3], and the school principal of the Intituto Técnico Profesional Marítimo de Valparaíso, a technical professional school recognized for its excellence, became its new principal.

The Liceos were not newly built. The municipality, having chosen to implement a Liceo, selected one of the existing schools, and the whole school was moved to another building, taking advantage of available sites due to reduction of public school enrollment during the last decade in Chile explained by the increase in private-subsidized (charter) enrollment. Students, therefore, lost touch with their classmates and became the "new kid" in the receiving school. Teachers were also transferred to other schools. Therefore, for the community, being selected as a student, teacher or school principal for a new Liceo de Excelencia was perceived a symbol of prestige.

Although this policy is clearly oriented toward segregation and, therefore, exclusion, public opinion perceives it positively and tends to focus on the benefits of pursuing excellence, undermining the costs of academic segregation and its impact on social equity.

For the year 2012, 30 more of these Liceos de Excelencia will be implemented in different communities throughout the country. 17 will be "re-constructed" and 13 will be newly built, with an investment of US $48 Million, of which the State of Chile will provide 75%, and the rest will be provided by the private sector. 27 will be municipal schools, and 3 will be private-subsidized (charter schools). There will only be one new Liceo de Excelencia in Santiago, and the poorest communes have had priority.

[3] Website: http://liceobicentenariovalparaiso.wordpress.com

Six of them will be technical profesional high schools. 95 projects were presented, which indicates the positive evaluation and the will of local governments to have a Liceo de Excelencia in their community.

The data above exemplifies how public policy for gifted learners operates amidst the effervescent debate on the private/public issue. How can the country meet gifted students' needs? As with many other educational policies in Chile, the initiative of the Liceos de Excelencia is a private - private sector solution. These Liceos de Excelencia have become newsworthy since they are publicly announced and promoted in the media by the Ministry of Education, once again, as a means for "hacer patria". This is why they are also referred to as Liceos Bicentenarios (Bicentennial Liceos, in commemoration of two centuries of Independence). As the Ministry of Education declared for the mass media:

"The spirit that marks the initiative of the bicentennial is academic excellence, effort, and commitment. This is what lies behind those already existing as well as those to come. It is fundamental to reestablish the quality that characterized the history of public schools (…) Bicentennial Liceos are motors that accelerate our commitment to improve the quality of education in all segments and areas of our country" (Bulnes, 2011).

The quote above shows how equity is understood under this type of provision pursuing excellence. Equity occurs when a highly selective school for the academically talented is created in a poor, underprivileged community. The fact that these schools threaten educational equity by segregating students, thereby diminishing their opportunities to share and learn with other learners, is an issue not raised.

### University-based Talent Programs

With the return of democracy in the 1990s, educational policies moved toward integration initiatives. The aim was to provide for diverse learners, including the gifted and talented, within the context of regular education, with complementary services when necessary. With initial funding from Fundación Andes, two scholars set about to investigate what was being done in other countries in terms of gifted education, and brought back a new idea: extracurricular enrichment programs for gifted and talented learners provided by universities as a complimentary service to regular education (Bralic & Romagnoli, 2000). The aim was to enrich school learning with different, non-school based content, and introduce gifted and talented students into an academic context of learning. The aim was also to avoid academic segregation, allowing gifted and talented students to share time with non-gifted learners in regular schooling experiences which would allow developing citizenship skills.

As a product of this initiative, Fundación Andes opened a contest for universities to design a university based program. One of the top universities won this contest and in 2001 implemented the first university-based enrichment program for talented students: PENTA-UC. This program is still operational and includes a process for identifying and selecting academically talented students, and an educational program consisting of courses taught by scholars with enriched contents in the areas of science, math, social sciences, history, and language, among others; courses focused on personal development, vocational orientation; and counseling services (Flanagan & Arancibia, 2005 ; López, Arancibia & Bralic, 2001). Most of the students participating in this program come from public municipal schools (and low socio-economic backgrounds).

However, this initiative was limited to a small number of communities in the capital city of Chile, Santiago. As an attempt to avoid geographical discrimination, the general purposes, structure, and organization of the program was replicated in another six regions. This initiative led to the creation of five regional programs, inspired by the first but administratively independent: the DeLTA-UCN program in Antofagasta (2004) at Universidad Católica de Norte; the BETA program in Valparaíso (2005) at Pontificia Universidad Católica de Valparaíso; the Talentos U de C program in Concepción (2004) at Universidad de Concepción; the PROENTA program in Temuco (2004) at Universidad de La Frontera; and the ALTA-UACH program (2009) at Universidad Austral de Valdivia.

Altogether, these programs wanted to give attention to approximately 2,500 students (Arancibia, 2009), who represent a small amount of the expected number of gifted students attending public municipal schools (which, in 2009, were nearly a million and a half students); 39,000 if we consider a strict 2%; and 310,000 if we consider a flexible, revolving-door percentage of 20% (García-Cepero, 2009). The First National Meeting of University Programs for Academically Gifted Boys and Girls of Chile revealed that today (2011), these programs are attended by a total of 2,275 students.

Five of these programs have now completed at least one generation of students promoted from high school. In general, the programs report that more than 90% of participants that finish the program enroll in Higher Education.

All of these programs have undergone assessment in terms of their impact in students' educational expectations and academic trajectories (Gudenschwager, Vargas & O' Ryan, 2011; Guzmán & García-Cepero, 2009; Arancibia, Lissi, & Narea, 2008; Narea, Lissi, & Arancibia, 2006). The assessment has suffered from the same problems described by Thompson and Subotnik (2010) regarding evaluation of gifted education programs.

**Process for identifying and selecting academically talented students**
Even if gifted and talented persons share certain cognitive, affective and social characteristics that allow distinguishing and identifying them, the selection of students to join a special program offered by a university is still a difficult task.

Therefore, the procedures that have been guiding these processes involve defining at the beginning what notion of academic talent to work with. This has obliged the programs to take up-to-date decisions regarding a variety of existing instruments (both individual and collective) in order to integrally assess these children, taking into consideration the handiness of having multiple informants, the limitations of classroom teachers (mostly distorted beliefs, overwork, stress and lack of time) and students' personal characteristics that cause incorrect identifications (Gudenschwager, 2008).

These characteristics may act as distorting elements that include low performance levels of children with cultural deprivation, lack of interest in school activities, behavioral problems, and introversion.

The identification process carried out by the programs is based on the model developed by the Penta-UC program, in which teachers are the principal informants. However, various programs have implemented or modified procedures (see Table No. 1) that give account of the theoretical models behind each of them. The selection process involves intelligence tests, including an assessment of cognitive skills and processing modes and the learning motivations, in order to ensure that no gifted and talented student from municipal schools is excluded. Part of the current challenge of the programs is to evaluate creativity as well in order to define profiles or to conduct studies on the effect of participating in the programs on creativity. Several authors consider creative thinking a fundamental part of talent development (Renzulli, 1988; Sternberg, 2006).

As for the use of teachers as informants, strategies focus on establishing partnerships with schools. In each school, a teacher is appointed to carry out the identification process, often called pre-selection or nomination. Some programs have involved the children themselves and their co-students as sources of information for the nomination process.

Although there are several instruments that could be useful in order to assess intellectual skills, the test currently used in Chile for the selection phase has some advantages: a) it takes little time to apply, b) it is easy to correct, c) as it is non-verbal, the cultural variable is minimized, d) it is applied collectively. Among its limitations are the fact that no detailed information on the assessed skills is made available, and, therefore, does not allow to establish a profile of the student and his or her most developed skills.

On the other hand, the Ministry of Education of Chile (Ministerio de Educación de Chile, MINEDUC), requires the use of this instrument for intellectual assessment in the process of awarding scholarships, restricting the use of other indicators such as motivation or creativity. We will refer extensively to the financing mechanisms of the programs and the role of MINEDUC.

These procedures are highly questionable because accumulated knowledge allows us to acknowledge that academic talent is not only about a high IQ test score, but involves multiple factors that under certain circumstances allow people to achieve outstanding performance. Family support, motivation, support from significant teachers, confidence in their own abilities, opportunities to enhance curiosity and eagerness to learn are undeniably essential factors for academic talent to be revealed.

**The extracurricular enrichment programs**

The concept of talent that guides most of the programs in Chile is based on Differentiated Model of Gifts and Talent (Modelo Diferenciado de Dotación y Talento, MDDT) (Gagné in Artola, 2005), which clearly distinguishes the presence of talent. Gifts are referred to as the possession and use of superior natural skills, untrained and spontaneously expressed (aptitudes) in at least one skill area, to a degree that places the individual within the top 10% of their age group. However, talent is defined as over-achieving in the systematical development of skills, knowledge, and dexterity in at least one field of human activity, to a degree that places the individual within the top 10% of their age group. Thus, talent gradually emerges from the transformation of aptitudes into trained and systematically developed skills that characterize a particular field of human activity (Benito, 1996).

One program, DeLTA by Universidad Católica del Norte, particularly chose the Model of the Three Rings of Renzulli (Renzulli & Reis, 1997). This model distinguishes gifted behavior as the interaction of three main components: 1) above average general or specific skills, 2) commitment to the task, and 3) creativity. Talent is understood as talented behavior and the product of creative achievements, the result of the interaction of these dimensions (Renzulli, 1978).

Although each program has freely chosen its own definition of talent and has defined its own selection and education processes according to this choice, all programs agree on differentiating academic talent from giftedness, genius and precocity. This conceptual distinction is an issue that, however, in Chile has not yet been incorporated in the common discourse and the media, so that newspapers, for example, frequently write about talented children in terms of genius or giftedness.

In Chile, these programs are primarily targeted at students from municipal subsidized schools (public and free education), which offer education between the second cycle of basic education (11 year old children, approximately) and fourth-year students of middle school (when they graduate from school).

Initially the programs were funded by Fundación Andes, a support that was maintained until 2006. This Foundation was joined by the Municipal Corporations of Education (administrators of municipal public education) and the Municipalities of the participating communities. Starting in early 2007, the Ministry of Education of Chile (MINEDUC) decided to subsidize half the cost of participation for each student (scholarships) through the program: "Promoting Talent in Schools and High Schools" (2007-2010), while covering the other 50% of cost became a responsibility of the municipalities. The aim of MINEDUC is to give a "national scope to the education of children and youth with academic talent." This support has been a major achievement for the programs as it did not only provide support economically, but also politically through the Supreme Decree No. 230 of 2007, subsequently amended by Decrees No. 341 of 2008 and No. 258 of 2010. Importantly for 2011, it has been given continuity to the program; however, it is unclear what will happen in 2012 and afterwards, a situation that jeopardizes the sustainability of the programs. For the year 2011, the recently elected right-wing government has reduced, approximately 17% of the subsidy for students attending the university-based programs. Instead, the Ministry of Education has promoted a "new" initiative for gifted and talented students: the "Liceos de Excelencia" or high schools of excellence.

### Operation

In practical terms, the selected students join a special program of studies at the universities of about 308 hours per year (32 weeks), which enhances and enriches the skills, strengths and knowledge of these students in various areas. The classes are divided into two semester-length modules of 120 hours (concentrated on Friday afternoon and Saturday morning) and an intensive summer module of 60 hours. While the programs, during the school year have the same hours of work with children in Friday afternoon and Saturday morning, for the summer season, programs have designed and validated their own forms to meet the particularities of its population. The exchange of students between the Universidad Católica del Norte, Pontificia Universidad Católica de Valparaíso and Universidad de La Frontera for summer school is found to be a very interesting initiative.

Each program aims to provide students with a diverse, varied and challenging curriculum, where free choice and specialized support aimed at those from economically disadvantaged environments are significant aspects. This is especially relevant because it is well known that the poorest families in rural areas distant from the poles of economic and cultural development (the capital city) are generally those with most difficulties for development. Therefore, efforts have been made constantly to enable the participation of children from diverse areas (Gudenschwager & Rehbein, 2009).

By enabling the development of children through access to higher levels of knowledge and improving their cognitive, affective and social skills, they are provided with tools not only to qualify for a better chance for future education and jobs, but also with tools to recognize opportunities, make informed decisions with an ethical basis. These tools promote entrepreneurship, and prepare to act in the best way in different social roles: as parents, neighbors, citizens, among others. Both sides of the development of children respond to a longing of many families, who see in education of the talented a chance for social mobility for their children. Prior to the implementation of the first program for academically talented students implemented by a university in Chile, Lopez, Bralic and Arancibia (2001) conducted a qualitative study to find out what the expectations of students and parents from public schools were for such a program. The results showed that academic talent was seen as a springboard that would allow students to "get ahead", achieve the social mobility desired by their parents and the education of talents as the path to make that dream come true.

Taking this into account, one can say that the programs in universities are entities that allow, above all, to actively promote social integration and welfare of children and young people with academic talent, while at the same time making a contribution to the development of society in general (Gudenschwager, Vargas & O'Ryan, 2011).

Some features of these programs that are worth noting and sharing are:

Inside the universities, the programs are ascribed directly to the Vice-Rectors for Academic Affairs or Research. This condition - not being housed in specific departments, faculties or programs - allows maintaining a very fluid and organic connection with all faculties, academic and administrative units, making their administration more effective and coherent. Thus, institutional support, which is essential for efficient operation, development and consolidation, is made clear also to the university and local communities.

The universities found in these initiatives are an effective bond with society that is highly valued by the communities they belong to. Some of the universities state in evaluations that, through these initiatives, they significantly carry out their social responsibility (Conejeros & Gudenschwager, 2010).

As not the academic talent, but the student with academic talent stands in the center of the proposed curriculum of the programs, it is feasible to always focus on the development of people. This involves supporting the development of disciplinary knowledge, skills for life in a globalized world, knowledge and appreciation of cultural heritage, artistic skills, appreciation of physical activity and a healthy lifestyle, among others. Moreover, the idea of integral development considers psychosocial support to child and family, psycho-education to the family to fulfill its

social function, and training their teachers in school. It can be concluded that appropriation by children and adolescents of the cultural capital available in society and the development of adequate skills for joining the world stage are cornerstones of the work of the programs (Conejeros & Gudenschwager, 2010).

The type or form of education that is offered, extracurricular enrichment, allows students to remain a relevant part of their school system and avoid driving them away from their reality, thus preventing that programs promote the formation of elite groups.

The school curriculum is considered a precedent, in the sense of the prior knowledge that the student has, so as not to affect the contents worked on by the Plans and Programs of the Ministry of Education. Being focused on deepening the content, integrating new materials and developing cognitive and socio-emotional aspects beyond what is permitted or promoted in the classroom, students can be offered what everyone needs in their educational process: democratic education based on equity.

As most of the sessions are taught by scholars, the program involves recognizing, valuing and using the expertise and capacity in the universities through their different areas of knowledge. The need to serve academically talented children, curious and eager to learn, allows and forces scholars to generate proposals for innovative, engaging, challenging and effective curriculum and teaching practices. At the same time, scholars are encouraged to use these new practices in classrooms with adult students, who often are described as more apathetic, unmotivated and passive than children.

Bringing together students from remote geographical areas with different cultural practices from the same region and from different parts of the country (exchange students during the summer) facilitates social integration and the establishment of more equal relationships. For example, in the PROENTA-UFRO program of Universidad de La Frontera, 32% of children come from indigenous Mapuche families (Gudenschwager & Rehbein 2009).

Considering the needs and interests of talented students includes the responsibility of being constantly attentive to the profile of the students, to know them and to recognize their diversity and, moreover, to listen and watch them with their strengths, needs and rights.

### Curriculum

In this context, in the First National Meeting of University Programs for Academically Gifted Boys and Girls of Chile, in June 2011, it was revealed that the basic curricular principles of these Programs are focused, even though with a different emphasis from one program to another, on:

- Integral education: disciplinary, artistic, athletic and personal development areas.
- Depth over breadth of knowledge.
- Development of higher cognitive skills
- Promoting interest in science and research skills for both natural and social sciences.
- Use, by teachers, of active and participative methodological strategies that focus on learning.
- Strengthening of interest in knowledge and passion for learning.
- Incentive of socially responsible or pro-social attitudes and behaviors
- Respect for boys' and girls' diversity and their rights.
- Promoting students' engagement with their socio-cultural environment.
- Promoting the generation by students of creative products of their own.

The basic curricular activities from the disciplinary area include academic courses. Its character is fundamentally disciplinary, as the objective is to enhance knowledge, skills and abilities of the students in relation to a subject, and therefore encourage the appropriation of advanced knowledge.

As for the instrumental area, the programs seek to strengthen the development of skills needed in the 21st century. Thus, the workshops allow to develop sensitivity and perception of the own body, the self-care and sports, art, handling of information and communication technologies;

communication skills in different languages. All these tools are considered relevant in the globalized information society.

Regarding personal development, the programs also provide spaces for reflection and development of values and skills. This includes reflection on life plans, vocational decisions and social and emotional development. Participants have the opportunity to turn around their visions of personal and family histories, experiences, perceptions in relation to itself, relations with others, managing emotions, and spiritual development. All these aspects will enable them to move forward in the construction of a life plan (Conejeros & Gudenschwager, 2010).

### *Family support and personal development*

In the context of encouraging parents' understanding of the particular characteristics of these students and to give them tools to strengthen them, the programs work with families in the form of semester workshops with important roles for parents. In addition, for students with socio-emotional difficulties support and referral to networks specialized in the field of Mental Health is organized in order to provide these young people with the chance of a healthy and balanced development. The forms of these support spaces vary in the different programs, from group theme workshops (on life skills, social skills, vocational orientation, etc.) to individual support and prevention programs based on needs assessment.

A survey about emotional variability carried out with the participant population of three of these programs (Delta-UCN, Beta-PUCV and PROENTA-UFRO) identified that in general terms this population does not shows significant socio-emotional difficulties. Therefore, it is possible to speak of an emotionally and socially adapted population. However, there are students with difficulties and severe problems that have a negative impact on their development. This shows that students with academic talent, but without the minimum support - in this case at social and emotional levels - from relevant contexts such as family and school, will hardly have the same opportunities as other students, even

if they have abilities for significant achievements (Conejeros, Cáceres & Oneto, 2010).

Consequently, the national programs of academic talent are an important protective factor for adequate development of talented youth, both on cognitive and socio-emotional levels.

Table 1.- University-based Programs in Chile

| Program | PENTA UC | DeLTA UCN | BETA PUCV | Talentos UdeC | PROENTA UFRO | ALTA UACH |
|---|---|---|---|---|---|---|
| Region | Metropolitan area | Antofagasta region | Valparaíso region | Bio-Bio region | La Araucanía region | Los Ríos region |
| Participating communities | 31 communities of the metropolitan area, 16 of which through agreement with PENTA UC | Antofagasta, Sierra Gorda, Mejillones. | Valparaíso, Viña del Mar, Quilpué, Casablanca, Quillota. | 11 participating communities in 2011: Concepción, Talcahuano, San Pedro de la Paz, Chiguayante, Coronel, Lota, Penco, Tomé, Hualqui, Santa Juana, El Carmen | Temuco, Padre Las Casas, Lautaro, Perquenco, Nueva Imperial, Freire, Teodoro Schmidt, Carahue, Pitrufquén, Villarrica. | Valdivia, La Unión, Río Bueno, San José de la Mariquina, Paillaco. |
| Definition of talent | Differentiated Model of Gifts and Talent, Gagné. For curriculum: Three-Ring Conception of Giftedness, Renzulli. | Three-Ring Conception of Giftedness, Renzulli. | Differentiated Model of Gifts and Talent, Gagné. | Differentiated Model of Gifts and Talent, Gagné. For curriculum: Three-Ring Conception of Giftedness, Renzulli. | Martínez and Rehbein (2004). Differentiated Model of Gifts and Talent, Gagné. | Differentiated Model of Gifts and Talent, Gagné. For curriculum: Three-Ring Conception of Giftedness, Renzulli. |
| Nomination method | Nomination from schools (Teachers, Parents and auto-nomination) | Teachers, students and Auto-nomination. | Nomination from teachers and Parents | Nomination from schools and family with a recommendation by school teacher. | Nomination from schools (Teachers) and peer nomination. | Nomination from schools (Teachers) and nomination by parents. |
| Selection instruments | Cognitive skills test, Motivation questionnaire. | Cognitive skills test, Motivation. | Cognitive skills test, Problem solving test, Motivation. | Cognitive skills test, Motivation. Social responsibility, socio-emotional adaptation. | Cognitive skills test, Motivation. | Cognitive skills test, Motivation. |
| Development emphasis | Critical thinking, Creative thinking, Problem solving, Self-esteem development, Ethical and socially responsible attitude. | Creative thinking and creative production, Leadership, Socio-cultural engagement, Critical thinking. | Critical thinking, Problem solving, Creative thinking, Pro-socialness. | Critical thinking; Creative thinking; Metacognitive skills; Research and problem solving skills; Social and emotional development, Social responsibility (especially). | Creative thinking, Critical thinking, Leadership, Social responsibility, Scientific reasoning, Information and communication technologies handling skills. | Critical thinking, Creative thinking, Logic and Reason, Language, Values and Culture. |
| Number of students (2011) | 883 | 398 | 285 | 240 | 238 | 231 |

## Acceleration and advanced placement

Acceleration was not an option until recently. The previous general education law (Ley Orgánica Constitucional de Educación, LOCE) prohibited accelerating students based on their academic performance. It has been difficult for those of us who have worked in gifted education in Chile to trace the reasons of this prohibition, concluding that they were probably due to similar worries concerning social adjustment problems as those described by Colangelo, Assouline, and Gross (2004). However, the current General Law of Education (Ley General de Educación, LGE) includes curricular advancing as a flexible strategy for specific population groups, as a form of differentiated education, allowing early admission of students to first grade (MINEDUC, 2009). Nevertheless, this is not yet a widely recognized strategy in society and has not been applied significantly by formal educational institutions (Conejeros, 2010).

Notwithstanding the above, there are certain actions that have been a fruit of initiatives of educational institutions and organizations such as UNESCO. This is the case of the propedeutical program "New hope, better future," of the University of Santiago de Chile USACH, through which 50 students from municipal schools have been prepared annually since 2006. These students come from schools with limited resources during their middle school period and grades within the highest 10% for each course. They are allowed to access college taking the University Selection Test (Prueba de Selección Universitaria, PSU), but without the requirement of a minimum score.

Students attend during 3 or 4 months classes on Saturdays at the University's grounds with teachers from USACH and from the Equitas foundation. The results have been successful as 80% of these students pass the courses and enter college without difficulties. Such has been the magnitude of this success that, by 2009, Universidad Cardenal Silva Henriquez and Universidad Alberto Hurtado have begun their own versions of this program. Three more universities joined in 2010; Universidad Metropolitana de las Ciencias de la Educación, Universidad Católica del Norte at Coquimbo and Universidad Tecnológica Metropolitana.

- Thanks to these initiatives, the Chilean Government included in the law project of modification of the teacher statute the possibility that the best students of low-income municipal and subsidized schools can be allowed to enter college without having taken the University Selection Test (Prueba de Selección Universitaria, PSU). This would allow about four or five thousand students, the highest achieving 5% of these schools, not to only attend high school in the University and choose their degree course, but also to participate in leveling courses during their last year of middle school. This modification is expected to take effect during 2012.
- For 20 years, a similar method has been offered by Universidad de Chile for its summer schools. Middle school students interested in learning beyond the regular curriculum are able to attend in-depth courses in areas such as Physics, Mathematics, Biology, Chemistry, Biomedical Sciences, Social Sciences and Humanities, and Visual and Expressive Arts.
- Likewise, the PENTA-UC program has implemented the Advanced Placement PENTA-UC program, in which over-achieving students of the program can take courses offered by Pontificia Universidad Católica de Chile for regular undergraduate students. This option is offered to students that start their last year of middle school, having already passed a pre-selection procedure. These courses are taught during summer and, if the student passes and then enters college, they are validated as a part of college education. Students participating in this program receive follow-up and support from their respective student coordinators, who pay attention to the needs and potential challenges, strengthening positively their achievements and efforts (www.pentauc.cl).

Even if the possibilities mentioned above offer some students the possibility to advance or deepen through acceleration certain contents regularly taught by the formal educational system, these remain as particular initiatives by some institutions and educational entities. Acceleration as a development

strategy in the work with Academically Talented Students still needs to be evaluated and widely implemented (White, R., Rios, C. & Benavides, M. 2004).

**In-school enrichment programs**

Focused overtly declared intra-school attention to this particular student body segment is of recent data. Nevertheless, an instance of such experience may be found in a private school in Santiago, Chile founded by Professor Mario Gambra, the Instituto de Superdotados de Chile (Institute for Gifted Children). This school, specialized in the induction of talent in every healthy-born child, based its programs on the belief that if students were "adequately stimulated, they would be able to learn early on during childhood the tools that will later become useful to them in order to perform brilliantly for the rest of their lives" (http://www.mercuriovalpo.cl/). It was run independently from the Chilean Ministry of Education for 36 years, eventually closing down in the midst of quarrels and accusations questioning its educational model and that its results did not match expectations (www.terra.cl).

Currently, apart from the six university-based programs mentioned above, there are two other experiences which involve initiatives to introduce gifted education into the regular school. One of them is a research grant given to Program PENTA-UC with extracurricular enrichment courses performed in elementary schools (PENTA-UC Escolar) (Arancibia, 2009). The other is an extracurricular enrichment talent program designed by a private-subsidized administrator of 17 schools in Santiago de Chile (Red SIP) with assistance from Verónica López (Sociedad de Instrucción Primaria, 2008, 2010). Both initiatives have faced initial resistance from the school system, especially during the first stages of implementation, and from regular school teachers who are cautious and somewhat suspicious about the prevalence of gifted and talented learners from lower SES status and about the possibilities of gifted education within the regular school system, especially in regular classrooms through differentiation strategies.

**School Network of Primary Instruction (SIP)**

On 2008, a Talent Program in the school network of SIP started. This initiative is coherent with the Educational Project of the institution, which establishes an individual concern for each student and that the teaching-learning process must respond to the characteristics of each student (Walker, 2001).

In this context, the Talent Program seeks to satisfy the educational needs of talented students, focusing in their academic and socio-emotional necessities.

They use the definition of talent of Marland (1972): "Children with academic talent are those who, because of their high abilities, have a high performance. They are children who have demonstrated high performance or potential ability in any of the following areas: a) general intellectual abilities, b) specific academic aptitude"

In this program participate four out of the seventeen schools of the Network, plus an associated school: a total of 365 students. At the beginning, the program attends students from 4th to8thgrades of elementary school. Currently it attends students from 1stgrade in primary school to 4thgrade in high school.

The program defines four areas of work:

Identification and selection: This area identifies students using three mechanisms: Self-nomination, a letter in which the student explains his/her interest in the program; teachers' nomination; and, standardized tests. The latter selects the students who are above the 90th percentile of the Level Tests, which evaluate outstanding academic aptitude in Language, Math, and Natural Sciences. It also uses the Raven progressive matrices test (General Scale).

Depending on the current grade of the student, there are the following differences:

- 1st to 4th grade primary school: No selection is performed. Educational strategies focus on fostering every student's ability.
- 5th to 6th grade primary school: Selection is performed using Level Tests and Self-nomination
- 7th to 8th grade primary school: Selection is performed using all of the above strategies

High School Selection includes all the students identified during primary school plus all the students who are above the 95th percentile in the Level Tests (compared to their course fellows). The latter also requires writing a presentation letter and getting a recommendation letter from a teacher.

- School advocacy and Professional Development. This area focuses in educating the school community about academic talent, to create the abilities in the schools of SIP to identify and understand talented students and give an adequate response to their educational necessities. This area also includes workshops with the students' parents and guardians, vocational orientation workshops for students, and workshops about talent and school challenges for students.
- Educational strategies. The program is developed during the school year, plus a summer school that facilitates meetings of talented students from different schools. Strategies differ according to educational level. From 1st to 4thgrade in primary school, the focus is on developing thinking abilities within the classroom. The students answer questions or develop activities related to the regular curriculum. Questions and activities have three difficulty levels: low, middle, and high. Students from 5th to 6thgrade in primary school develop inter-school activities, three times per semester. The activities include problem-solving and thematic workshops. Students from 7th to 8th grade in primary school develop thematic workshops each

semester, two chronologic hours per week. These workshops are extra-programmatic and extra-curricular and use the Enrichment methodology. Students from high school perform academic discussions about research topics across the year, which are directed by a tutor. A common strategy for all grades is the Summer Talent School in the first week of January, which consists of extra-curricular workshops

- Evaluation: This area includes the evaluation of the effectiveness and quality of the program, and the evaluation of the educational activities performed during the year. The evaluation of the effectiveness of the program analyzes whether students participating in the program have or have not a significant increment in Level Tests and semester grades with respect to their fellows.

The quality of the program is assessed through evaluations performed by students, guardians, teachers who participate in the workshops, the program coordinator, directors, and school counselors. The evaluation includes assessment of students' attendance and learning progress, and class observation. Students learning evaluation has different strategies per level:

- From 1st to 4th grade of primary school, the teacher assesses students' advancement with an extra grade in his/her course.
- From 5th to 6th grade of primary school, a specific learning assessment for each workshop attended by the student is carried out.
- From 7th to 8th grade of primary school, learning advancement is assessed through an evaluation at the beginning and another one at the end of the period. Evaluations focus more on skills than in content. Attendance is also measured. It is a requirement to continue the next semester to have an average of 80% attendance.
- For high school, the assessment evaluates a final presentation of the research results of the student. In addition, the tutor performs process evaluations. To continue the next semester, the student must have a 90% attendance.

### Results

During the second semester of 2010, an evaluation was performed to find the perception of all of the actors related to the Program. Students were questioned about which aspect of the Program they liked the most. Workshop contents were liked the most by 40% of the sample. Program methodologies were liked the most by 36% of the sample. Teachers were liked the most by 26% of the sample.

Parents and guardians were questioned about perceived benefits of the program. Most of them indicated an increase in academic development of the students, increasing motivation for learning and academic expectations (66%). They also reported personal and social gains for their children (25%), particularly the tendency toward assuming commitments, increased sense of responsibility and independence, and increased toleration to frustration. Teachers perceive changes in their students (65%), particularly increased self-assurance and knowledge, better grades, and motivation to learning.

The program is consolidated. There is a plan to expand it to respond to the academic necessities of all of the talented students of the SIP school network.

An important aspect is monitoring the activities performed by students, to ensure that they are challenging enough for students. Another challenge is to tailor the school curriculum to the needs of talented students. Some of the future objectives are:

- To improve and standardize the identification and selection process of talented students.
- To standardize the academic talent training of all of the actors of the Program: parents and guardians, teachers, school counselors, directors, and students.
- To increase the complexity and diversity of education strategies being offered to the students, to differentiate them in each stage of their vital cycle.
- To standardize the evaluation process, with regards both to the educational strategies offered as well as to the program in general.

### PENTA-UC School Program

This program was created from the FONDEF project D051-10398 (Scientific and Technologic Development Fund). The project is called "Identification and Education Program for Students with Academic Talent of the First Cycle of Municipal Schools: Impact Evaluation of the Transference to the School System". This project links directly to the PENTA Program UC, which attends students from 11 to 18 years old in the University context. This project was awarded with the Bicentennial Seal[4] because of "the transcendental contribution associated to the materialization of this initiative toward building a socially equitable country" (www.pentauc.cl)

National associations connected with the project include the Puente Alto Municipal Corporation, El Mercurio Newspaper, Andes Foundation, and the Ministry of Education. International collaborators include Tufts University and University of Iowa.

The implementation of the project between 2007 and 2009 (36 months in total) was in the Puente Alto Commune. The team comprised a multidisciplinary group of researchers of the Pontificia Universidad Católica de Chile from Math, Education, Psychology, and Political Sciences; and researchers from the Center of Studies and Talent Development – PENTA UC.

The objectives were to design and implement an education program for students with academic talents of municipal schools. The program focused in students from 1st to 4th grade of primary school and it was developed within the classroom in the spaces of the full-time school. It required designing and implementing an identification and selection program and an educational program with deeper and ampler curriculum in Language and Math, and focused in developing abilities not conventionally promoted by the school system. The program also sought to identify and select teachers from the school system who demonstrated special motivation to work with talented students and had a higher academic qualification.

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[4] Award for citizens or private sector that have a significant contribution to the development of the country on 2010, when Chile became a 200-year-old independent republic.

These teachers participated in a voluntary training program, so they could apply the program by themselves in selected schools. The project required developing a management model for its implementation in the municipal system (Arancibia, 2009).

Underlying the Program was the concept of practical intelligence based on Sterngerg's Triadic model of intelligence. According to this researcher, outstanding intellectual performance is the result of three abilities: analytical, creative, and practical. Consequently, the program designed three instruments to evaluate these abilities: a creativity test, an analytical intelligence test, and an everyday life test. This battery specifically suits to select children according to their academic talent. An additional self-concept test was also used for selection purposes.

The tests were administered in a population of 4,706 children from 1st to 4th grade in primary school (6-10 years old), in a group of ten municipal schools. From the initial group, 504 students who had the 10% highest results were selected. The program defined two work groups, five experimental schools and five control schools. In the experimental group, which comprised 254 students, work was focused on the implementation of an extra-curricular enrichment program in Math and Language. A control group of 250 students was also identified.

Regarding parents and guardians, a questionnaire was applied only on the experimental schools. For teachers, a questionnaire was applied to the head teachers of both groups and a classroom observation was performed to 20 teachers in experimental schools. A questionnaire was also applied to the directors of all of the schools (Arancibia, 2009).

A curricular model was developed by a team of university professors. Sixteen manuals (8 per disciplinary area) were created so that teachers could work with children in the classroom during the two years of the program. School teachers were trained on the conceptual basis of these manuals and their application. In general, the teachers were the regular school teachers, although in some cases other professionals performed the job.

In Math, the curriculum sought to develop analytical, creative, and practical abilities. The main topics were: arithmetic, geometry, and probabilities (San Martin, 2009).

In Language, the vision was interdisciplinary, visualizing it as a social practice through a discursive approach. Meta-linguistics was emphasized and heuristic, analytical, creative, and practical abilities were developed within the framework of the Triadic model (Medina, 2009).

### Results

A central aspect of the program was the evaluation of results and impact of the pilot evaluation. The main research question regarded the effects of intervening in the development of talented students, in their school and family contexts, and in the community of application as a whole.

In general, the program presented neutral or positive impact results in different levels of the evaluation. Effects were observed in the increase of educational expectations in the families participating. There was improvement in pedagogical practices of the teachers, who transferred what they learned to the regular classroom.

The talented students showed positive impact in their emotional, intellectual, and educative development, aspect that contributes to reduce school desertion. In this regard, they said that they liked more to go to school, they felt more motivated to learn and got along better with their classmates (Segovia, 2009).

In terms of the curriculum, the evaluation considered quality, effectiveness, and relevance criteria. Learning achievements were evaluated by national and international experts. Manuals and effective materials were evaluated through tests applied to students and by math and language teachers, who applied them in the developed courses. Finally, the courses were evaluated through surveys applied to the students (Cabrera, 2009).

In regard to learning results, students from the intervention presented higher achievement percentages in Language and Math than non-intervened students. In the case of Language, there was improvement in

reading comprehension and idiomatic correction. In Math, the achievement was lower, presenting an advantage in their knowledge of numbers and problem solving.

Regarding the training manuals, teachers considered them to be a useful tool to develop this kind of education. From the point of view of the students, the courses were stimulating and challenging.

The curricular framework of Language and Math was evaluated by an international expert. The math framework was also evaluated by a national expert. The evaluation indicated that in both areas the curriculum corresponded to the characteristics of the population to which it was targeted.

### Future challenges

The Program seeks to implement and replicate the model in other communities and schools of the country through the generation of transference strategies. This process is performed through a request of the interested schools, who assume the costs of the process. The implementation will be successful if the school is committed to the program and has motivated school management teams.

Another challenge in terms of research is to determine whether the developed identification and selection tests can be used with other populations of students or not.

### Conclusion

As you can see, provision for gifted and talented learners has grown during the last decade, but is limited to mainly two types of possibilities: highly selective public schools, or University-based enrichment programs. By far, most talented learners from disadvantaged backgrounds, especially those from regions and rural areas, have not had access to any one of these options (Gudenschwager & Rehbein, 2009; Bralic, 2010).

Maybe for the first time in its short history, Chile is caught between the options of segregation and enrichment. With six operational enrichment programs distributed in large-population cities throughout the country, the government is currently opting for the traditional form of provision for the gifted, through academic segregation. The advantages and disadvantages of both forms of provision are a matter of controversy; however, it should be more open to public discussion since they are a matter of public interest.

This "election-like" situation has been keeping programs in uncertainty due to the completion by 2010 of the "Promoting Talent in Schools and High Schools" program, linked to Supreme Decree No. 230, which regulates and oversees these programs from the Ministry of Education. The decision to continue funding for 2011 was threatened by budget cuts announced in late March 2011, which makes more difficult the implementation of the programs. Moreover, the lack of definition for the following years creates a lack of stability, causing that the programs are not only jeopardized by funding uncertainty, but also vulnerable to the shiftiness of political decisions. Much of the funding of these programs is supported with input from the state, while also financially backed by municipalities.

If the support from the Ministry of Education is not continued for the coming years, this will be a strong message from the State, according to which enrichment is a secondary option, that municipal education administrators could not possibly provide resources to the programs for gifted students from their communities, arguing that it is not a government priority. Currently, there are difficulties and resistance in some municipalities to continue co-funding the participation of students. There are at least two reasons for this resistance. On the one hand, to paraphrase the Mayor of a Municipality, the funding entities say that the programs have not had the expected impact for them, referring to enrollment of students in higher education, particularly in traditional and prestigious universities. In this sense, the discourse of equal performance as criteria for quality measurement re-emerges. Everyone is measured by the same standards without considering that most programs have a 90% of students that finished the program enrolled in higher education included in this group,

technical training centers and private universities. On the other hand, it is likely that local funding parties, noting the changes aimed at Liceos de Excelencia brought about by the new government, prefer to invest their resources in this type of education aimed at developing talent.

The risk of these measures involves the detection of academic talent with high achievement, which induces a restricted view that does not consider the needs of specialized support at the educational level of students. It would also imply to stop provision for gifted underachievers. An additional risk is that the High Schools of Excellence are another form of educational segregation in a school system that is already highly segregated. A model of educational differentiation which brings together students with similar people, without allowing them to experience diversity of interests, abilities and socio-cultural aspects of other students, is likely to only deepen social segregation. The form of coexistence promoted by the Liceos de Excelencia represents a standard of educational exclusion. In the long run, it will contribute to the development of less tolerant students, unwilling to live with diversity on both educational and social levels, and drifting away from the possibility of constructing a more inclusive and supportive country.

In this sense the talent education in Chile today is in a way "orphan", referring to public policy needed to regulate and to continue education as a right that talented students have. The future of talent education in this context is uncertain.

**Perspectives for the future**

According to the discussion in this chapter, Chile has yet to go a long way to give talented students the right to an education in which their needs are respected. It is fundamental to understand what equity means, and not to consider it a synonym of equality. To give various forms of education is a challenge that involves analysis of ethical and political implications, and to create places for dialogue and training with school administrators and classroom teachers.

This challenge also requires that the programs, still in development, disseminate massively the contributions made, as it is the only option that keeps students in the school system and at the same time provides quality and equity to this group of students. Pursuing integral development on cognitive, emotional and social levels means educating citizens that respect fellow human beings and that are engaged to social development. This type of education does not only have an impact on academic performance, but also on personal development; we need emotionally integrated citizens who are recognized for what they are and not for their achievements. In this sense, the results related to the impact of programs must be seen from the perception and experience of the students, as related to developing a positive emotional and social level. These results show encouraging effects at the level of social inclusion since students feel more capable and better prepared to participate in society.

As for training in the area of Talent Education, it is essential to incorporate the subject matter and pedagogical choices in the initial and continuing training of teachers and psychologists. Through this training, an inclusive framework can be constructed that allows professionals to differentiate curriculum and contest resistance to the provision of a specialized product, which is normally the result of a lack of knowledge. This type of education will encourage all learners, and the experiences in the field of gifted education will be a model for general education as many of its educational activities have proven to be effective for all students (VanTassel-Baska and Brown, 2007).

The main task starts with conviction, belief and motivation of all the educational agents involved: a committed state, differentiated and inclusive educational policies, flexible schools willing to take risks such as new strategies and differentiated teaching tools, teachers trained in education of talents, engaged families, and of course talented students passionate about learning (Renzulli, 1977, Renzulli and Reis, 1985 Reis and Smith, 1981, Schack, 1993).

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**CHAPTER NINE**

**Talent development in Mexico: Challenges and opportunities**
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**Country overview**

Mexico belongs geographically to North-America, ethnologically abides to Latin America, and was the site of advanced Amerindian civilizations that came under Spanish rule for three centuries before achieving independence early in the 19th century. Today, Mexico is the most populous Spanish-speaking country in the world with nearly 110 million people and almost two million square kilometers, sharing a border of nearly 3,000 km with the United States. About 76% of the people live in urban areas and nearly 15% of the population has immigrated to the north. The official currency is the peso and the GNI per capita is US $9,980 (World Bank, 2008).

The Mexican education system is organized into four levels: preschool, compulsory basic education (grades k–9), high school (grades 10–12) and higher education. The government is only officially responsible for providing compulsory basic education, although it is also involved at the other three levels through public provision of preschool and upper secondary, as well as public funding of higher education in most states.

The Mexican educational system is huge and serves almost 35 million students (a third of the population). In addition, services for the gifted are of little importance in a country with tremendous educational challenges. The average number of years of schooling is around eight years and alarming dropout and failure rates (nearly 50%) in highs school are still a challenge; enrollment is particularly low in preschool (56 percent) and upper secondary schools (51 percent). Indeed, only around 68 percent of students accessing the first grade will complete all nine years of basic education. Thirty-five of these will go on to graduate from upper secondary and only slightly more than 12 percent of the population aged 18 and older in Mexico have a university degree in 2011.

Public schools serve 87% of all students in the country at the basic education level and around 36% at college level. Governance is centralized at the national level with the Ministry of Education (SEP) prescribing the curriculum, selecting textbooks, hiring and firing school personnel, and setting salary and schedules. Problematic issues include poor teacher training and lack of research and assessment practices to account for reliable information regarding schools' functioning and efficacy.

Mexico's public spending on education amounts to 5.9 percent of gross domestic product, about $28 billion dollars a year, almost a quarter of its government's programmable budget. The Ministry of Education (SEP) and the teachers' union (SNTE) are the two main actors in the educational policy area. International organizations such as The World Bank and the Inter-American Development Bank also have a major and long-standing presence in Mexican education, and their influence on policies and educational reform is significant considering their rather small contribution to the education budget (less that 5%). Private foundations and parents still play a very limited role in educational policy and services.





**Gifted Education**

As in many other countries, gifted education emerged as a distinctive branch within special education services, under the dubious assumption that both children with disabilities, as well as those with talents, presented special education needs. Thus, services for the gifted and talent development programs were mixed with services for students with disabilities and administered by teachers with little training in gifted education.

The first official program for the gifted was implemented early in the 1980's as the Model of service to gifted students (CAS). With student

selection based primarily on nomination or recommendation from teachers and other education authorities, such bias in admission hindered quality of services and children without potential to excel consumed resources for gifted programs.

Current intervention programs for gifted students in Mexico have made some improvements to the selection process but were for many years limited to 5th and 6th graders, with the exception of various State or independent programs, such as the program of Gifted Support in the State of Sinaloa, ASES, which serves 150 gifted students at primary, secondary, and high school level throughout the northwestern state of Sinaloa (Labastida, 2010). Typically, once students complete sixth grade, follow up studies are terminated and services to gifted students are withdrawn. Furthermore, no studies of the impact of these programs have yet been reported. In 1992, this program was thoroughly revised and extended to all states, as well as detached from the standard services to students with learning disabilities.

In 2002, the program for integration and support of the special education system began to pay particular attention to the development of programs for the gifted, and federal funds were invested in research in 2003 becoming the first national research project to explore ways to service gifted children. Results from this effort showed some problems, for example, a very limited number of students involved in gifted education programs, lack of criterion for screening, problems of having such programs in traditional special education units, and lack of training for teachers and principals.

In general, most programs in the last 20 years aimed to develop enrichment programs and screening for gifted students. Early in 2000, services to gifted students were viewed as an opportunity to transform schools and enrich the educational atmosphere. By recognizing the needs of these students the Mexican educational system assumed organizational changes, initiated the improvement of existing infrastructure, and triggered the training and preparation of elementary school teachers to identify and provide proper attention to talented students.

The federal government in the last 5 years has implemented new policies for the attention of the gifted aiming to:

Improve in-school and community enrichment.

Expand the number of students identified and served.

Provide economic support (for poor families), and social and emotional support for all students.

Most strategies for the 2008-2012 term focus on the enrichment of the educational context and the provision of methodological and material resources for teachers. Also included are the strengthening of team work and teacher training, as well as the involvement of parents and headmasters in servicing the gifted.

**The concept of Gifted in Mexico**

Providing clarification and a precise definition of what it means to be gifted has been an important task in this country. Hence, it is particularly important to review the concept of giftedness in the Spanish language, as various terms are often used interchangeably to refer to a group of gifted students. Likewise, the same term may be used to refer to various student abilities and profiles. In general, there is considerably more conceptual confusion in Spanish literature when approaching the gifted.

A gifted person is someone who shows, or has the potential for showing, an exceptional level of performance in one or more areas of expression. Some of these abilities are general and can affect a broad spectrum of the person's life, such as leadership skills or the ability to think creatively. Some talents may be specific and only evident in particular circumstances, such as a special aptitude in mathematics, science, or music. The term giftedness provides a general reference to this spectrum of abilities without being specific or dependent on a single measure or index. It is generally recognized that approximately five percent of the United States student population, or three million children, is considered gifted.

Teachers in Mexico are usually not trained to teach gifted students, and school systems often lack programs and teachers to search for talented students. Thus, in this research, emphasis was placed on gifted students, following Lopez's (1994) general idea of screening students with a high IQ and high levels of general academic competence, motivation and creativity.

Considering contextual issues, such as the desire to motivate these students to pursue higher education, it was particularly important to screen children for high academic and scientific potential.

In the Spanish language, there have been attempts to distinguish between the gifted and the talented, but name labels are still used loosely. Certain terms for describing gifted children are commonly found in the literature: 'sobresalientes' (Hernández, 2003), 'sobredotados' (Delgado, 2003) or 'talentos especiales' (Sánchez, Cantón y Sevilla, 1997).

In Mexico, as Zacatelco (2003) broadly evidenced, the concept of giftedness remains unclear. Much work is needed both in research and in educational practice to distinguish between the concepts of talent and gift. As some authors assert, giftedness may be as simple as the ability to solve real life problems in a creative manner (Castro, Oyanadel, Paez y Quintanilla, 2003, p.13). Furthermore, additional studies would reveal the implications of gifted children for the school.

In general, talent refers to any exceptional ability to develop and excel in specific fields or tasks, such as sports or the arts, which can be nurtured in special programs generally beyond the classroom; whereas gifted students (Alumnos altamente sobrealientes) refer to those pupils with tremendous academic potential that is suitable to be approached in school.

**Policy toward talent development**

The Mexican government has structured policy toward talent development in three major areas. The first and most traditional has been toward sports. In Mexico, parental involvement has been traditionally greater toward sport and recreational activities than for school related activities. The second field of talent development has been that of the arts, basically consisting of various informal programs, generally of entertainment in nature, and only in some regions of the country. The third field of course has been the field of gifted education, which is the most recent avenue of attention.

In fact, only recently in 2007 the Senate submitted an amendment to the 41st article of the general law of education that was eventually approved. Such change argues that gifted students and those with talents are a fundamental resource for the nation, thus the state must provide services for the full development of their potential. Reports associated with these changes underlined the brain drain of talents toward the US and Canada, the lack of appropriate services for the gifted, and the need for specific programs across the country.

**Screening for gifted children**

Sanchez (2007) reported that most children in gifted education programs in Mexico were selected either by their commitment or effort or because they were advised by or related to teachers or other decision makers, instead of their great potentialThus, a reliable screening of children within a context of scarce resources to serve and develop talents is a must.

In rural marginalized areas of Mexico, children often do not develop to their full potential because of scarce opportunities and lack of educational services. Due to the socioeconomic situation in rural areas, serving gifted children is seen as an act of social justice. Furthermore, screening gifted children in rural zones may enhance the emerging trend to service and stimulate gifted children. The belief exists that these children constitute an important resource for Mexico's sustainable development; when their full potential is achieved, they will be incorporated into the country's scientific, industrial, and entrepreneurial efforts.

Parents, teacher or student recommendations, a high mark on an examination, or a high IQ score do not qualify a student as gifted, although these indicators may be a signal that giftedness exists. Some of these indices of giftedness are more sensitive than others with regards to differences in the person's environment.

In Mexico, criteria for screening gifted children has often been overlooked since emphasis for special education and services has been focused on children at risk of school failure, (Sánchez, Acle, De Agüero, Jacobo y Rivera, 2003), a tremendous problem in a country with an illiteracy rate of 10%, a general education of 7.6 years, and a 50% failure rate at 10th grade (SEP, 2006).

Sáenz (1997) has depicted the various needs of gifted children in Mexico and has discussed the dubious preparation of most Mexican teachers in dealing with these children.

Authors such as Johnsen y Corn (2001), Sánchez, Cantón y Sevilla (1997) and Shea & Bauer (2000), coincide that, to be labeled as gifted, a student must perform significantly higher in various tests and routines. This methodology permits evaluators to screen students in an efficient manner, as Blanco (2001) claims, that this allows the school to provide educational services and guidance to gifted children and to their respective parents.

Thus, the choice of strategies for screening Mayan children encompassed an assorted array of suggested techniques, from teacher's nominations, to Soto's (2003) suggested measures of creativity and intelligence, to Gantu's (2005) measure of task commitment. As it will be argued later, however, these measures were considered in a holistic fashion since none of the routines can independently lead to adequate judgments. For example, biases in teachers' nominations, as depicted by Sanchez and Schuman (2007), could significantly skew results. Furthermore, reports on customary practices and traditions among Mexican teachers and the cautionary statements made by Sanchez, Vales, Esquivel (2007) with regards to the standardization of the WISC-4 in Mexico were also taken into account, as certain characteristics in the Mexican school system could also undermine the accuracy of the study. In fact, in Mexico, general criterion for acceptance would be an IQ of 120 or higher when using the Mexican norms of the WISC-4 (Sanchez, Fina & Hollingwort, 2010). Sanchez (2007) also suggests from the findings in his study that students are to be admitted if they are above the 75th percentile in the creativity and motivation scales, and have a GPA of nine or above (in Mexico the scale is 5 to 10). Roughly only 10% of students nominated to gifted programs by a teacher fulfill these criteria.

Screening for Mexican talent remains a complex issue and needs reliable instruments and procedures, but above all it requires a change of mentality regarding the needs and value of these talents for the country.

***Instruments***

A number of instruments and scales have been used to select gifted students, for instance:

***Motivation and task commitment test***

This instrument was especially designed and developed for this research. Major dimensions measured were: curiosity, task commitment, socialization

in the school, and enjoyment of scholastic tasks. Cronbach's coefficient for this test was α = .7632.

### Multi-factor creativity test

Although most reported measures of creativity refer to visomotor tests in Mexico, following the general idea of Torrance (Duarte 1997), a multi-task creativity test was designed and developed for this research project. This multi-task creativity test allowed researchers to explore three dimensions of creative thinking, each assumed to be independent from one another.

The test consisted of three routines. The first intended to assess visomotor creativity and plastic tasks, and requested the student to draw a picture containing the six stimuli items given: circles, lines etc. The second was a test of verbal composition intended to measure verbal creativity, and this test required the student to write a short essay using cue words purportedly unrelated to each other. The third and final task was an attempt to evaluate inventive capacity by asking the student to mention as many uses for two common items: a blanket and a rope. The traditional categories proposed by Torrance's early work: flexibility, fluidity and originality were used to evaluate performances. Two independent judges evaluated each performance, and the inter rater reliability coefficient was rk = .7462.

### SAGES-2

This is a test commonly used in the United States to screen and identify gifted children, particularly those with outstanding school potential. The Spanish language adaptation for Mexico is known as the Screening Assessment for Gifted Elementary students (SAGES-2; Manual Moderno, 2003). This test was standardized for the Mexican population by Sanchez (2003), who later found the secondary school version (4-S) more adequate than the one for younger children (K-3), in the identification of high academic competence students. At the same time, however, Sanchez acknowledged some limitations in the psychometric properties regarding its ability to assess divergent thinking previously reported by Hunsaker &

Callahan (1995), and Plucker & Runco (1998). The battery consists in three subscales: math and sciences, language and literature, and reasoning skills. This later routine is the best estimate of 'g' intelligence, as it uses images and symbols. Furthermore, according to Jensen (1980), it is free of cultural influences and language competency.

### WISC-4

The Wechsler Intelligence Scale for Children – 4th Edition (WISC-4) is an individually administered clinical instrument designed to assess the cognitive ability of children aged 6 years through 16 years 11 months. These instruments are the most frequently used standardized tests for assessing children's intelligence in the U.S. (Prifitera, Weiss, Saklofske, & Rolfhus, 2005). In 2005, Harcourt Assessment offered a Spanish version of the test for use in populations of American children who speak Spanish. As part of the internationalization of the test, the translated version was adapted for cultural fairness and piloted in Mexico in 2008 with a sample of participants in an effort to create norms for use with an international population.

Several challenges have come to light through the Mexican standardization process, including issues of culture, language, and intelligence. Addressed in particular are the validity issues that arose due to the differences between the Spanish language versions created for use with Americans who speak Spanish as their first language and for use with children in Mexico. This research could affect the future standardizations of the WISC-4 for use with Cubans, Puerto Ricans, and other Hispanic participants. It will address issues put forth by the International Test Commission's Guidelines for Test Adaptation (2001) and the Standards (AERA et al., 1999). For example, in addition to test translation, the adaption process must consider other factors which can affect scores, including construct equivalence, test administration, item format, and the influence of speed on performance (Hambleton, 2005).

This project seeks to provide validity evidence in support of the WISC-4 Mexican norms. This is needed because, without it, clinicians and practitioners in Mexico are limited to using U.S. norms and a test which has not been

culturally adapted. Moreover, as an individual's score must be interpreted in light of a reference group's characteristics, the validity evidence collected in support of these norms permits the use of the WISC-4 in Mexico.

### Services in Mexico: A Critical view

Since then, efforts have been made to develop various intervention strategies in all 32 federal states. Problems, however, have impeded a true national policy to effectively serve these children. For example, there is confusion on the definition of the gifted. Kids with talents pertaining to art or sports usually do not get attention in the school system, and certainly we need follow up and efficiency studies.

In addition, services are lacking infrastructure such as materials for testing, computer services and labs, and teachers are either ill trained in gifted education or they are replaced by new teachers after they have completed training. Again, there is a need of educational research in the field that provides feedback to implement and improve intervention policy and practices.

Intervention models in Mexico can be located in the texts of Mason & Mönks (1993), Benito (1996), Granado (2005), and Zavala (2006). However, these models are more political in nature than technical; they usually emphasize the discourse rather than practices and techniques, and they all lack objective indicators of pertinence and efficiency. Indeed, one can conclude that services for the gifted in Mexico are just emerging and they need strong technical and logistical support.



### Research on gifted education

The target population was 7th and 8th grade Yucatecan students in five bilingual regions (Spanish and Mayan). Students were from 21 different counties, all of which are characterized by a high level of socioeconomic marginalization.

A conventional criterion was used to select 27 secondary schools in which access was granted to the investigator by state authorities and local principals.

Through teachers' nominations, 242 students were included in the study's initial phase. To be nominated, students had to be singled out by two different teachers, and they required the approval of the school director. Letters explaining the purpose of the study, the general characteristics of a gifted student, and the importance of identifying gifted students were issued to every teacher and principal. Special forms were used to collect teachers' nominations, principals' approval and parental consent for further testing. These students represented approximately 5% of secondary school students currently enrolled in Yucatan's rural school

system. Finally, 175 students completed all tests, interviews, and requirements from the second stage. Table 1 illustrates participants by gender and region (insert table 1 here).

**Discussion and recommendations**

Considering basic international criteria to identify giftedness, only 21 participants (12%) of children of 175 identified as gifted by their teachers were actually gifted. This first fact argues against considering the teachers' perception as a main criterion to identify gifted children in this region.

Results convey implications for teacher training in the concept of giftedness, and on simple interventions such as acceleration that could be decided on in this region. Likewise, government and academic institutions could program enrichment activities considering many of the unique resources of this region, such as archeological sites and tropical forest reserves.

Martín, Medrano and Sánchez (2005) had previously reported the relative difficulty in screening for gifted children in the school system in the Yucatán. This study does not only corroborate the above, but also emphasizes the lack of attention and services for the gifted in the Mayan zone.

Although standardized tests were also used, there are some caveats to their utility and limits to the interpretative value of these instruments considering contextual factors. For example, these children had no previous experience in responding to standardized tests and in many cases, conditions to carry out the test were not optimal. While teacher perception overvalues child potential, testing underscores their ability. For example, these children score lower than expected in scales such as the reasoning scale, theoretically free of cultural influences. Hence, caution must be exercised using tests elsewhere developed but with weak psychometric properties and poor reliability in this population as argued by Sanchez, et al. (2003).

The scientific study of the gifted in Mexico, particularly in the bilingual rural zones is emerging. The challenging task of discovering talent and giftedness awaits further research efforts.

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**CHAPTER TEN**
**Talent Development in Peru**
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**Broad description of Peru**
Are the Peruvians heirs of a hidden-talent tradition? This is the question that arises after visiting Macchu Picchu, or any of the archaeological testimonies of the high achievements mastered by Ancient Peruvians. The following historical analysis may clarify this question.

*Historical milestones in talent development*
From an historic point of view, high ability has a long past but a short history, as Tannenbaum (2000) stated by the end of the last century, and this condition is also applied to talent development in Peru. The comparison between the worldwide recognized achievements of Ancient Peruvians and the actual technological production provokes a cognitive dissonance. However, the analysis of these origins, a little explored and less documented topic will facilitate the understanding on the social representations of the talent children and youth in the actual Peruvian society, as seen in Table 1.

Table 1. Antecedents of the value related to talented individuals in Peruvian history

| Historical Era | Talented individuals | Representatives |
|---|---|---|
| Inca Empire (1414-1524) | Blood royal elite (Orejones de sangre): Represented a concerting leading class of talented individuals. Gifted people were not valued following their initiative, but in the fulfilling of divine mandate. Old people represented a privileged sector. | The Inca: The personification of divinity. He was perceived as the most gifted and talented individual. The Incas Pachacútec, Túpac Yupanqui, and Huayna Cápac, were the most representative. |
| Spanish Conquest (1524-1532) | Diminishing of the Inca perception of talent development. Memory and factual knowledge was prioritized, over reasoning and creative problem solving abilities. | Silencing of local and native talented people, who were born in the conquered territories. |
| Spanish Viceroyalty (1532-1821) | Repression of high abilities in creoles, mestizos or native Indians. This situation was dramatically worsened during the Bourbon Reforms (XVII century), when creoles were excluded from every public activity. | Inca Garcilazo de la Vega (1549-1616): literary writer who in his mestizo condition achieved European recognition. |
| Republic Era (1821-1920) | Beginnings of the Republic: Intellectually talented individuals hired in public affairs, such as Congressmen. Visual and music talents were not recognized | Castilla Presidency: First identification program for the intellectually talented young men, who were sent to England and France. |
| | 1983: Official definition of the gifted and talented children and their psycho-educational needs. The Norm provided the political framework to begin scientific studies related to the highly able. 1988: The first public after-school program for the intellectually talented children was launched in Lima (PAENFTS), followed by the Alfred Binet school in Arequipa. 2001: Identification and Attention programs were spread in the public schools all-around Peru. 2010: The first public boarding High School for the Intellectually Talented, serving 800 students was launched. | Gonzáles (1992): Identification of the talented youth in the Southern city of Tacna. Blumen (1998): First Teacher Training program in Gifted Education (ECHA Diploma/Mente Futura Foundation/Ministry of Education). Blumen (2000): Identification and attention programs for the intellectually highly able in Elementary public schools. Blumen (2005): Inter-disciplinary Research group Creativity, Technology, and Talent founded at the PUCP. Blumen (2008): The PUCP model for Talent development was launched at the VII Ibero-American Conference held in Lima-Peru. |

Jose Antonio Del Busto (personal communication, May 24, 2004), who was one of the most important Historians about the Inca Empire, stated that the Inca culture (1414-1532) established a blood-related leading class, possibly including the highest talented individuals of the Inca Empire, known as the *Orejones de Sangre*: The Army Chief, the Priest Chief (Valcárcel, 1981), and the Chief of the Teachers/*Amautas* (Pease, 1981). Each Chief was selected by the Inca, in order to achieve a goal, being highly recognized while achieving his duty, but severely punished if he could not reach the assigned goal. The most talented individuals were designed for those activities, although the selection criteria cannot be identified yet. It seems that either education or birth-right was determinant, and Ancient Peruvians considered them as superior human beings (Del Busto, personal communication, May 24, 2004).

During the Inca Empire, formal education was founded by Inca Roca, and was spread by Pachacútec, the ninth Sapa Inca. Education was designed for the royal elite and for the sons of conquered chiefs, and its goal was to train children and youths to become good administrators and leaders of the Empire. The teachers, so-called *Amautas*, mastered philosophy and morality, used punishment, and a vertical educational system. The curriculum included mathematics and astronomy, in order to maintain an economy system based in agriculture. Moreover, learning Quechua was mandatory due to political and educational reasons. Although each royal male was born with a mission, he needed to proof his value, achieving the divine mandate. In this sense, there was no place for the *caudillos* in the social representation of the population. The Inca was the only human seen as the personification of the divinity, and was considered the most gifted and talented individual among the population. Hence, during the Inca Empire, gifted and talented representation was similar to classical European tradition in which talent was considered to be a gift from the divinity or from nature in the form of exceptional cognitive abilities, and appreciated as a national resource to be developed for the benefit of the community.

Later, in the XVI century, during the Spanish Conquest, Western European conception of talent (i.e. factual knowledge and memory) was prioritized, and the native-Inca conception of human talent (i.e. reasoning and problem solving) was diminished. This situation was dramatic along the Bourbon Reforms (1713-1806) in the XVII century, when *creoles* - Spanish sons born in American territories - were excluded from the public activity. Since then, there was a clear tendency to diminish the talent of those born in the Spanish American Colonies. However, there were exceptions such as Inca Garcilazo de la Vega (1549-1616), a highly-talented *mestizo* - mother Inca royal/father Spanish -, considered as the greatest literary author of the Colony, who inspired European authors such as Voltaire and Rousseau, as well as American Revolutionaries, such as Tupac Amaru II (Sánchez, 1981).

The main educational goal along the colony was to Christianize the native Peruvians and transform them into loyal subjects. They began re-educating the native adults and providing instruction to the children and youth, indoctrinating and educating them in the rudiments of Western European social life. This was called *Elementary education*, as there were other institutes, such as the *Universidad Nacional Mayor de San Marcos* (founded on May 12, 1551), which was accessible to those of the aristocratic class, and to people with political and economic power. The *Middle schools* were founded to educate the creoles, *mestizos*, and some wealthy merchants. Moreover, the *College of Chiefs* was founded to give instruction to the sons of the Inca descendants – native Indian Chiefs -, established in 1536, and abolished by Simon Bolívar. However, neither the middle-lower native population, nor the women had access to formal education. Along the Spanish Conquest and Viceroyalty, education was mainly Roman-catholic religious oriented, and ran by religious orders.

It was in the XIX century - during the Republican Er a- that President Castilla (1797-1867) developed the first official proposal to identify Peruvian talented individuals. He developed a program to identify the most talented university students, and granted them with a fellowship to follow their studies in England and France. Also, Alexander Von Humboldt stated that the members

of the *Mercurio Peruano* newspaper (1790-1795) were talented people that exhibited cultural, scientific, and social development similar to their European colleagues. However, this situation was an exception considering the exclusion of the talented people who could not held political or public positions, mainly due to their ethnic background. Hence, people such as Pedro Ruiz Gallo, Arnaldo Márquez, and Alcides Carrión could not be recognized in their time. Along this period, the productions recognized as *extraordinary products* were reinforced, but the *potential to create* was not recognized as such (Guerra, personal communication, May 25, 2004). Moreover, visual-arts and musical abilities were not officially considered as talents, but as forms to demonstrate love to the divinity.

During the nineteenth century and until the beginning of the twentieth century, high ability was associated with geniality and other internal factors. As societies progressed, it became increasingly necessary to develop models of high ability which included contextual factors, and not only personal characteristics. Nowadays, education for the talented children and youths is a national concern in most countries, as well as a need for their own development (Passow, Heller & Mönks, 1993; Heller, Mönks, Sternberg, & Subotnik, 2000). In the past 30 years, as the possibilities to achieve universal education have increased to include much of the population of the world, scientific studies on talented individuals have also increased.

Hence, Peruvian Contemporary Era is marked by the Education Norm launched in 1983 that recognized and defined the talented individual as "… the special girl or boy that exhibits high abilities that significantly surpasses the normal level of intellectual functioning, and that needs special programs in different modalities…" (Ministry of Education, 1983). This norm (a) promoted advocacy toward the talented needs with gender equity, (b) underlined the importance of identification and talent development in the educational setting, and (c) established the foundations for the psycho-educational attention involving teacher training programs and school activities for them (Blumen, 1999a). However, along the 1980s, political conditions and educational priorities changed, and a quarter of century was needed to eradicate misconceptions and to establish better conditions for talent development in Peru.

### Location and educational system

Peru, the third largest country in South America bordering the South Pacific Ocean, is a land of contrasts. High mountains configure the Andes Cordillera, dense tropical forests shape the Amazon jungle, and barren deserts along the coastal area; all are found in close proximity. It is a multicultural and multilingual country located on the Midwest and West of South America, which has achieved an impressive degree of education coverage and gender equity compared to similar areas of Latin America with heavy indigenous presence (World Bank, 2007). Moreover, coverage levels are high compared to what one would expect based on GDP per capita.

Since 1837 the educational system in Peru is run by the Ministry of Education on a central system style, which formulates, implements, and supervises the national educational policy of the country. Following the Peruvian Constitution, education is compulsory and free in public schools, along the Early/Initial, Primary, and Secondary levels. It is also free in public universities for those students who cannot pay the tuition but exhibit good academic performance. In 2008, UNESCO, the World Bank, and the Inter-American Bank of Development established Peru as having the best education system in Latin America, showing the highest education attendance rates. The quality of education in the country is promoted by law (No. 28740) by the National System of Quality, Evaluation, and Certification (SINEACE), through the establishment of operating organizations which accredit the educational quality from basic education to technical schools and universities.

In the Peruvian educational system, early years/initial education starts at the age of three, in order to provide cognitive and affective learning enrichment along child development. The main goal is to promote the development of the children together with internal (parents) and external (teachers) agents in centers based on free play. Primary school is related to the first level of education, and covers from 1st to 6th grade, divided in three cycles: cycle one (1st-2nd Grades), cycle two (3rd – 4th Grade), and cycle three (5th – 6th Grades). The system involves a decision-making process in which parents make the decision to send their children to a public or private school. After finishing 6th Grade,

students go to Secondary school which starts in the equivalent of 7th Grade, so-called Secondary I in the Peruvian system, and runs until Secondary V, after which the students exit the regular school system, as seen in Table 2.

Table 2. Common patterns for education in the public sector

| Minimum Age (yrs.) | Grade | Demographics | **Educational Level** |
|---|---|---|---|
| 3 | 3 year-old-program | 1 264 677 (*) | Initial/ |
| 4 | 4 year-old-program | | Preschool |
| 5 | 5 year-old-program | | |
| 6 | 1st Grade | 3 754 547(*) | Primary school/ |
| 7 | 2nd Grade | | Elementary |
| 8 | 3rd Grade | | Education |
| 9 | 4th Grade | | |
| 10 | 5th Grade | | |
| 11 | 6th Grade | | |
| 12 | I Secondary | 2 598 379(*) | Secondary school/ |
| 13 | II Secondary | | Secondary Education |
| 14 | III Secondary | | |
| 15 | VI Secondary | | |
| 16 | V Secondary | | |
| 17 | 1s t- 2nd Semester | 662,687(**) | Undergraduate |
| 18 | 3rd – 4th Semester | | Studies/ |
| 19 | 5th – 6th Semester | | Bachelor Degree |
| 20 | 7th – 8th Semester | | |
| 21 | Professional Practice | | |
| 22 | 1st – 2nd Semester | 23,412(**) | Master Degree |
| 23 | 3rd – 4th Semester | | |
| 24 | 1st - 2nd Semester | 7,563(**) | Doctoral Degree |
| 25 | 3rd – 4th Semester | | |
| 26 | 5th – 6th Semester | | |
| 27 | 7th – 8th Semester | | |

(*)Demographics taken from the website of the Ministry of Education
(**)Demographics taken from the website of the National Assembly of Rectors

Higher education involves two modalities. On the one hand, students may apply to public or private technological colleges, which offer technical professions involving three years (approximately 3,000 hours) of study, giving the student the title of *Professional* in a certain domain. On the other hand, students may attend university studies, after passing the entrance exam, and leading to undergraduate (Bachelor degree) and post-graduate (Master and Doctoral) studies.

However, there is still a gap between coverage and learning since Peru is producing large numbers of high-school graduates with poor cognitive skills. Scientific studies have shown that (a) schools in rural areas are associated with less average knowledge of pupils; (b) there is a correlation of malnutrition and low achievement at school; and (c) income shows a positive correlation with education. This situation may create a crisis of expectations since this high level of educational inequality is not explainable in terms of Peru's overall economic inequality, but has to do with (a) poverty and socioeconomic issues; (b) school and classroom management, and pedagogy, having norms and standards; and (c) ethnic and gender disadvantage.

Peru spends about 3 percent of its GDP to support education through public expenditure, but this proportion is not benchmarked as its value is relatively meaningless without reference to what is "produced" in exchange for the expenditure. Following the World Bank 2007 report: (a) personnel expenditure is high; (b) a reasonable goal or benchmark is somewhere in the range of 65 to 70 percent, although Peru is now at 75 percent; (c) total current expenditure is going up from 86 percent of total expenditure a few years ago to 93 percent in 2004 and 90 percent in 2005, and should come back down to 86 percent; (d) the ratios of spending per student as a proportion of GDP per capita are fairly low, but the proportions among these ratios are approximately right; (e) education expenditure as a proportion of GDP is essentially static at about 3 percent of GDP.

Having developed a significant literature based on empirical studies, the main constraint to improve education in Peru is neither more research nor more policy analysis, but to rank policy prescriptions in terms

of potential cost-effectiveness based on research. In this sense, few studies focus on the management and institutional economic issues that will have to be resolved if the problems are to be confronted. Moreover, there are few successful and well-evaluated experiments that put the key policy recommendations to work and show unmistakable, large-scale, systemic improvements in learning achievement. Although it is known that there are schools that produce good results, despite their clientele is poor, there are few credible models of systemic interventions that truly work in driving cognitive development among those living under poverty conditions.

Moreover, the official documents tend to underemphasize issues related to standards, and to emphasize resource provisions, narrower curricular matters, as well as ambitious styles of pedagogy related to superior cognitive abilities in the official curriculum. Official recommendations on policy actions tend to be qualitative, but not quantitative goals, with the exception of those referred to funding issues. However, specialists coming from think-tanks and academic settings tend to emphasize the need of standards and accountability, establishing a disagreement between research and policy recommendations. Therefore, the most significant difficulty that remains is related to clear policy agreements on the variables affecting learning, as well as implementing solutions coming to agreement on standards, management, accountability, and the needed spending. In this sense, the development of stable management teams is needed in order to lead the implementation effort over the following years.

## Peru, a competitive country

Peru climbed up five positions in The Global Competitiveness Report 2010-2011, presented at the World Economic Forum in Switzerland, the most important and prestigious comparison done on a global scale about competitiveness in 139 countries (Espresso, 09/09/2010; WEF, 2010). It is a good comparison measure about how Peru is doing as a country, and which elements are in need to be attended in order to gain competitiveness

and maintain a sustainable development. This is good news, since during the past twenty years Peruvian macroeconomic stability has been strengthened, and it needs to be maintained. Moreover, the efforts done are being recognized by the international cooperation, and places Peru in a better position compared to former years: from position 83 in period 2008-2009 to position 72 in period 2010-2011 (WEF, 2010). However, Peru is still beyond its closer competitors in global economy, such as Colombia, Mexico, Brazil, and Costa Rica.

Education is one of the areas showing neither improvement, nor backup. This is particularly dramatic since Peru is still exhibiting low achievement in basic reading and writing comparisons. In this sense, there is concern among professionals, researchers, and educators (Blumen, 2010), who are continually stating that although Peru has shown a significant economic growth in the former years, and has passed the economic crisis, this growing will not be sustainable unless pending reforms related to education are applied. This statement is of utmost importance in education and innovation.

Nowadays, Peruvian human capacities, which constitute the most important national resource of the country, are non-sufficient to satisfy the application of the national programs. Following indexed international scientific publications, there are no more than 1,000 Peruvian researchers who are active in duty and exhibit international accreditation with doctoral degrees, both in the country and abroad. From them, 40% work abroad, and many of them are leading research projects in developed countries. However, the total amount of human resources in science and technology, considering all the professionals and technicians in natural and exact science, as well as in engineering and technology, independent of the activity they realize, correspond to the 24% of the total national resources with superior education.

This situation is also related to the fact that very few university programs exhibit international accreditation, and only 10% of the postgraduate students finish their dissertation thesis. In this sense, international cooperation

is having a significant role in the support of postgraduate formation. Moreover, the consolidation of international networking among research centers is of utmost importance for searching excellence in the postgraduate programs. It is being considered a priority at the Peruvian National Council of Science and Technology due to its role in the improvement of the quality of the academic programs, as seen in the partnership with Brazil, China, France, Israel, Mexico, Spain, The Netherlands, and the U.S., among others.

Taking into consideration actual Peruvian reality, there is a need of an integral human development approach, understood as the material and spiritual realization of the people, broadening their capacities and rights in order to fulfill their potentialities, promoting the regional and local development, the social responsibility of the enterprises, and the reduction of the social exclusion, valuing multiculturalism with gender equity.

In this sense, there are many confluent efforts in order to establish a synergic alliance between enterprises and research groups for technological development, which is consolidated as a dynamic innovation system with the intervention of public organisms. Moreover, participation of the civil society is welcome, through efficient participation mechanisms in order to identify local needs. Following these considerations, social sciences have a strategic importance since they permit a better prospective comprehension of the economic, political, cultural, and managerial activity of the society in the present context of globalization and international competitiveness. Moreover, they give value to the ancient cultural roots, and contribute to link local knowledge with the dynamic of the society of knowledge.

One of the most important national goals is improving the teaching of science and technology in basic education in order to promote a culture of creativity and entrepreneurship. In this sense, there are action lines which involve the congruence among pedagogical contents in school and university settings, as well as the socialization of scientific knowledge among school and university levels promoting continuing education for teachers, professors, and researchers.

Since a quarter of century ago, the Catholic University of Peru constituted itself as the laboratory of different initiatives with scientific basis (Blumen, 1995). It leaded the need for the promotion of creativity and talent development in the different areas of knowledge in order to improve Peruvian competitiveness and to promote international accreditation processes (Alencar, Blumen, & Castellanos, 2000; Blumen, 2001). Nowadays, conferences about creativity and talent development are being multiplied from the school setting toward the organizational setting, and phrases such as "…school kills men's creativity"(Torrance, 1974), or "… creativity was considered a divine gift" (Tannenbaum, 2000), are often stated. Moreover, "intelligent creativity" (Waisburd, 2004), a term initially appointed for creativity applied to artificial intelligence processes, is also being used in relation to the marketing industry.

After several decades of sustainable efforts developed by both educators and psychologists in order to promote creativity in the global educational context (Renzulli, 1978; Mönks & Van Boxtel, 1985; Mönks,Ypenburg, & Blumen, 1997), it was not until these ideas were shared with philanthropists and experts in technology, entertainment, and design, that the impact was sealed (TED, 2006). Hence, after specialists such as Sir Ken Robinson (2006) underlined the need to promote the development of creativity in the school from the podium of the TED 2006 conference, the idea was not only adopted by the global audience, but also arrived Peru as the main topic of the TEDxTUKUY 2010, organized by the PUCP (2010).

However, there is still the need to prepare children, youths, and adults toward an uncertain future (Blumen, 2009), as Eric Hoffer stated in 1963: "In times of changes those who are open toward learning will own the future, while those who believe to know everything will be well-equipped for a world that does not exist any longer". It is probable that half a century ago some people thought he was exaggerating, but today his words are dramatically challenging.

Although Peru has significantly advanced in the promotion of the global market and international investment, which supports natural resources and manufacturing industry, it still has a pending debt with activities

based on knowledge, those that significantly support the generation of human capital in learning and innovation (Blumen, 2002).

However, the Peruvian educational setting has not been able to mark a distance from repetitive processes, where memory and fear toward failure are still held (Alencar, 2008; Blumen, 2008a). It is dramatic that Peruvian public schools cannot constitute yet centers in which opportunities for critical thinking are multiplied (World Bank, 2007).

In Peru, the main elements which interfere with the talent development of girls and boys are related to socialization processes which start in the family setting, and consolidate in the school and then in labor settings, where: (a) the fear toward failure (i.e. "…do not commit mistakes", "…put all your effort, and do not make mistakes…"); (b) social desirability (i.e. "… do this as I say…", "…now is time to work, think later in your free time…"); and (c) negative self-perception about her/his own possibilities (i.e. "…nobody in my family is creative, so how I am going to be creative…") are sensibly diminishing the possibilities of giving themselves the opportunity to create (Blumen, 2009; Treffinger, et al., 2007).

Moreover, rigid norms and rules, condition school placement, and establishing chronological age but not ability level, are the regulators of final placement decision. Therefore, Peru as a country is condemned to have boys and girls creativity chained until the end of their schooling. Hence, it is of utmost importance that policy makers consider the need to prepare our children not for the Industrial Era (Rajadell, Marimon, & Garriga, 2006), but for the global competitiveness, in which the promotion of creativity from family and school settings is determinant to improve our competitiveness as a country.

**Screening for the gifted and talented**
Since the birth of Psychology as a science, psychologists tried to understand the highly able following their intellectual abilities (Galton, 1869/1976; Terman, 1954). However, taking into consideration the one-dimensional conception of intelligence, operant until the beginning of the XX century,

intelligence was to the conceptualization of high ability as the intellectual coefficient was for the development of intelligence as a construct: variables that limited their understanding (Blumen, 2001b, 2007a). Later, Guilford (1959) and Cattell (1971), among others, stated that intelligence could not be understood from a one-dimensional approach, and that a multi-dimensional conceptualization was considered, involving abilities, aptitudes, personality characteristics and environmental conditions. This situation also influenced the conceptualization of high ability as a construct, and is particularly significant in the study and practice with the highly able living under multicultural influences, in which the mastering of the dominant language, gender equity, malnutrition, and the exposure to western culture might sensibly bias their performance on psychometric measures (Blumen & Cornejo, 2006).

In the Peruvian scientific literature there are important efforts related to the identification of the gifted and talented attending public schools and universities. In 1972, the National Council of Peruvian Universities issued Resolution No. 776, by which the best first and second student graduating from every public school or public technical institute might apply for a fellowship in any public or private university corresponding to the geographical region of the school, without needing to pass the admission exam. Since 1983, the University Law No. 23733 included the top two students from private schools, and since 2000 the ranked top 10 universities of the country established a special entrance procedure for the upper 75% of each class. There are several studies on the impact of this measure, among them Pereyra (1987) which showed positive impact on the highly talented students of the National University of Engineering, which has broadened the entrance system to other universities nationwide.

On January 15, 1983, by Supreme Decree No. 02.83-ED, the Rules of Special Education were given, involving two articles that benefited gifted and talented children: (a) the exceptional child due to outstanding abilities that significantly surpasses the average of normal intelligence needs special programs in different modalities; (b) a student subject to special education

has the right to: (i) be accepted in the Center or Program of Special Education without any discrimination or in the Centers or Programs of the different levels and modalities of the Educational System, according to the achieved performance; (ii) receive an integral education in the different levels and modalities which permit her/him the effective incorporation in the society, mainly in the labor field; (iii) be treated with dignity and fondness, respecting her/his individual differences; and (iv) receive freely the educational services in the Public Educational Centers and Programs.

In 1988, the National Council of Science and Technology/CONCYTEC proposed the need for a talented detection program in order to secure the scholarships granted to students of low financial resources. The creatively talented child was defined as: …the person with high levels of creativity, good tolerance to frustration, highly level of self-esteem, good sense of humor and a steady structure of personality" (CONCYTEC, 1989). Therefore, a battery of tests was developed in order to assess the intellectual, creative, socio-emotional and personality aspects of these children. Initially, the following diagnostic criteria were considered: IQ higher than 127 (WISC-R), high scores in the creativity test and a stable personality structure (Eysenck Inventory of Personality). Although there was a nationwide request for parents, few parents responded and none of the children who were evaluated fulfilled the diagnostic criteria. Therefore, it was decided to take into account only the intellectual criterion (IQ > 127), but the 28 identified intellectually talented children never followed a special program due to funding difficulties within CONCYTEC.

In 1989, The Unit of Educational Services-No.15 took charge of the program supervision and the study was continued with 16 children. The project was carried out on a weekly basis in a school of the USE 15 jurisdiction. During the years 1989 and 1990, the process of detection was continued and succeeded in selecting 40 children. Toward 1991, the program included 100 children, but due to lack of funds, the number of participants was reduced to 50 and the selection process was suspended. At that time, the timetable was modified to daily basis as an extracurricular activity, including Saturday mornings. Later, in 1992, the detection process was started again, using the same selection criteria of 1986. The program was oriented toward the gifted and talented children ranging from 5 to 12 years old who belonged to the public schools of the jurisdiction. The goals of the program were: (a) to extend the coverage of the educational services for the very able children; (b) to extend the curriculum according to individual characteristics; (c) to develop training programs for psychologists and teachers in order to improve the quality and efficiency of the educational services; and (d) to broaden screening programs toward every public school of Lima City and its jurisdictions.

The stages in the execution of the program were: (a) the public school teachers referred two or three children from their classroom that fulfilled the characteristics on an observation scale; (b) referred children assessed with two tests (PPVT and CPQ-Cattell), and those that exhibited rapid learning ability were placed in the superior category. Then, the WISC-R was administered and those who obtained IQ$\geq$130 were selected; (c) finally, a complete psycho-educational battery was administered using a matrix criterion, according to the children age and IQ, for the placement process. All the programs were lead by psychologists. The program evaluation involved: (a) pre-post assessment, at the beginning and at the end of each academic year; (b) bi-monthly evaluation registered qualitatively, indicating goals achievement by a nominal rating system; and (c) a follow-up study was carried out after two years assessing the students' goals in the program. Results showed that the children were good students in their regular school classes, although they were not the best academic achievers.

Officially, the main difficulties facing the program were related to financing both, the physical infrastructure and the testing materials, but no information was registered in relation to the long study hours children had to be exposed to during the after-school activity. This situation was strongly criticized by parents and teachers because it seemed that children were punished with extra work due to their intellectually talented condition. Later, as advocacy toward the gifted was increasing, Ruiz (1991) did a descriptive study about the personality traits of highly able girls,

and Gonzales (1991) developed an intervention program for the intellectually talented Secondary students of the Southern border city of Tacna.

At the beginning of the 90s, scientific research on the identification of gifted and talented children was consolidated within the Inter-disciplinary Research Group *"Creativity, Technology, and Talent"* of the Catholic University of Peru, with the funds of Mente Futura Foundation, and the support of the Center for the Study of Giftedness at Radboud University Nijmegen, in the framework of a doctoral dissertation about high ability in Lima (Blumen, 2000). Since the beginning of the cooperation in 1991, there was a dual work concerning identification processes. The establishment of advocacy toward the needs of the gifted and talented with the officers from the Ministry of Education, and the need to build a scientific body of empirical data in relation to the gifted and talented in Peru.

Along the 90's, identification processes were focused on the selection of the academically talented, and the rejection of the non-talented. Hence, the question was mainly: "…to be or not to be talented" (Blumen, 2000). In the the decision-making process, it was aimed to diminish the chance of committing a *b*-type mistake. At the same time, the efficiency and efficacy indexes were calculated to understand the process. Most of the identification programs were based on the internal triad of the *Multi-Factorial Model of Giftedness* (Mönks, 1992) because it had a flexible character, and was oriented to enrichment strategies inside the regular classroom in public school settings. In Peru, where there is still a lot to do in the highly able identification process, it was necessary to first develop the adaptation of adequate instruments to evaluate specific talents such as verbal and mathematics, which are basic to school learning. Also, it was important to establish norms for the existent tests. The instruments mainly used were the Portfolio Method, the Test of Creative Thinking-Drawing Production/Form b, the Raven Progressive Matrices Tests (CPM and SPM), as well as the Cognitive Abilities Test/Form 5 (Blumen, 2000). Usually, control variables involved grade placement, teacher qualifications, type of school and whether or not the students were receiving the complementary nutritional diet.

### Multicultural assessment

Are identification practices scientifically based, fair and unbiased? Financial pressures from managed care interests, educational policies, and multicultural issues are forcing psychologists and educators to face these questions. Economic, cultural, legal, and scientific forces are causing profound changes in psycho/educational assessment practices because the financial pressures of managed care services, educational institutions, and private foundations have altered the identification practices of many psychologists and educators. Moreover, recent developments in the law are encouraging the critical examination of identification techniques that are used in clinical and educational settings. Furthermore, the ethnic composition of Latin American countries present new challenges to old practices, since children belonging to Quechua, Aymara or Amazon communities tended to be chronically under-represented in programs that promoted talent development.

Forces from both inside and outside the field are posing hard questions: Are psychologists' assessment fair and unbiased? The answers may reshape both, the science and the practice of the identification of the talented living in a multicultural environment. Although the ethnic composition of Latin American countries is rapidly changing, there are still countries such as Peru, Bolivia, Ecuador, and Brazil where the multicultural and multilinguistic condition still prevails, involving more than 40 vernacular languages spoken in the Amazon region, out of the Aymara dialect and the different versions of the Quechua language spoken in the Andean Mountains.

Advocacy toward the identification of the gifted in multicultural settings has grown among academics and practitioners. Nevertheless, the quality of research continues to be far behind what is needed. Studies about the South American talented individuals are scarce for the popular assessment techniques used, such as the Torrance Test of Creative Thinking, the Millon Clinical Multiaxial Inventory (MCMI-III), the Rorschach Psychodiagnostic Test (Exner's Comprehensive System), the Thematic Apperception Test (TAT), the MMPI-2, and the projective drawings, among others. There is also a need to examine possible differences in the

validity of testing scores across diverse cultural and linguistic groups. Facing the scarce of reliable and valid tests for multicultural population, there has been the emergence of new approaches to assess factors such as intrinsic motivation through productivity level with the Portfolio Assessment technique (Blumen, 2001), and creative performance both through drawing production, such as Urban & Jellen Test of Creative Thinking-Drawing Production/ TCT-DP (Blumen, 2002, 2003), and through verbal inquiry, such as the CREA test. In recent years, the Children's Achievement Intrinsinc Motivation Inventory (CAIMI) was also considered (Blumen et al., 2004).

The normative studies of neuropsychological tests by Ardila and his colleagues (Ardila et al. 1994), as well as studies with the Raven's Progressive Matrices in different countries (Esquivel, 2000; Thorne & Blumen, 1996), and the normative studies with the TCT-DP (Blumen, 2003), were significant in the assessment of the talented living under multicultural influences in South America. All those studies have systematically identified moderating variables, such as educational level better than chronological age that should be taken into account in the assessment of Latin American talented children living under multicultural conditions. Another important development has been the publication of several acculturation scales that are suitable for multicultural spaces (Stephenson, 2000). Recently developed instruments all conceptualize acculturation as two separate dimensions rather than a single bipolar dimension. Acculturation is important in clinical work because, among other reasons, it sometimes moderates the validity of test scores (Cuellar, 2000). Considering the suggestions made by Ardila and his colleagues (2000) about assessment in clinical settings, whenever we want to identify giftedness in a multicultural context, it is important to routinely assess the person's level of acculturation, linguistic preference, age and educational attainment, and then choose the instruments and norms that are most appropriate (Blumen, 2003).

### Identification of the talented in multicultural settings

Important insights can be drawn from research on the identification process of the talented in multicultural settings in recent years. Many of the results point out ways that can become more reliable and valid. First, results from recent studies indicate that agreement between identification made by health professionals (pediatricians, neurologists and psychiatrists) in the course of their work and research diagnoses based on full battery assessment ranges from fair (*kappa*=0.57) to good (*kappa*=0.85). However, the agreement between identification made by non-trained teachers or parents and research diagnoses ranges from poor (*kappa*=0.24) to fair (*kappa*=0. 53) (Blumen et al., 2004). Results improved with teachers trained in talented education.

Second, it appears that under certain circumstances clinicians tend to establish a link between certain pathologies and talented people, perceiving them as very psychopathological. In some cases, the tendency to establish pathologies against the talented individuals has been due to the inadequacies of popular psychological tests (Blumen et al., 2004).

Third, important results have been obtained regarding the effect of bias on diagnoses. Agreement between clinical diagnoses and research diagnoses has not been significantly different in terms of gender. However, it is sometimes different for ethnic groups: In a Peruvian study focused on the identification of the talented in multicultural settings, agreement between clinical and research diagnoses has been better for the Coastal sample (better for urban that rural areas, 57% vs. 48%), and worse for the Amazon than for the Andean children (*kapp*a= 0.43 and 0.45 for Amazon; *kappa*=0.55 and 0.59 for Andean) (Blumen, 2005). It is not clear why results on ethnic groups varied across studies. However, it might be related to the cultural differences in the conception of talented (see Table 3).

Table 3. Differences among the Western Paradigm, the Andean Cosmovision, and the Amazon Tribes related to the conception of giftedness (Blumen & Cornejo, 2004).

| | Western Paradigm | Andean's world view | Amazon Tribes' world view |
|---|---|---|---|
| Theoretical Framework | Evolutive and developmental theories. Process oriented. | Divinity, animism, naturalism. | |
| Giftedness as a construct | Involves multiple variables, both intrinsic and extrinsic to the individual. | Related to collectivism with a strong relationship with nature phenomena. | Strongly related to nature, with elements of collectivism and individualism. |
| Identification of the gifted | Based on Achievement and domain-specific Tendency toward diversity | Leadership through community recognition Knowledgeable on divinity issues Mastering survival skills. Ethnocentric and social factors. | |
| Determinants in the expression of giftedness | Environmental variables such as family, school, work and community | | |

Fourth, when referring to the talented living under multicultural conditions in Latin America, it is important to state that socioeconomic status (SES) might be related to this condition. Although several ways of measuring SES have been proposed, most included quantification of family income, parental education, and occupational status. Research shows that SES is associated with a wide array of health, cognitive, and socio/emotional outcomes in children, with effects beginning prior to birth and continuing into adulthood. Its effects are moderated by children's own characteristics, family characteristics, and external support systems (Blumen et al., 2004).

### *Clinical assessment*
Intellectually talented children usually tend to be assessed from a perspective which dissociates cognitive and emotional areas. Therefore, Blumen and Cornejo (2006) used tha Rorschach Projective Test as complementary to psychometric tests. Rorschach Psychodiagnostic Test supports integral comprehension between intellectual ability and fantasy-emotion, achievement and conflict, as well as between intellectual level and the use of her/his potential. Although a good intellectual functioning contributes toward further treatment of problems, this may not indicate emotional well-being, if it is serving defensive intellectualization, whether or not there is disposition toward insight, or if destructive tendencies prevail. The results found by Blumen and Cornejo (2006) with the Rorschach Psychodiagnostic Test described personality characteristics of the intellectually talented living under poverty conditions. Participants were 55 boys and girls (27 intellectually talented, 28 non-talented), ranging between 9 and 12 years old, previously selected for a former study. Results revealed that the intellectually talented children exhibited the following personality characteristics: (a) tendency to approach situations from personal reflections; (b) sophisticated emotional resources; (c) high levels of initiative and creativity; (d) tendency to perfectionism; (e) need to control situations; (f) unconventionality; (h) high levels of sensibility (i) oppositeness,

as well as (j) insight resources. They also exhibited characteristics expected in poverty contexts such as cautiousness and low level of self-confidence, high levels of stress and alert toward the environment, as well as tendency to depression. Hence, recommendations for intervention purposes were given, as well as the need to develop research lines to form a multidisciplinary approach.

As this review has shown, identification of the talented living under multicultural conditions is in the midst of significant change. New pressures are forcing psychologists and educators to demonstrate that their assessment techniques are cost-effective, scientifically sound, and culturally sensitive. Therefore, we offer the following conclusions:

The economic constraints on health, psychological services and education that characterize Latin American countries will not disappear any time soon. Psychologists and educators will be held accountable to show their identification techniques, and provide valid information. Some traditional identification techniques will have to be abandoned and new ones will be developed.

As the world population becomes more diverse, valid multicultural assessment will become increasingly important. For many years, multicultural issues have been regarded as peripheral to research and practice in clinical and educational assessment, or in certain multicultural countries. In the future, they will become a major focus of attention.

Developments in science are likely to introduce radically new and unexpected elements into the identification process, beyond those we have identified here. Research in the next decade should help explain how diversity operates through multiple mechanisms simultaneously affecting the developmental course, how those paths vary across ethnic and cultural groups, and how different components of socioeconomic variables conjointly affect different developmental systems.

## Talent development programs and educational services

Talent development is considered a right for the talented girls and boys in many countries, and Peru is no exception. Although, for many years, special education needs for the talented was in conflict between what was perceived as elitism and excellence. This situation changed in 1983, when the Law of Special Education established the existence of differences in the learning process, and characterized the function of the special education programs as open to all individuals, but differentiated in terms of their abilities and aspirations (Ministry of Education, 1983; Mönks, Ypenburg & Blumen, 1997).

Since the educational reforms of 1972, talent development programs were organized in an attempt to achieve the integral education of the students, and research on creativity, expressed through visual arts, began. In the first half of the 1970s, theoretical and methodological proposals were submitted and the Ministry of Education, in agreement with the then Federal Republic of Germany, carried out a project on Education for the Arts. Since 1978, the research carried out in Peru was mainly experimental and comparative. The relationship between variables such as the demographic and socioeconomic level and creativity were examined. Reategui CCAP Test (Test of Creative Capabilities in Visual Arts) was used as an instrument for evaluating creativity and for the placement in programs to promote children creativity.

In the 1980s, various mediating and conditioning processes were incorporated into the research. During this period, creativity was defined as a measurable rational function developed through constant and voluntary practice. In the middle of the decade, the first research with talented children was carried out. In general, the purpose of these studies was to detect very able children in order to help them become productive members of the society. Theoretical and methodological proposals aimed at achieving a complete use of the human resources to improve the development of the country.

At the beginning of the 1990s, research focused on those specific areas that contributed to creative ability. Proposals and methodological suggestions have been made regarding how creativity can be oriented and

expressed in different ways. A more practical tendency in the research has also emerged. Attempts have been undertaken to detect talented and creative students in order to help them in their adaptation, socialization and development, as well as to orient them toward improving the living conditions in their society, community and country. By the end of the 90s, there was a particular need to provide counseling support to the members of the International Math Olympic team, since the children and youth were coming from poor conditions and experiencing difficult life experiences. Since then, tailor-fitted counseling programs were developed for the mathematically talented youths who were under intensive training to compete at the International Math Olympiads (Blumen, 2008b), showing significant improvement in the former years.

Issues concerning enrichment programs have been developed, especially because studies on cognition established the importance of both, early stimulation and learning along the life span. Enrichment activities such as knowledge bowl, chess club, Model UN, debate, drama, music classes, math and science-related clubs are available at the private IBO schools (Alencar, Blumen, & Castellanos, 2000). Students also participate in the various talent search programs, such as science fairs, inventor's fairs, math competitions, among others, and can also compete or get together on international events. These programs are sponsored by universities in their own countries.

Another common procedure is clustering; especially for grades 1-5 (Costa, 2001). After the identification process, the students are grouped based on their ability, and the teacher receives training and special support in the characteristics of the gifted and talented, expected difficulties often found in talented students, as well as an introduction to methods that have been successful with the highly able. Clustering provides opportunities for the students to be grouped together with academic peers, although these programs seemed to succeed due to individual efforts. Special institutions such as universities, research organizations, museums, and other professional organizations are slightly becoming committed to support talent development (Blumen, 2008a).

Taking into consideration the need to integrate scientific research done in academic context with the professional work done at schools, Blumen (2000) developed an experimental study to analyze the effects of a teacher training workshop on creativity, cognition and school achievement. Results revealed that the use of standardized instruments and the involvement of well-trained teachers are required. Also the multidimensionality of the talented concept was supported, and assessment elements appropriate to rapid screening based on school achievement were established. The findings imply that school placement criterion should consider multiple indicators, and not be restricted to chronological age as the only valid indicator, but be flexible in terms of learning abilities. It seems that in Peru, chronological age is interfering in talent development, such as the intelligence quotient (IQ) interfered in human intelligence studies in the past century.

Moreover, the results found by Blumen (2000) revealed that: (a) figural-creative performance can be developed through a training process that involves well-qualified and well-trained teachers inside the regular classrooms; (b) there are negative consequences of the gifted not having an appropriate educational environment to develop since they tend to diminish their performance, apparently in an attempt of adaptation; (c) teacher understanding of the gifted has helped to promote their development. Evidence about the benefits of an enrichment program in a non-gifted population was also obtained.

In December 1997, the book *Nuestros niños son talentosos* (Mönks, Ypenburg & Blumen, 1997) was published as the first book in the country to call advocacy toward the needs of the talented, and to promote appropriate educational programs. In January 1999, the European Advanced Diploma in Educating the Gifted, sponsored by the European Council for High Ability, was started in Lima (Blumen, 2000). Peruvian candidates came from the religious and non-religious private (35%) and public (64%) sector. Nowadays, the trained teachers are working on a national basis to promote gifted education in Peru with the support of the PUCP (Blumen, 2001, 2002). Since 1997, 10,000 Elementary public school children have

benefited of having enrichment programs in their regular classrooms. Among them, approximately 500 talented children have received special attention, as well as their parents and their teachers.

In Peru there are a number of IBO schools that offer the International Baccalaureate Programs in English, French, German and Spanish, having excelled the girls-only British school of Lima in the international exams of the past three years. Those schools offered HGCSC and AP classes, as well as enrichment in science and technology. Usually, technology subjects which require high advanced laboratories are placed at university settings. Acceleration is not officially recognized as such, although it is being practiced in schools and universities, with very good results.

### Intervention decisions

Many psychologists and educators are unfamiliar with the scientific literature in therapeutic and pedagogical interventions. This is one reason why treatment decisions are sometimes inappropriate. The problem of inappropriate interventions is in part an assessment issue, and not only an intervention issue. It seems that some psychologists and educators make inappropriate decisions when assessing parents or teachers about the needs of their talented child, and formulating intervention plans. Studies in developed countries (Colangelo et al., 2004) and developing countries (Alencar et al., 2000; Blumen, 2003) are establishing acceleration as the most effective way to provide the challenge needed for talented children. However, health professionals, psychologists and educators, based on myths and popular misconceptions related to emotional and social negative effects, are failing in the development of administrative procedures to make this possible.

Intervention decisions might also consider in-service training for qualified teachers in order to support and monitor identification and attention programs for talent development. Teacher training impact is well-documented along a week boarding modality, and following the teacher training international diploma for educating the gifted (Blumen, 2001).

However, it is also necessary to consider that some training programs on talented education may encourage poor decisions by offering continuing education credits for a range of pedagogical techniques that have not been empirically supported (Blumen, 2001).

Another significant result on decision-making is related to ethnic bias. Ethnic bias has been observed on the recommendation of enrichment programs in Latin American countries (Alencar et al., 2000). This finding was replicated in a study between urban and rural poor talented children coming from multicultural settings in Peru exhibiting similar results (Blumen et al., 2004). There is a tendency to recommend verbal enrichment programs or enrichment through visual arts for the rural talented children, and enrichment programs in math and science for the talented living in urban areas.

Finally, there is still an unsolved issue which is related to the nature of the talented. If talent is considered as the ability to be informed to answer questions, then the talented in Latin American countries will be strongly attained to educational opportunities, which are scarce for the majority of children living under poor conditions. However, if talent is considered as the ability to know what questions to ask, then schools will become a place to learn how to inquire, and it may not necessarily be related to socioeconomic status, but to well-trained teachers and supportive parents. In the future of education, the ability to know what questions to ask will be valued since knowledge itself will be at hand.

### Perceptions, meaning of and handling talent development

There are still unsolved issues concerning several topics related to talent development, from the need of a comprehensive paradigm to more practical issues related to identification and intervention. First, the Spanish term mostly used to refer to the gifted is *superdotado*. Although accepted in Spain, in Latin American Spanish-spoken countries, this term involves a strong elitist connotation, generating antagonisms among experts,

teachers and peers, and leading to the rejection of the gifted. In this sense, Blumen (2007) results related to a study in social representation of the academically talented shows that misconceptions and stereotypes prevail in relation to talented individuals, since traits related to pathology and physical characteristics are still given, as seen in Figure 1.

Figure 1. Social Representations of the academically talented by a group of school teachers by teaching level (Blumen, 2007)
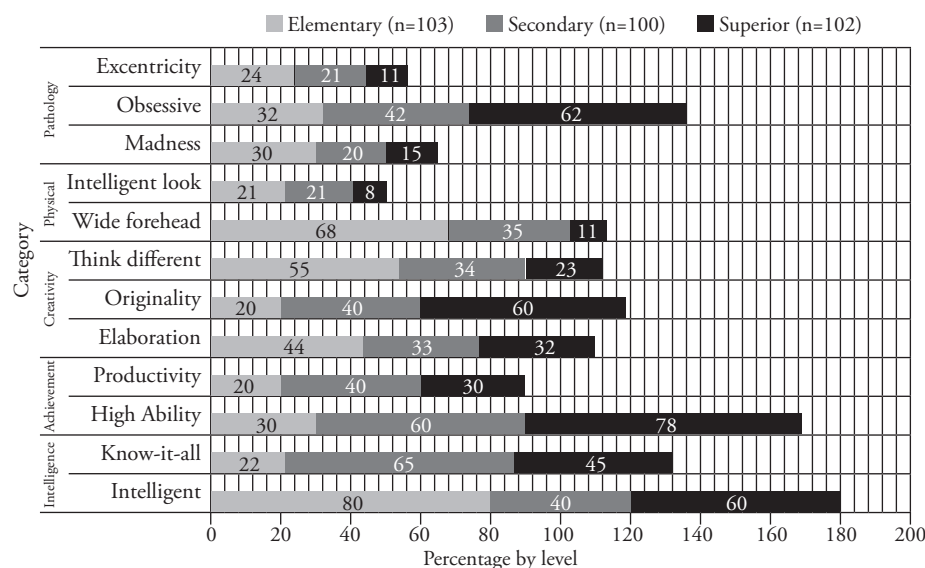


Second, in developing multicultural countries, such as most in Latin America, it is mostly necessary to consider environmental factors as a must in any definition that aims to explain giftedness or talent development. Furthermore, if we take into consideration (a) the importance of nutrition in school achievement and its relation to the development of cognition in the human being, and (b) the relevance of schooling, especially in poor and disadvantage areas (rural and shanty towns), and its relation to intelligence performance. Therefore, nutrition and schooling are factors that might be considered in any paradigm expected to explain giftedness and talent in this area.

Third, most Latin American talented adults that became creative and productive toward their communities although coming from very poor families, exhibit also important levels of resilience. Therefore, it would be important to study the relationship between resilience and giftedness in this region, especially under extreme poor conditions.

Fourth, although hereditary influence is important, in countries where there still exist big differences between the quality of public and private educational services, giftedness and talent would be more appropriate to be considered as a development expertise (Sternberg, 2000), dependent on environmental stimulation (Blumen, 2002).

Fifth, the legal framework to provide special services for the gifted and talented must be reviewed. In some countries such as Peru, the Law specifically prohibited *acceleration* in the regular schools, as well as *early entrance* to universities. It is very common to find in Lima news related to 13-14 year-old kids that have passed the entrance examinations of the most prestigious universities in the country. However, most of them have to wait 2 or 3 years to be accepted as students, and become frustrated in their willing to continue university education.

Sixth, topics about gifted education should be part of any initial training teacher program that aims to provide a quality education. Seventh, scientific theory should support any identification process in the different Latin American educational systems, which need to establish goals in terms of the pedagogical demands and the theoretical construct that supports the process. Eight, it is necessary to state the method which guide the process, since diagnostic decisions should be made on the basis of valid results, and not on the basis of subjective decisions. Ninth, the media tend to present wrong information related to giftedness, based on marketing goals, which contributes to reinforce misunderstanding and myths about giftedness.

Finally, due to the situation of poverty in which most of Latin American gifted children develop, they are vulnerable to two main risks: (a) being captured by so-called pre-university schools which offer them scholarships to

continue their studies, although pressing them to maintain excellent performance and continually exposing them to the media for marketing purposes; and (b) belonging to extreme poor families, their parents offer them to universities or institutions expecting economic benefits in return. This is the most dramatic situation for a talented child born in extremely poor families. Therefore, it is of vital importance to develop foundations based on scientific and ethical criteria that provide support to the talented girls and boys of Latin America. We, as specialists, have the professional, moral and ethical duty to develop safe and healthy environments to promote their development.

### The Templeton Fellowship

The Templeton International Fellowship granted in 2008, and the Templeton Award of 2010, both developed with the partnership of the Belin-Blank Center of the University of Iowa, was of particular importance for the Peruvian case. They supported an intensive training in 2008 to promote advocacy on gifted education in the country. They also developed an updated network on the psychology and education of the gifted that promoted a collaborative global work with colleagues from Brazil, Chile, the U.S., and The Netherlands, working on innovative ways to face different challenges in talent development. Moreover, it provided the framework to lobby the highest authorities in the country for the enhancement of talent development in Peru, leading to the launching of the Colegio Mayor Presidente de la República, a public boarding Secondary school for the academically talented poor children coming from all-around the country, as seen in Figure 2. Moreover, the media exposure in relation to advocacy toward talent development significantly improved in terms of frequency because of TV programs, Radio interviews, and the newspapers. Intensive networking along international events also led to the organization of two biennial International Seminars on Creativity, Technology, and Talent, as well as the 2008 Ibero-American Conference on Gifted Education together with the International Ibero-American Summit of Talented Youths. It also gave more public exposure to the topic of talent development, generating advocacy toward their needs (see Figure 3).

### Advocacy for talent development in South America

Advocacy toward the talented in South America is improving, and isolated efforts are becoming integrated into clear public policies that benefit the talented children. Beginning with Brazil, and followed by Peru, Venezuela, Colombia, and Argentina, a network of specialists on creativity and talent was developed by the last quarter of the 20th century. On their turn, each of them lobbied their respective Ministry of Education for changing the public policies. Moreover, at the beginning of the third millennium, Chile and Ecuador showed an incredible commitment to supporting talent development. In Chile, advocacy started at the Catholic University, where the Penta-UC program was developed. Today, several programs hosted at university settings are developed in different regions of the country. These programs are led by specialists trained in the U.S., Spain, and The Netherlands. In Ecuador, the Technical University of Loja is holding a center for the development of creativity. It is mainly focused on the virtual learning modality, and it is done with the support of the Spanish virtual university UNED.

Figure 2. Colegio Mayor: Exclusive Education?
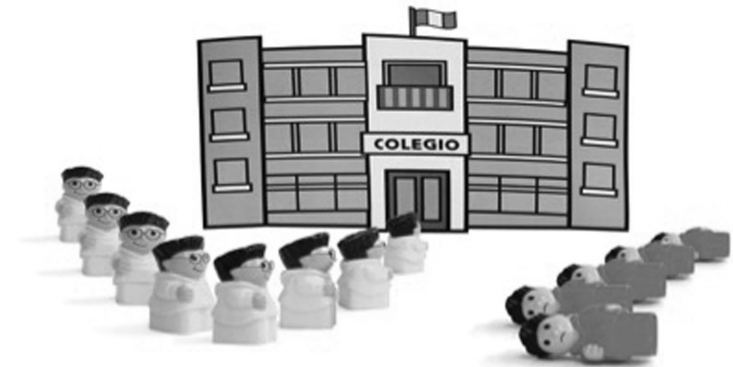
Figure 3.-Ibero-American Summit of Talented Youths



**Perspectives and future of talent development**

Peru is a multicultural and multilingual country that, although the limitations of its environment, has consolidated a significant body of scientific studies related to (a) screening and identification of the intellectually talented: involving studies that analyze the relation among determinant factors of academically talented in urban and rural areas, since preschool (Blumen, 1995) to adulthood (Blumen, 2008b), passing through schooling (Blumen, 2001); (b) psycho-educational intervention: involving explanatory studies about the impact of the inclusive enrichment programs in creativity and cognition (Alencar & Blumen, 2002); (c) teacher training and formation: studies that analyze the impact of the training programs in the development of creativity and talent in

students and teachers (Blumen, 2005), as well as with students along the enrichment programs executions in the schools (Blumen, 2000, 2005); (d) socio-emotional development: personality traits related to the highly mathematically talented who compete internationally were identified; (e) attitudes toward the girl or boy who is academically talented (Blumen, 2007): social representations about teachers in the different education levels (Blumen, 2007); (f) conceptualization of talent development from the Amazon and Andean world view (Blumen, 2008b, 2008c).

In order to provide areas to facilitate the emergence of talents along the different educational levels, taking into consideration the need to generate a human capital of excellence in learning and innovation in order to become globally competitive (see Figure 4), the project Creativity, Innovation and Talent (CIT) (Blumen, 2007b, 2008a) is proposed.

Figure 4.Competitiveness as decision of state in Peru (IBD, 2006; Blumen, 2007)
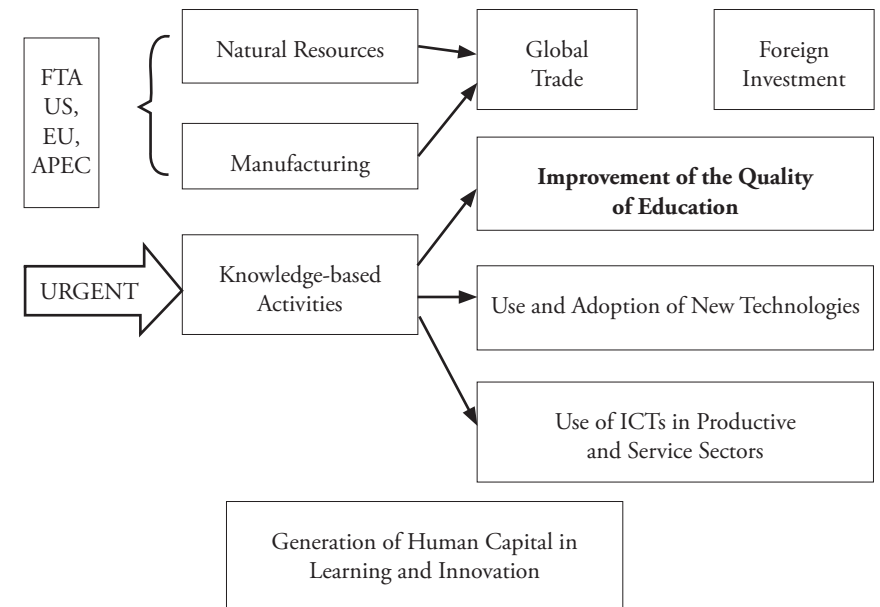
This project reorients intervention between the school classroom in Elementary and Secondary education, toward the public call to compete in tertiary education (university setting). This project is proposed in three intervention levels: university, secondary, and elementary. At the university level, a national competition is held to promote scientific, technological, education and humanistic research in the academy in order to (a) promote productive innovation in Peru, (b) contribute to the development of new technologies in the productive level, and (c) develop creativity and innovation in the population, with social responsibility (see Figure 5).

Figure 5. The CIT Project: activities and products by educational level and year (Blumen, 2007b).
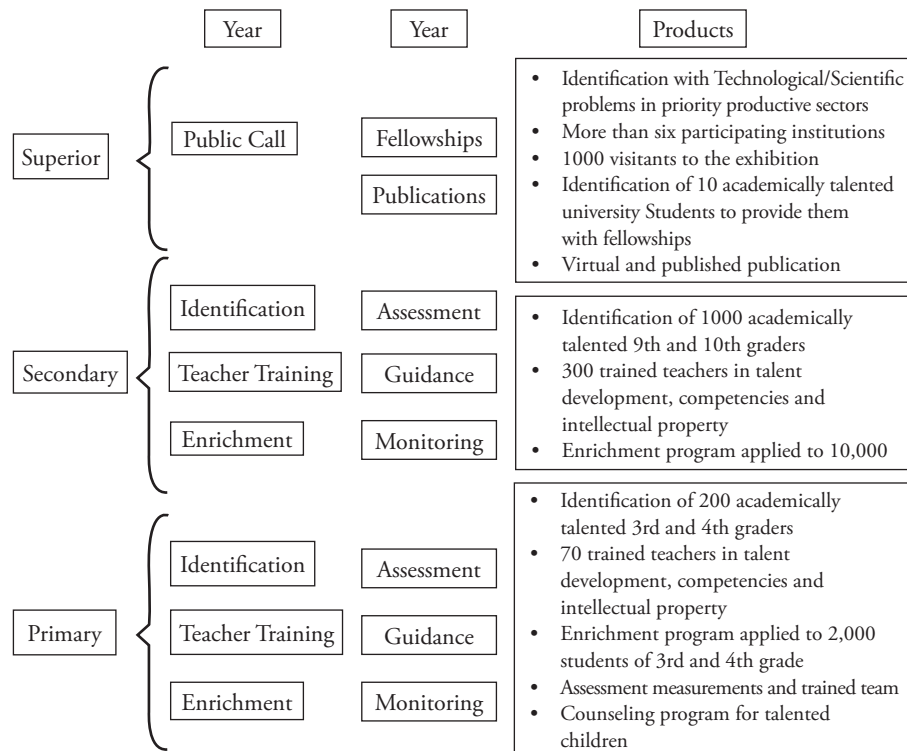
On Secondary and Elementary level, identification programs for verbal and mathematical talent are proposed in the different regions of the public schools with the aim of training teachers to apply enrichment programs inside the regular classroom. This will not only benefit the academically talented, but also the non-talented students, facilitating psychological climate to improve the quality of education and the emergence of creative abilities, innovation and talent, with ethics and social responsibility.

The main goal of the CIT project is to promote quality and excellence from the development of educational competitiveness through the identification and support toward the talented school and university students, promoting their creative abilities, and innovation applied to science and technology, as well as their educational, humanistic, and social development. The following are the specific goals for the talented university students: (a) to identify the talented university students from their abilities in the creative-productive generation, motivation and leadership with ethics and social responsibility; (b) to promote innovative initiatives in university students, acknowledging cases toward the productive application; (c) to develop fellowships with institutions and enterprises in which labor experiences are applicable to their talent area (scientific, technological, educational, and humanistic); (d) to spread on national and international level the Peruvian creative-productive talent through publishing a book co-authored by the winners.

The following are the goals of the talented school students: (a) to identify the academically talented students from 9th and 10th, as well as those of 3rd and 4th Grade, considering their intellectual functioning, creative development, intrinsic motivation, and leadership with social responsibility; (b) to develop a standardized psychometric battery to identify intellectual talent inside the regular classroom in basic regular education; (c) to organize and execute acceleration and enrichment programs for the intellectually talented in the school setting; (d) to promote in-service teacher training in instructional strategies that promote creativity, innovation, and talent development inside the regular classroom; (e) to promote teacher

participation in academic events, mainly in topics related to giftedness and talent; (f) to spread on national and international basis the creative-production of talented students, promoting their participation in national and international events.

The relation of the activities and products by educational level and execution year are seen in Figure 2. The project design involves the follow-up evaluation, the impact evaluation, and a proposal for the sustainability of the project (Blumen, 2008a). This project is oriented toward the promotion of scientific, technological, educational, social, and humanistic research in the academic and school setting. It promotes productive creativity, as well as innovation in Peru, welcoming new technologies in productive sectors and new strategies in learning. It also advocates scientific, technological, educational, social, and humanistic research oriented toward problem solving, and demands satisfaction in strategic economic sectors.

### Considerations for the future

The academically talented children in Peru, as well as in other developing countries, constitute a very special group due to the disadvantaged conditions in which the majority has to develop. In this context, their identification might be considered superfluous or even elitist. However, scientific research is needed to fulfill their talents, seeking for competitiveness in the international community. Remarkable progress has been made in the field of high ability in the last two decades, and empirical studies revealed that many of the intellectually talented are not capable to reach their full potential on their own, but need external support from parents, brothers, friends, teachers or significant others. It is considered of vital importance to identify them at the beginning of their schooling if we intend to address their pedagogical and psychological needs within the educational system.

My first recommendation is related to the need to increase the minimum goals expected in Peruvian public schools, compared to the high expectations observed in Western European countries, as well as in the countries of the Asian South-East. Therefore, it is needed to increase academic standards for all our students. If the expectations increase, then many of our highly talented students who are actually bored inside the regular classroom will have appropriate cognitive challenges.

Second, it is imperative to establish an identification program for the talented students attending public schools in order to offer Advanced Placement classes. These students might be placed in math, science, or social studies advanced classes depending on their educational level. This type of approach domain is consistent with Stanley's (1979) proposal. Hence, those Elementary students who need advanced courses might have the opportunity to attend Secondary classes, and those attending Secondary school might take courses at the University. At the beginning, students might choose their advanced classes, and those who might not be able to follow the rhythm might retire. Self-selection can be monitored by the teacher. Moreover, there should be clear policies of talent identification focusing mainly in multicultural and disadvantaged population.

Third, pedagogical institutes should include talent development content in their teacher formation programs, both in the undergraduate and postgraduate level, in order for the teachers to be able to support the children in the regular classroom, and monitor their selection. In the case of the highly talented children, acceleration alternatives and homeschooling programs should be considered, especially on rural areas.

Moreover, networking among schools using the virtual modality is always a less expensive alternative when establishing monthly activities with talented students, and providing them with advanced virtual modality courses.

Finally, our recommendations are related to the improvement of the academic standards and expectations toward all of our students, and to provide enrichment and acceleration programs for the intellectually talented students involving academic placement and virtual modality subjects. In this sense, the talented students might join talented peers with similar interests, and the challenging opportunity will fulfill their cognitive needs.

It is of utmost importance to improve our comprehension about talent development, especially under multicultural and poor conditions. Formal

outlines of talent promotion are needed in its different forms, with the commitment of civil society and the State, involving the participation of the regions, municipalities, and universities, as well as the enterprises supporting talent development with social responsibility.

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**ASIA**

**CHAPTER ELEVEN**
**Gifted Education in Korea**
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**1. Introduction to Korea**

South Korea, officially the Republic of Korea (ROK), is a country in East Asia, located on the southern portion of the Korean Peninsula. It is neighbored by the People's Republic of China to the west, Japan to the east, and North Korea to the north. Its capital is Seoul, which is also its largest city. South Korea lies in a temperate climate region with a predominantly mountainous terrain. Its territory covers a total area of 99,392 square kilometers and has a population of 50 million.
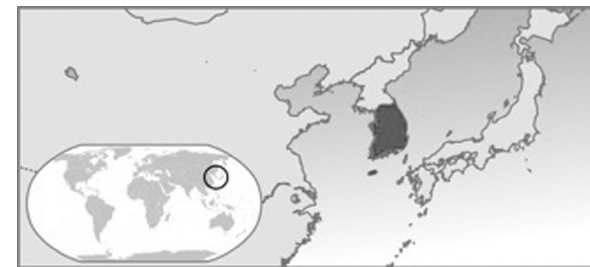


Figure 1. Location of South Korea

Figure 2. Flag of South Korea

On June 25 1950, South Korea was invaded by forces from the North. The resulting war between the two Koreas ended with an Armistice Agreement, and made the border between the two nations the most heavily fortified one in the world. After the war, the South Korean economy grew significantly and the country was eventually transformed into its present-day status as a major economy and a full democracy.

South Korea is a presidential republic consisting of sixteen administrative divisions and is a developed country with a very high standard of living. It is Asia's 4th largest economy and the world's 14th (nominal) or 12th (purchasing power parity) largest economy. The economy is export-driven, with production focusing on electronics, automobiles, ships, machinery, petrochemicals and robotics. South Korea is a member of the United Nations, WTO, OECD and G-20 major economies. It is also a founding member of APEC and the East Asia Summit.



Figure 3. Temple in the mountain



Figure 4. Korean traditional garden

## 2. History of Korea

Korea is a proud country with a unique culture and tradition that are over 5,000 years old. This section is a brief overlook on Korean history from Gojoseon (approx. 2333 BC) to the present time.

### 1) Ancient Time - Gojoseon

According to the legend, the first Korean kingdom, Gojoseon, was founded approximately 2333 BC by Dangun Wanggeum. Its influence stretched from the Korean Peninsula to the Manchuria, where relics and artifacts from Gojoseon's days were found. Politically and militarily grown into a powerful state, Gojoseon's society was organized mainly by clans and classes, and culturally flourished; even the Chinese sages praised Gojoseon people's decorum of their society. It was also the zenith time in Korean Bronze Age. It is worth note that in Korean history, there is no relics of Copper Age remaining - somehow, the culture jumped from the Neolithic Age to the Bronze Age.

Yet, this kingdom (or some claim that it was a federation) had to face continuous hostility from China, and after many confrontations, weakened Gojoseon broke apart into many states after its disintegration around 3rd Century BC. The successor states were Buyeo, Okejeo, Dongye, Guda-guk, Galsa-guk, Gaema-guk, and Hangin-guk.

### 2) Three Kingdoms Era

After Gojoseon, the Common Era began. Eventually among those successor states, three powerful nations rose from former Gojoseon's territories, conquering other states. These nations were Goguryeo, Silla, and Baekje. Goguryeo and Baekje were born from Buyeo, while Silla descended from the confederation of the powerful clans (once powerful but later annexed to Silla, Gaya) in the southern region of Korean Peninsula. These three kingdoms competed with each other in many ways. During this period, Korean Peninsula saw the formation of these three nations and with the introduction of Buddhism and trades with China and Japan, the culture of each nation thrived on the land. Goguryeo's culture was more or less warrior-oriented and flamboyant, while those of Baekje and Silla were more artistic and elegant - as for Silla, Buddhism was highly emphasized in the culture.

In the military perspective, Goguryeo was able to recover much of Gojoseon's territories; through the entire Korean history only King Sejong of Joseon and King Gwanggaetto of Goguryeo are undeniably accepted among Koreans as 'the Great'. The latter conquered most of the Manchuria and his memorial tablet to celebrate his feat still stands on the Manchurian soil even now. In the cultural perspective, Baekje played a considerable role in the birth of early Japanese culture and politics - the roots of most of Japanese aristocratic clans can be traced back to Korea. These three kingdoms did indeed contend with each other, but Silla's power eventually grew, and allying with Tang Dynasty of China, unified the Korean peninsula by 676 AD.

The unified Silla was truly the Golden Time in Korean ancient history and with peaceful time to foster cultural advancement, many mind-boggling artifacts and historically valuable heritage such as the Seokgulam Grotto came out during this period. Yet, the unified Silla itself disintegrated in 9th Century AD. After the bloody 'Later Three Kingdom Era', Korean Peninsula was once again reunited under Goryeo. As for Balhae, the catastrophic volcanic eruption from Mount Baekdu was largely responsible for the eventual downfall. In the end, when Balhae fell, those of noble and royal families came to Goryeo seeking protection.

### 3) Goryeo - The Buddhist Nation

During the Goryeo Period, Buddhism thrived as it enjoyed the status of national religion. Many Buddhist temples were built, and as for Buddhism in Korea, Goryeo bore the fruit of the devotion. Laws were codified, and the international trades flourished. Although Korea was not entirely unknown to the West, it is this time when the international business began to grow. The very name 'Korea' came from the mispronunciation of 'Goryeo'.

It was the time of technological and cultural enrichment. The oldest existing copy of moveable metal type was made in this era, the famous Goryeo celadon porcelains were traded to other countries, and the 80,000 sutra were made wishing to fend off Mongolian invasion by borrowing the power of Buddha.

In the later period of Goryeo, the gunpowder was introduced and was quickly adopted into the military uses, which strengthened the military muscle significantly. Yet, like the other nations before, Goryeo met her downfall. A coup from General Lee Seong Gyae ended the Buddhist nation.

### 4) Joseon - The Confucian World

The early history of Joseon is a period of eradication of the memory of Goryeo. Joseon encouraged Confucianism and discouraged Buddhism (Buddhism was so deeply rooted in Korean culture that it still remains as one of the predominant religions in Korea). In the time of Sejong the Great, the 4th King, probably the most intelligent and talented monarch in Korean history, Hangul (Korean alphabet) was created, and various cultural and technological advancements were made during his reign.

Joseon was a time of relative peace and cultural prosperity saved from two foreign invasions. One was from Japan, from 1592 to 1598 (also named 'Seven Years War'), and the other from China (Qing Dynasty) in 1620s. Peaceful time gave a ground for the commoners' culture to grow. For example, instead of the celadon porcelains, white ones (for simpler taste) became popular. The kings of Joseon left records of their own times, known as 'Joseon Sillok' (The True Records of Joseon), providing valuable historical documents. However, the world did not let Joseon to daydream because the newly modernized Japan annexed Joseon in 1910 by force, bringing down the fall of the Dynasty.

### 5) Korea Today - The New Beginning

The time of Japanese occupation between 1910 and 1945 were the darkest years in Korean history. When Japan was defeated in World War II, Korea was liberated again. However, the postwar international politics took control of the fate of Korea, dividing the country into two. Soviet Union took control of the northern part of Korea establishing a communist government. The United Nations and the United States helped to build a democratic government in the southern part of the peninsula. Eventually, the tensions of the Cold War and the invasion of North Korea in 1950 resulted in a civil war (the Korean War which lasted three years and have not ended yet. Korea is under truce now), which nearly destroyed whatever was left of the Korean infrastructure.

Postwar time was nonetheless a difficult time for Koreans. Political upheavals, countless protests, and continuing threat of invasion from North Korea were common in those years. When Park Jung-hee seized power in a military coup d'état, the nation started to rebuild itself, the economy began to grow, and by 1969, South Korea's economy outgrew that of North's.

In the international relationship perspective, when the U.S. got into the Vietnam War, so did South Korea, and the relationship with Japan was restored. All that happened under Park's rule, and for that, the judgment on him differs radically from a "tyrant-illegitimate ruler" to "the best President Korea has had" between Koreans even now.

The rise of the South Korean economy was remarkable, and some said that it is "Han River's miracle." In 1988, South Korea hosted the Olympic Games, heralding her launch into a developed country. Yet, the Asian Economic Crisis in 1997 was a massive blow to the Korean economy; however, like so many other occasions throughout Korean history, Koreans stood united to face the hardship and overcame it. The 2002 FIFA World Cup was a significant event held in Korea and Japan. It symbolized that Korea had overcome the economic hardship, and new development. Now, Korea is ready for the next gigantic leap.

Figure 5. The world's longest bridge fountain in Seoul


Figure 6. The National Folklore Museum

## 3. Education in Korea

Education in South Korea is regarded as being crucial to one's success, and competition is consequently very heated and fierce. In the 2006 results of the Programme for International Student Assessment by the Organization for Economic Co-operation and Development (OECD), South Korea was first in problem solving, third in mathematics and seventh in science. South Korea's educational system is technologically advanced and it is the world's first country to bring high-speed fibre optic broadband internet access to every elementary, middle, and high school nationwide. Using this infrastructure, the country has developed the first Digital Textbooks in the world, which

will be distributed for free to every primary and secondary school nationwide by 2013.

A centralized administration in South Korea oversees the process for the education of children from kindergarten to the third and final year of high school. South Korea has adopted a new educational program to increase the number of their foreign students through 2010. According to the Ministry of Education, Science and Technology, by that time, the number of scholarships for foreign students in South Korea will be doubled, and the number of foreign students will reach 100,000.

The school year is divided into two semesters; the first starts at the beginning of March and ends in mid-July, and the second starts in late August and ends in mid-February. The schedules are not uniformly standardized and vary from school to school.

From kindergarten to high school, matriculating through the grade levels is not determined on knowledge, grades or passing any test, but is based purely upon the student's age.

Many elementary, middle, and high school students also attend after-school academies and some receive extra instruction from private tutors. The core subjects, especially cumulative subjects like English and mathematics, receive more emphasis. Some after-school academies specialize in just one subject, and others offer all core subjects, constituting a second round of schooling every day for their pupils. Indeed, some parents place more emphasis on their children's after-school academy studies than on their public school studies. Additionally, many students attend academies for things such as martial arts or music. The result of all this is that many middle school students, like their high school counterparts, return from a day of schooling well after midnight.

### 1) Kindergarten

In South Korea, children normally attend kindergarten between the ages of three and seven. When the child reaches about the age of six or seven, he/she is systematically moved on to the first year of elementary school.

### 2) Elementary school

Elementary school consists of grades one to six. Students learn subjects including, but not limited to, Korean, mathematics, science, social studies, fine arts, English, P.E., moral education, practical arts, and music. Usually, the class teacher covers most of the subjects; however, there are some specialized teachers in professions such as physical education and foreign languages, including English.

### 3) Middle school

Middle schools in South Korea consist of three grades. They mark a considerable shift from elementary school since students are expected to take studies and school much more seriously. In the final year of middle school, examination scores become very important for the top students hoping to gain entrance into the top high schools, and for those in the middle hoping to get into an academic rather than a technical or vocation high school.

### 4) High school

High schools in South Korea teach students from first grade to third grade, and students commonly graduate at the age of 18 or 19. High schools in Korea can be divided into specialty tracks based on the student's interest and career path. For example, there are science, foreign language, and art specialty high schools which students can attend with prior entrance examinations, which are generally highly competitive.

Other types of high schools include public high schools and private high schools, both with or without entrance examinations. These high schools do not report to specialize in any field, and are more focused on sending their students to college. For students who do not wish a college education, vocational schools specializing in fields such as technology, agriculture or finance are available, in which the students are employed right after graduation. Around 30% of high school students are in vocational high schools. On noting the schedule of many high school students, it is not abnormal for them to arrive home from school at midnight, after intensive "self-study" sessions supported by the school.

The curriculum is often noted as rigorous with as many as 11 or so subjects, and most of the students choose to attend private academies to boost their academic performance. Core subjects include Korean, English and math, with adequate emphasis on social and physical science subjects. It is critical to note that the type and level of subjects may differ from school to school, depending on the degree of selectivity and specialization.

High school is not mandatory, unlike middle school education in Korea. However, according to a 2005 study by the OECD member countries, some 97% of South Korea's young adults do complete high school. This was the highest percentage recorded in any country. Korean high school students produce outstanding results in the area of mathematics and demonstrate high literacy, ranking among the very best in the world.

## 4. Background of Gifted Education in Korea

Educational system in Korea is highly centralized. This fact explains a large part of gifted education in Korea. Korean education is influenced by both Confucian tradition and the American educational system.

Koreans believe that human resources are a necessity for any nation, and a strong gifted education program in science is the key to such needs. The Korean government has endorsed the strategy of fostering continuous development of advanced technology through the education of gifted students. According to Korean educators, scientifically gifted students should have more challenges and special experiences in science to fully develop their abilities.

With efforts made by professionals and advocacy groups, the first Science High School was established in 1983, and 22 more were established in succeeding years. There are also 31 Foreign Language High Schools for students with high ability in foreign languages, and 25 high schools for the Arts. In addition, gifted high schools catering to high ability students are now in operation. The first gifted high school is Korea Science Academy which opened

in 2003, and 3 more schools following suit. By 2013, 6 gifted high schools, and 2 schools for those gifted in the arts are planned to be open.

In 1987, the Ministry of Science and Technology established an institution for gifted university students in science and technology, namely, Korea Institute of Science and Technology (KIST) in order to expand the education of the scientifically gifted students in the higher education level.

The society is aware that the future depends on how well we care for and develop human resource at the public school level. Therefore, much effort is put on providing a challenging education based on sensible and insightful identification procedures that are able to detect most, including hidden, gifts and talents in young people.

These efforts may help create a more favorable and diverse social climate and support system inducing people from various careers, such as artists, writers, film-makers, researchers, etc. to invest their efforts in contributing to the development of the country.

## 5. Implementation of Gifted Education

### Gifted Education Policy and Laws
In 1999, the Gifted Education Development Law was established for two reasons: a) to provide individualized education to exceptionally talented children and allow them to fully develop their skills, and b) to nurture excellent minds that will add to Korea strength as a global competitor.

The law contains recommendations regarding the gifted education selection process, methods of instruction, administration procedures, and so on.

### 2) The Development of Gifted Education
In the 1980's, schools started to experiment with gifted education; some general high schools offered gifted classes for foreign languages, science, and other subjects. Notably, Gyunggi Science High School is founded, and the Office of Gifted Education is established at the Korean Educational Development Institute.

In the 1990's, specialized high schools emerged, and gifted education is provided through the form of acceleration. To better serve the gifted population, the Korean Society for the Gifted is founded (1990). Local offices of education oversaw the administration of acceleration programs for the gifted. Gifted students began to skip grades and graduate early. Also, some universities began to offer gifted science programs for pre-college students.

In the 2000's, gifted education became more structured, and a national comprehensive developmental plan for gifted education was launched. The Gifted Education Development Law was passed (2000), and gifted classes were offered at some school sites as extra classes, while local offices of education operated gifted education centers. Moreover, the Korean Educational Development Institute was authorized by the government as the National Research Center on Gifted and Talented Education (NRC-GTE) (2002). In addition, the First Comprehensive Plan (2003-2007) for the Gifted Education Development Law was implemented. The Busan Science Academy was authorized as the first Gifted High School (2003). The Gifted Education Development Law was amended to better enforce the education for the gifted, and the enforcement ordinance of the Gifted Education Development Law was amended.

In the 2010s, the perspective on gifted education was widened, and the need to provide programs other than in the science and technology areas was recognized. Also, efforts are being made to create diverse methods to cater to high ability students in the existing educational system. Gifted education in Korea can be characterized by a variety of approaches: Special High Schools for the gifted and talented, after-school enrichment programs in elementary and junior high schools, acceleration, enrichment programs by gifted education centers affiliated with school boards and universities, and cyber gifted education system. While in the past the subject areas in gifted education were centered mostly on mathematics and the sciences (approximately 80% in 2009), recently, attention is being paid to further develop programs in foreign languages, arts, social sciences, and other subjects.

Currently, a movement for creative-character education is being launched, with the aim of enhancing well rounded, high achieving individuals for leading the society in the future. In addition, implementing arts in the schools (STEAM education) is being planned.

The above content can be summarized as follows:

(1) The Founding Period (1980's)
• A school specialized in educating gifted students in the sciences is founded.
• Schools experiment with gifted education: general high schools start offering advanced level classes in each grade for foreign languages, science, and other subjects (1981)
• Gyeonggi Science High School opens (1983)
• Office of Gifted Education is established at the Korean Educational Development Institute (1987)

(2) The Settling Period (1990's)
• Specialized high schools emerge, and gifted education takes the form of acceleration.
• The Korean Society for the Gifted is founded (1990)
• Local offices of education oversee the administration of acceleration programs for the gifted (1996)
• Gifted students are able to skip grades and graduate early (1996)
• The Center for Gifted Education is founded at the Korean Educational Development Institute (1996)
• Universities adopt gifted science programs for pre-college students (1998).

(3) The Stabilizing Period (2000's)
• The Gifted Education Promotion Law is passed (2000)
• Gifted Classes are offered at some school sites as extra classes, and local offices of education operate gifted education centers (2002)
• The first (2003-2007) and second (2007-2012) Comprehensive Plan for Gifted Education Development Law is established (2002)

• The first Gifted High School opens (Korea Science Academy) (2003)
• The Gifted Education Development Law is amended
• The enforcement ordinance of the Gifted Education Development Law is amended

(4) The Enrichment Period (2010's)
• The Third Comprehensive Plan for Gifted is in progress.
• A total of 6 gifted high schools, 2 arts high schools open
• Creative-character education is implemented.
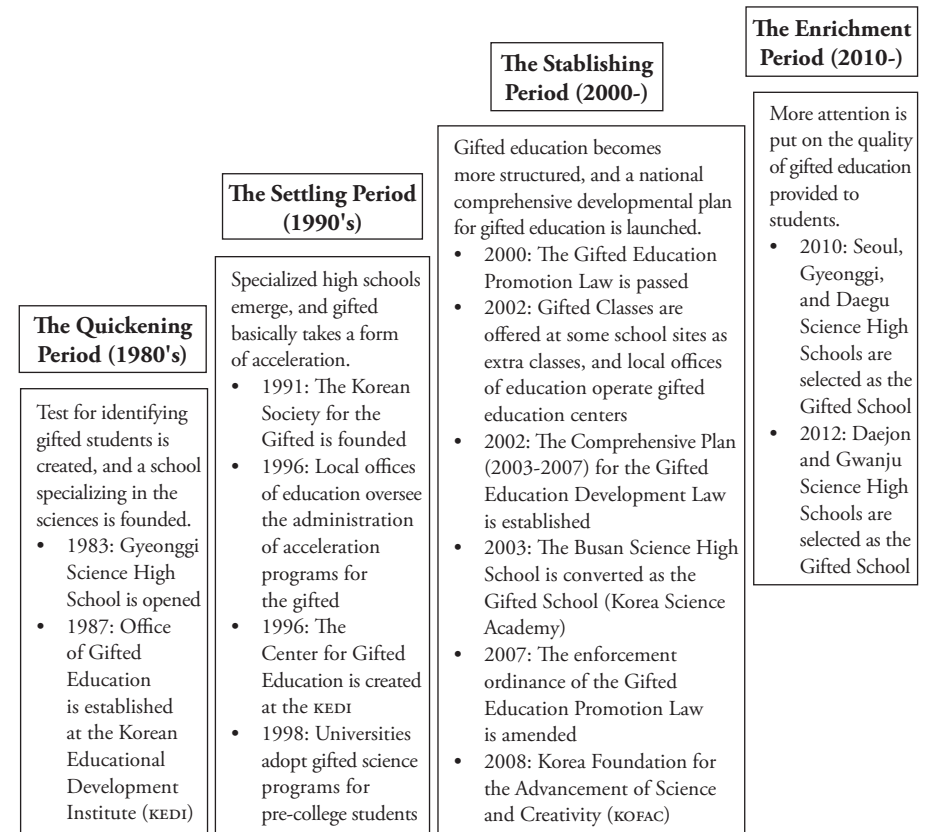


Figure 7. Development Phases of Gifted Education in Korea

## 6. The Gifted Education System

The gifted education system is divided into Gifted Schools, Gifted Classes, Gifted Education Centers, and University Gifted Science Programs.
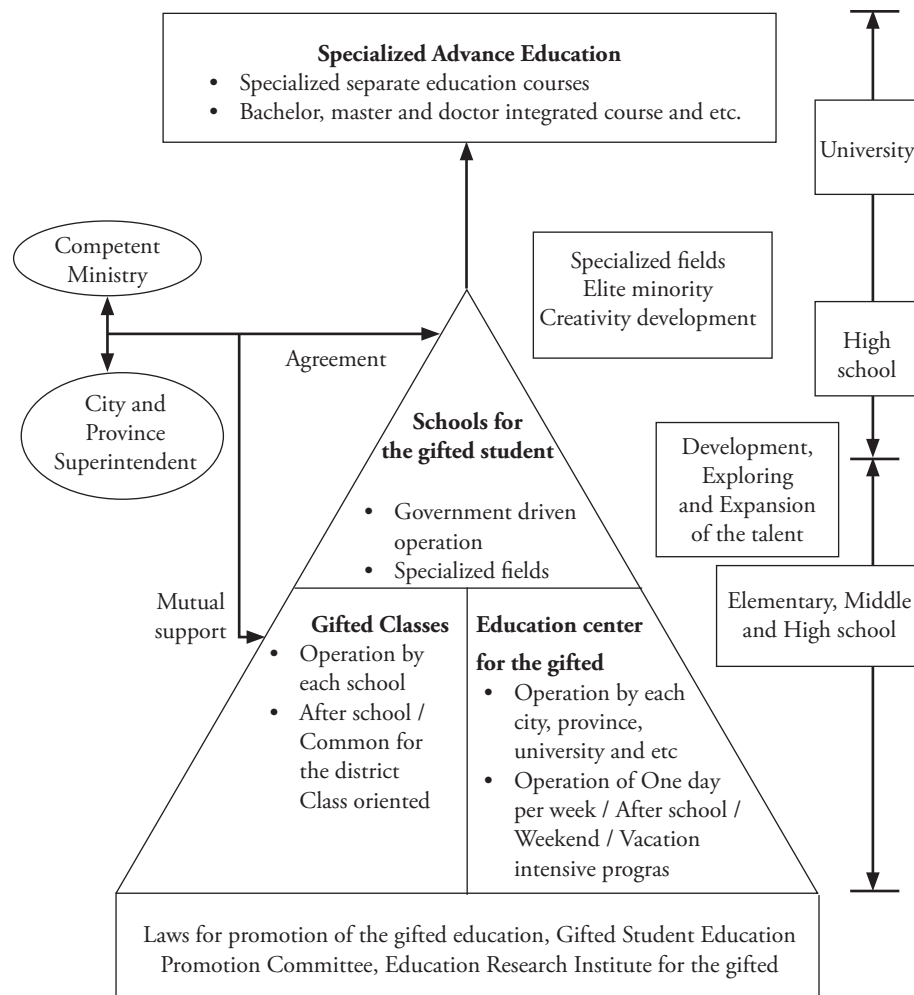


Figure 8. The Gifted Education System

### 1) The Gifted High Schools

The Gifted School operates full-time and has a fixed curriculum. The minimum age for admissions is 12 (typically grade 7). Currently, there are 4 gifted schools in Korea. The Korea Science Academy was the first Gifted School to open in Korea.

### 2) Gifted Classes

Gifted Classes are offered in elementary, middle, and high schools, and are particularly beneficial to small cities or rural areas, where students do not have access to Gifted Education Centers. Gifted Classes are held after school and on holidays. They are usually 2-4 hours a week, and the main subjects taught are mathematics and science. Each class has less than 20 students.

### 3) Gifted Education Centers

Gifted Education Centers are managed by local offices of education, and offer classes after school, during independent study hours by regular schools, on weekends, and on holidays. Some also operate during regular school hours. Depending on the center, students spend around 70 and 450 hours in these centers.

### 4) University Gifted Science Programs

Universities offer advanced science classes for pre-college level students on holidays and weekends. Less than 15 students are selected, and classes run about 100 hours a year. The admissions process is in December. The program is divided into three levels: the first year covers the basic level, the second year covers the advanced level, and after the third year, the students are placed in a mentorship program.

## 7. Gifted Education Today in Numbers

Until now, gifted education in Korea is centered on mathematics and the sciences. However, recently more attention is being paid to the further

development of programs in foreign languages, music, arts, social sciences, and other subjects.

## 1) The Gifted School

There are 4 Science High Schools for the Gifted.

Table 1. Distribution of the Gifted Schools and Students (Nov. 2010)

| Classify | | School A | School B | School C | School D |
|---|---|---|---|---|---|
| | Male | 380(18) | 323 | 235 | 81 |
| | Female | 71(4) | 17 | 23 | 16 |
| | Total | 451(22) | 340 | 258 | 97 |
| The number of classes | | 38 | 24 | 16 | 6 |

## 2) Gifted Classes

There are a total of 78,474 students attending the gifted classes, which are operated by 16 local education offices (Nov, 2010). A total of 54,155 are elementary students, 20,405 are middle school students, and 3,914 are high school students.

Table 2. Distribution of Gifted Classes and Students

| | Total | | | school | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Elementary school | | | Middle school | | | High school | | |
| | Male | Female | total | Male | Female | total | Male | Female | total | Male | Female | total |
| total | 46,546 | 31,928 | 78,474 | 31,614 | 22,541 | 54,155 | 12,398 | 8,007 | 20,405 | 2,534 | 1,380 | 3,914 |

<Total data base of Korea Education Development institute (2010.11.25)>

## 3) Gifted Education Programs

There are a total of 1,913 programs, 3 gifted school centers, 1585 gifted classes, 275 gifted academies of Education office, and 55 Gifted academies of university operated by 16 local offices of education (Nov, 2010).

Table 3. Distribution of Gifted Education Programs and Students

| The field of teaching | Total | Gifted school | Gifted class | Gifted academy of Education office | Gifted academy of university |
|---|---|---|---|---|---|
| Total | 1,913 | 4 | 1,585 | 275 | 55 |

<Total data base of Korea Education Development institute (2010.11.25)>

## 4) University-Affiliated Science Gifted Education Centers

The following is the number of students at university-affiliated science gifted education centers reported in November 2010.

Table 4. Distribution of University Science Gifted Education Centers

| University | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|
| A | 206 | 214 | 225 | 207 | 183 | 185 | 206 |
| B | 207 | 217 | 231 | 112 | 207 | 345 | 326 |
| C | 166 | 156 | 166 | 168 | 181 | 156 | 184 |
| D | 184 | 182 | 176 | 228 | 194 | 187 | 187 |
| E | 245 | 322 | 384 | 420 | 430 | 427 | 412 |
| F | 178 | 172 | 198 | 199 | 188 | 173 | 218 |
| G | 194 | 246 | 243 | 223 | 230 | 223 | 232 |
| H | 209 | 206 | 226 | 239 | 268 | 340 | 322 |
| I | 180 | 175 | 159 | 205 | 213 | 220 | 214 |
| J | 227 | 236 | 273 | 291 | 342 | 233 | 219 |
| K | 86 | 116 | 105 | 110 | 145 | 149 | 193 |
| L | 156 | 202 | 248 | 285 | 255 | 279 | 332 |
| M | 142 | 126 | 125 | 127 | 127 | 157 | 190 |
| N | 129 | 169 | 207 | 226 | 226 | 236 | 273 |
| O | 117 | 118 | 140 | 136 | 150 | 145 | 144 |
| P | - | - | - | 96 | 144 | 166 | 181 |
| Q | - | - | - | 112 | 172 | 174 | 191 |
| R | - | - | - | 98 | 197 | 216 | 198 |
| S | - | - | - | 129 | 210 | 231 | 258 |
| T | - | - | - | - | 117 | 191 | 274 |
| U | - | - | - | - | 132 | 208 | 256 |
| V | - | - | - | - | 118 | 206 | 237 |
| W | - | - | - | - | 70 | 123 | 148 |
| X | - | - | - | - | - | 94 | 144 |
| Y | - | - | - | - | - | 202 | 192 |
| Total | 2,626 | 2,857 | 3,106 | 3,630 | 4,499 | 5,266 | 5,731 |

< Ministry of Education, Science and Technology 2009.1>

## 8. Identification Processes of the Gifted Students

Recently, Korea has dramatically switched the method of identification process of the gifted, from the existing written-examination-based method to the class-observations and nominations-based method.

### 1) The Previous Identification Processes for the Gifted

In Korea, the gifted students are being selected by different institutes; the national university-affiliated gifted education centers, the gifted education programs affiliated by the city and provincial education offices, classes for gifted students affiliated by the education offices, and schools for the Science gifted.

The identification process of the gifted students varies according to their type of educational program, but they basically share the frame as follows;

The 1st Stage: Teacher´s Nominations
The 2nd Stage: Test of Giftedness
The 3rd Stage: Scholastic Test
The 4th Stage: Personal Interviews
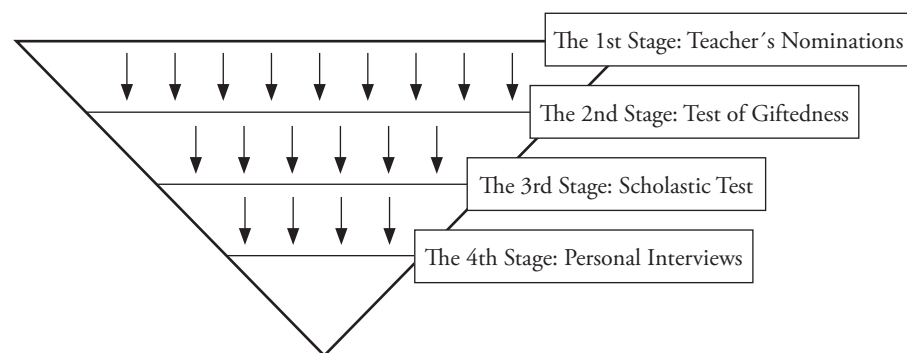
Figure 9. The Previous Identification Model
(Korea Education Development Institute, 2008)

The university-affiliated gifted education centers selected elementary and middle schools students mostly by using creative problem-solving abilities in science and mathematics. The creative problem-solving ability tests are used only once and are newly developed every year. Some examples of identification process for university-affiliated Science Education Centers are as follows:

Table 5. Examples of Identification Processes
(University-affiliated Science Gifted Education Centers)

| Center | First Stage | Second Stage | Third Stage |
|---|---|---|---|
| Kongju National University-affiliated Science Education Center | Screening of Applications for Qualifications | Math & Science Exploration. Creativity Test | Evaluation of scientific creativity & In-depth Interviews |
| Kunsan National University-affiliated Science Education Center | Screening of Applications for Qualifications | Written Test Evaluation of Creativity & Problem-solving ability[Written test of Math & Science exploration province | In-depth Interviews |

Each city and provincial Education Office provides diverse programs for the gifted students according to their respective circumstances, and some examples of their selection procedures are shown in Table 6.

Table 6. Examples of Identification Processes
(City and Provincial Education Office Gifted Education Centers)

| City and provincial education office | First stage | Second stage | Third stage | Fourth stage |
|---|---|---|---|---|
| Jeju | School Principal's Nomination | Test of Creative Problem-solving ability (KEDI) | Discerning Tools of Major province(KEDI) | Interview |
| Busan | Test of Applicants' Logical Reasoning(KEDI) | Document Screening Process of School Principal's Nominations | Test of Creative problem-solving ability according to academic province(KEDI, special agency | In-depth Interview, Joint question-setting in Busan |

## 2) New Identification Process through the Use of Observation and Nomination

The identification processes have changed dramatically from the four-stage screening method to a method of teachers' observations and nominations. It is considered to be the identification method based on potential rather than on test scores. It is hoped that such a new screening method will be an improvement over the previous method which incurred excessive competition over scores, inordinate expenditure on educational expenses, and disadvantage to the neglected class of people.

Improvement in selection process of the prospects for GATE

**The process of observations & nominations by a teacher**

**Formation of potential group of the gifted students**

- Request by a teacher
- Counseling of Students
- Discovery of the gifted students by a teacher

**Execution of observations by a teacher in charge of the gifted students**

- Continuous Observations by teachers
- Test of the basic giftedness
- Class observations, etc.
- Use of Diagnosis Tools of Giftedness
- Profilings, etc.
- Long-term observations

**Nomination & Education**

Nominations of the gifted students

Assignment of the gifted students to an educational institute & their continued management

Figure 10. The Changes in Selection Processes
(Ministry of Education, Science, and Technology, 2010)

The stages for selection of the gifted by each institution are as follows:

(1) Stage 1: Collecting Information
The applicants are required to submit documented evidence such as recommendations, an applicant's letter of self-introduction, checklist of behavioral characteristics, materials proving the giftedness of an applicant, a copy of school record, etc.

(2) Stage 2: Nominations
A teacher in charge of the selection process for the gifted must set up a plan for interviews with the student, class observation, and task presentation on the basis of the collected information.

(3) Stage 3: Gifted program coordinator or a teacher in charge
The teacher in charge of the identification for the gifted submit the written overall opinions, on the basis of the information obtained from the interview, class observation, and task performance of the targeted student, to the nomination-screening committee. Then, the committee decides on whether or not they recommend the student for an education center for the gifted.

(4) Stage 4: Selection of the gifted students
The institutes select the students who show the corresponding potential to the purposes of the programs. At this point, a letter of self-introduction and recommendations get to play the most important role.

(5) Stage 5: Assignment
A gifted student is assigned to a program, and decisions on whether or not the student will continue participating in the program offered by the center for the gifted are made through continuous observation and evaluation. And in case the student is judged to find it difficult to complete the prescribed program, decisions on suspension of the student's participation in the program should be reviewed.

Figure 11. The New Identification Processes (Ryu & Jung, 2010)

The diagram contains the following elements:

**Stage 1: Gathering of Multidimensional pieces of Information**

Multidimensional Information Gathering
1. Recommendations-a teacher, school principal, parents, friends, experts, etc.
2. A checklist containing the bahavioral traits by [the former, present] teachers
3. A student's school record
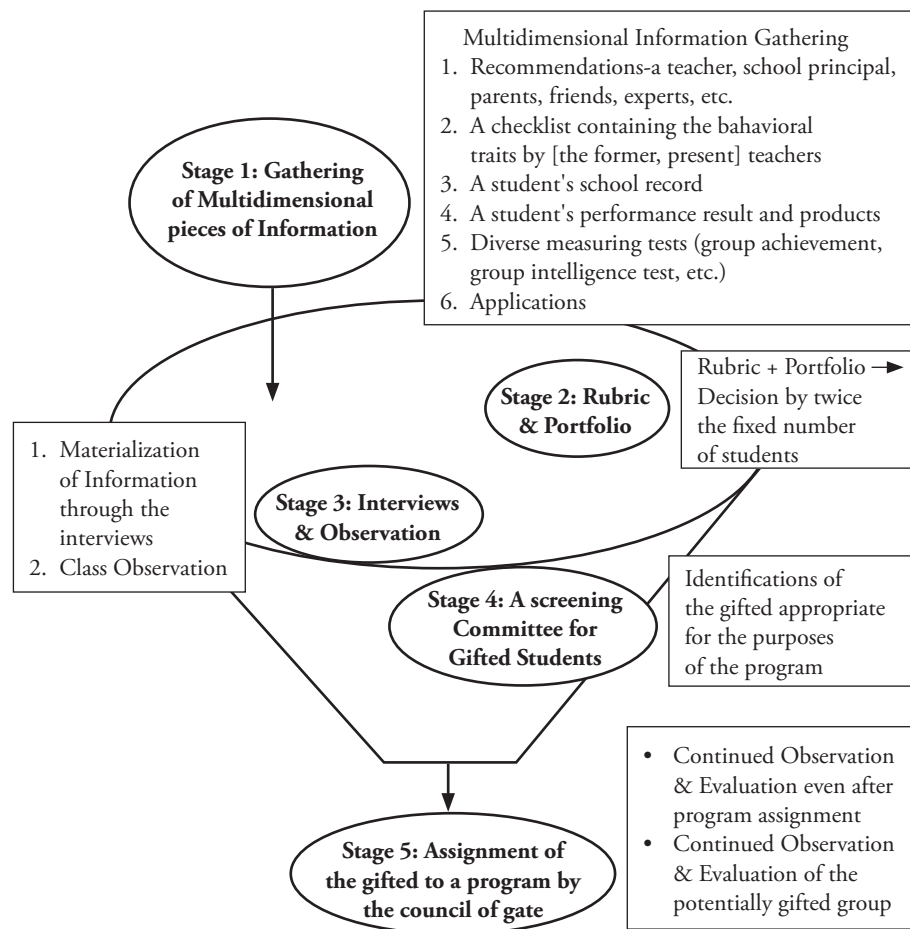4. A student's performance result and products
5. Diverse measuring tests (group achievement, group intelligence test, etc.)
6. Applications

**Stage 2: Rubric & Portfolio**

Rubric + Portfolio → Decision by twice the fixed number of students

**Stage 3: Interviews & Observation**

1. Materialization of Information through the interviews
2. Class Observation

**Stage 4: A screening Committee for Gifted Students**

Identifications of the gifted appropriate for the purposes of the program

**Stage 5: Assignment of the gifted to a program by the council of gate**

- Continued Observation & Evaluation even after program assignment
- Continued Observation & Evaluation of the potentially gifted group

### 3) Identification Processes of the Science High School for the Gifted

Gyeonggi Science High School, which is regarded as a pioneering school putting the education of the gifted into practice for the first time in Korea even though it is not a gifted high school itself, had an application system in which only the student staying at the top 3% on the basis of the third year of the middle school could apply by recommendation of the principal located in Gyeonggi-do. And then, the achievement test and scientific aptitude test were conducted on the recommended students.

Since then, the science high school for the gifted such as Korea Science Academy and Seoul Science High School are employing the screening process of four stages until they do the final selection of the gifted students; evaluation of the submitted student's filing at stage 1; evaluation of giftedness and academic aptitude in mathematics and science at stage 2; evaluation of overall thinking skills using the independently devised test of creative problem-solving ability in the field of science and mathematics at stage 3, and the screening at stage 4 includes a science camp for a training for 3 days and 2 nights through which students go under multidimensional evaluation including scientific exploration ability and attitude through task performing ability and in-depth.

However, there are some schools using admission-officer-based screening system for 30% of the students by introducing the admission-officer system since 2010. It's said that they select about 1,500 students through students' filing at stage 1, they reflect students' creativity, learning motivation, passion and human character evenly besides subject records, and individual matters related to screening are decided by the screening committee; then, they conduct a training camp for about 200 selected students at stage 2 for four days and three nights.

From their process of selection of the gifted, we can see that they make the multi-level use of the contents in many different fields, which are emphasized in selection of the gifted. Taken together, it is understood that school authorities' trend in selection of the gifted students, which used to be limited to intellectual ability through one-shot written tests, and to be centered on the intelligence quotient, and recitation-centered measurement of knowledge, is moving toward gradually giving weight to creative problem-solving ability including the diverse measurement of knowledge-using problem-solving ability, rather than simple memory, such as problem-solving ability, researching ability, synthesis ability and critical

ability, away from the stereotyped aspects. Such process of measurement makes it possible to reflect not only a student's intellectual ability but also task commitments and learning attitudes. Recently, academic circles are gradually seeking a new, dynamic method such as behavior assessment, output assessment and assessment of circumstance-using ability, and these factors will provide a lot more information together with school records, intelligence, creativity and output assessment.

## 9. Teacher Recruitment and Training in Gifted Education

Gifted education teachers must be certified to teach general classes and must undergo a training course. In order to teach the gifted students, teachers are appointed on the basis of thorough understanding and genuine care for gifted children, passion about gifted education and a strong sense of duty toward teaching, constant search for ways to improve methods of teaching gifted children.

Training is continuously offered, and teachers for the gifted are required to attend a teacher's workshop one or two times a year. The basic and advanced domestic training courses are repeated annually.

### 1) The Basic Training Course (60 hours)

The object of this course is to produce professional gifted education teachers. The 60 hours of training include a cyber course and a training camp. At the camps, teachers are divided by classes and subjects into discussion groups, where they are encouraged to exchange ideas. Also included is a workshop on teaching methods and strategy development.

### 2) The Advanced Training Course (120 hours)

The object of this course is to single out leaders among gifted education teachers. Those who take the advanced course must have already completed the basic course and must currently be teaching gifted education. The 120 hours include a cyber course, a training camp, in-class training, regional workshops, and group research. The teachers can choose their own subjects based on their majors and interests. Famous foreign specialists frequently give lectures at these advance courses. During the regional workshops, teachers meet up with local specialists and try to come up with strategies that cater to each region's unique needs. During in-class training sessions, these regional specialists evaluate the teachers' performances and bring up suggestions for improvement. Teachers also meet up with school inspectors at the workshops to discuss the future of gifted education. The course ends with a banquet, during which a presentation is made regarding the progress made in the research and application of gifted education over the last year.

### 3) Benefits for teachers who teach gifted students.

- Depending on the region, gifted teachers receive an augmented salary or are placed in high positions.
- Gifted teachers are not subject to the teacher rotation policy (law requiring all teachers at general public schools to transfer to a different school every 4-5 years).
- Working with gifted programs also gives teachers the opportunity to experiment with teaching strategies and be involved with gifted education development.

## 10. Organizations Supporting Gifted Education

### 1) The National Gifted Education Development Committee

This committee is responsible for enforcing gifted education policy on a national level. It monitors the efficiency of current policies, conducts projects to integrate gifted education more into society, and is responsible for certifying (or de-certifying) schools as gifted.

## 2) Local Gifted Education Development Committee

The local committees have jurisdiction in their particular city or province to review basic gifted education policies, oversee selection processes, control the budget, and designate classes as gifted or general.

## 3) The Gifted Education Supervisors' Council

The council meets regularly to discuss the progress of gifted education and is composed of representatives from 16 cities and provinces, the Ministry of Education and Human Resources Development, and the Korean Educational Development Institute's National Research Center on Gifted and Talented Education

## 4) The Korean Gifted Education Research Association of Teachers

At this center, leading teachers from 16 cities and provinces come together to discuss and exchange information and research on gifted education methods.

## 11. Issues facing gifted education in Korea

### 1) Public Awareness

One of the most urgent tasks is to achieve public awareness of the justification and necessity for education for the gifted, particularly among parents and teachers and policy makers. Gifted education is not against equality of educational principles but is based on the idea of "education according to one's ability" which underlies the educational philosophy of democracy.

Clarification that intellectual education (given in institutions), accelerated preparatory education for entrance examinations to upper level school or universities, are different from gifted education by its nature.

### 2) Schools

The right place for challenging and promoting highly able students is in the public education sector, namely the school system. Offering differentiated curriculum in terms of teaching methods and performance demands can raise the motivation and aspirations of the students. Gifted students are reported to spend more than half of their time "waiting" for others to catch up.

The schools must be convinced of the necessity of gifted education as well as be willing to recognize special talent at an early stage and to develop this in a professional manner.

### 3) Research Efforts

Decision makers and experts in all fields of society must be aware and willing to do scientific research and implement practical measures in the area of promotion of the gifted education. Related research must be conducted, such as in identifying, program planning and implementation, teacher training, counseling and guiding the highly able students so they can realize their potential. High ability cannot grow by itself, but need to be nurtured. Effective methods and accurate results from various areas in education need to be adopted in the gifted/talented area.

It is the task of all professionals in the field of education to look into the state of affairs in gifted/talented education, as well as education in general, and work together to better the educational climate of our able youngsters. There is much work to be done in this field. Experts in the field of education can help in establishing a standard in philosophical orientations, target populations and identification processes, planning and developing programs, clarifying needs and conditions of all those involved, administrative mandate and leadership, program models, curriculum differentiations, selecting and training teachers, in-service training, funding and financial issues, formative and summative program evaluations, and much more.

## 12. Perspectives of Gifted Education

Talents emerge from general ability as a confluence of genetic dispositions, home and school experiences, and student's unique interests and learning styles. Educators have an obligation to formulate the best possible environment

for students. Many issues need to be addressed in the area of gifted education such as expansion of the number of students to be provided with enrichment programs, specialization of gifted education programs for the gifted, expansion of fields for gifted education, securing strong connections of educational programs between high schools and universities, promotion of qualified teachers for the gifted, programs, and provision of financial and administrative support for research and development in gifted education.

Korea is known for parent's high interest and aspirations for their child's education. By establishing quality programs geared toward various levels of ability, it could be possible to stream the flow of interest and funds from private sector into the public education sector.

In addition it is worth noting that programs and concepts originally developed in gifted education programs are adopted and adjusted to benefit the general education curricula. An example of such phenomena is creativity. Research in the area of gifted education is not limited to just that area, but rather works toward advancing other areas of education.

Another point worth noting is the movement toward confluence. It is not difficult to see instances where more than one subject is integrated into one program, and recently, the Korea Foundation for the Advancement of Science and Creativity has launched a project to increase art time into various subjects in the schools, and also integrate arts and sciences in our gifted programs. It is a well-known fact that the revenue from one movie made by such gifted artist as Steven Spielberg is more than that of 1,000,000 exported Hyundai cars. This is just one example of what creative content could bring about. In short, research in the area for the highly able can benefit not only the gifted and talented, but also the education in general.

Gifted education in Korea has developed from a seedling starting from the voices of a few determined professionals to nationwide educational content. However, there are still quite a few issues to address regarding this area. Hence Korea is currently working toward taking the following steps to improve gifted education:

### 1) Provide a continuous and uninterrupted gifted education program
The education system must ensure that all grades, starting from early age, have a gifted program (currently, only certain grades offer gifted education). Since the biggest issue in education is the entrance procedure into universities, various methods must be made to enable universities to develop an admissions process that reflects the curriculum taught at gifted schools or special science schools.

Additionally, exceptionally gifted kids should be allowed to enter university early, if qualified. And continuation of gifted education throughout college (by offering advanced honor classes) is required.

### 2) Gifted education should be made more accessible to all populations.
Currently, 1.5% of students are said to be receiving gifted education. This should be the minimal percentage, since many scholars are advocating at least 10~20% of the students be able to receive special education. Also, considering the fact that Korea is fast turning into a multicultural society, we must strive to include as many cultural and social minorities as possible. This includes offering support to children in low income families as well. In order to serve the diverse populations, we need to develop and improve on teaching –learning methods and materials.

### 3) Improve teaching methods and gifted curricula
There is a need to ensure that all methods and curricula are in congruence with the goals and principles of gifted education, and need to focus on gifted education program to promote student with high intelligence and even better moral character.

### 4) Provide excellent gifted education teachers.
It is a proven fact that good educational program depends on good teachers. In order to attract excellent teachers, there is a need to raise incentives for teachers and enhance their pride in the profession. Such

treatment will enable gifted institutions to recruit specialists from universities and research institutes, as well as inviting international gifted education specialists.

Taking even one course in gifted education can change the perspective of a teacher, and even if that person may not be in charge of a class, basic knowledge concerning gifted students can induce cooperation in a school setting. Hence, there is a need to implement a course of gifted education in teacher training university, or a graduate program in education.

In addition, making training courses more accessible by offering courses online, regularly holding faculty meetings and organizing workshops may help in the long run.

### 5) Offer administrative and financial support

All educational programs need support in order to succeed. Therefore, there should be a gifted education department in each local office of education to support, supervise and evaluate gifted programs. Administrative as well as financial support is crucial in improvement of gifted education.

### 6) Widen the scope of gifted education into all subject fields.

We need people from all fields of subjects to make up a diverse and productive society. Although science and technology has made our lives more convenient and easy, we need the liberal arts and social sciences to advance our values, and arts to enrich our everyday lives. The gifted programs should be offered with a balanced diet.

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**CHAPTER TWELVE**
**Gifted Education in Vietnam over the History**
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**Introduction**

On the stelae of doctorates at the Temple of Literature, Vietnam, it is stated, "Hiền tài là nguyên khí quốc gia", translated into "Talented and virtuous scholars are the life blood of a country", or, "Talent is the national treasure". The maxim has been applied as a slogan for the nourishing and nurturing process of gifted and talented personnel in Vietnam's human resource development strategies since the Le dynasty (1428–1788), one of the longest and most prosperous period of time in Vietnam's history. This emphasises the significance of the education of gifted and talented human resources for the affluence of the nation. The motto was initiated by Than Nhan Trung (1419-1499), a high-profile mandarin, who was ordered by king Le Thanh Tong to compose a speech for the inaugural of the stone stelae at the Temple of Literature 526 years ago (1484- 2010). The stelae record 2,313 students graduating as doctor laureates during the Vietnam's history from the first royal exam in 1075 to the last royal exam in 1819. King Le Thanh Tong chose the tortoise to carry these stelae, because tortoise is one of the four supernatural animals in Vietnamese people's mindset: dragons, unicorn, tortoise, and phoenix (Ngoc, 2004). Tortoise is also the symbol of everlasting life.

Main entrance to the Temple of Literature, the first university in Vietnam

The saying Talent is the national treasure is not only applicable in Le Thanh Tong's dynasty in Vietnam's history 4 centuries ago, but also highly relevant in the current situation, when education becomes national priorities, when intellectual forces play significant roles in the constructing and building process of the country these days. The facts that a Vietnamese mathematician, Ngo Bao Chau, won Fields Medal in August 2010 (the equivalent of Nobel Prize in Mathematics), that Vietnam's team always win in international competitions in Mathematics, Physics, Chemistry, that a fourteen-year-old boy with scrap paper and a few ropes can devise

a sweeping robot, and that a farmer with steel scraps, kerosene and some oxidised engines can develop a flying machine, prove the inventive, resourceful and creative characteristics of Vietnamese people. To utilise all those gifted and talented human resources, to achieve sustainable developments, to attain international reputation with high living standards, it is mandatory that the human capital is carefully looked after. Vietnamese adolescents are the backbone of the infrastructure - the future of Vietnam, among which Vietnamese gifted students are the prominent group that requires the understanding, attention and assistance from their parents, teachers, trainers, educators, policy makers, governmental leaders and other members of the society to fully develop their talents.

According to the decree 82/2008/QĐ-BGDĐT endorsed by the Ministry of Education and Training, budgets from Vietnam's Ministry of Education and Training for schools for gifted students are double those for non-gifted learners. Schools for gifted students strive to provide students with the best facilities to conduct specialised streams, while at the same time, to aim for a well-rounded education. A recent national conference on identification, curriculum differentiation and provisions for gifted students was held in Nam Dinh city on the 26th December 2009 with the participation of over 60 schools for gifted students in Vietnam. This shows the strong will of Vietnamese people to realise the potentials of gifted students and to provide them with the best learning environments.

**Overview of Vietnam's Education**
Education has been highly valued and respected in Vietnam since the foundation of the nation four thousand years ago. It has been cultivated in the minds of millions of Vietnamese people that "Education can change the life of a person, irrespective of their family backgrounds or physical appearance". Parents accumulate all their wealth solely to spend on their children's education. They work extraneously all their life with the vision that with a superior upbringing environment and well-prepared

knowledge, their children will possess bright future prospects. In fact, education is a preparation for life. In Vietnamese folklore literature, there are several folk-songs to praise the noble task of teachers.

> Muốn sang thì bắt cầu kiều
> Muốn con hay chữ thì yêu lấy thầy
> *(If you want to cross the river, you need to build a bridge;*
> *If you want your children to be well-educated, you need to respect*
> *their teachers.)*
> Một chữ cũng là thầy, nửa chữ cũng là thầy
> *(Any person who teaches you anything, how trivial it is, is your teacher.)*

In the past, teachers used to be considered in higher social status than parents. "Quân, sư, phụ" ("King, Teacher, Parents"), a Confucianism-based ideology, was a law-protected hierarchy in Vietnam. That is the order of respect observed by Vietnamese people. In that order, the King was of upmost power and requested the highest respect, followed by teachers, who even possessed higher social status than parents. In modern times, a specific day is strictly reserved to commemorate teachers, the knowledge cultivators of the next generations of the nation. That day falls on the 20th of November, a day everybody in Vietnam knows of. It is named Vietnamese Teachers' Day. On this special occasion, students, even the most ill-mannered ones, always follow the rules and behave themselves to please their teachers. Students also present flowers to their teachers to showcase gratitude and respect. In several cases, representatives of the Parents' Association might visit their children's teachers, to show how much they care for the teachers' well-being. This is a significant day in each and everyone. In fact, education in any form (nursery, elementary, secondary, or tertiary education) exists in any single family. If your children are not at school age, your grandchildren, or nieces, or nephews must be. Thus the discussion around dinner tables, whether in the city or the countryside, in one way or another, always involves education topics.

As of 2010, Vietnam is divided into 64 provinces (known in Vietnamese as *tỉnh*) or cities (*thành* phố) which are directly centrally-controlled administrative units. According to the data from the General Bureau of Statistics, recent census indicates that the population of Vietnam is beyond 84 million. 1 in 4 people in Vietnam is directly involved in formal education and training activities, either as students or teachers. There are almost 20 million students and over 0.5 million teachers and instructors. The official spoken and written language of Vietnam is Vietnamese. While Confucian-style education in Vietnam may be traced back to the 10th century, the current primary, secondary and tertiary educations have recently been implemented for less than a century. In addition to general secondary schools, Vietnam has established approximately 300 vocational schools in teacher training, medicine, agriculture, forestry and fishery, economics, gymnastics and sports, and culture and arts. An increasingly "expanded network of private and semi-private primary and secondary schools has been put into operation (The Ministry of Education and Training, 2004). As the economy power of Vietnam increased exponentially since the *đổi mới* (the renovation process) in 1986, the government decided to partially financially support educational system. As a result, secondary vocational and tertiary education has been no longer free of charge. The following is the chart of the Vietnamese educational system:
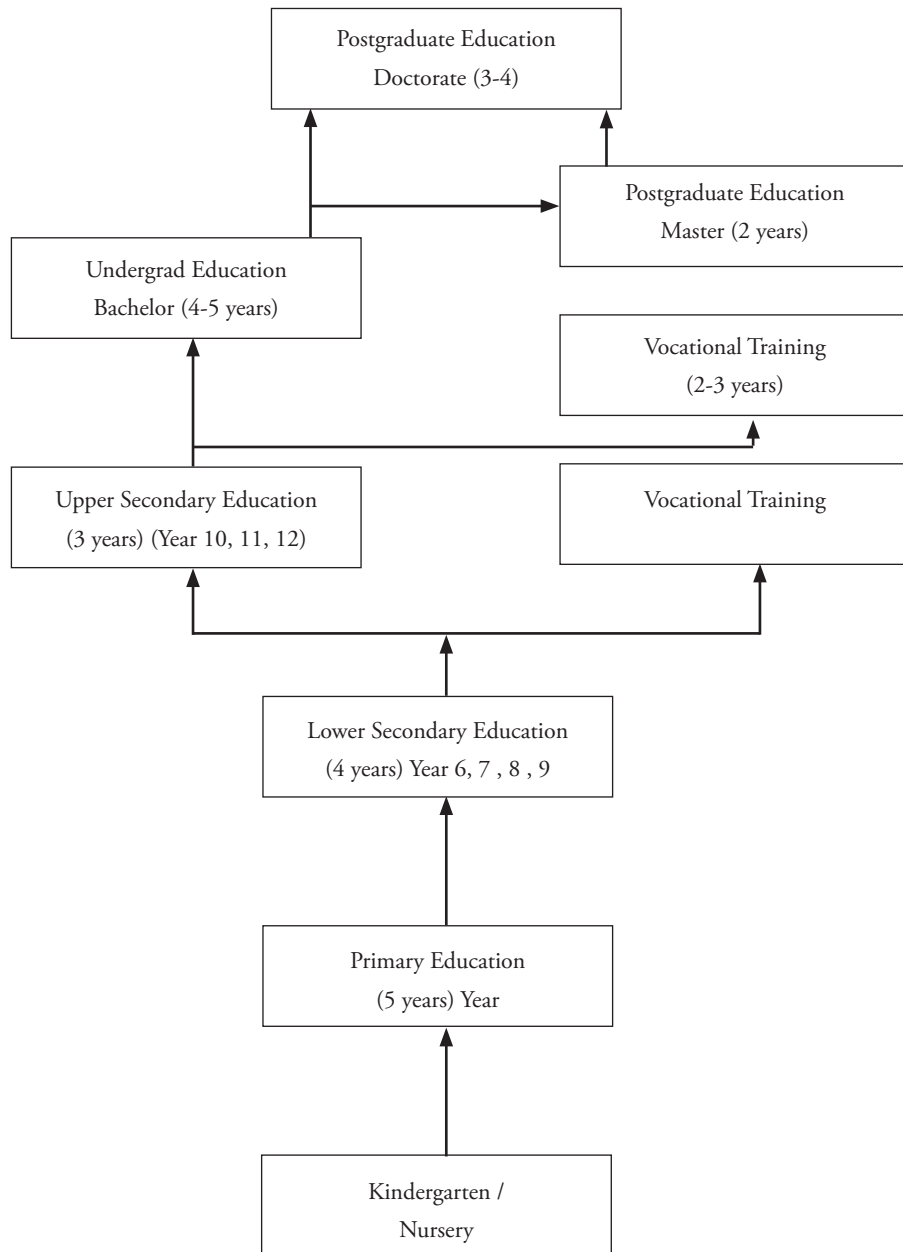
In comparison with remaining developing countries, Vietnam's population benefit from a relatively high standard of education. Children begin to enrol into kindergarten/nursery when they reach 3 years of age. In large cities like Hanoi, Ho Chi Minh city, Danang, there are enormous demands for this form of schooling, as the population is densely concentrated and parents are required to work long hours. In rural areas, as the pace of life is more relaxing, and the population is sparsely concentrated, the situation is not as pressured. Primary education is deemed compulsory in Vietnam to eradicate illiteracy rate among the population. Primary education starts from Year 1 to Year 5 which aims to provide basic learning skills for students. Once finishing primary school after Year 5, students continue their studies in secondary schools, starting from Year 6 to Year 9. In Hanoi, Ho Chi Minh city, or Danang, secondary education is compulsory. In the next decade, the Vietnamese Ministry of Education and Training aims to expand the number of provinces with compulsory secondary education. This is considered to be in line with the economic development of the country. Right after secondary education when students finish Year 9, they can enrol in vocational training and become skilled workers upon graduation approximately 3 years later. Otherwise, students choose to continue their education into high schools where they are trained academically to compete for university education three years afterwards. The option for vocational training is also possible at this stage, where students with high school certificate can enrol in those vocational training courses and become skilled workers. Approximately 90% undergraduate students once they complete their university degrees, join the workforce. A small number of students continue their postgraduate education either full-time or part time while they are working. Postgraduate education in Vietnam is gradually improving with increasing enrolments. While Master degrees are pursued by few students, the doctoral level applies to a considerably smaller percentage of population. Overseas study especially to English speaking countries such as the US, England, Australia, or Singapore is now on the rise. The reasons for that phenomenon are that

the English language proficiency of Vietnamese students is increasing; and the economy of the country is booming, allowing wealthy parents to send their children overseas for further studies. Moreover, foreign aids have been used to support the Vietnamese education and training system where the best students are sent overseas on various scholarship schemes. These students are expected to return to Vietnam to contribute to the economic and social development of the country.

### The Establishment of Gifted Education in Vietnam

In the year 1964, in order to encourage students with a passion for Mathematics to advance further in their studies, Hanoi University cooperated with the then Ministry of Education and Training to organise an enrichment program for mathematics-gifted learners. In September 1965, the first "special mathematics class" was established (Nguyen, 2001). In the 1980s and the 1990s, the expansion of those classes specialised in Literature, Foreign Languages, Physics, Chemistry, Biology, Informatics, History, Geography, together with the establishment of selected schools for gifted students, created a system of provisions for talented learners. This was a "giant leap" which provided gifted students with numerous opportunities for them to reach their full potentials. In the 2007 International Mathematics Olympiad (IMO), Vietnam ranked the 3rd, with 3 gold medals and 3 silver medals. Vietnamese students competing in the IMO were all from schools for gifted learners (IMO official website, 2007).

| No | Name | Gold Medal | Silver Medal | Bronze Medal | Honourable Mention |
|----|------|-----------|-------------|-------------|-------------------|
| 1 | Russia | 5 | 1 | 0 | 0 |
| 2 | China | 4 | 2 | 0 | 0 |
| 3 | Vietnam | 3 | 3 | 0 | 0 |
| 4 | Korea, South | 2 | 4 | 0 | 0 |
| 5 | United States | 2 | 3 | 1 | 0 |
| 6 | Ukraine | 3 | 1 | 2 | 0 |
| 7 | Japan | 2 | 4 | 0 | 0 |
| 8 | PDR of Korea (North Korea) | 1 | 4 | 0 | 1 |
| 9 | Bulgaria | 2 | 3 | 1 | 0 |
| 10 | Taiwan | 2 | 3 | 1 | 0 |

The first national conference on gifted education in Vietnam was organised on the 14th September 2007 at Hai Phong city. The main aim of the conference is to review the development of Vietnamese gifted education through 42 years, and to identify innovative directions for further developments. For the first time, a systematic organisation was proposed, not only for the development of gifted education, but also for a more efficient operation of the whole educational mechanism through all levels from kindergarten up to tertiary education. Based on preliminary developments of the first conference on gifted education, on the 26th of December 2009, the second conference was held in Nam Dinh city with the participation of over 60 schools for gifted

students in Vietnam. Several proposals were submitted with the purpose of building and upgrading school systems in Vietnam to better equip gifted students with high technology and modern infrastructure. A preparation plan for the next 10-15 years of future developments was designed. It was mentioned in the documents that full and well-rounded developments of students needed to be paid attention to, to ensure that students were fully prepared for the challenges of the 21st century, the century of technology. Additionally, teachers from schools for gifted students are required to frequently upgrade their knowledge, expertise, methodology to keep up with current trends.

Vietnam focuses on providing the best learning facilities for students with an emphasis on creativity and a more comprehensive education. In each of the 64 administrative areas in Vietnam, there is at least one high school for the gifted students to cater for their needs. In large cities like Hanoi, Ho Chi Minh city, Danang, there are more than 1 high schools for gifted students, as these areas are densely populated. All gifted students are required to fulfil qualifying criteria to be admitted to these schools. The qualifying criteria consist of a test on students' specialised subjects and their academic results at secondary schools. Most students and their parents show strong interest in these schools for subsequent reasons:

• Students in gifted schools are educated by the best teachers in local areas.
• Students in gifted schools are provided with the best learning environments.
• Students in gifted schools receive numerous financial assistances and scholarships.
• Students in gifted schools are highly respected by the society.

There are a number of websites and forums created by students or alumni of schools for gifted students to exchange ideas regarding their studies and extra-curricular activities. Students from these schools have the opportunity to fully develop their physical strengths as well. Teachers are carefully recruited and greatly better - paid than those from comprehensive schools. The reason for this practice is that teachers will afterwards have more financial security

to fully concentrate on their teaching profession, rather than conducting private tutoring to earn extra income. Schools for gifted students are provided with computers, laptops, and high technology to create favourable conditions for teaching and learning. Management skills and teaching skills of teachers are frequently updated through professional development programmes. Separate curricula are required to teach students with specific talents. The Vietnamese Ministry of Education and Training sets target for the year 2015, in which 50% of gifted students will reach level 3 of the Foreign Language Proficiency standardised by the Association for Foreign Language Assessment Authorities. Up to the year 2020, the figure is 70% of the total population of gifted students. Further subjects are expected to be taught in English. Accordingly, students will encounter no difficulties in English language to participate in international competitions and have higher chance to win scholarships in prestigious overseas universities. It is budgeted that from now (2010) to the year 2020, 750 teachers will be trained overseas and 1850 teachers will be trained in Vietnam on how to teach their specialised subjects in English. It is also aimed that in 2015, there will be 15 schools for gifted students that meet international standards. English language is considered the core subject for entrance exams and will be the language for instruction in the next 5 years.

Most schools for gifted students teach 2 sessions per day, as opposed to 1 session in comprehensive schools. 100% teachers from schools for gifted students have excellent pedagogical skills, among which 20% of the total number are capable of using foreign languages in teaching, 50% possess postgraduate qualifications. Gifted students are expected not only to excel in their own specialised subjects, but also to be proficient in foreign languages and modern technology. They are required to be fully developed in independent thinking, research skills, group work and teamwork skills. Other than those functions and responsibilities specified to comprehensive schools, schools for gifted students carry out the following tasks:

Identify and foster talents of gifted students in one or two particular subjects, or specific areas on the basis that the students will experience a well-rounded development.

Instruct gifted students to explore research methods and scientific activities and to apply new knowledge and technological advances relevant to the schools' facilities and gifted students' physiological and psychological developments.

Cooperate with educational institutions in the national and international arenas to conduct research to enhance the quality of teaching and learning activities.

### The Selection of Academically Gifted Students in Vietnam

The Education Law in 2005 stipulates that high schools for gifted students are educational institutions for those students who are high-achievers in academic domains to develop their talent with the aim that they accomplish well- rounded growth. Several national conferences with the participation of policy makers, school management boards, teachers, parents of gifted students are organised. The purposes of these conferences are to outline and highlight recruitment procedures and curriculum differentiation for gifted students; build up teaching workforce and management boards, establish professional development program for staff at various levels; provide high infrastructure with modern facilities for teaching and learning purposes; promote innovations in teaching methodology, assessment methodology for teachers and students; increase cooperation in professional seminars, both locally and internationally; create favourable conditions with high salaries and financial incentives for dedicated teachers and gifted students; and lastly to evaluate achievements, identify shortcomings, and offer suggestions. Depending on specific circumstances, each province or city under the direct control of the Central government has at least one school to cater for the needs of gifted students. The total number of students studying in these schools should not to exceed 10 percent of the population of the host city or province. In large cities where the population is highly dense, two or even three schools for gifted students are constructed. These schools are constructed and administered under the Department of Education and Training and the Province or City Councils. Another system of schools for gifted students is established in universities based on the available facilities within these educational institutions.

The Department of Education and Training in each province/city or Management Board of educational institutions (universities) in charge of schools for gifted students are required to plan the recruitment process for next batch of students on the 30th April every academic year at the latest. As each school year starts in September, the school's entrance examination is usually held in June. The average intake of each school for the gifted students in Vietnam is around 300-400 students each year. The number of classes in each school is determined by the direct management board on the basis of recommendation for the principals of the schools. Each class does not exceed 35 students. Schools for gifted students might cater for the needs of students who possess talents in the following categories:

Specialisation in Math
Specialisation in Information Technology
Specialisation in Physics
Specialisation in Chemistry
Specialisation in Biology
Specialisation in Literature
Specialisation in History
Specialisation in Geography
Specialisation in Foreign Languages

Because gifted education is highly valued in Vietnam, competition for places in these schools is very strong. Students train rigorously to get admission into these prestigious schools. The policy of admission tests vary from schools to schools and are based on the decision of the management board of the schools as well as the Department of Education and Training in each administrative city/province. Nevertheless, overall, the admission of each student is based on previous academic results at secondary schools and entrance exams. In several schools, the procedure is fairly

simple. Candidates must take two compulsory subjects (Literature and Mathematics) and one elective subject for their specialised streams. Time duration for each test ranges from 90 minutes to 150 minutes depending on the specialisation. In other cases, decisions are made mostly through at least 3 rounds. In the first round, interested applicants are assessed on their performance at secondary schools. In the second round, a limited number of candidates will subsequently be invited to participate in entrance exams. Logical reasoning, outstanding reading and writing skills, and a wide knowledge on specialised subjects are essential for securing a place at gifted schools. The third round involves interviews with individual students. The interviews aim to give a better understanding of students' personality, aspiration and leadership skills. This round also takes into account students' enthusiasm and participation in extra-curricular activities, which is considered as the manifestation of students' soft skills. Schools for gifted students under the management of city or province authorities are permitted to recruit students within that particular city or province, and the final approvals of students' admission are at the discretion of the management board of the schools. For those schools established in universities, the recruitment is conducted nationwide to select the best students in the country.

**Facilities for Schools of the Gifted Students**
Schools for gifted students in Vietnam receive funding from several sources such as governmental agencies, educational bodies, or private corporations. High infrastructures are priorities for the development of schools for gifted students. The Department of Education and Training, as well as the Management Boards at educational institutions are required to intensify their investments into these infrastructures. The budgets for schools for gifted students are guaranteed 200% more than those provided to comprehensive schools. Teaching staff in these schools are selected from general teaching staff who have prestigious reputations in the field and high commitment to the education of gifted students. They are among the

best teachers in the local areas. Once recruited into these schools, teachers have higher salaries and better provisions than their colleagues in comprehensive schools. After 5 years in operation, schools for gifted students have to achieve at least 30% teaching staff qualified with Master Degrees, not including visiting teachers. Professional development programs are designed to equip teachers with up-to-date knowledge in the field. Furthermore, training in utilizing computer applications and modern facilities in teaching are frequently organized to fully assist teachers achieve the best teaching outcomes. Support for overseas training for teachers are also considered. In several cases, study leave is granted to teachers who have the aspiration to upgrade their knowledge.

Scholarships from school authorities, Departments of Education and Training, and educational institutions are offered to students with high scores in exams and competitions at all levels. Furthermore, local and

international businesses present a number of scholarships for students achieving high prizes. Several students are recruited into the talent search programs initiated by these businesses. In some schools for gifted students, stipends are offered to students to cover the cost of uniform, books, transport and meals. Specific bus routes are organized to provide pick-up services for gifted students. Dormitories are provided to those students who live in far distance from the schools. High buildings with tight security create a safe environment for the development of gifted students. In addition to academic curricula, schools for gifted students organize extra-curricular activities to support students with regards to their social lives. Camping trip or excursions are arranged on public holidays to strengthen the solidarity among school members, as well as develop soft skills such as time management skills, leadership skills, or organizational skills. Selected schools for gifted students have permission from the Ministry of Education and Training to invite overseas educators/researchers to teach specialized subjects to their students. The state-of-the-arts library facilities are frequently updated to provide students with the most updated knowledge. Furthermore, Internet services utilize the latest technology for learning and teaching purposes. With outstanding support from the government, the Ministry of Education and Training, as well as from the management teams of these schools, gifted students in these schools are expected to reach their full potentials.

### Challenges in the Gifted Education in Vietnam

In line with the resources and supports provided to gifted students, there are several cases where students in gifted schools are pushed to study to achieve high prizes in competition. This is an extremely dangerous situation where students spend hours and hours on those subjects which do not interest them at all. They are forced to study, thus bring pride to the schools. The number of học sinh giỏi (students with high merits) increases but in fact, it is what is called bệnh thành tích (or the disease of achievements). This shows the limitation of the system of schools for

gifted students. It is speculated that students who experience this incident early in their life often encounter frustration and lead to the loss of creativity in their future years.





In several cases, schools for gifted learners concentrate only on the preparation of exams for their students. They aim to achieve high prizes in competition, thus do not pay sufficient attention to remaining subjects

at schools. Consequently the lack of understanding knowledge in other subjects is not a surprising phenomenon. Students are forced to spend their time studying only specialized subjects instead of those required by the national curricula. That leads to the fact that students in gifted schools, though at a very high level at their specialized subjects, have limited knowledge in other domains in schools (Mai Minh, 2009). This is a dangerous situation where well-rounded developments are required from future generations of the nation.

The other challenge in many schools for gifted students in Vietnam is the lack of physical education. Students do not have sufficient extra-curricular activities, which might hinder well-rounded development of gifted students. Though the concern of the schools for gifted students is to provide the best learning environments for students, some students do not voluntarily participate in physical activities. As students are so absorbed in their study, they do not pay attention to extra-curricular games. Their physical strength, thus, is not fully developed as students from comprehensive schools. They are not into team-building activities, and do not have the opportunities to develop their social skills. Anecdotal evidence has shown students from gifted students are less likely to integrate well into community, as they do not possess sufficient social and personal skills.

The quality of education is also of serious concern. Though gifted students receive many international awards and scholarships from prestigious universities around the world, they lack essential skills for critical thinking, original research, and problem-solving skills (Mai Minh, 2009). These skills have been proved to be of significant importance for students in this fast changing world. If these students are to become scientists in the future, these skills are undoubtedly essential for their future careers. Furthermore, to achieve high accomplishments in any stage of their lives, students need to be equipped with those skills. Further training in this area should be addressed as quickly as possible in the current context of globalization.

With regard to teacher quality and training issues, in the national conference on gifted education in Vietnam in 15/09/2007, Mrs. Le Thi Chinh from the school for gifted students specialized in foreign languages in Hanoi stated that teachers in schools for gifted students, who are considered to possess wide knowledge and excellent teaching methodology, are now transferring to private schools, where higher salaries are offered. This is an outstanding issue for the government. If good teachers are leaving, the quality of teaching will diminish. Appropriate measures to train good students and retain them in the teaching workforce are to be considered. The roles of teachers are undeniably valuable in securing future prospects for the society in educating young and gifted generations. Teacher quality and teacher supply has been an on-going issue for discussion in the last few decades. Teachers, in general, are valuable assets of the society with whom future generation of a nation are nurtured and cared for (Burke, 1989; Kaplan & Owings, 2002). The provision of professional development programs, the design of long-term staffing needs, the establishment of a register of qualified language teachers are to be implemented at national, state, and grassroots levels (Goldhaber, Eide, & Liu, 2003). The quality of teachers is an essential element in the success of the program (Booth, 1989; Grace & Lawn, 1991).

Last but not least, though Vietnam has a number of students with high prizes in international competitions, such as the International Mathematics Olympiad, Asian Pacific Mathematics Olympiad, or International Olympiad in Informatics, these students do not have opportunities to develop their talents in their later years. The number of patents granted to Vietnamese nationals is not up to the expectations. Furthermore, most of these students usually move overseas for tertiary education and settle in the new countries permanently, leading to the brain drain of the nation (Smart, 2006). Brain drain is traditionally defined as the "emigration of skilled and professional personnel from developing countries to advanced industrialised nations" (Miyagiwa, 1991) (p.743). This is not only the problem of Vietnam, but of all developing countries, who lose thousands, even millions of skilled professionals to developed countries.

## Perspectives and Future of Talent Development

In the current situation, talent development in Vietnam mostly concentrates on intellectual giftedness rather than other domains such as sports or music. Part of the reason is that Vietnam does not have the professional consultation and facilities to cater for the needs of gifted students in those fields. Training in areas like sports or music is difficult to conduct on a wide range in Vietnam, a developing country and thus only confined within family environment rather than arouse national interest within society. Additionally, the love for learning in line with the influence of Confucianism transferred from generations to generations strongly and favorably emphasizes giftedness in academic domain as central attention. It is expected that in the next few years, provisions for gifted students in other field rather than academic domain will be catered for. Funding's from relevant governmental bodies as well as private sectors are to be distributed to these students. Furthermore, identification of gifted students in rural and remote areas, especially among the group of minority ethnic students, imposes critical issues. The infrastructures and the social-economic developments in these areas are limited, which results in low levels of literacy in the area. Gifted students might not be able to be identified, as they might not have the opportunity to be sent out for identification. Qualified staff should be sent to these areas for further processes of conducting the identification procedures. Rising awareness of the identification issues in rural and mountainous areas is essential to create the favorable conditions for gifted students to grow. In the near future, more gifted students from these areas are expected to be identified. As the global economy is moving toward the knowledge economy, it is highly vital to realize that talents are precious treasures of the nation and that talents should be nurtured.

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**CHAPTER THIRTEEN**
**Gifted Education in Zambia**
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### History

Zambia is a former British colony located in Southern Africa, an independent country since the 24th of October, 1964. From 1953 to 1963, Zambia, Zimbabwe and Malawi were one country, known as Northern Rhodesia, Southern Rhodesia and Nyasaland, respectively. While the official language and thus that of all government business, is English, Zambia has 73 other local languages. The main local languages spoken are Nyanja, Lozi, Tonga, and Bemba.

Zambia has a population of twelve million people and having experienced many of the wars infamous of Africa, could be considered an average African country. On one hand, there are a lot of things that make it a world class country, but the roads could be better, the number of people living in poverty is high and the quantity of skilled manpower is still on the low side. Millions of Zambians live below the poverty datum line of $1 a day.

Zambia is a country of great diversity, with beautiful national parks and some of the world's most beautiful animals: impalas, cheetahs, hippos, kudos and many others make Zambia their home. Among the natural treasures most praised by visitors are Luangwa and Kafue National Parks and

Zambia's four rivers: Zambezi, Kafue, Luangwa and Luapula. Victoria Falls, regarded as one of the 'seven wonders of the world', is also located in Zambia. In addition Zambia boasts of considerable mineral wealth. Holding 6% of the world's copper reserves, copper accounts for most of Zambia's foreign earnings.

It is comparatively a new country and has a plural political system. The three main political parties are Movement for Multi-party Democracy (MMD). Patriotic Front (PF) and United National Development Party (UNPD). Elections for the president and members of parliament are held every five years.

Zambia is mainly inhabited by people of African descent and thus the majority of children speak African languages at home. Public schooling, however, is conducted in English. This poses problems in that most children speak English as a second language.

The Ministry of Education is the branch of government targeted at the development of education. The government policy is that children start school at seven years. Primary school starts from grade one and continues to grade seven. Junior secondary is only two years. That is from grade eight to grade nine. The last three years are for senior secondary school. After grade twelve, students proceed to universities and colleges. Zambia has only three state universities, University of Zambia, Copperbelt University and Mulungushi. National examinations are administered at grade seven, grade nine and grade twelve. Government schools are tailored toward universal education. Private schools are more popular with the middle class.

HIV-AIDS is responsible for reducing the best of Zambian professionals – including teachers, engineers and politicians. It has killed thousands of teachers and pushed the aspiration of the country backwards.

**Screening**

Zambia like other third world countries has mainly been preoccupied with universal education. That is, making sure that most people can read and write. That said, other issues in education have not received the same attention. Broadly speaking, the average teacher does not have adequate training.

The main testing battery that the ministry of Education uses is the national examination. The national examinations have multiple uses. Among many other functions, it is used to filter students for the limited places available in schools. Unlike developed countries, school places are not always guaranteed in Zambia. In some cases however, educators have used examinations to identify students that are talented. The students are tested in mathematics, social studies, English, science, and intelligence quotients. The cumulative total is considered and those students that score above 800 are said to be gifted. However, even after being identified, very little support is given to students that reach this upper limit. The Grade seven examinations are the first filter at primary level so from grades one through six, individual schools and teachers have to take their own initiative in identifying gifted students. Probably much more than in other countries, the creativity of a teacher is paramount.

Private institutions have been more robust than government institutions. Most private schools use the NFER, to test primary and secondary students. While it is subject and age specific, most teachers are uncomfortable with the NFER because it has a cultural bias. It is meant for students in Britain and thus the expected norms are different. The tests offered are general and not differentiated. It is not clear whether the battery is measuring the right things or not and the upper ceiling is hard to measure. Are the tests measuring achievement, or the level of giftedness? The truth is, testing in Zambia is very underdeveloped.

English language as a means of instruction also poses great challenges for students that are being tested. Most children speak multiple languages. Although all testing is in English, some children capable of better grades do not have full fluency in the language. The danger represented here, is that sometimes the testing is more about the language than the ability.

Unlike testing, teacher identification has been quite reliable. Although most teachers need orientation in the teaching of the gifted and talented,

they do a better job at identifying and selecting these students. Most testing apparatus are either irrelevant or are poorly administered. One size fits all testing does not work for all students. The complexity of testing and assessing has not fully been appreciated. Not all levels of ability are being measured and worse still, very few teachers have expertise in gifted education. None of the universities in Zambia offer courses in gifted education and most of the batteries being used in private schools were designed either in Europe or North America.

**Talent Development and Educational services**
Development of talent is enhanced in a variety of ways. In some cases, the Ministry of Education has allowed students that are above grade level standards to skip grades. In these situations, it is usually the parents that bring about the change. Grade skipping is not always popular with teachers because of the social emotional issues that arise. A lot of teachers and headmasters have become resistant to students skipping grades.

Most schools do not have special services for the gifted and talented children. Often teachers are stretched. The ratio of teachers to students at primary level is about 1:50. The teachers have a difficult task of meeting the basic needs of regular students. Tending to students with special needs appears to be an additional responsibility. Some students do however, have enrichment activities. These are probably the most common activity given to gifted students. Unfortunately, careful planning is not always a factor in developing the work for enrichment.

Extra-curricular activities are well developed in most Zambian schools. Do they help in stimulating talented children? Very few studies have been taken to measure the effectiveness of after-school programs. The main challenge of after-school activities is consistence. Furthermore, the groups are not always screened, and thus the teacher does not always have a strong relationship with the students. More teachers are provided for children with special needs. The most common of these is for English as a second

Language (ESL) classes, but the student -teacher ratio is usually very high.

Gifted students are sometimes pulled out of a mainstream classroom to spend a part of their time in a gifted class. This doesn't happen in state schools, but it does take place in private schools. At one school it only happened for one semester, as it was disabled because of 'staffing needs'. Such scenarios are very common due to 'budgetary constraints'.

**Perceptions and Handling of Talent development**
It is assumed by many teachers that smart students have minimal problems in class. To ask a teacher to spend more time with a person with special needs is a straight forward case. It is given that a child in that position needs a lot of compassion and motivation. Many teachers that are grounded, gifted education practitioners find it a big bother to give more attention to talented children. With a class size of between 40 to 50 students, these educators look at acceleration and differentiation as complete luxuries.

As in many parts of the world, gifted kids have to fight a culture that presupposes that 'good' students should be submissive and' well behaved'. Teachers are uncomfortable with students who think or work 'outside the box'. It is a common occurrence that smart children who challenge teachers and authorities get in trouble. Creativity and talent are not always celebrated because it sometimes makes society rethink what they are doing. Punishment is deeply entrenched in school cultures throughout Africa. In a way, not all things that chastised deserve that. In some cases, gifted children drop out of school because the atmosphere prevailing in educational establishments does not reward talent. As previously mentioned, most teachers have not had training in gifted education. More investment in teacher education will lead to confidence and better teaching strategies. Because of a poor technical base, most teachers employ teaching methods that are not challenging to the kids. 'One size fits all' seems to be the functioning philosophy. Research based instructions and inquiry are not

fully supported. Thus, gifted children are taught things they already know and are also exposed to lessons that are extremely boring. Lessons tend to be examination driven and not fully authentic.

Policy framework at the top has not been encouraging either. Advocacy and sensitisation need to be adopted at the highest level. The people most passionate about gifted education here in Africa are parents. They know the kind of problems and challenges that their children go through. When the parents are quiet, it leads to the silent frustration of children.

Many teachers assume that if a person has serious special needs, then they cannot be gifted in other areas. It explains why most schools do not take an effort in testing and strengthening the strong areas of children in jeopardy. It is particularly evident in early years when children and parents do not really know what the child is capable of doing. Intervention strategies for students that are twice exceptional are not piloted. Lack of hope leads to low expectation and low teacher expectation always has negative implications on the learners.

Cultural issues are probably the most frustrating aspect of reaching out to talented children. It is not uncommon to hear that female students have dropped out of school because parents would rather sponsor a male child. Not so long ago, we heard of a similar case. The girl was very talented and a wonder to all the teachers. She showed a lot of promise and was already receiving differentiated instructions. Until one day, the father decided he would rather educate the boy child. Although Zambia has one of the highest literacy levels in Africa (87% for males and 75% females) such stories are common.

### Future of Talent development
The most pressing challenge facing gifted education today is lack of policy declaration. The ministry of Education has been fairly quiet on this topic. Private schools have matched the challenge, but even, clear guidelines have not been outlined. It is thus, imperative upon all the stakeholders to reach

out to the authorities. The policies and practices of schools need to be examined. A vacuum of leadership exists that will usher a new generation of teachers, one that will be conversant with the needs of a gifted learner.

Universities in Zambia have always been agents of change. Most leaders have received their education from University of Zambia and Copperbelt University. At the moment, none of the state or private universities offers a course in gifted education. This explains why the take-off has been slow, but change has to start with universities.

The first 40 years of the country have been dedicated to universal education. The time has now come to look at other areas of education besides the quest for literacy and numeracy.

We have not yet developed testing batteries which are consistent to Zambian and African norms. This explains why we have a challenge in developing a coherent policy framework for gifted education. Although English is the national language, it is spoken by Zambians as a second language. While there are different levels of proficiencies, if a person has a language problem, all other talents may be affected.

The current educational structure is such that children from disadvantaged families cannot have access to specialized instructors. It is more for those who have access to resources. Most people in the countryside are very poor and rely on the government for vital services. As a matter of fact, private schools are almost all in cities, further decreasing the chance for gifted students from poor, rural areas to receive necessary attention. As much as we may be passionate about gifted education, for it to be equal in Zambia, the government may have to get involved.

The following must addressed for gifted education to become a reality in Zambia:
- Procedures to promote identification and develop local testing batteries
- Understanding of processes of talent development in education, especially with regard to conceptual aspects and methodological features of gifted education.
- Initiation of programs to promote gifted education.

- National policy on gifted and talent development.
- Highly trained personnel.

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**CHAPTER FOURTEEN**
**Gifted Education and Talent Development in Nigeria**

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**The Country: Nigeria**

Nigeria is located on the West coast of Africa, and is the most populous country in the Sub-Saharan Africa with an estimated population of 152 million people.

Nigeria is a multi-ethnic, multicultural, multi religious country, with its strength in its Unity within the diversity.

Nigeria was a British colony until 1st October 1960 when the country became independent, and started first with Prime- Ministerial governance type, later military governance and now democratic governance with the Presidential system.

To date, Nigeria is divided into thirty-six states, and one Federal Capital Territory, Abuja.

*Educational System*

The educational system has gone through various stages of development.
    As of now, Nigeria operates the 6-3-3-4 systems, that is:
- Six Years of compulsory Primary School Education for all children from age 6 years, now renamed Universal Basic Education (UBE)
- Three years of Junior Secondary School Education
- Three years of Senior Secondary School Education
- Four years of Tertiary Education in Colleges of Education, Technical Colleges, Polytechnics and Universities.

These Institutions are owned by Private Proprietors, the State Governments and the Federal Governments.

Primary and Secondary Education systems are administered by the state government, though general education policy may come from the Federal Government, through the Federal Ministry of Education.

Tertiary Education policies and administration are under the Federal Government which has the responsibility to coordinate, administer, approve and accredit Tertiary Institutions under its agencies National Colleges of Education Commission for Colleges of Education, National Board of Technical Education for Polytechnics and National Universities Commission for Universities.

### Historical Overview of Gifted Education in Nigeria

The Federal Government of Nigeria under the then, Head of State, General Yakubu Gowon in a nation-wide broadcast in 1974 announced the provision of special education programme for Gifted Children and physically challenged children. When the National Policy on Education was released, it contained the introduction of Special Education programmes which caters for the handicapped and the exceptionally gifted children. Specifically, section 8; 36 of the National Policy on Education (1981) clearly states that all children including the gifted as well as those with physical, mental and learning difficulties must be provided for under the new education system.

Education for the gifted, according to the policy statement is designed to enable the exceptionally gifted children develop at their pace for full self-actualization in the interest of economic and technological advancement.

To implement the policy statement, a Committee which was set up by the Federal Government to work out a suitable programme for the education of the gifted recommended the appointment of five Federal Government Colleges to serve as pilot institutions. The approval of this recommendation led to the appointment of King's College, Lagos;

Federal Government Colleges in Ilorin, Benin, Kano and Maiduguri as pilot schools for gifted education in Nigeria. As time went by, the Federal Government, eventually, instituted a gifted school in Suleja named Suleja Academy in 1989 exclusively for the education of the gifted children at the secondary level of education. Suleja is in the suburb of the Federal Capital Territory of Abuja.

However, the National Policy on Education (1981), lays emphasis on the education of the gifted in the following words:

There are also specially gifted children who are intellectually precocious and find themselves insufficiently challenged by the programme of normal school and who may take to stubbornness and apathy, in resistance to it. Government has already directed that all children including the gifted must be provided for under the educational system. The corollary of UPE, therefore is that special educational arrangements must be made for the "handicapped "and the exceptionally gifted (p. 36).

Government's major objective in respect of gifted children is stated in the National Policy on Education (1981);

To provide opportunity for exceptionally "gifted" children to develop at their own pace in the interest of the nation's economic and technological development. (p. 36)

It was as a result of this provision and the need to implement these objectives that the Federal Academy (Formerly Suleja Academy) was founded.

### *The Federal Government Academy (formerly Suleja Academy)*

Federal Government Academy, Suleja is an institution for the children selected for gifted education in Nigeria. This institution is located at the defunct Federal School of Arts and Science, Suleja, 45 kilometer South-East of Federal Capital Territory. It is the National Center for nurturing gifted and talented children.

Balogun (1992) reported that the school started with 205 students in the second year of Junior Secondary School (JSS 2) and second year of Senior Secondary (SS2) with 15 academic staff. These students were drawn from

the pilot schools operating gifted education programme in Nigeria, namely, King's College Lagos, Federal Government Colleges at Ilorin, Kano, Maiduguri and Federal Government Girls College Benin.

At inception, the Academy operated an acceleration programme, graduating students in four years instead of the normal six years of secondary school education.

The students enjoyed Federal Government Scholarship covering Tuition, Boarding, Feeding, Uniforms, Text books and Exercise books.

### Selection of Children to Gifted Education Schools

The establishment of Suleja Academy for Gifted Children, led to a multi-stage selection procedure for the admission of pupils into the academy. At the initial stage, the top five percent of pupils in all the Local Governments of the Federation are identified. Candidates who scaled this selection were further subjected to further screening exercise at the state and national levels from where the top five percentage are admitted into the academy. The screening exercise was basically through the National Common Entrance examination conducted by the National Examinations Council.

Presently, the National Board for Educational Measurement has been mandated to select qualified pupils for the academy. The new assessment procedures of the board include:

- Identification of the best ten primary six pupils in all Local Government areas. There are 772 Local Governments in the country.
- Conduct of common entrance examinations in mathematics, English language, psychometric matrices and General Aptitude Tests.
- Submission of the results to the Minister of Education for decision making process.
- In an attempt to ensure equal representation of pupils from all states of the federation, the board has recently introduced relative merit strategy. This new procedure admits the best two candidates from all the states of the federation and Abuja.

Ibironke (1995) notes that the instrument used in identifying the gifted is loaded on cognitive traits, hence high achievers are identified.

Federal Academy offers a wide range of subjects in line with the National Curriculum approved for Junior and Senior Secondary Schools in Nigeria.

Balogun (1993) remarked that now the curriculum in the Academy leaned toward enrichment rather than acceleration.

### Challenges facing the Federal Academy, Suleja

There are a number of challenges facing the gifted education programme in Nigeria. Balogun (1993) highlighted these shortcomings as:
- (i) Inadequate infrastructural facilities.
- (ii) Inadequate funding.
- (iii) Poor staffing and general lack of incentive for the ones we have.
- (iv) Lack of coordination between policy and implementation.
- (v) Inadequate publicity and public enlightenment on the Academy
- (vi) No Advisory Council for the Academy.

One major problem confronting the programme is the normal curriculum it runs without enrichment or/and acceleration. Other challenges facing the Academy can be grouped under Economic, Social and Political challenges.

### Economic Challenges

Ojerinde (1994) observed that the Academy has suffered to some extent financial deprivation in recent years. He observed that apart from the structure inherited from the former School of Arts and Science, not much can be seen in additional development. He observed that instructional and learning facilities for the institutions appear quite inadequate.

The Blue Print on the education for the gifted suggests a tripartite arrangement in which the Federal, State and Local Government share in the financial responsibilities of funding gifted education. To date, the Federal Government alone funds the programme.

### Social Challenges

Apart from economic factors militating against effective implementation of the programme, Ojerinde (1994) observed that most states shortlist candidates who in most cases show no evidence of giftedness. One can see that from the multicultural nature of our country the approved procedure and guidelines for admission for gifted education is hardly followed because of federal character policy and the various perceptions of the people due to different cultural values.

### Political Challenges

The Federal Government Academy is an educational institution caught up in political web. It can be observed that some sections of the country see the Academy as a Federal Institution that should cater for all sections. Some Nigerians see the Academy as part of the national cake which must be shared by all irrespective of approved procedures. Political consideration come to play in the admission of the gifted in Nigeria as consideration is given to National and State merits

### Challenges Associated with the Assessment and Identification of the Gifted Child

Gifted and talented individuals, if identified early, assisted and motivated toward the right path, are assets of immeasurable proportion to national development. The identification of Gifted Children can only take place through accurate psycho-educational assessment. It is appropriate assessment that will distinguish them from their counterpart in schools and out of schools and also expose their educational, vocational, and psychological needs.

However, a number of challenges are facing the psycho-educational assessment of Gifted children. These challenges include those that are posed by parents, government and non-government agencies, personnel or professionals working with the gifted children. The assessment problems may be viewed from three overlapping areas.

- Problems inherent in the actual assessment procedures,
- those relating to Assessors, and
- Parental/Guardian Ignorance.

The informal assessment strategy recognized parents/guardian as the first assessors of a gifted child. They live and interact with the child and most of these inherent traits of giftedness are exhibited in their presence. Ironically, most parents/guardian are too preoccupied to notice these traits or lack techniques of isolating them or are ignorant to the point of referring the child for professional assessment. Some parents, in the submission of prevent their children from being assessed because of the stigma associated with special needs. While some parents, due to lack of knowledge, curtail the inquisitive children because of cultural practices, some parents hide or prevent their gifted- handicapped children from attending school, or social functions.

Inappropriate Test Instruments. Standardized tests usages are indispensable tools in the assessment of gifted children. There are several tests in circulation but the ones that would discover and assist the Nigerian gifted child mostly are the ones developed by Nigerians.

The cultural bias inherent in several tests to discover gifted/talented students often makes it difficult to obtain fair estimate of their abilities. Unfortunately, most assessors of gifted children rely on foreign tests or adapt foreign tests when dealing with the gifted child.

The foreign standardized tests cannot be perfect for usage in Nigeria because of cultural beliefs and attitude. Furthermore, most intelligence tests have an "Anglo-Centric bias in terms of differences in language, attitude of individual student, critical life experiences, children relationship with peers, attitude toward multiple-choice situations, and trial and error approaches.

Inadequate Training/Personnel. Trained personnel must have undergone a number of special theoretical and practical courses at the university level before he/she is qualified to conduct assessment tests for identifying Gifted Children. Some of the courses that would improve the proficiency

of personnel, include introduction to measurement, evaluation procedures for teachers, individual psychological testing, psychological measurement practicum in psycho-educational assessment development. It is, however, doubtful if some of these courses are included in the curriculum of trainee.

Unhealthy Rivalry among Professionals. As earlier indicated, multidisciplinary or interdisciplinary approach is the best form of assessing the gifted child. This approach utilizes team technique of assessment in which diverse professionals such as special educators, Guidance Counsellors, Educational Psychologists and other professionals contribute to the assessment of the gifted child. The collaborative efforts of these professionals would lead to accurate assessment while unhealthy rivalry would thwart meaningful assessment. If the multidisciplinary team has insufficient or inappropriate representation there will be a breakdown in assessment procedure which would lead to inaccurate conclusions. It is disheartening to note that discrimination by some professionals is a problem militating against assessment. Some professionals tend to feel that they are more relevant to the gifted child or superior to other professionals.

Poor funding of Test Construction. The development of standardized test requires financial back up or sponsorship. This is because the tests are supposed to follow international guidelines during the process of construction. The huge amount requires may put off interested test developer from venturing into such area. Regrettably, government and non-government organizations that ought to be of assistance are focusing their attention on other numerous challenges ravaging the country.

Inadequate number of Gifted Schools. Gifted schools are places where gifted/talented children are trained. There is only one of such in Nigeria – The Federal Government Academy, Suleja. This is grossly inadequate to cater for gifted children in Nigeria. When qualified children are not adequately admitted in gifted schools because of insufficient space, some parents might not see the need for psycho-educational assessment of their children. Apart from this, the school is mainly for secondary education, which implies that the child would still have to complete his/her

university education in the conventional university just like pre-primary and primary education.

Impact of Environment on Gifted Child. The contributory impact of environment of giftedness cannot be underestimated. Children who are gifted abound in both urban and rural areas. However, the environment in which these set of children operate has significant effect on their performance on assessment tests. Exposure of gifted children in the urban centers cannot be equated with that of gifted children in the rural areas. The children who are raised in a less nurturing and rich environment but have potential for giftedness are at a disadvantage. The intelligence tests are constructed in a way that has built-in limitations and as such, it can be unfair to those who are not closely identified with the dominant culture.

The National Education Research Council, Nigeria pointed out that children from culturally/linguistically diverse and/or economically disadvantaged families and gifted children with disabilities have been dramatically underrepresented in programmes for gifted students. Consequently, the absence of stimulating learning environment could hinder a fair assessment of children from rural setting.

Ceiling Effects. There is also this challenge of ceiling effects in an attempt to assess the gifted child. Ceiling effect occurs when the child's knowledge goes beyond the limits of the test (Silverman, 2009). When this happens the inherent abilities in the child is under-assessed and this could negatively affect the decision making process on the child's performance.

Underachievement. Underachievement has been a major concern to parents and experts in the field of gifted and talented. It has been observed that students who were identified as gifted did not reflect academic excellence and as well did not perform to the measuring standards and level of their abilities. The problem of underachievement in gifted students seems to be prominent in Nigeria due to the inability of parents and the community to identify the gifted at the early stage and lack of adequate planning to enhance their intellectual potential in a more challenging environment by the government. When the environment is poor and lacking in the basic

educational facilities, the result is that the educational background of the children is faulty. In addition to this, the gifted are not motivated and challenged, become tired of doing the same thing every day in school, and turn out with poor grades. These problems result in socio-emotional problems in gifted youth.

Period of Identifying the Gifted Child. Scholars in gifted education acknowledge the significant impact of heredity. This therefore implies that a child is capable of eliciting giftedness/talented traits at early stage of life because these traits are innate. The period that these traits are elicited has implications for the child assessment. When a child is detected to be gifted early in life educational programmes that would cater for his/her needs could be mounted. In Nigeria, the attempt to discover gifted children takes place when the child is about to gain admission into the junior secondary school.

This implies that most of the child's educational needs have not been adequately addressed.

Government and Funding. In Nigeria, the policy environment is not too conducive as the political will of national leadership is not strong enough to support programmes that could fast track inclusive development of gifted education in the country.



*General challenges associated with gifted education and talent development in Nigeria*

- Limited existing information on the cost of adequate services. There are the challenges of accurate, reliable, credible, and believable statistics.
- Poor record keeping about expenses on programme on gifted education.
- Budget crises of states and local councils, and opposition by political power players could also affect adequate funding.
- Lack of legal backing by the state creates flexible attitude toward the funding of gifted education.
- Most gifted children are not easily identified, because some of them are not in the school system. An official UBE source once quoted that about ten million children of school age are out of the school system. UNICEF, in 2008, however, gave fifteen million for children in similar category.
- Poverty has limited the exposure of gifted children to good and quality education.
- Infrastructure decay and insufficiency, coupled with tardy policy implementation have not allowed gifted children to become obvious in demonstrating their innate and template intelligence, and unusual abilities.
- Poor monitoring and evaluation does not encourage a holistic action in regard of development of gifted and talented children in Nigeria.
- Though disappearing gradually, gender inequality constitutes a limiting factor in the selection of female students for gifted education programme.
- Growth of private schools at the expense of the development and expansion of public schools to cater for critical mass of student population, where gifted children are lost in the crowd, is another major limiting factor.
- Educational planning and implementation for special education - children with disabilities and gifted children – is haphazard and lacks articulation.
- Most schools have not been committed to addressing the needs of the gifted and talented children seriously.

**The way forward**
As earlier noted, identification of gifted person and provision of a challenging curriculum constitute very important steps toward any Gifted programme.

The gifted children at the Federal Academy should be properly identified and nurtured with a challenging curriculum.

Another important element to enhance gifted education in Nigeria is funding. The arrangement on the Blue Print for its funding where the three tiers of government take part should be revisited.

As recommended by the Committee of experts in 1986, there is the need for every Local Government to designate one special school for the gifted that should be taught by specially trained teachers. A resource center is also relevant at this level.

Another positive step to be taken has to do with staff development. The Federal Government must ensure that teachers of the gifted have a qualification relevant to special education or gifted education.

The Federal Government should change her University Admission Policy of admitting only candidates who have reached the age of 16 because of the gifted at Federal Academy.

There should be de-centralization of the gifted pogramme; States and Local Governments should be empowered by legislation to identify and nurture their giftedness while the Federal should content itself with policy formulation and financial support.

The National Examination Council (NECO) should ensure that the instruments used in identified the "gifted" is loaded on creativity, leadership, intellectual and artistic measures.

Government and non-government agencies should eradicate parent/guardian ignorance on gifted children through enlightenment programmes on media houses, schools, and public places. This must be with a view to identify gifted children in rural and urban areas at a tender age;

Government and non-government agencies should sponsor the development of psycho-educational assessment tests that are culturally relevant and devoid of ceiling effects;

Government policy should ensure that only qualified personnel are employed to teach the gifted child with provision of adequate facilities.

Government should increase the number of gifted institutions in Nigeria and also ensure that only the gifted children are admitted.

### Need for a Paradigm Shift
Gifted education has become necessary today, because it is a form of special education and a legitimate right of those children who require a different form of education from that of the mainstream.

Dealing with issues of the gifted and talented requires a paradigm shift in our educational system, because gifted children learn differently, or faster, teachers have to adjust to that pace and learn to catch up with the ever -widening intellectual scope and curiosity of gifted children.

Changing the way we teach now will become an imperative.

Learning for these kids is likely to be non- linear or sequential but hypermedia, constantly manipulating information and data and going back and forth instead of progressively from beginning to the end.

Teachers of gifted children will have to adopt a new perspective about their profession.

For gifted education, the teacher's job will not just be instruction; they must be open to construction and discovery of new knowledge. Of course this type of education, or teaching and learning will have to change from teacher-centered to learner-centered. According to Ryan & Cooper (2001) "Learner-centered education begins with an evaluation of abilities, learning styles, social contexts, and other important factors that affect the student. Learner-centered education is also more active, with students discussing, debating, researching, and collaborating on projects with one another and with the teacher."

The paradigm shift will also require that the one-size-fits-all approach be discarded in place of individualized teaching and learning. This education will be very tasking, but rewarding since both teacher and learner are involved in the construction of new knowledge.

Okafor (1974) "the wise development and utilization of human powers of the nation is the surest rock for constructing national power." We must therefore, extract and train not just tomorrow's leaders, but youngsters of exceptional intelligence and talents without whose accomplishment, and our future development will remain only the stuff of myth. Let the search begin!

### Proper and Adequate Funding

Some strategies for proper and adequate funding of gifted education and talent development in Nigeria have been identified. They include:

- Creation of reliable and valid data bank for gifted and talented children in line with the right of the Nigerian child to education.
- Enacting a law that will give legal backing to the provision of budgetary allocation to the education of gifted and talented children. This should apply to the three tiers of government.

Endowment or Trust Fund, especially for the education of gifted and talented children should be established by each tier of government to be managed by men and women of high probity and transparency. The Trust Fund Board to be accountable to the legislative arm of government in each case.

Apart from 2% pre-tax earnings paid by profitable companies to Education Trust Fune (ETF), a special tax for gifted education should be accommodated, say point two five percent (0.25%) to a special fund to be tagged "Gifted Education Tax Fund" (GETF). Or in the alternative, the same percentage (0.25%) to be assigned from ETF to GETF for this purpose.

Banks and Insurance Companies should be encouraged to develop special products that can serve the need of the funding of gifted education. Patronage of such products should be flexible and encompass various stakeholders.

There should be an encouragement and stimulation of an active participation of the private sector, Non-Governmental-Organizations and Local Communities in the education of gifted children. Some private sector organizations and NGOs operate mandate which supports the funding of the gifted children education.

Adequate funding could also be achieved through the establishment of working partnerships and collaboration with international community and Donor Agencies. In this respect, educational co-operation and aid from developed nations and their Agencies should be more visible, transparent and predictable to enable government draft long-term policies, that is: covering a period of at least ten years.

There should be the creation of a permanent monitoring agency on the financial commitment and disbursements for the education of gifted children to be located in the Ministry of Education of a state government, and Federal Ministry of Education, in the case of Federal Government.

Promoting stakeholders interest and commitment in building quality capacity for the future through the education of gifted children

With this paradigm shift, funding of gifted education will become functional, articulate and responsible.

### Some research reports on gifted education in Nigeria

Fakolade & Oyundoyin (2008) develop an experimental study that adopted the pre-test, post-test, control group quasi-experiment design in a 3 x 2 factorial matrix on seventy-five gifted students from eight secondary schools in Nigeria to determine the efficacy of Efficiency Triad and self-Directed Models on Achievement. Analysis of covariance was used to test two hypotheses at the probability level of 0.05. The findings revealed a significant treatment effect on subjects" post-test academic achievement scores. It also indicated that gifted male subjects exposed to Enrichment Triad and Self-Directed Models had higher mean score than their female counterparts exposed to the same treatment.

The most obvious finding of this study is that the two treatments are very important instructional strategies in improving the academic achievement of gifted children in Nigeria, and are far better than the conventional methods that seem inadequate in challenging the gifted children.

Mark (2008) in an attempt was made by the Plateau State Government in Nigeria to implement the National Policy on Gifted and Talented

Education from 1987 to 1994. Government Science School, Kuru, Plateau State, was chosen to run the programme while the curriculum content was modified for their intervention. This paper reveals the programme in Plateau State, its identification and management strategies of secondary school students so identified as gifted and talented. The study revealed that the programme which lasted for less than ten years was a success despite some constraints. Most of the pioneering students graduated from various universities and are now occupying positions within and outside the country. The programme so challenged principals, teachers and parents that various enriched academic programmes were introduced for students in both special and general schools.

Oduolowu (2008), investigated teachers' perception of creativity and the Nigerian creative child. Two hundred and fifty teachers from ten primary schools in Ibadan North Local Government Area of Oyo State were involved in the study. Findings from the study revealed that the subjects identified creative traits to include academic success, originality and fluency. The study also indicated that classroom practices and exercises in Nigerian primary schools do not encourage creativity among the pupils. It is thus suggested that the child-centered education should be encouraged. This will create the classroom atmosphere, which will foster self-revelation, flexibility and originality.

**Conference on repositioning gifted education and talented children education in Nigeria**

In April 2009, Godmijt Educational Consultants, Nigeria in collaboration with Lead City University, Ibadan, and Nigeria organized a roundtable conference on Repositioning Gifted Education in Nigeria. Participants at the conference represented the multiple stakeholders interested in promoting Gifted Education programme in Nigeria. One hundred and nine participants attended the conference while fifteen papers were presented.

A summary report of the Conference is below. The papers presented at the conference covered the following sub themes:

Sub-Themes: Conference Theme: Positioning Gifted Education in Nigeria—Conceptual Issues in Gifted Education—Gifted Education & National Development—Psychological & Educational Assessment of the Gifted Child—Talent Search and Development—Management of the Gifted Child—Prospects & Challenges of Gifted Education—Funding of Gifted Education—Curriculum Development & Gifted Education inNigeria

The key Note address at the conference was presented by Professor Duro Ajeyalemi, a Professor of Curriculum Studies at the University of Lagos, Nigeria and currently a Special Adviser to the Honourable Federal Minister of Education.

A total of fifteen (15) papers were presented in three (3) sessions which were chaired by Professors in the field of the Humanities. Some of these papers are:

- Positing the 'Mind' in the 'Gifted': A Philosophical Look At Gifted Education By AkeemAmoduPh.D(Ife)
- Conceptual issues on Gifted and Talented Children By Dr. D. A. Odeleyeand Dr. (Mrs.) G. O. FolukeAbiona
- Some issues in Acceleration By Dr. (Mrs.) OpeOkunolaPaper Presentation Sessions
- Funding of Gifted Education By BanjiOlaniyan
- The Prospects And Challenges of Gifted Education Programmein Nigeria By Ibironke, MakanjuOyetunde
- Prospect and challenges of Gifted Education By Richard A. Omolade—Issues and Challenges of Community Members' Participation in the Identification of Gifted Children in Nigeria. By OyeOyelami
- Management of The Gifted Child By WasiuOlanrewaju-smart
- Psycho-Educational Assessment of the Gifted Child in Nigeria: Appraisal, Challenges, and Remedies By AbiodunM. Gesinde
- —Attitude Toward Giftedness: A Socio Emotional Problem Confronting Gifted ProgrammeBy FakoladeOlufemiAremu

- • —Dealing with Gifted Children's Uneven Development by Olaniyi-Adegun, Felicia Oluwakemiand Adebisi, Samson O.

At the end of the conference, participants produced a Communique for the attention of the Federal and State Governments and all stakeholders in Education.

The Communique asserts that the Identification and nurturing of Gifted and talented minds is a veritable platform for socio-economic and technological development of Nigeria, because gifted citizens are usually the initiators of change and innovations for the transformation of the society. Gifted and talented children are present in all socio-economic and cultural groups; therefore efforts at the identification should not be restricted to the elites.

The procedure for identifying gifted children should be planned, involving not only the student and his teacher, but family and all other stake-holders.

The Legislative arm of all tiers of government in Nigeria should provide special legislation for gifted education.—There should be decentralisation of the gifted education programme; the Federal Government should concern itself with policy formulation and provision of an enabling environment while States and Local Governments should establish and run their own Gifted Education Centres. —There -branding phenomeon going on in Nigeria today should include the gifted education programme.This re-branding should not, asusual, be a mere change of nomenclature; rather it should be a sincere and far-sighted repositioning strongly backed by appropriate political will.

The participants also decided to form an Association on Gifted and Talented education in Nigeria.

Current Agenda of the Association—Lobbying of Government to support the Gifted education Programme, backing it up with Legislation, facilities and finds.—Organising seminars and training programmes for primary and secondary school teachers—Linking up with organisations that can fund a 'Foundation for Gifted Education and Talent Development'.

Promoting the establishment and management of Gifted Education Research Centre at Lead City University, Ibadan, and any other university in Nigeria where similar interest is shown.—Publishing a Journal of Gifted Education and Talent Development —Keeping the Association for Gifted Education and Talent Development active and members in regular communication.

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