

International Horizons of Talent Support, I
Best Practices Within and Without the European Union, 1

GÉNIUSZ BOOKS

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Edited by János Gordon Győri



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FOREWORD

Having long traditions in the search and development of talented children, Hungarian talent support has gained new impetus through several initiatives in the past few decades, though perhaps the most important turning point was the 2006 establishment of the National Talent Support Council by 13 civil organisations contributing to talent development from different aspects. The Council led by Professor Péter Csermely currently represents the 29 most prominent Hungarian talent support organisations, exerting influence on Hungarian education policy, too. Among its long-term priorities we find also the publication of a book series on Hungarian good practices, as well as on international talent support initiatives and good practices, in both Hungarian and English.

The Council intends to promote increasing cooperation between the Hungarian talent development initiatives and foreign partners, focusing especially on the strengthening of relations within the EU and the Carpathian Basin, supporting talent development initiatives proposed by Hungarians living within and beyond the borders.

The possibility to implement these objectives has opened in the framework of the Hungarian Genius Integrated Talent Support Programme launched in 2009 by the Association of Hungarian Talent Support Organisations, established by the Council, and financed by the European Social Fund (ESF).

The present volume summarises the results of the Foreign Relations Research Team founded within the framework of the Hungarian Genius Programme at the beginning of 2010, made up of university lecturers, teachers, and other experts involved in practical talent support.

Our intention was to compile a publication that is interesting, useful, and inspiring to theoretical and practical experts, but containing important information also for decision-makers and other actors of education policy. This is why we decided to present each good example within the framework of the educational system of the given countries, reflecting upon their complete talent support strategies as well. Thus, each chapter provides an overview of the society and talent support activity of the country under scrutiny, but the main focus is always on presenting one (sometimes two) example(s) of good practice in talent support. By this we wish to facilitate the adaptation of certain components of the good examples, or even the entire programme, by the readers/users to the talent

support system of their own country, with the Hungarian opportunities outlined at the end of each chapter. According to all this, chapters are more detailed and longer compared to the general practice of such publications, however, we still hope that having read the book the reader will have found it worthwhile studying the macro and micro aspects of the topic in detail.

Obviously we could not present a full international panorama in one single collection. The book reviews good practices of talent support in Austria, Finland, Germany, Great Britain, Israel, Singapore, Slovenia, Spain, and the United States of America, with a closing study summarising the international findings of the research. The list shows that we focused primarily on EU Member States, but felt that a book presenting international good practices could not be complete without examples from Israel, Singapore or the United States, which have all achieved outstanding results and have long traditions in talent support.

In line with the original concept of the Council, one important aspect of our research methodology was building on personal experience and networking; apart from one or two exceptions, this requirement was met in each case. Every member of our team spent on average one week in the target country to visit and study in detail the sites implementing the presented good practice, and to meet also the individuals elaborating, developing, and implementing them. Our researchers were received by politicians responsible for talent support and by prominent theoretical and practical experts in each country covered by the book. The hosts recommended which good practices to present and organised visits to the sites of the application of the good practice. We may confidently say that the activity of enthusiastic Hungarian researchers committed to talent support were assisted by equally enthusiastic foreign teams, and we wish to express our gratitude for their valuable support.

Any reader who takes such a book in his hand, is not likely to have any doubt about the strategic importance of the identification and professional development of talents in Europe as well as throughout the world. The reader of these studies will also find numerous examples proving that, in most cases, assistance in talent development involves also a high degree of moral responsibility for the future on the part of the experts and actors of education policy working in the field of talent development. Hence it is among the explicit, long-term objectives of this book to contribute to the development of a talent-friendly social environment, too.

We hope that this first volume presenting international good practices of talent support will soon be followed by others. We intend to publish a similar compilation presenting both the collected good examples that had to be omitted from here, and our research results focusing on other areas. It is also important

to note that the collection of Hungarian good practices of talent support will be published in parallel with this book, while another publication dedicated to talent support in the Carpathian Basin is also being drafted within the framework of the Genius Programme.

On behalf of the team, I wish to thank *Professor Péter Csermely*, President of the Council, and *Professor László Balogh*, Professional Manager of the Genius Programme for their assistance to the preparation of this book, supporting our work with valuable ideas and professional contacts.

I would also like to specifically mention *János Gordon Győri*, member of our research team and the editor of this volume, whose professional skills and editorial experience guaranteed the high professional quality of the publication. Last but not least I thank the complete 11-member Hungarian research team for drafting the studies, and the nearly 50 foreign talent-support experts and education-policy decision-makers for their active and generous participation in collecting the good practices and drafting the studies.

Csilla Fuszek

Foreign Relations Research Team Leader

Tamás Nagy* –Csilla Zsilavec**

Best Practice in Austrian Talent Support:

Model and Practice of the Platon Jugendforum

I. INTRODUCTION

1. Austria: Its present

The Republic of Austria (or, in German, Österreich or Republik Österreich) is a democratic republic in Central Europe. It has a territory of 83,870 km², a population of 8,284,691, and a population density of 97 persons/km².

Austria has 9 federal provinces (Bundesländer), governed by their respective provincial governments (Landesregierungen), led by a governor (Landeshauptmann). 30% of Austrians live in the five biggest cities of the country: Vienna, Graz, Linz, Salzburg, and Innsbruck. One fifth of the population, 1.6 million people, live in Vienna.

The official language of the country is German: at the census of 2001, 88.6% of the population declared that German was their mother tongue. At regional level (in Carinthia and in Styria), there are some frontier areas where Slovenian (in Burgenland) or, at settlement level, Hungarian and Croatian are also official languages.

The decisive majority of Austrians is Roman Catholic (78%), but there are also some minor Protestant (mainly Lutheran) communities scattered in the country (5%). As for the immigrants, most Turks and Bosnians are Muslims (6.2%), whereas Serbians adhere to the Eastern form of Christianity, i.e. they belong to the Serbian Orthodox Church.

Austria has been a member of the United Nations and joined the European Union in 1995.

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2. The Austrian school system

The Austrian education system is regulated by the government: both the school types and the curricula are standardised. The National Core Curriculum is stated in a Decree, and teachers must comply with its content and requirements. Furthermore, the School Act states that teachers must conform to the mission of the Austrian school system through their responsible and reliable teaching activity. The Act links the work of teachers to the provisions which govern the Austrian education system, especially as far as the various tuition and instruction methods of schools of individual types are concerned. Teachers work according to one-year plans – i.e. the curriculum is adjusted to the needs of the various classes and situations. The implementation of the programmes is reviewed by the school principal and by subject supervisors.

In Austria, some children start attending kindergarten at the age of 3. It is compulsory to spend at least one year in kindergarten before going to school. Compulsory education starts when children reach the age of 6, and lasts until the end of the 9th form.

Children who are not mature enough for school may go to pre-school (Vorschule) for one year before starting primary school (Volksschule). The latter is the first institution of education in the strict sense for children who are ready for school.

Lower primary school, i.e., forms 1 to 4, is followed by the first 4 forms of a higher type of school which provides general knowledge/education (Allgemeinbildende Höhere Schule (AHS) Unterstufe), i.e. the upper school, or by the Hauptschule, which is actually the follow-up of primary school in another institution. The child must have a good certificate to enter this level – in German also called “gymnasium” –, and some institutions actually make admission conditional on good final examination results. The Hauptschule is open to all. Pupils in need of special education or development may study at special schools (Sonderschule).

In the Austrian school system children can decide relatively early whether to choose an intellectual or non-intellectual career. At age ten, they can opt for upper school followed by university, or vocational education. This choice predetermines their prospective vocation/profession. Although there is some communication between the various school types, it is rather cumbersome to change over from one to another later on.

At the end of the 8th form, students may choose one of theoretically four, but in practice three, strands. This actually applies to those who finished upper primary school, because those who started an 8-year upper school usually

remain there for the next 4 years, except for a few percentages of the pupils who find upper school too difficult and prefer shifting to vocational education after all. The chances are even smaller for a pupil in upper primary school to be admitted to the upper forms of an upper school. Applicants must take exams in the major subjects of the upper school (defined by the upper school itself).

Theoretically, children can choose one of the following four strands after the completion of the 8th form:

1. AHS–Oberstufe (upper-level secondary academic school, i.e. upper school, upper forms)
2. BHS – Berufsbildende Höhere Schule (vocational upper school)
3. (BMS) Berufsbildende Mittlere Schule (secondary-level vocational school)
4. Polytechnische Schule (technical school) which may be followed by Berufsschule (skilled worker training school).

Entry to AHS and BHS is conditional on reaching a certain average result and/or on the results of an admission/aptitude exam.

Upper-level secondary academic school (AHS) and technical and vocational colleges (BHS) end with a diploma examination (maturity exam or baccalaureate) serving also as the admission examination to the institutions of tertiary education: universities, specialised high schools, academies. On completion of BMS education, students take a leaving examination and, optionally, a Reifeprüfung or vocational maturity examination, in possession of which they can, in principle, study at institutions of tertiary education. This, however, is not a frequent practice. Polytechnic schools (Polytechnische Schule) and vocational schools for apprentices (Berufsschule) offer their students a vocational diploma acquired in several steps.

Public schools are free of charge, but students pay for the textbooks. Of course, there are many private and Church schools where parents must pay a certain, lower or bigger, tuition fee. In some private schools, such as the Vienna Private Volksschule am Judenplatz, children must be put on the waiting list right after their birth to have a good chance of being admitted there at age 6.

The Austrian education system is rather diversified, providing adequate transition opportunities for pupils/students between levels and institutions. One of the special features of the system is the tight link between economy and education in vocational schools. The system which synchronises and combines theory and practice in (vocational) education is called the dual education system. In addition to the acquisition of vocational experiences, the need for

specialisation is highlighted as well. Whether the institution is a higher-level technical or business school, the option of specialisation to acquire in-depth vocational knowledge is always present.

3. Talent support in Austria: General features

3.1. Talent support: Its relevance and guidelines

Minister of Education Dr. Claudia Schmied wrote the following in her preface to the summary work *Talent Support and Talent Research in Austria: Balance and Perspectives 1996–2006* published by the Ministry: “Not the same to all, but the most suitable to each” (Federal Ministry for Education, Arts and Culture (German abbreviation – BMUKK) 2007). According to this statement, students must be given a chance to develop according to their potentials and abilities, in their own interest, but also in the interest of the class lessons and the other students. For, according to Schmied, talent is not self-centred: it must be put at the service of many. Talented people are responsible to society and to the economy. Their loss for a given society is a kind of brain drain, a loss of grey cells, a phenomenon that society must prevent more effectively than ever (BMUKK 2007).

“We must not lose from sight the following: talent support must begin at home and in kindergarten education; it must continue at the school lessons, and be accomplished in tertiary education. Every level must do its utmost, to serve thereby the interests of gifted children and youth, parents, families, society and economy overall. /.../ Talent is human potential. It is important to interpret and treat it in a dynamic, not a static way. It will change in line with the amount of development and support invested into it. The success of talent support is indicated by the rate of transformation of potential into performance, and that, of course, is not independent of the family and school environment. Consequently, talent support is the common task of students, parents and teachers” (BMUKK 2007).

3.2. Talent support organisation and management

Talent support in Austria is organised at 3 levels. The first and highest level is the Austrian Federal Ministry of Education, Arts and Culture (abbreviation: BMUKK), the second one is the Austrian Research and Support Centre for the Gifted and the Talented (Österreichisches Zentrum für Begabtenförderung und Begabungsforschung; abbr.: ÖZBF), and the third one is represented by the federal talent support coordination points of the Provincial Self-governments

(Landes StaatsRat). The Ministry and the Centre act at national, and coordination points at regional level.

The BMUKK defines the guidelines and objectives, provides for the personnel and technical conditions, and manages and supervises talent support. Furthermore, it is responsible for the legislative background. Its scope of competence includes the management and development of the national contests (Olympiaden) and of the related scholarships (e.g. Junior Alpbach Stipendium). It is the central managing authority of Austrian talent support, and in this capacity its priority functions include the organisation and management of the Federal Conference on Talent Development (Bundeskonferenz Begabtenförderung), the development of international and Central European networks (e.g.: MOE – Central and Eastern European Relations, Hungary included, in 2000), organisation of congresses (Österreichische Zentrum für Begabtenförderung und Begabungsforschung 2010), and cooperation between various levels of education and their respective institutions, e.g. kindergartens and schools, schools and institutions of higher education.

The ÖZBF, the Centre representing Level 2, was set up in 1999 on the initiative of Prof. Mag. Gerhard Schaffer, then undersecretary of state and president of the school government of the Province of Salzburg (Landesschulrat für Salzburg). It operates in the legal form of a society and depends on the Ministry of Education for its business management, personnel and ideology. Its core task is to support and educate talented/gifted young people, and it is the pioneer of the establishment and development of the overall Austrian talent support network. As a national centre, it is the initiator of innovative measures in talent support; it operates on the borderline of theory/research and practice. It is the centre of national and international networks, the designer of new strategies. Its tasks include, furthermore, quality improvement and assurance, realised partly through the appropriate flow and storage of information, and partly via various training programmes.

Hence the functions of the ÖZBF are the following:

- development of strategies and plans (e.g. core decree on talent support, drafted in collaboration with the Ministry, effective since the academic year of 2009/2010);
- talent research (e.g.: Big-Fish-Little-Pond-Effect researches, ELCAD project);
- conference, congress organisation (biannual international conference on talent support);
- teacher training, curriculum development (e.g. integration of talent support modules into tertiary-level teacher training);

- proposals, measures to develop education (e.g. specification of quality criteria for schools with a talent support profile; Internet-based Best Practice databank; warehouse of electronic teaching tools);
- networks and cooperation (e.g. organisation of conferences with the Ministry; cooperation with schools, societies, etc.);
- pilot project development (e.g.: SchülerInnen an die Unis);
- information, diagnostics and counselling (e.g.: publication of the periodical “News & Science”; online technical literature; publications, presentations; KLIKK – further education for parents).

Level 3, as mentioned above, includes the Federal Coordination Points. Federal coordinators are appointed by the actual presidents ever of the Provincial School Governments. They are responsible for the coordination of intra-provincial, regional talent support, the linkage of schools and government agencies and the use of the established networks. They organise in-service education for teachers, and summer universities, workshops, presentations etc. ECHA-Österreich, the Austrian branch of the European Council for High Ability, orchestrates together with the coordinators the annual Austrian The ECHA-Days (Österreichischen ECHA-Tage). They take part in every activity of the Enrichment Project (e.g.: contests) and also keep in touch with every educational institution from pre-school to university where they assist with the implementation of the SchülerInnen an die Unis and the Kinder-Unis projects. The federal coordinator represents the first step in the huge system of national talent support, as he is the first to be addressed when schools, teachers and parents look for advice and information to help their students or children.

Levels 1–3 are supplemented by a large number of talent support societies/associations.

The ECHA-Österreich was founded for the purpose of talent research by University Professor Dr. Franz J. Mönks and by Mag. Dr. Sieglinde Weyringer in Salzburg, in 1998. The society researches talent-related phenomena and concepts, and talent itself, and publishes relevant scientific results, organises presentations, further education and conferences. It is active in talent diagnosis, analysis and counselling. A large number of teachers active in talent support possess an ECHA diploma.

3.3. Forms of talent support in Austria

To return to the words of Thomas Köhler: “Talent must be interpreted dynamically; developed continuously and purposefully, and treated flexibly, depending on the age, sex and family/school background of the child. Talent

support is the common mission of students, teachers and parents. The system must be approached holistically, and any action must be governed by the outcomes of such an approach. Consequently, talent support is governed by the principle of differentiation or, to put it in another way, individualisation – integration and/or separation, enrichment and acceleration are the consequences of this latter” (BMUKK 2007).

Differentiation or individualisation is the drive of every talent support measure. Its point of departure is the minimum unit of the education system: the lesson. Talent support begins with the personalisation of the school lesson and a differentiated approach to its management. All other forms of talent support are an extrapolation and extension of the same approach to larger units. The talent support forms listed below were created and function in the current Austrian school system on the basis of these principles.

The most interesting measures/options, codified also by the law, relate to acceleration. Children demonstrating exceptionally high ability already in kindergarten can go to school earlier than the age of school maturity (6 years) (Frühzeitiges Einschulen). Talented children whose higher-than-average abilities are revealed during their school studies and who are capable of (much) faster progress than their classmates may “skip” classes (since 1999). Students have three “acceleration” options during their studies, which allow them to take the final exam and to be admitted to university earlier. Students in higher forms who do not wish to skip classes, but are well ahead of their classmates in some subject(s) may visit the lessons of certain universities (Schüler an die Unis), and the subjects completed there are acknowledged on the occasion of their actual enrolment.

It is a precondition of acceleration that the school system should be able to treat flexibly the various needs occurred during talent support provided to individual students. This is the point where integration and/or separation become important, since students enjoying special treatment have personalised timetables (separation). During certain pre-determined lessons they work independently or are assisted by a mentor, but since they need also to integrate their knowledge and themselves into a peer age group, they can have a stimulating effect on the others and do not lose contact with their own generation. Students requiring a quasi individual timetable – and their teachers – can choose from the following options:

- the Revolving Door model (Drehtür Modell) allows to “revolve” in certain subjects to higher classes – e.g. Gymnasium Sacre Coeur, Vienna;
- “empty” school lessons built into the syllabus, i.e. lessons which can be allocated to any subject or to some other area of talent support (Freigegegenstaende);

- exemption from the attendance of a lesson (Fernbleiben vom Unterricht)
 - this may mean absence for even a whole day, provided that the student spends time liberated this way on (individual or collective) further education;
- mixed, i.e. age-diverse, classes (Mehrstufen Klassen) – e.g.: in Öffentliche Volksschule St. Elisabeth Wien.

The category of enrichment comprises voluntary extra-curricular lessons held at the school. In a Vienna-based primary school (Private Volksschule am Judenplatz) children themselves call the afternoon lesson dedicated to research and experiment the “Cunning fox” course (Schlaufux Kursen). Other enrichment programmes include school and national contests, student Olympiads, and the related scholarships. One of the most interesting and best-known scholarship is the Junior-Alpbach, which gives the winners of the national contests and students from Alpbach an opportunity to work with Nobel-Prize-winner or other well-known scientists on various projects for a few days. This scholarship is an excellent example of the combination of integration and separation, proving that these are not contrary, but complementary concepts. Best-practice schools such as the Sir-Karl-Popper-Schule or the Schumpeter-Handelsakademie are important contributions to expansion and enrichment. They provide exemplary talent care, so much so that other schools can draw on their work or take over their tested methods. Last but not least, summer academies (Sommerakademien) are also part of the enrichment endeavours, such as the “Kinder-Unis” where students of various ages can enhance their knowledge with the assistance of university teachers and professors.

Although the primary stage of talent support is the school, a major part of the relevant issues are discussed outside the school system, and the relevant decisions are taken at other fora. The codification, continuous reform and amendment of acts, syllabi and decrees are indispensable for the existence and operation of talent support (e.g.: Besser Fördern – Develop better, decree from 2005). The plan is to expand the national and the international networks; to increase the number of coordinators and, first and foremost, to give more publicity to talent support and the events which take place in that context.

3.4. Key persons and events of talent support in Austria

Talent support and research became a crucial public education issue in the mid-1990s, in the wake of the activities of University Professors Dr. Franz Mönks (Nimwegen/The Netherlands), Dr. Friedrich Oswald (Vienna) and Dr. Christiane Spiel (Vienna). With the establishment of the European Council for High Ability (ECHA), Dr. Franz Mönks inscribed his name into the European history of talent support and has been called its “pater familias” ever since. The same applies to Dr. Friedrich Oswald in the Austrian context. He was a teacher who, together with psychologist Dr. Christiane Spiel, gave considerable impetus to the cause of talent support, which grew from an internal project of the University of Vienna into a national project of Austria overall.

The joint activity of these three renown personalities peaked with the international “Creativity and Culture” conference organised in Vienna in 1996; subsequently, they launched such pilots, together with the Ministry, as the Sir-Karl-Popper-Schule (a best-practice school) in Vienna. A new law was passed in the same year of 1998, which authorised talented/gifted students to skip classes/levels, if their fast development allowed and required that. The ECHA-Österreich, mentioned already, was also set up in 1998.

Mag. Gerhard Schaeffer, who worked in Salzburg, and on whose initiative the ÖZBF, the Austrian Research and Support Centre for the Talented and the Gifted was established in 1999, was also a prominent representative of the Austrian talent support movement.

In 2004, the TIBI institute (Thomasianum: Institut für Begabungsforschung und Integrative Initiativen) was created in Vienna on the proposal of Dr. Christine Mann, leader of education and training at Erzdiözese Wien. TIBI is an acronym in which the T (Thomasianum) refers to St. Thomas Aquinas, outstanding theologian and philosopher of the Middle Ages. TIBI is an institute of further education, research and counselling, the goal of which is to offer talent support/development projects and seminars to students as well as parents and future teachers which serve talent and its unfolding as much as possible. From 2010 to 2012, for example, it offers a further education course in talent support which provides an ECHA-diploma.

Societies active in talent support have mushroomed in recent years; the number of conferences, further education events and courses focusing on this topic has been on the rise, and there have been lots of workshops and seminars. Almost every school has employed talent-support-specialist teachers (with ECHA-diploma) and started to treat talented/gifted students more and more flexibly, exploiting the options available under the relevant legislation.

The Platon Jugendforum, the best practice model to be discussed in the following chapters, is also part of this development process. The programme, active since 2004, has already acquired remarkable international fame. It is a unique initiative, created not by the state apparatus of talent support, but by Mag. Dr. Sieglinde Weyringer, President of the ECHA-Österreich.

II. THE PLATON JUGENDFORUM TALENT SUPPORT PROGRAMME

1. Function and relevance of the talent support programme; methodological features of the research

Platon Jugendforum – the Platon Youth Forum – is a one-week international summer camp in the vicinity of Salzburg, organised jointly by the ECHA-Österreich and the Department of Pedagogy of the Salzburg University (Weyringer 2009). The role and goal of the Platon Jugendforum is, on the one hand, to introduce 50 talented students from all over Europe to the diversity of Europe and to let them experience that it is possible to find similarities despite the differences and, on the other hand, to help them develop a European citizen's consciousness ('Das Bewusstsein einer europäischen Bürgerschaft').

The term itself – European citizen's consciousness – refers to a method based on the development of understanding and decision-making capacity through which young people can represent their own interests efficiently and, beyond the personal level, become capable of deciding on the economic, political and scientific issues of their country and place and judge such critical issues in the European context.

The European citizen's consciousness is developed through issues which are currently relevant in every Member State but, when they are processed collectively, students will reason and debate according to the viewpoints of their respective nations/nationalities. Through the direct confrontation of viewpoints and arguments students can understand what distinguishes them from the citizens of the other nations and what axioms they can explore to promote mutual understanding conducive to inter-national tolerance and a common, consensus-based, solution of the outlined problem – the so-called dilemma story (Weyringer-Patry 2005; Weyringer 2009).

Another programme goal is to bring together youngsters of identical interests and abilities, ready to immerse in topics of relevance for the European community, and to create and experience, during the debates, the traditional historical and geographical sense of togetherness, of mental kinship, of European citizens. Friendships created in the camp point beyond the national

frontiers, since the specific, tangible objective of the programme is to create lasting contacts overcoming geographic distance, to lay the basis of the development of a new, tolerant, – and due to their talents, leader-level – European citizen community (Weyringer 2009).

The first and most important milestone of the emergence of tolerance is the practice of intercultural understanding. In addition to the multilingual nature of the project, students must overcome the difficulties implied by the EU topics, learn to understand and accept the different ways of thinking and positions of the others, stemming from their respective cultural, political and historical traditions. No tolerance is feasible without the recognition that the other's viewpoint, too, has its *raison d'être*. The Platon Youth Forum provides an exceptional opportunity to its young participants to get to know each other and each other's cultural background through joint work and other activities, and to become able, as a result, to see themselves, and also their own national affiliation, in a wider context.

The programme offers its participants the following:

- interdisciplinary exchange of ideas and communication of young talents specialised in different areas;
- cross-national cooperation of young persons of outstanding abilities and professional knowledge;
- familiarisation with discussion methods based on different knowledge bases;
- active exchange of opinions on the freedom of values in research;
- participation in the development of the common European value and knowledge community matching a multicultural Europe.

The initiator, and since 2004 also the organiser and leader of the programme has been Mag. Dr. Sieglinde Weyringer, professor at the Department of Pedagogy of the Salzburg University (Weyringer 2009). The authors of this chapter met her and heard about her talent support camp for the first time in February 2010, and it was at the ECHA Conference organised in Vienna in April 2010 when it became a certainty that they would be given an opportunity to study the programme.

The research method was field work. The authors studied the programme for four days as observers and occasionally also as participants. During those days they could conduct interviews with teachers and with students and they could observe workshops. They were provided some of the questionnaires filled in by the students upon arrival and at the end of each day, after the sessions, anonymously, of course. The first, two-page, questionnaire concerned the core values and issues of existence as citizens of Europe (Das Bewusstsein einer

europäischen Bürgerschaft) from the point of view of the individual. The other questionnaires were meant to document, after each phase of seminar work, the changes in the ranking order of the values and in the positions of the participants, in order to make visible by the end of the project the process through which the students developed their ultimate value sets and positions concerning the story. It was interesting to see whether the members of a given group could agree on a shared set of values and/or a shared position concerning their topic.

The mapping of the programme was promoted, in addition, by a questionnaire “brought from home”, compiled in advance by the work group of the Association of Hungarian Talent Support Organizations for experts collecting international best practice models, to explore the operation of the talent support programme in a targeted manner.

2. Details of the talent support programme

2.1. Structure and features of the programme

The programme, currently known under the name of Platon Jugendforum, underwent several major transformations during its history. Initially it was called Archimedes Programme, but as the teacher team changed, it was renamed and its current form and concept has taken shape. The name change is expressive: Plato’s philosophy and methods of education are quite similar to what is at the basis of the programme: learning through dialogue, construction of reasoning systems, acquisition of advanced-level discussion techniques, opinion formation.

The “heart and soul” of the programme, as mentioned already, is talent support specialist Mag. Dr. Sieglinde Weyringer. Ms. Weyringer used to work as a primary school teacher, then, attracted by talent support, gradually became the leader of the ECHA, the European-level talent-support organisation. It was during her work that she got in touch with the teachers acting as team leaders in the Camp, who work together on that occasion only.

It is worth taking a look at the special fields of the experts who worked as team leaders/teachers of the Camp in 2010:

- Richard Pirolt, primary school teacher of the Vienna–Krems teacher training primary school of KPH, the Teacher Training College of the Church;
- Annette Resch, vocational school teacher (primary school, upper level), currently adult trainer at the Salzburg BFI (Berufsförderungsinstitut);
- Markus Präauer, health care teacher at the vocational school of STALK (Salzburger Allgemeine Landeskrankenanstalten);

- Helen Franke, student of Humboldt University, Berlin; major subject: communication;
- Mag. Dr. Sieglinde Weyringer, teacher, assistant professor at the Department of Pedagogy, Salzburg University.

Over the past 7 years the programme won considerable fame and popularity. These days it attracts young people from many countries of Europe, some of whom have become programme coordinators or teachers in the meantime. The activity of the 2010 Camp was assisted by 4 “returning” participants (Christina Schlesinger, Leo Bettini, Florin Dobrescu, Samuel Alonso) who, although excluded from the programme due to their age, still found a way to be part of it again.

Student selection is based on individual assessment, performed by the programme leader team. There are applicants from almost every country of Europe, thanks to the fact that schools, societies and youth organisations are informed of the programmes not only in Austria, but also throughout Europe (Lithuania, Estonia, Latvia, Romania, Bulgaria, Turkey, Greece, Portugal, Germany, the UK, South Tyrol, Hungary, the Czech Republic, Poland, Slovenia, Slovakia, France and Belarus). From the start, the programme has been in contact with the talent support organisations of the neighbouring EU countries (e.g. Bildung und Begabung e. Verein Deutschland), schools (e.g.: Humboldt-Gymnasium Potsdam), every school which has an Europa Klasse (Europe class), the Goethe Institut, and the talent points in South Tyrol and in Greece, having been active for a longer time.

Part of the students “win” participation in the Camp in return for their results at national or regional school contests. The winners of the language competitions of the neighbouring countries (Germany, France and Italy), e.g., are awarded participation in the Camp as a special prize. A major part of the training participants, on the other hand, simply apply for the announced programme – for a participation fee which was EUR 350 in 2010. This is a talent support programme where talent identification is present, but does not play an exclusive role.

Let us have a look at the distribution of the participants of the 2010 Camp by country, and the number of those who were awarded the option of participation as a reward for their outstanding performance. 22 of the 51 students came from Germany; 6 from Austria, Italy, Spain and Romania each; 2 from France and 2 from Greece, and one student from the Czech Republic. Note that the East and Central European countries are usually represented by few or not at all, despite the fact that this region would especially be in need of developing its talented students into self-conscious European citizens, well-aware of their possibilities and capable of exploiting them. 20 of the 51 students were boys and 31 girls, and

a total of 10 won the right to participate as winners of foreign language competitions in Germany.

Although entry to the programme is not regulated very strictly, there are still some selection criteria. Applicants must be motivated and open as far as the proposed topics are concerned; they are expected to command the skills needed for independent research and information processing, as well as the skills of debating based on reasoning. Students must complete pre-defined assignments as a condition of participation, to show that they are ready to study during the school holidays. The following issues are suggested to them for consideration:

- What European issues are you interested in and what is your personal opinion/position about them?
- Newspaper articles on the topics of interest to you.
- What do your friends think of the same topics?
- What is the public opinion concerning these topics in your home country?
- Is there a topical debate issue in the media and if so, what is it?

The official working language of the Camp is German – because of the host country –, the second one is English, used for team work at seminars, for the presentations and the morning briefings, as needed. The third language, of course, is the mother tongue of the participant, unless that is identical with one of the first two. Often several languages are used for discussions within the same group. In this context, students learn how to overcome the linguistic barriers to argue, to follow and understand the others' line of thought and, finally, to work out a joint position. This demands extreme flexibility on the part of every student.

The one-week Camp has been organised at the same venue for 7 years, in the Youth and Family Guesthouse of the village of Obertrum (Jugend- und Familiengästehaus Obertrum), not far from Salzburg, dedicated precisely to boarding school and camping activities. The location and especially the layout and amenities of this building complex make it an excellent choice.

Salzburg is a well-known tourist centre in Austria; many are curious to see Mozart's native town and the Camp usually coincides with the Salzburg Summer Festival. The venue of the Camp is at no more than 20 minutes from Salzburg centre, an easily accessible destination for all Europeans.

The building complex offers the Campers a hostel wing, a big dining hall, a gym hall, seminar rooms, computer labs – with Internet access, of course – and a big lecture hall. The standard equipment of the seminar rooms includes, in addition to a board and a presentation board, such technical equipment as TV sets, CD players and printers, and the organisers of the Camp provide for the supply of pens, felt tip pens, glue, plasticine and a video camera which the

students can and do use for producing films. The big lecture hall (equipped with an overhead projector, amplifiers, microphones and a laptop) is the point of departure and the end point of the activities.

As indicated above, the technical infrastructure needed for the programme depends mainly on what is furnished at the venue. Apart from that, the organisers and teachers of the Camp must do with a minimum amount of support provided by a few civil organisations and any revenue they can collect from promotion activities and from occasional sponsors. The student participation fee (EUR 350/person) covers the costs of the accommodation and the meals. However, as mentioned already, several students are invited as a reward for their placement in school contests in their respective countries, and some enjoy the financial support of their school as part of its talent support programme (but in the latter case, too, the underlying reason is the academic performance of the student). Any remaining funds are used to cover the fees of the teachers involved in the programme. As Sieglinde Weyringer told the Authors repeatedly, the neuralgic point of the organisation and maintenance of the Camp was to provide for its financial background, as the state provided no support at all for this internationally recognised project. Currently, in Austria, only talent support within the school system is eligible for public support.

The Camp is a kind of a talent support programme which strives to affect the students via topics touching upon moral thinking, decision-making and responsibility. Of course, as will be described below in the presentation and analysis of the modules, the process does not match the personality of each and every student, yet can have a surprising effect (from a development psychological perspective) on the thinking, value set and attitude of the adolescents involved.

The structure of the one-week programme is simple: the first and the last day is devoted to arrivals and departures, respectively, and the 5 days in between are work-days, starting at around 8 a.m. and ending with some social programme every night. The welcome party on the evening of the first day is not only a social event, but also an occasion to present the technical details of how the five work-days will be organised. On workdays, there are parallel modules implemented in workshops, revolving around the pre-defined focus points. Students can apply for any of these at their discretion, but they cannot alter their choice during the week, because the nature of the modules is such that continuous collective work is needed to achieve the specified target.

Workdays are divided into two major parts: three hours in the morning, to analyse and discuss the topic of the group, and two hours in the afternoon to do research, answer questions raised in the morning and immerse in the given subject area.

Later on in the afternoon there are also leisure and thematic leisure activities. Special mention should be made of the collective visit to the city, the collective singing and musical programme (the students form their own orchestra), and the participation at the dance school.

The weekly programme is segmented by two major events: Firstly, a so-called Forum is formed after 2.5 workdays (usually on Wednesday, assuming that arrivals take place on Sunday), where each group presents its project research carried out that far to the entire circle of participants who can react freely and express their opinions on the presentation.

Of course, students are informed of this mid-term presentation already on their first workday, so they can prepare for it as they want to. The groups are managed in a democratic atmosphere; group leaders act as moderators and channel rather than guide the group processes.

The professional background of the programme is provided by the so-called VaKE project method (to be described later on), which is actually a group-level debate and discourse process organised around certain dilemma situations, in which individuals may take over temporarily. A dilemma situation is a story written down on an A/4 sheet, focusing on an issue of relevance for the European countries and on a serious moral dilemma, presented, usually, through the life story of a protagonist, in which the decision-making situation often affects also economic, social and political issues.

The parallel workgroups work separately, governed by the principles of the VaKE model, and it is the task of the group leaders to ensure compliance with the time, content and professional framework setting defined by them. The students move about and mix in the group and, of course, they can communicate freely with others on the issues at hand in their leisure time.

Participation in the groups is not compulsory; it is voluntary, and the freedom of the exchange of ideas and the equality of the group members are the most important driving motives.

The communication process is fostered at meta-communication level, and also at the level of the multimedia: students have unlimited Internet access, and they can use the projector, the video camera and other technical tools. The group leaders give explicit encouragement for researching the questions raised in connection with the topic under study.

2.2. The VaKE (Values and Knowledge Education) model

The model was created by Professor Jean-Luc Patry, head of the Pedagogy Department of the Salzburg University, to boost and make more efficient value- and knowledge-based education. This teaching model, which can be integrated

into any learning process or applied on its own, is suitable for the development of the moral thinking and value sets of students through the teaching of a specific body of knowledge in the acquisition of which the student plays an active part.

In the context of the teaching model, students process stories similar to Kohlberg's applied moral dilemmas. They focus on the moral conclusions of the stories (cf. teaching of values), collect information related to the moral story (cf. knowledge acquisition), and discuss such information in teams (Weinberger–Patry–Weyringer 2007).

The crucial point of the model is that learning does not mean the passive absorption of information, but the active examination of new knowledge contents, as a result of which a unique and individual reality is construed. Real learning occurs when one is confronted with a problem that cannot be solved with his previous knowledge base and, furthermore, in order to ensure the assessment of the usefulness of new information, it must be interactive. This interactivity is the general condition of optimal learning, but there is a content requirement as well, namely that the “fable” proposed by the teacher must provoke cognitive conflicts on the part of the students. In the process, and during the independent work of the students involving the expansion and revision of their knowledge base, the teacher assumes the role of the *escort*. The professional challenge and professional support aspects of this role can best be described by the motto: “As little as necessary, and as much as possible”.

The core elements of interactive learning are therefore the quest for information and the assertion of the principle of “cooperation instead of rivalry”. When selecting the dilemma story, attention must be paid to the fact that collective work may lead to strong commitment and involvement in connection with the selected topic on the part of the students. The stories themselves may, of course, vary according to the actual European topics.

The general conditions of group work must be such as to provide the students the greatest possible autonomy in common as well as individual work. The group-performance-level manifestation of interactivity is always a collective project presentation, the content and quality of which reflects development achieved in relation to the topic.

It is worth going into the details of the teacher's function which, as indicated above, is a mixture of the roles of the traditional school teacher and the mediator. In the programme, the moderator, mediator and facilitator roles excel, and they are blended into a coherent and authentic phenomenon by the professional expertise of the teacher. The teacher takes part in the work through the latter: his activity centres on assistance to solve the problem situation which unfolds from the dilemma story.

The goals to be attained and mastered by the students through the VaKE model can best be described at the level of cognition. Since group work focuses on dialogue and discussion, the quality and content of communication stimulate first and foremost such cognitive operations as learning, understanding, implementation, analysis, synthesis, assessment, which create temporary reality constructs via the debate dynamics, to promote the understanding, analysis, acceptance or rejection of the approach and cognitive attitude of the *other*. The expected result of the learning process, from the perspective of each and every group member, is cognitive flexibility.

This goal is achieved by various special work techniques such as Brainstorming, the Mindmap technique, portfolio development and the WALK technique, to list only the essential ones.

The WALK technique comprises the following stages:

Stage 1: Write down briefly as many potential topics and problems as possible. List briefly as many features/values as you can.

Stage 2: Which problem seems the most important to you? Sort the problems according to a hierarchy. Which features seem the most important to you? Sort the values according to a hierarchy.

Stage 3: Formulate as many questions as possible concerning the most important problem. Assign the questions to specific fields of science.

Stage 4: Answer the questions and try to find a solution to the problem. Take short narrative notes.

Prototypical course of VaKE projects (see *Table 1*):

Table 1. Presentation of the Platon Jugendforum workshops (Weyringer 2009)

	Activity	Content	Form
1	Introduce teaching story/ dilemma situation Brainstorming: Knowledge and Values	Introduction, content explanation, first exchange of opinions. What is the problem? What values is the story about?	At class level
2	Reflection / Proflection WALK (Stages 1 and 2) Value hierarchy, Mindmap, Portfolio	What comes to my mind in connection with the dilemma story? What is my opinion? Why do I think it so? What values have I found and what do I adhere to myself?	Individual processing level
3	First decision	Who is for it? Against it? Who cannot decide?	At class level
4	Discussion of the first dilemma story	Why did you vote in favour? Why did you vote against it? What do we vote about at all?	At class level
5	Reflection / Proflection WALK (Stage 3) Mindmap if needed, Portfolio	How do I think now about the problem? What is my opinion now of the problem? Why? What questions do I have?	Individual processing level

6	<u>Experience exchange and missing pieces of information</u>	Which arguments are strong? What pieces of information do I need for my own reasoning?	Group-level processing
7	<u>Looking for evidence</u> WALK (Stage 4) Mindmap if needed, Portfolio	Collect every piece of information you need! Use every information source at your disposal!	Group-level and individual processing
8	<u>Exchange information</u> Make collective Mindmap	Inform your workgroup of the new facts Are these pieces of information sufficient?	Group-level processing
9	<u>Synthesise information</u> Make collective Mindmap	Presentation of the pieces of information and final conclusions of the class	At class level
10	<u>Reflection / Proflection</u> WALK (all stages), Value hierarchy, Mindmap as needed, Portfolio	How do I think now about the problem? What is my opinion now of the problem? Why? What questions do I have?	Individual processing level
11	<u>Second decision</u>	Who is for it? Against it? Who cannot decide?	At class level
12	<u>Second dilemma of the discussion story</u>	Why did you vote in favour? Why did you vote against it? What do we vote about at all?	At class level
13	<u>Repetition: Change of perspective</u>	Steps 5–12 may be repeated if necessary	
14	<u>Reflection / Proflection</u> WALK (all stages), Value hierarchy, Mindmap applied if needed, Portfolio	How do I think now about the problem? What is my opinion now of the problem? Why? What questions do I have?	Individual processing level
15	<u>General synthesis</u> Closing presentation, Class portfolio	Closing of the processes and summary	At class level
16	<u>Generalisation / Transfer</u>	Feedback on the entire project. Discussion on similar topics and problem areas	At class level
<p>Note: In italics: Value-based match control Underlined bold: Knowledge-based match control In italics and underlined bold: value and knowledge based match control</p>			

Consistently with the programme structure, the topics presented during the one-week camp are always current ones, of interest/relevance to the youth, and suitable to serve as the basis of a framework story for the special talent-support-type process hallmarked by the motto of “European citizen’s consciousness” and based on the VaKE method.

The development targets are difficult to designate, despite this relatively specific development content, because instead of the more fashionable intellectual skills development used in talent development, the designers of the programme focus on the reinforcement of a set of values as attitudes which are closest to the development of moral thinking and affect the areas of family, education and cultural background.

The four workshops presented below are examples of how the above targets are/can be realised through the programme. For lack of space, we shall present those four of the five topics of the Camp visited by us that reflect best the speciality and specificities of the Platon Jugendforum.

2.3. Platon Jugendforum, 2010: Workshop topics

1. Individuality and electronic media – defencelessly confronted or protected?
2. Solidarity surcharges and the question of social justice
3. Boundless love, friendship, partnership and their social limits
4. Memory, brain and neurobiology
5. EU – an economic area with high social standards or with social dumping?

1. Individuality and electronic media – defencelessly confronted or protected?

This workshop was special in the sense that the group leader, Helen Franke, took part in the Platon Jugendforum as a trainee several times before, and her first-hand experience of it rendered her personality and work most authentic for the group members.

The topic of the module was internet-based commerce and promotion. How much, in what way, to whom, and what can be promoted via the Internet? Is there a written or unwritten moral code which forbids the use of the data of Internet communities to bombard people with dedicated promotion? Does data protection exist at all, and if it does, how does it work?

The protagonist of the dilemma story is a businessman selling IT products online in the EU. He is so successful he can afford to buy an online community (a community page). He uses the data acquired to enhance the efficiency and degree of personalisation of his promotion activity, and to display them on blog sites and other websites. Later on he teams up with another businessman and they merge their databases. It is too late when he realises that his partner uses data obtained from him to financially exploit minors on his gambling site and to lure them to gambling. What can he do before the scandal breaks out?

The first task of the group was to lay the basis of the topic, i.e. map the human/humane value system, i.e. finding out what values the group members considered important in life and how they ranked them by importance. The Internet was first approached from the side of the media, as a new format replacing the traditional media, and the question was raised whether the students were familiar with its functioning mechanism and structure. This is

what provided the students the first opportunity for research and opinion-forming.

The following days were structured accordingly: the students dug deeper and deeper in the relevant legislative regulations and the political background of the e-media; they got acquainted with its financial and profitability implications and, last but not least, they identified some reference points on the social impacts of the e-media.

The mid-term presentation was raw but intelligible, and it mirrored the positive bias of the students in favour of the advantages of the Internet. Group feedback on the presentation was of low intensity, but the camp leader tried to colour the topic by introducing the dimension of personal involvement.

During the subsequent days the group members reasoned for and against the Internet and the advantages and disadvantages of the manageability of personal data, supporting their standpoints with statistical data and stories.

After a week spent together in hard work, the group came to the conclusion that the new media required (would require) new rules. They demonstrated this in another presentation to the Forum. Feedback by the other participants was positive; several persons expressed personal (positive and negative) experiences with the Internet.

The topic itself and its implications motivated the thinking and attention of the adolescent-age youth.

As for the group leader's role, this was quite special during the week. At the beginning it was obvious that the group leader had no relevant experience, which led to several wrong moves and long and apparently superfluous loops. Later on the leader "found herself" thanks to the team discussions carried out in the background, and she managed to lead the group in a democratic way and to apply the principles of the VaKE method, i.e., support the independent decision-making, opinion-forming and research of the students from the background.

From among the 5 parallel modules, except for the professionalism of the one led by the programme leader, this was the one that met best the principles and expectations which define the functioning mechanism of the Platon Jugendforum Camp.

2. Solidarity surcharges and the question of social justice

The leader of the module was Dr. Sieglinde Weyringer, the leader of the Camp and the person responsible for the fine-tuning of the practical implementation of the programme, who had been using this method both in schools and in the field for several years.

During the group work we had an opportunity to consult the leader on an ongoing basis, and she explained in detail the VaKE method and its functioning mechanism and dynamic in the group under study.

The dilemma story of the group related to a current issue: in connection with the Greek national bankruptcy, a member of the EU decision-making body, Maria, experiences a personal moral crisis. Maria comes from a poor family in an Eastern European country; her studies are financed by a foundation with strong party affiliation, and she finds herself in a decision-making situation in which she must choose between two conflicting alternatives: her own way and the one expected of her by her party.

The week-long work of the group was structured by the leader according to the principles of the VaKE model, with free discussion and opinion-forming in the centre, and assistance to ensure the free flow of information and the use of every possible way of information acquisition. As for the last, the use of the Internet played a key role.

The goal of the leader was to make the adolescents experience the rule- and value-shaping power of a debate generated by clashing opinions, and to experience their self-efficiency through the free expression of their opinions during the debate, and the shaping of their system of values and standards via the development of their knowledge base.

The unconcealed objective of the method is to toughen the value- and norm-generating role of collective opinion-shaping in the decision-making mechanism; to prompt the personality development of the adolescents who can thus step out of an established framework of thinking and opinion-shaping, and have a flow experience (Csikszentmihályi 2001) of the impact of their opinions and decisions on society and hence also their own lives. European culture considers this type of self-efficiency and self-strength to be part of the “adult’s rights” but both the creator of the method and the leader of this camp think that it represents the bases of the future “European citizen’s consciousness”, and may play a significant role in the development of a responsible and morally mature human being.

On Day 1 the leader proposed a communication task to generate group cohesion. The game, in which she took part herself, too, was of the socialising type: personal conversations in pairs to learn as much about the other person as possible. The task ended with a group discussion in which the participants told what they had learned about each person.

Then followed the introduction of the dilemma story: every participant received a printed copy of the story and two questions: In your opinion, what decision will Maria make? And what decision would you make?

The week-long group process was divided into three parts:

- (1) Days 1 and 2 were dedicated, essentially in line with the stages of the VaKE method, to the mapping of the value and knowledge systems of the students who had to get used to a new way of working; the leader regularly stepped out of the group and delegated the tasks of leadership, decision-making and structuring to the group. Her activity was restricted to putting notes on the board, to create the framework setting for the questions and answers channelling the VaKe method (see the table above, e.g.: What is your opinion, what do you think now and who agrees etc.), and she tried to prevent the debate from getting too personal or get irreversibly stuck.

The method was well-illustrated by the scenic element that, during the group discussion held on Day 2, the group leader stepped out of the discussion situation and sat on the chair near the wall of the room, and consistently responded to the group members' questions and instructions requesting guidance, explanation or a decision by calling on them to find a solution. In the afternoon of the same day, after introducing to the group certain elements of the arsenal of VaKE methods (e.g.: Mindmap-making), she urged the children to work independently and left the group premises, to return after two hours. She avoided the typical teacher's tasks of calling to account and checking; on her return, she went through the questions and critiques of the students concerning the topic, identified lack of information as a problem source and set the further methods of research and information acquisition as a target.

- (2) The prospect of the mid-term presentation to the plenary Forum lay heavily on the students. Their debates became increasingly frequent; the "battle" of personalities came into the foreground; members with a more prominent personality led the group in directions leading away from the topic on several occasions, and there were fierce debates on what they deemed to be irrelevant issues in retrospect.

The group leader had to exercise restraint not to interfere with the students' debates and opinions; she found it very difficult to resist the temptation to resume the traditional teacher/leader roles of administering correction, rewards and punishments. The observers had the feeling that the group made no progress; "nothing happened"; the members were caught in senseless debate vortices, quite frustrating for the participants (the observers included).

In answer to our question raised at the discussion after the group's day, the leader told us that the events of the following day, the Forum, would trigger major changes, because the group members would be confronted with their

results or rather the lack of it, and the consequent social pressure would be so strong that the accumulated frustration and tension would “explode”. She indicated that if that would actually happen, her role would be limited to ensuring that, instead of being channelled to the personal level, the change should take the form of a re-working of the decisions and opinions.

The Forum was not a clearly positive experience for this group: they considered their performance a fiasco as compared to the other groups. The dynamic of the discussion following the Forum (with the participation of the leader), however, was clear: the shared fiasco, the shared experience created a collective “us” consciousness and reshuffled the group relations and hierarchy, and gave a new impetus to the group processes.

- (3) As a result, endless debates gave way to a search for compromises and to the classification of the collected data, in the framework of the repetition of the stages of the VaKE method mastered in the previous two days. The group members drew up models to understand the possible decision scenarios, and examined the broad spectrum of potential presentation forms, from personal presentation to a video-based report. The leader spent little time with the group during the process. As she repeatedly said: “They don’t need me any more; they will function on their own.” Her role focused mainly on the preservation of certain framework conditions and on administration.

The change in the group can best be described as the experience-based realisation of students that their limits as they knew them could be transgressed, their only real limits being their own abilities and thinking.

Finally, the presentation held at the Forum on the closing day took the form of a video report, which presented the problem of the protagonist of the dilemma story through flashing images and thought-provoking questions. The interactive video presentation motivated the audience to contribute, and this was given a special “flair” by the fact that the Camp participants included young Greeks who, however, did not work in this group.

From a professional point of view (pedagogical, psychological relevance), the group dynamic was, finally, exemplary: the students mastered a new learning method without getting acquainted with its theory and system, without receiving theoretical training in that domain, and through its application they experienced personality development. And, as with every technique with a personality development effect, it was the intensity of their own flow experience which ensured the fixation of what they learned and which made it likely that their new knowledge and values, this cognitive attitude, would reappear and become useful in future life situations.

3. Boundless love, friendship, partnership and their social limits

The leader of the module was a most interesting and charismatic artist-teacher, Markus Präauer. The students were enchanted from the moment of his introduction of the topic. His popularity was further enhanced by the fact that this was the most interesting topic for the teenagers. Love across the frontiers is a sensitive issue, affecting many, but the love and marriage of people with different religious backgrounds, and the acceptance of homosexual relationships within the family and in bigger communities (countries, the European Union), are even more interesting.

The dilemma story was complex and had several threads. It focused on a family conflict affecting another family as well. According to the story, 17 year-old Roman Catholic Sandra falls in love with 22 year-old Nicbe, a Muslim home decorator. Sandra would like to move in with the boy or rather continue her studies with him in another country. Her father is against it, her mother supports her, but she has some negative feelings concerning Nic's family, as Nic's father lives with his lover, although he did not divorce his wife, because his religion permits polygamy. Moreover, Nic's brother is homosexual and lives with his friend, not far from the girl's family. The two families have radically different opinions about the love and plans of the young couple. The solution of the conflict is aggravated by the fact that siblings and friends on both sides influence the lovers motivated by their own selfish goals.

The first assignment of the group was to sketch the system of relationships in the two families to facilitate understanding and to clarify the problem. They proceeded according to the VaKE method, and the initial standpoints were expressed. Since, however, the group members could propose no scientifically grounded arguments as yet, the discussion was more of the emotional kind. Subsequent research covered several areas. They examined the dogmas and laws of the religions involved; thought over the existing family models, and studied the relevant national regulations concerning homosexuals. They also compared the rights and obligations of minors on the basis of some European and some Islam countries.

The group leader used various methods to assist with the classification and integration of information originating from the researches; the development of the debate and communication techniques, and the better understanding of the motives of the family members. Given his artistic disposition, the group painted, used playdoh, illustrated the conflict situations with role-playing, and even pantomimed. The underlying base was Dr. Marshall B. Rosenberg's dynamic communication method, i.e. Nonviolent Communication. They practiced the jackal/giraffe language; they learned that manifest big emotions hid fears,

unsatisfied needs, unexpressed requests. A significant part of the seminar activities was designed to let them experience, understand and accept emotions.

At the Wednesday presentation the group illustrated the dilemma story by role-play and posters; they addressed provoking questions to the audience, who were highly motivated by both the topic and the problem. Subsequently, they developed their debate and presentation technique, got closer to a consensus-based solution of the dilemma story, and prepared for their Friday presentation.

4. Memory, brain and neurobiology

The leader of this workshop was a teacher Annette Resch, the most determined group leader personality in the Camp. Here again the topic touched upon rather delicate questions of interest to the teenagers. Today, there are many tests and exams in every school, and university admission exams are especially significant. Of course, everyone would like to perform as well as possible, write the best admission exam, meet every expectation and have excellent maturity results. Students are under great pressure, and do not tolerate tension in the same way. Many young persons suffer from sleep disorders, migraine headaches, indigestion, i.e., problems caused by the over-burdened nervous system or, to use a more common name, stress. Without effective support, the human organism cannot withstand that for a long time. The solution is almost obvious. A high percentage of the youth has recourse to drugs, medicines, stimulants, energy drinks. But is there a moral/legal limit to self-doping by a school child, or the endurance capacity of the body is the only limit? What future will the youth of our days have this way? Is free will no more than an illusion? Is it possible, is it a must to enhance performance capacity infinitely? What values and rights can people give up in the interest of better performance? Are knowledge, memory, the capacity of the brain simply the functions of physics and chemistry? These were the main questions raised by the dilemma story of this workshop.

Here is the story and the central dilemma to be resolved by the student team. In Austria, admission exams to the university of medicine take place on 9 July 2010. There are several times as many applicants as places: one of every seven students will be admitted. The universities have voluntary preparation courses, occasionally for a fee. Matthias enrolls for a course where she meets Anne. The girl wants to be admitted to university at any price, and she is willing to sacrifice lots of money for that purpose. She therefore buys various performance-stimulating products and offers them also to Matthias. The boy, previously confident of his abilities and knowledge, loses certainty, because he realises that with the stimulants he could be better than good, and he knows that only the best will be admitted. Should he take the risk of relying on himself, instead of grasping every means to be admitted?

The students progressed according to the VaKE method. They asked questions, ranked values, expressed their opinions, took up a position, then researched the topic and started the question series again. They used several techniques to map the research areas, including the WALK technique, brainstorming, Mindmap-making, and they made posters. With the preliminary results, they carried out extensive research via the Internet. They studied the various performance stimulators, their effect mechanism, price, procurement terms and dangers. They researched the chemical and biological features of the brain, and of memory disorders. They read the positions and calls of schools on the topic. They looked for psychological studies to see to what extent positive thinking, belief, self-confidence and strength of mind influenced performance.

They were most creative when it came to the use of the presentation tools: they made a short film with the video camera of the Camp for the Wednesday forum. The location was a school classroom where students prepared for a test and were, of course, very nervous. One of them offered the others “some excellent stuff” which some children accepted.

Such situations are not rare in our days, so one must discuss them in order to prepare students to take an informed decision if necessary.

III. CRITICISM AND LESSONS OF THE PROGRAMME; POSSIBLE INTRODUCTION IN HUNGARY?

1. Criticism and lessons of the programme

The implicit advantage of participation at the Platon Jugendforum is the international contact building opportunity offered to students. In addition to the professional programme, the Camp offers intensive social life to the adolescents. The multi-lingual environment, the different, but not radically different cultural habits and characteristics of the others give the youth exactly the kind of extra stimulus which they like and need, given the psychological and sociological aspects of their development. The leader of the Camp as well as the teachers and assistants took part in the leisure activities and promoted them, along with the establishment of contacts on an equal footing and familiarisation with the various countries.

Beyond the above, the programme of the Platon Jugendforum fits very well into the series of fashionable talent development programmes organised in the form of summer camps in Europe. However, it is special due to its method and programme: contrary to the structure and goals of the other camps, instead of aiming at the development of skills or abilities needed for school-based learning or further education, it targets a less tangible, complex attitude, to be described by a paraphrase rather than a definition: the development of a European citizen's consciousness. From a certain point of view, the term itself is an appealing promotion name and image, something that can be "sold" outside talent development, yet the professional programme concerned is nevertheless broadly recognised and quite popular.

The programme leader told us that the results of work over the past 7 years and of the questionnaire surveys of the past years are subject to processing and awaiting publication in the form of a thesis. Only part of the papers published on the VaKE method so far have been specifically about the Platon Jugendforum.

Therefore, it is difficult to judge the efficiency of the model and the programme in terms of talent development; the best approach is to consider the professional recognition and authenticity of the programme as a basis for the

judgement of the weight it carries in the area of talent support at European level (for more detail on the features of the programme, see “II. Presentation of the Platon Jugendforum talent support programme” above).

However, to get back to the professional aspect of talent support, let us note again that the programme involves no talent identification; and it has no selection or admission procedure based on tests or other standardised methods. Students arrive to the Camp via several channels; their admission is decided upon by the leader and her helpers, and in personal conversations and interviews with the students it was repeatedly uttered that they did not know precisely what to expect/what would happen in the Camp, or they expected something entirely different. Follow-up of the participants is patchy and, in addition to information from the returning students, it typically takes the form of spontaneous, informal Internet contacts and communication.

Despite its obvious values, the structure and operation of the programme can be criticised in several respects. On the one hand, it is “leader-sensitive”, i.e., the organisation has no professional team with relevant scientific recognition and qualifications (the staff come from practice; they are teachers of various subjects). There are no persons, or not many, in the programme whose professional expertise would guarantee the intellectual development of the Forum and also the function and possibility of its internal supervision.

On the other hand, the Camp receives little financial support from the Austrian state and other organisations which limits its options (although this does not constrain its activity in the strict sense). In the absence of a supporting background organisation, however, it is difficult to predict the future progress and development of the organisation.

This latter aspect might well be the most crucial issue to be settled by all means, as far as its potential application in Hungary is concerned: What are the future perspectives of the expansion and development of the programme? Can the model be applied with success also in other areas of talent support, and how could it be made more marketable, i.e. eligible for funding, without losing its professional authenticity?

2. Possible implementation and necessity in Hungary?

Catching up with Western Europe had been essential also prior to Hungary’s accession to the European Union in almost every area of life and social action, but accession has made it more clear and obvious than ever that, the economic and political tasks implied by integration and catching up notwithstanding, it is imperative to reconsider and reframe the tuition of the future generations, a process that is underway and, hopefully, will become more and more effective.

Foreign language skills are key to the process: Will talented/gifted Hungarian students be able to show in a short while that kind of linguistic flexibility and adaptation capacity which is at the basis of Platon Jugendforum when it throws its presumably talented/gifted students “in at the deep end”, i.e. puts students of different nationalities into the same group? The rapid alteration of the English and German languages in the debates, *efforts* to be mutually intelligible act like a press that scrapes the differences and creates a common denominator between the students through the mechanism, well-known in pedagogy, of cooperation and acceptance of the individuality of one another in a shared information situation, in the interest of a *well-motivated* common goal.

In Hungary every component is available for the implementation and development of programmes similar to the Platon Jugendforum: the financing intention of the public and the private sector, the high-level education of talent support experts; the institutional network of talent development, a well-functioning talent support and development programme of long standing (Arany János Tehetségfondozó Program, AJTP), internationally recognised research workshops. The established talent support networks would provide for the screening, identification and development of talented students, and Hungarian talent support has adequate international contacts. Consequently, as for the framework conditions, there is no hindrance to the adaptation of the programme to the Hungarian context.

But how, to what extent, could the programme be made richer in the Hungarian context than in Austria, and how could its options be best exploited under the Hungarian circumstances?

Firstly, the primary sphere of attraction of the Camp organised in Austria is the circle of the traditional Western European countries, with only a small number of participants coming from the Eastern European countries (the exception being Romania). Therefore, in the case of a Hungarian adaptation it would be worth mapping, collecting, on the one hand, the relevant Hungarian-language knowledge base through which talented young residents of the neighbouring countries who speak (also) Hungarian could establish their contact system. On the other hand, background support for the Camp as well as its further development could be provided for if the multinational and large companies present in the East Central European region and taking knowledge-centred and sustainable development seriously would provide a practical terrain and join the programme (in Germany and Austria this is a widespread option).

If, however, we focus “only” on the implementation options in Hungary, a national talent support programme realised in the form of a series of summer camps would be needed (the conditions are given) that connects with and fits into the organisational setting of talent support in Hungary and, due to its

special nature, also popularises the values and slogans associated with the motto of European citizen's consciousness among adolescents. The professional quality of the Camp would guarantee the appropriate number of applicants, and the experiences and education provided there and their career orientation effects would represent a good target for either the institutions of higher education the competitive sector. We can state that, considering the Hungarian circumstances, the best practice model of talent support known under the name of Platon Jugendforum would certainly provide an excellent shell and draft in terms of organisation and content of a similar venture in our country.

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Balázs Hornyák*

Pillars of Talent Support in Finland: The Päivölä School Mathematics Programme

I. INTRODUCTION

1. Society and economy of Finland

What do the Finns leave behind when they go abroad? What can visitors take home from this Nordic country? In addition to the triad of sauna, *sisu*¹ and Sibelius, Finland came up with many innovations and achievements at the turn of the millennium. At the end of the first decade of the 21st century the country was among the world's top 15 economically strongest countries. It excels in timbering and tourism, in design, and with Nokia, its strategic private company.² There are two official languages, Finnish, spoken by 93%, and Swedish, the native tongue of 5.6% of the population. The Sami population totalling less than 7000 speaks Lappish³ (Terttu 2006).

As for the foreign languages, a large number of the Finns are fluent in English, due among other things to the fact that only the TV programmes for the youngest are dubbed, while the English-language programmes are subtitled. Thanks to the well-functioning education system, the illiteracy rate is 0%, and the rate of immigrants is also very low in comparison with other North European countries; many are of the opinion that this, too, contributes to the success of education (Birkhold 2006).

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¹ *Sisu* means perseverance, toughness, power, and also steadfastness. It is a key value concept, the ideal state of body and mind.

² Approximately one fifth of the Finnish tax revenue and of the GDP is provided by Nokia.

³ Other minority languages are Russian and Estonian.

2. Finnish educational policy in the early 21st century: Results and general characteristics

The economic- and educational-policy achievements of the past one-and-a-half decade put Finland in the limelight globally. According to the PISA⁴ survey of the OECD (the organisation which gathers the most advanced countries), 15-year-old Finnish students produce outstanding results in both mathematics/natural sciences and humanities (reading literacy). What is the explanation for this outstanding performance? What factors influence the educational policy of the country? Where does the Finnish school put the most emphasis?

2.1. Education-policy guidelines in our days

Finnish education differs in many respects from the current practice of other European countries. Decentralisation, one of its decisive features, has led to the reinforcement of the competences of the local institution operators. The approximately 450 local municipalities can take autonomous decisions on the content and structure of education. The functional competence of municipalities keeps expanding: they act as institution operators or financiers, and they also fulfil local curriculum development, supervision and quality control functions (Balogh 2004).

The main cooperation partner of the Finnish Ministry of Education and Culture is the National Board of Education. The Board, responsible primarily for professional expertise and decision preparation, creates information networks in the educational sector, provides further education and training options for teachers and is also involved in the development and dissemination of training materials. Its experts regularly publish and present at international education-policy events, and they drew up the National Core Curriculum upon the commission of the Ministry of Education (National Board of Education 2010).

The Finnish education policy of the new millenium stresses the importance of individuality and free choice, under the signs of quality, efficiency and modernity. Curriculum development has granted autonomy to the schools and lay down the principles for differentiated education. The national curriculum defines no more than general guidelines.

⁴ Program for International Student Assessment. The programme surveyed the problem-solving and reading skills of students in mathematics and natural sciences.

2.2. The school system

Compulsory schooling of Finnish children begins at age 7, although children can take part in pre-school education from the age of 6. The starting date, different from that in other countries, is explained by the fact that, before the 7th year of age, the main instrument of learning and of the acquisition of new knowledge is playing. Compulsory schooling lasts until the age of 16, and in addition to 6-year primary education, it contains a 3-year lower secondary school period. There is no secondary school admission examination at age 13, which spares children the concomitant stress and the difficulties of integration into a new community. Primary schools are no doubt the basic pillars of the educational system since, without the sound knowledge base acquired there, students would find it very difficult to cope with tasks in upper secondary school. After the completion of the 9th form, students can complete a 10th form as well, on a facultative basis, where their marks can only be corrected upward, not downward. The significance assigned to primary-level education is indicated by the fact that teachers must have the highest-level university qualification (MA) to teach in the relevant institutions. In the first six years children are taught by university graduate “general teachers”, who are then replaced by subject teachers. Furthermore, special emphasis is given to providing the children assistance to catch up, which process is funded by the municipality. The necessary human resources are provided by development teachers with a relevant specialist university degree. Almost 30% of students take part in some catching-up session, which eliminates the problem of discrimination. The necessity of prompt intervention has been realised and, consequently, no students lag behind in the longer term, as problems are remedied in time via at extra-curricular lessons held by professional teachers.

After compulsory schooling, the youth aged 16 can choose from schools which provide either general or vocational upper-level secondary education. At the end of this cycle, students take a “maturity examination” (GCSE). A successful exam opens the way not only to the universities of Finland, but also to those of every Nordic country.

2.3. Higher education, university education

The Finnish higher education system comprises two parallel institution systems: polytechnics (institutions of professional higher education with practical orientation) and universities.

Polytechnics provide education in specific professional fields, in close cooperation with the business sector, as witnessed by the fact that the courses they offer reflect the changing needs of the labour market. Education includes a practical training period and it lasts for 3.5 or 4 years in general.

Similarly to the other European countries, universities offer a lower (Bachelor) and a higher (Master) level qualification. Furthermore, students are offered numerous postgraduate courses. The university system comprises multidisciplinary and specialised institutions and art academies.⁵ At the moment the youth can choose from among 20 publicly funded universities in the country. The oldest among them opened its gates to students in 1640 in Turku; now it is located in the capital and provides for the education of some 38 thousand students. Despite their public funding, the universities enjoy considerable autonomy in regard of their internal affairs and the content of the educational programmes. Under the sign of academic freedom universities are genuine arenas of discussion and development. Finland makes outstanding efforts at international education events to establish contacts with other educational organisations operating in the world. The Helsinki University is a founding member of the League of European Research Universities. Finnish higher education is extremely popular; apart from bilingual education in Swedish and Finnish, it offers a wide range of English-language courses to foreign students. The Helsinki University alone has more than 300 Erasmus partners and more than 80 other cooperation agreements worldwide (European Commission 2008).

2.4. Teacher training and teacher career in Finland

The Finns have realised that the operability of the educational system and the quality of the school system depend to a large extent on the performance of the teachers. Finnish teachers enjoy high social prestige: they are respected and their work is appreciated. This is demonstrated by a fivefold over-application rate to teaching programmes. In the countries with the most successful public education (South Korea, Singapore, Hong-Kong, Finland) teachers come from the upper tier of university graduates; in Finland they come from the uppermost 10% (Pusztai 2010).

Would-be teachers must pass a two-round admission exam to be admitted. The first round assesses their reading/writing, calculation and problem-solving skills via multiple choice tests. The second round is organised by the universities

⁵ One of the most significant academies of arts is the Sibelius Academy in Helsinki.

for applicants who had the best results in the first round. This time they test the applicants' communication skills, learning skills and commitment to the teaching career. During the collective sessions at the university and throughout the teaching practices the students demonstrate their communication and social (contact-building) skills. At the end of the teacher-training process, graduates must meet also the requirements of the individual schools to be employed as teachers.

Several components of researcher training are also applied in teacher training. This is because the Finnish model considers teaching a process of continuous research and development, an activity in the context of which the teacher produces on site the knowledge confirmed by scientific means and required to improve his work. The scientific instruments are introduced into the teaching process through the preparation of the teachers for their active use (Csapó 2009).

In Finland university graduate teachers have a relatively high starting salary, which is a good incentive for attracting the best to this career. The rate of career leavers is not high later on either, despite the fact that the difference between the initial and the highest teacher salaries is no more than around 20%. In addition to the in-service education options provided to teacher teams, the institutions concerned focus on building up close cooperation within such teams. Finnish teachers often visit each other's lessons, make lesson plans collectively and contribute to each other's development. Teachers with MA enjoy considerable freedom in methodological issues and in the selection of auxiliary materials. They are motivated by the fact that they can teach in a creative way (Pusztai 2010).

Professional teacher training pre-supposes a significant increase in the prestige of the teaching career, and the elevation of the average wages of starting teachers is certainly not the only means for that. To keep up motivation, teachers with adequate qualification must be granted sufficient elbowroom to select training materials and must be provided continuous further education. If teachers have the opportunity to discuss their work and experiences and to expand the tools of their trade in a co-operative setting, burn-outs and career exits may be prevented.

Dedicated senior teachers who remain in the profession as well as their young colleagues deem it equally important to embrace the cause of the development of "promising talents". The country has no codified talent support concept, but every component of the educational system promotes the development of students with exceptional abilities.

3. Forms and institutional background of talent support

Talent support is an organic part of the national culture and of the teaching practice in Finland. Discussion of strategic issues of talent support, assistance to the relevant institutions and development of their networks are functions assigned to the competence of the National Board of Education. The autonomous approach adopted in education encourages schools to work out individual curricula which let high-ability students unfold their talents.

Finnish children usually go to the school nearest to their home, but parents may also choose any other school, if they think it is ideal for their child. In such cases the costs of commuting to the more distant school must be borne by the parents. At secondary level, 37 of the 463 general secondary schools of the country provide special education. These could also be defined as talent support institutions, for it is very difficult to be admitted there. Selection is based on the marks of the student, while most places organise their own an admission exam as well (Tirri 2006).

Most upper-level secondary schools are non-graded schools, enabling students to proceed faster than their age peers, driven by their interests. There is a long tradition of secondary school contests. Students who excel there can go to the international student Olympiads in mathematics, physics, chemistry, biology or informatics. Such trials are preceded by considerable preparation in the form of intensive weekend and afternoon courses led by university teachers and students who had good results at previous Olympiads. In recent years an increasing number of development programmes have been made available to children, on a voluntary basis. At the Tampere University students interested in mathematics and physics can regularly test their knowledge against one another and practise in an environment that implies bigger challenges than the school. Decisive components of the same project include summer camps which are ideal occasions for intensive preparation (Balogh 2004).

The Natural Sciences Faculty of the Helsinki University organises family programmes and presentations to young people to introduce them to the world of chemistry, mathematics and physics. On certain announced dates the well-equipped university laboratory hosts not only students, but anyone who is interested and joins the programme organised by the LUMA⁶ centre. Such occasions offer inspiring programmes to enrich talented high-ability students. Impressions gained there may help them develop lifelong commitment to the natural sciences.

⁶ The word LUMA derives from Finnish “luonnontietee” (natural sciences) and mathematics.

The LUMA Center was founded in 2003 by ten institutions in close cooperation. The partners included educational institutions and the representatives of the industrial sector. The primary objective of this venture was to popularise and support the tuition/learning of natural sciences, mathematics and informatics, and to build networks of schools, universities and partner institutions. The Center organises seminars, workshops and summer courses for teachers, and club sessions and international camps for the youth. One of the most recent initiatives is the Millennium Youth Camp (MYC) organised every summer. It was designed primarily to identify young talents and to help them launch their career. During the one-week camp, students meet researchers and scientists, go to presentations and workshops, and carry out projects in team work. The first camp was organised in June 2010, and out of almost 1000 applicants, 30 talented young students from 14 countries took part in the programmes free of charge.

Apart from the universities, a growing number of upper secondary schools also provide initiatives to support high-ability students. In terms of results, one of the most remarkable of the many nationally known programmes outside the capital is the Mathematics Programme of the Päivölä School.

II. THE MATHEMATICS PROGRAMME OF THE PÄIVÖLÄ SCHOOL

1. Genesis of the programme; methodological features of the research

The Päivölä School, at a distance of 135 km from Helsinki, in the vicinity of Valkekoski, designed a nationally unique mathematical talent development programme which deviates from the mainstream Finnish practice, yet embodies the specificities of Finnish education. The essence of the programme is that upper-secondary-school-age students complete in 2 years what is otherwise accomplished in 3 years in a normal school, and they do that by learning in a boarding school, in a special system. The Päivölä School Mathematics Programme started as a pilot in 1994, and it acquired its current form in 1997. It can be defined as a talent support programme, given the fact that, in addition to having higher-than-average abilities, the admitted students are committed to learning mathematics and natural sciences subjects and they are motivated to learn. The options of fast progress and of gaining university credits in upper secondary school give high-ability students long-term advantages.

Considering its results, the cooperation network of the school and the operation of the boarding school which differs also from the general Finnish practice, it is obviously worth taking a closer look at the programme. The Author's research was assisted by the leaders of the institutions, by the persons who designed the programme and former and current students. The on-site interviews and consultations gave an insight into the life of the school; the Author got acquainted with its didactic principles, objectives and achievements. On the occasion of visiting to lessons, he could take part in practical work as well.

1.1. The host institution

The mathematics programme is hosted by the Päivölä Folk High School. Folk high schools⁷ have a long history in the Nordic Countries as special, mainly

⁷ Folk high schools originate from Denmark. The system and its education programme was devised by Nikolaj Frederik Severin Grundtvig (1783–1872), Danish Lutheran priest, poet, historian, popular educator. Folk high schools gradually spread from Denmark to the nearby Northern European countries, Sweden, Norway and Finland, and subsequently similar institutions were founded everywhere in the world.

adult education institutions. In Finland there are some 90 folk high schools which offer further education in the most diverse cultural areas. These popular institutions of long standing teach in Finnish, but almost 20% of schools provide education also in Swedish. The mathematics programme is located in a separate building of the folk high school building complex.

The experiences of operation for almost one and a half decade have of course brought many changes into the life of the school, but its didactic principles and programme objectives have remained unchanged. The primary goal of the talent support programme is to provide high-ability students an opportunity to proceed at the pace dictated by their abilities, needs and interests in mathematics and natural science subjects, and to help them formulate short and long-term goals. It is important that the students have a realistic view of their givens by the time they complete the programme, and find out which institution of higher education and which workplace offers the best match for their abilities. The school therefore not only prepares students for their maturity exams, but also for their university studies and the period following graduation.

1.2. School facilities

The building which hosts the mathematics programme has four big halls equipped with computers and most students have a laptop as well. The residential quarters are located in the same building, so students spend also a major part of their leisure there. In addition to the four spacious classrooms, there are several other smaller rooms suitable for playing chess, for physical exercises, conversations, watching TV or for individual learning. The complex has a fitness centre, and of course a sauna and a swimming pool. Students are provided four meals a day for free at the restaurant near the main building. In their leisure time they can play chess, billiards or basketball, which is one of their favourite sports.

2. Cooperating partners of the school

The Päivölä School is in close cooperation with the Valkeokoski Secondary School, the Tampere University, the Tampere Technical University, the East Finland University and the Nokia company, a supporter of the programme. Cooperation is a key aspect of both the financing of the programme and the further education and enrichment of the students.

2.1. The role of the corporate sector in education

One of the biggest advantages of the institution is that students can gain work experience during their school years at the Toijala centre of Nokia. This is a curricular activity, implemented in 12 hours a week, for two years. It goes beyond simple workplace practice: based on their time spent at the company, students can establish important contacts which they can capitalise on later, preserving their motivation and acquiring up-to-date knowledge on the IT world. Their situation is comparable to that of media students, for whom it is a definite advantage to have a chance to work in the media from the start while obtaining a post-secondary (college or course-based) certificate in communication studies. Time spent at Nokia lets the students get a realistic picture of the high-tech world which develops so fast in our days that it is difficult to keep pace with it. The company provides an opportunity to apply in practice what has been learnt at the programming lessons, and to master new, state-of-the-art software development techniques.

Practical knowledge acquired in the context of such work is very different from textbook-based knowledge. For the same reason – partly due to the general Finnish education-policy guidelines, and partly to the significance of local innovations – teachers provide many extra-curricular addenda. No teacher can be absolutely up-to-date on ICT; therefore, former students, young professionals keep returning to the school to assist the youth, their future colleagues. On the occasion of these regular visits, they relay information and up-to-date knowledge, and they also give a model example. Students become more motivated if they see where they can get with the work they do day after day.

2.2. Cooperation with the Valkeokoski Upper Secondary School

The other major cooperating partner of the school is the Secondary School of Valkeokoski. The teachers of general secondary school subjects commute to the institution from the small town of Valkeokoski 15 km away, inhabited by 20,000. In addition to the commuter colleagues, the school has three main-job-holder teachers of natural sciences, mathematics and Swedish, respectively. Owing to this basically student-friendly approach, students do not have to commute between the two institutions, the teaching team does that in their stead, to ensure that students have every lesson at the same place.

2.3. Cooperation with universities

In Finland's course-based secondary school education system (cf. 3.3.), students can complete university courses in upper secondary school. Thanks to cooperation with universities, students have a clear view of the learning techniques applied in higher education by the beginning of their university studies. The primary goal of cooperation with universities is therefore to let high-ability students learn the most up-to-date subject material in secondary school and master new learning techniques. As for the latter, the crucial area is the skills-level mastering of independent research work. Through the creative "upgrading" of the body of knowledge acquired already, students become professionals capable of independent research. They can write complex analyses, make model experiments and have advanced written communication skills.

2.4. The Päivölä community

The boarding school is a real "second home" for students due to its special features. Students feel at home among its walls, and their teachers act more like mentors than teachers. The programme leader and his family live with the children, monitoring their development and providing personal assistance to help them overcome any difficulties. This mentoring role is essential in the practice of the school. Children often visit teachers in the evening to solicit help in connection with the solution of a problem; they share their personal problems with the mentors and they try to solve them together.

Learning is a kind of team-building activity in the school. Team work is encouraged. This is one of the essential tuition principles, and former students help realise it. There is one official meeting annually, to which every member of the "Päivölä community" is welcome. Current and former students and teachers in the community are always accessible to one another, whether to help with a specific curricular task or to do some extra-curricular assignment. The teachers do not provoke direct competition situations among the students, at least not within the school walls. Students mostly see the others as friends, not rivals. This has several reasons, the most important being that they live together and mostly spend their leisure time together, and the family-like atmosphere of the school suggests that they must compete with the world, not with each other.

3. Characteristics of the best practice of the school

3.1. Selection; programme participants

Currently the school has 44 students, and some 20 of them can be admitted to the mathematics programme annually. Girls make up 25% and boys 75% of programme participants. The institution has no statistics to show the rate of socially underprivileged students.

The leadership professes that students admitted to the mathematics programme are not latent talents, but rather “promising” or “motivated” children. The programme is announced to the neighbourhood schools every year, but due to the good experiences, it frequently happens that a sibling or even a foreign student also appears on the first open day. In the past 13 years, there were some Russian, Korean and French students among the applicants⁸.

The school leaders announce three open days at weekends, to give the applicants a chance to get to know the activity and goals of the school, to assess their own commitment and to get acquainted with prospective classmates. Written tests are important parts of the selection process for two reasons: the capacity of the school is a given, i.e. maximum 20 children can be admitted to the programme annually and, it is a precondition of the students’ fast progress that they have a good command of the basics and a commitment to mathematics. Most students are attracted to the institution by their interest in mathematics and natural sciences, but of course Nokia itself is also highly attractive to innovative and creative teenagers who are open to the world.

Children are usually accompanied to the open day by their parents who can thus see the tuition circumstances and conditions for themselves. The school principal introduces the programme in a detailed presentation and this is followed by the test-writing session. In March, students already know the results and can prepare for the academic year which begins in the summer period.

3.2. Structure of the academic year and the daily routine of the students

The daily routine of the students and the structure of the academic year in the Päivölä School are essentially different from those of a normal school, due partly

⁸ The language of tuition is Finnish, but differentiated education and the versatile teaching staff make it possible to teach foreign students as well. Thanks to their personalised curriculum, students can overcome the linguistic barriers quite soon.

to the specific features of boarding schools and partly to the didactic principles of the programme. Intensive preparation programmes are given priority in every period of the year, but at the same time due attention is paid to compiling weekly timetables which ensure that the academic weeks between the holidays imply no excessive burden for the children. The life of the students is comparable to that of the trainees in secondary schools for music or in the conservatory of music, since continuous work and practice are the main features also of the preparation of instrumental musicians. There are intensive courses and on-going practices even in the summer holidays. Of course, one must not forget that the students of the institution are highly motivated, so specialised education in a high number of lessons is not as tiring for them as it would be for the students of normal schools.

3.2.1. Structure of the academic year

Contrary to the practice of normal upper secondary schools, the academic year starts in the summer period. This is a 5-week period, and students are given a whole week of holidays after each week. On the last day of each week they write a test which enables them to remedy any deficiencies revealed there during the holiday week. In the summer weeks, the programme participants are provided development courses in mathematics and IT. The IT courses take up 5 weekends, in 15 lessons per occasion. The first development session comprises 90-minute lessons on hardware, computer networks and operation systems, respectively. Algorithms and programming are taught after the founding sessions, as special subjects, on three weekends. At the end of the course students design a programme of their own. For most students, this is the first time they learn programming, but some already have adequate preliminary knowledge, so the members of the group are taught simultaneously at three different levels. The main purpose of the summer period is to make everyone capable of designing a simple programme as a precondition of further studies. Education typically focuses on practical assignments rather than long presentations.

From the second half of August, as in normal schools, the academic year is resumed after a short summer holiday. In the first weeks, special emphasis is given to the reinforcement of mathematical skills, partly to lay down the basis of studies in physics. The intensive foundation period is also important, because physics as taught in the school is very different from the corresponding material in normal secondary schools. The pace of learning is faster and the quantity of the material to be mastered is much bigger.

In the autumn period the weekends of the long (14-day) school weeks are spent with special courses, intensive preparatory courses organised by the

students of the school for external students. The weekends of preparation for the maturity exam and the contests, organised twice annually, are the most popular among the students. Students have a 3-week winter holiday, and in the spring period first-year students can already pass their final (maturity) exam in some subjects. The final exam period is followed by a study trip, which is a major professional and community-building experience for the students.

3.2.2. Daily schedule

Contrary to the practice of other secondary schools, teaching begins at 9 a.m. in the Päivölä School. Before the lessons students have breakfast together in the canteen of the institution. Late start is justified by the fact that the evening lessons are often protracted; on certain days, students finish at 9 p.m. The lessons are interrupted by long breaks, and one of the main goals is that everyone should learn the material during the lessons without the need for any long afternoon learning sessions. There is seldom any homework, because the lessons provide sufficient time for practising.

During the long day, students have no more than 4 lessons, but these are longer than usual, and last for 135 minutes. Normally, upper secondary school lessons last for 75 minutes. Päivölä School students are allowed to get up and even leave the classroom during the lessons, provided that they do not disturb the lessons. Girls may even do needlework in some lessons if that enhances their concentration. The children must not be inhibited in any way; it is important that they dare ask questions and tell in time if they do not understand something.

3.3. Didactic principles of the programme; school reports

3.3.1. Acceleration

There is general agreement among talent support experts worldwide that talented/gifted students must be given an opportunity for faster progress. The mathematics programme provides theoretical and practical support for that.

The small number of students involved in the programme and the system of course-based education makes it possible to draw up personal development plans and realise telescoping in practice. Students can develop according to their abilities and degree of determination at a pace that may be several times faster than that of their age peers. At school they receive a mark for each course they complete. At the end of the year, instead of taking home a school report, they have a certificate of their completed courses. 75 courses can be accomplished during the secondary school years, and the studies end with a complex,

comprehensive final “baccalaureate” or “maturity” examination taken mainly in writing⁹.

The above-mentioned cooperation schemes and enrichment programmes of the school also promote fast progress. The emphasis on catching up and on differentiated teaching is a typical feature of the entire Finnish education system, but it is especially relevant at the Päivölä School, since the components concerned are the practical instruments of acceleration.

3.3.2. The role of tests in the process of education

Students of Päivölä School have much more opportunities to test their own knowledge than students in a conventional upper secondary school. It is one of the main principles of the programme leaders that students must be provided sufficient opportunity to identify areas mastered at the courses on the one hand and deficiencies on the other. Once the teachers have mapped the deficiencies with the didactic method of diagnostic control, they stop and help eliminate them via individual or collective development work. The precise knowledge of the deficiencies improves time management. Therefore, evaluation is done in stages, not at the end of the course. For this reason, teachers present the course material faster, and more time is left for testing. It is possible to write as many as three tests based on the material of the same course, since the objective is that the students have as thorough a knowledge of the material as possible. Given the small headcount, teachers are aware of the pace of progress and deficiencies of every student, and the teacher team tries to remedy the latter collectively. Often, two teachers are present at a lesson of physics, or the same subject is taught by several teachers. The multi-perspective approach to the material promotes understanding while making the lesson more colourful.

3.4. Extra-curricular programmes

The institution offers a wide range of sport and leisure programmes outside the school. It is possible to do sports, go hiking, but the institution does not adhere to the conventional programmes of community life in a normal secondary

⁹ Baccalaureate (maturity) examinations are organised twice in Finland, in the spring and in the autumn, simultaneously in every secondary school. Students must pass exams in every GCSE subject within a maximum of three consecutive examination periods, but it is possible to take them all in the same period. The native tongue is a compulsory subject, and 3 of the following 4 subjects must be chosen: a second official language of the country, a foreign language, mathematics and a freely chosen general subject. Of course, students can take exams in more than 4 subjects.

school. A traditional ball is held on the national holiday (Liberty Day), but there are no other similar events.

The hiking places and lakes in the vicinity of the school are ideal for collective excursions and sports programmes. Students do not have to travel much to enjoy beautiful natural scenery. There are lots of lakes suitable for rowing and hiking near the school. Apart from the frequent preparation courses, camps, local programmes, the school organises also longer trips abroad for study purposes.

3.5. Assistance to reading

It is a tradition of Finnish culture to hold reading in high regard. It is considered important to help and popularise reading at local as well as national level.

Students have 24-hour access to the school library where they can collect materials for their own researches and individual projects. The university diploma works and PhD theses of former students are also accessible on the shelves of the library.

Finland has a top-quality, dense network of well-equipped libraries; professional cooperation between the libraries and the schools is especially notable. The use of libraries is not the privilege of residents of larger towns: owing to the mobile library network, people living in smaller settlements can also borrow books regularly from the regional libraries. Buses are operated by the local libraries, and this service is free of charge. Thus in addition to the library of the school, students can order the books they wish to borrow on the Internet, and have them delivered by the big library vans, and it is also possible to borrow from the mobile stock on site.

“My biggest success during my secondary school years was that I won the national mathematics contest, and Viksu, the study contest organised by the Academy. I learned more and made faster progress in the Päivölä School programme than I would have at an average secondary school; this is one of the reasons why I got my PhD degree by my 23rd birthday.”

Kaisa Matomäki
Professor of Turku University

3.6. Schools contests, results

Now, at the beginning of the 21st century, there is no doubt about the importance of school contests, the main goal of which is to identify talented students and to develop talent. The period before the contest is an excellent opportunity to dive deeper in the given subject matter and to carry out research. International contests provide an opportunity to establish friendships and later on even work contacts between young persons of identical interests who come from different cultures. Last but not least, students who stand out in the contests find it much easier to be admitted to the elite universities.

Päivölä students regularly test their knowledge at national and international contests. The school encourages participation at the international events as a means for the students to position themselves in the international scene, to have an incentive for further development based on the precise assessment of their knowledge and to gain self-confidence in view of their results.

The most important contest results of the school are positions obtained at the International Olympiad on Informatics (IOI). The first IOI¹⁰ was held in 1989 with the support of the UNESCO. At the first contest held in Sofia, 13 countries were represented; one year later, in Minsk, there were 25 countries and in Bonn in 1992 46 countries, with teams of 4 persons. In the past decade, 12 of the 26 Finnish medals were brought home by students of the Päivölä School. Beside the IT competitions, students are regular participants of the national and international mathematics contests. In the last 10 years, the National Mathematics Competition of the upper secondary schools was won by Päivölä students on five occasions. Good contest results facilitate university entry but, according to the students themselves, the main point of the contests is preparation: the intensive preparation period preceding the contest itself is an ideal opportunity for immersion in a given area, and this, no doubt, is the main yield of the contest period. The abstracts of the prize-winner works, projects, are exhibited in the school corridors, and hence former and current students can learn a lot from each other's research results.

Students like also MCM (Mathematical Contest in Modelling) and the ICM (Interdisciplinary Contest in Modelling), hosting applicants from more than 500 institutions from all over the world. The team contest is announced for secondary school students and undergraduate high school students. Prepa-

¹⁰ The official language of the Olympiads is English. The tasks are algorithmic ones, without any language or hardware specialities. 50% of contestants get a medal; the ratio of the three kinds of medals is 1:2:3. The winners are chosen from among the best young computer scientists.

ration for the contests develops the complex problem-solving skills and academic writing skills of the participants.

Apart from the many contest awards, the leaders of the institution are proud of the excellent GCSE results and the fact that almost all students continue their studies at the various universities of the country.

3.7. Special talent support courses and camps

The leaders of the mathematics programme organise many intensive courses and camps during the academic year, which provide an opportunity for practising, development and immersion not only to the students of the school, but to anyone concerned. There are mathematics camps organised specifically for students in lower secondary school. Applicants to these intensive courses are usually children in 7th and 8th forms. The residential camp gives the students an opportunity to get acquainted with the teachers of the school, and to decide whether they would like to continue their studies in the Päivölä School after the 9th form. The camp lasts from Monday to Friday, and it usually takes place in the 30th week of the year.

A course offering similar intensive practising and interesting, up-to-date knowledge is the so-called ICT camp, organised on the 26th week. The teachers of the camp provide talent support in several areas. Apart from that, they carry out talent identification and talent counselling within the school walls, which helps the career and school choice of students. Many former and current students say that their decision to continue their education in the Päivölä School was the result of their camp experiences.

The Finnish Mathematical Society organises special preparation weekends every sixth week at the school, and on the week before the Mathematical Olympiad they provide the talented youth an opportunity to expand their knowledge in the context of an intensive course. The topics, compiled by experts, require a much higher, advanced level of knowledge on the part of the applicants. Despite the difficulties, students come to the intensive weekend programmes from a range of several hundred kilometres. The sessions are open to all; students are provided accommodation and full board on site.

III. SUMMARY

The high level of schooling is a cornerstone of the Finnish national strategy. In order to create a society of educated people with competitive knowledge, even the smallest components of the well-structured school system must be in the right place. Assistance to developing through the establishment even of a free library network, is essential for achieving a knowledge-based society. The Finnish example shows that the wide gaps in terms of knowledge levels disappear if catching up is given stress in time.

Given their invaluable role, the high prestige of teachers and of the teaching profession is a precondition of the correct operation of the public education system. Reliable teacher selection and training mechanisms must be worked out; adequate initial salaries must be provided, and the professional prestige of teachers must be restored. Finnish practice might provide a model example for the other European countries in this respect.

In the programme of the Päivölä School, the mentoring role of teachers is essential. Teachers committed to their profession can act as mentors, leading to much deeper human and professional contacts with the students. The cohesive force of the “Päivölä community” cements lifelong relationships between teachers and former and current students of the school. The good relationship of former students with the Alma Mater is based on the open attitude of the teachers to professional cooperation. They consider it a success if a former student surpasses them. This is explained in part by the priority position of lifelong learning in the education policy of Finland. Open universities and folk high schools offer many kinds of education also for the more elderly generations.

Most schools cannot respond fast enough to social change or to rapid technical progress. This creates a radically new situation for teachers, forcing them to face challenges for which they have not been prepared. The pledge of successful operation is cooperation with partner institutions, companies and universities within and without the frontiers of the country. Work experience acquired during the early school years is an invaluable asset. Successful talent support, in the professional as well as the financial sense, is not just a question of concluded written agreements, but also of actual cooperation between the

corporate sector, the schools and the programmes and institutions in the vanguard of talent support.

It is essential to custom-tailor education in terms of the pace of progress and also of the quantity of the training material. Interaction and cooperation based on the principle of partnership facilitates progress and the fast presentation of the training material leaves more time for testing. Both the student and the teacher must diagnose any deficiencies, which can then be remedied by individual development support.

It is not certain that the mathematics programme described above could be adopted by a larger institution with more students. It would be difficult to provide for the human resources needed to ensure smooth and undisturbed operation. Moreover, the leaders of the Pävölä School programme provide personal mentoring to every student, and this could not function effectively in a larger institution.

Homesickness is a concomitant of life at a boarding school. The long academic weeks and the longer-than-average lessons may be exasperating for students who are not sufficiently motivated. In the Pävölä School, however, the decisive majority of students are well-motivated and determined, and the drop-out rate is very low indeed.

As for the potential adaptation of the programme in Hungary, the methodological components could be made available, but financing would require more intensive cooperation between the corporate sector and the institutions of public education. Hungarian secondary-level education has a much more closed structure than the Finnish one, which makes it impossible to establish the Pävölä School type of cooperation, the key to the success of the venture, with either partner institutions or universities. A similar programme, however, could be implemented in Hungary with the cooperation of civil organisations, secondary schools and especially youth hostels (called “colleges” in Hungary), which provide accommodation but no tuition to students, but could serve as ideal talent points also for the talented/gifted students. The rapidly expanding Hungarian Talent Point Network might provide a suitable basis for such a venture.

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Talent Support in Germany Based on a Talent Development Model

I. INTRODUCTION

1. German society at present

Germany, one of the most powerful countries in Europe in regard to industry and economy, is a republic with the capital Berlin. By its territory of 357,021 km², it is the sixth largest state in Europe, and its 80 million inhabitants make it the continent's second most populated country. Its role in the breakout of World War I and World War II is historically well-known. After World War II, the country was divided into two parts, the Federal Republic of Germany (FRG) and the German Democratic Republic (GDR). The provinces, re-established in the territory of the former GDR, and the provinces of the old FRG merged on 3 October 1990, and formed Germany, as it is today.

The political and social structure of today's Germany is heavily affected by the country's ethnic composition: the various ethnic groups bring diversity into everyday life in terms of religion and culture, but they also lead to significant social and political tensions, as observed, e.g., in relation to the assimilation process of the multi-generation Turkish immigrant population. The current composition of the population after 2000 is the following: 90% ethnic German, 2.2% Turkish, 1 % Danish, 1% South-Slav, 1% Frisian, 1% Italian, 0.5% Serbian 4.5% other (Németh 2002; Ormos 2008).

This breakdown shows that the 'other nationalities' make up approximately 10% of German society. This brings a special feature to its dynamism, which is reflected well in the inclusion problems of Turkish guest workers, Turkish

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families living in Germany for generations, and their descendants. German society is heavily divided in regard to their approach towards immigrants and minorities; as we shall see later, segregation and integration are strangely combined also in the talent support programmes.

Although the German talent support programmes are open to other nationalities, and several strongly supported organisations conduct talent development programmes specifically dedicated to other nationalities, there are very few young people of the other nationalities participating in the talent development programmes run by larger foundations or in or out of school programmes. On the other hand, the majority of the talent development programmes include schemes which are explicitly targeted at foreign students studying in Germany for shorter or longer periods and returning to their home country after completion of those studies.

1.1. Structure by ethnic group, language and religion

There are approximately 7.3 million foreign citizens living in Germany, most of whom are guest workers and their families. Approximately 60% of those people have lived in the country for more than 8 years, and more than 20% of them were born in Germany (either of those two conditions entitles them to citizenship) (Statistische Ämter 2010).

Through the immigration of guest workers, considerable Turkish, Italian, Serbian, Greek, Polish and Croatian minority groups have been formed. The number of immigrants from Third World countries is also rising (Indians, Chinese, Black Africans). According to German surveys, the European immigrants have integrated into the society better than the Turks.

A large number of German-nationality immigrants arrived to the country from the territory of the former Soviet Union, from Poland and from Romania between 1980 and 1999 (Horváth 2001). These people were granted German citizenship on the basis of their nationality following an official procedure and 2 years of residence in Germany, and therefore they were not included in the official immigration statistics. The extreme (primarily Russian chauvinist) political views of their descendants caused serious problems in the country, the reason why so-called German *integration courses* were launched in January 2005 not only for the new immigrants, but also for those born in Germany (Statistische Ämter 2010).

1.2. Religious segmentation

The German Constitution grants the freedom of religion, and it also prohibits discrimination on the grounds of religion or belief. Notwithstanding, the largest religions enjoy some advantages as, e.g., they can teach religion in schools, and churches are also entitled to a share of tax revenues (Statistische Ämter 2010).

Christianity is the largest religion, as two-thirds of the population are Christian, while half of the Christians (33% of the total population living mainly in the south and west) are Catholics, and the other half are Protestants (mainly in the north and east). Approximately 3 million Muslims live in Germany (most of them of Turkish origin). According to the official statistics, there are 160,000 Jews (Statistische Ämter 2010). 30% of Germans do not belong to any religion (this figure is higher in the east).

1.3. Features of the economy

After the United States of America, China and Japan, Germany has the fourth strongest economy in the world, but the system of high social benefits places a huge burden on the internal market of the country. The rigidity of the social system made unemployment a long-term problem, and because of the inadequacies of the family-support policy, it is becoming increasingly difficult for the active income-earning population to fund the social insurance system (Illés 2002).

As expected, the introduction of the common European currency, the Euro, and the eastern enlargement of the European Union introduced big changes in the German economy, without significantly influencing the country's economic performance; Germany, which has 1/6 of the population of the European Union, generates nearly 1/3 of the output of the European Union (Germany's social and economic situation 2009). Within its diversified industry, machine production, chemical industry and electronics are the largest sectors.

The performance and competitiveness of German enterprises are illustrated by their positions acquired on international markets. Germany is the second largest exporter in the world after the US. With its near 18% share, it lies in a prominent position in the world trade of cutting-edge-technology products. In Germany, every fourth job directly or indirectly depends on export. Germany is the No.1. source of purchasing for 15 of the 28 countries managing 2/3 of world trade. The German market offers good opportunities also to foreign trade and cooperation partners.

Germany has a major role also in Hungarian foreign trade. A considerable volume of Hungarian exports is sold on its markets; half of our export goes to Southern Germany.

Naturally, the role of German education is closely related to the development of the social and economic changes over the recent decades, as World War II and the changes introduced in the 1950s and 1960s also triggered transformation in the education system: it became more and more focused on children, and the previously diversified system of education was regulated by the state in the form of decrees, standardising the education process from early age to adulthood (Cortina et al. 2003).

Special and new emphasis was put on talent development in German education and training in the 1960s, when it became clear to the legislators that the German students were not educated in an appropriate quality; equality, represented at each level of education, does no good to the quality of education as it will not produce a new generation of scientific and economic elite and, therefore, the country will lag behind and become dependent on others. This recognition, which was based on the acquisition/ retention as well as the strengthening of economic and geo-political power, was the basis upon which a talent support doctrine began to take shape in the country.

The 1980s and 1990s brought new challenges in German education, and those challenges still prevail: as guest workers and their children settled down and were naturalised, cultural and generation problems emerged in education, generating social tensions, together with the growing financial difficulties.

Talent support is present at each level of education in Germany, and may accompany the study years of a particular child, though it still faces similar challenges to the talent support systems of many other European countries. It seems though that they have managed to come up with effective responses to the issues of talent identification and support, as can be clearly seen from the economic data.

Below, we shall review first the structure of German education and its talent support system, and use that as a framework for the later presentation of the operation of the talent support programme.

2. The German education system and its general characteristics

2.1. Education system

Germany provides a multi-coloured and diversified picture in terms of the structure of its education system, because education falls within the competence of the individual provinces, and thus the parts and forms of the system differ, although that difference is mostly restricted to the designations. In the second half of the 20th century however, a national framework was put in place for the German education system, based on the general obligation of school attendance (until the age of 18), and the four- or five-level education system (Anweiler 1992). School education begins with primary school (Primarstufe), which generally covers the first four school years, though in some counties it may even be six years and in others the 5th and the 6th years are *orientation years*, depending on the nature of the school.

Primary school is followed by Sekundarstufe I., i.e., (lower) secondary education, including three traditional types of school based on a pupil's ability as determined by teacher recommendations: the so-called *Gymnasium* enrolls the most gifted children and prepares students for university studies, and attendance lasts eight or nine years depending on the province; the *Realschule* has a broader range of emphasis for intermediate students and lasts six years; the *Hauptschule* prepares pupils for vocational education.

The second level of education ends with primary or secondary qualifications. Primary school provides basic general education to start vocational training, while the technical school provides extended general education. A successful secondary-level examination gives the right to attend the higher classes of the grammar school.

This phase is the upper-secondary-level education (Sekundarstufe II), provided in the upper forms of the grammar school or in the form of vocational education. This latter means 'dual education': apprentice training and vocational school, a preparatory vocational training year, specialised vocational school, vocational secondary school and vocational grammar school education. The schools providing general education usually comprise 9 or 8 forms. In almost all provinces a maturity exam can be taken after the completion of the 12th form. Vocational grammar schools focus on vocational training which is based on '*Realschule*' qualifications or other school qualifications equivalent to that. It comprises of forms 11 to 13, and provides general high-school qualifications (diploma).

The third level of education (Tertiärbereich) begins with the completion of the maturity exam, which grants the right to enter a higher educational

institution. This level is comprised of high schools, specialised technical colleges and technical academies.

The fourth level of education (Quartärbereich) includes private and vocational further training. Further training involves retaking, updating and maintaining any type of study.

Children with special educational needs are also taught in this type of school. The educational tasks are defined with consideration to the degree of the student's handicap. The graduation from a special needs school is equivalent to completion of the lower level of primary school.

Preparatory vocational training is available for students who were not admitted to vocational schools, or are not yet prepared for starting a vocational school. The purpose of this vocational phase is to master some basic-level vocational activity.

Although some form of talent development exists at each level of the German education system, beginning with the screening and development of kindergarten pupils, it is most stressed in the development of the 12–19 age group. Talent development is concentrated in 12 large foundations which established a common portfolio on the Stipendium Plus website (www.begabtenfoerderungswerke.de) for presenting themselves and for concentrating and managing talent development in Germany.

However, the opinion of another organisation, Deutsches Bildungsserver, Förderung von Hochbegabten (German Talent Development Server) should also be noted. According to them, there are at least 300,000 talented individuals in Germany, half of whom face social and school problems and therefore experience their talent as a disadvantage and a threat rather than an opportunity (Bildungssysteme der Länder in der Bundesrepublik Deutschland 2010).

In order to understand the social and talent support process better, we should briefly review the main historical events involved in the shaping of the current form of German talent support. Of course, there is the question of whether these days one can reach a single view on the history of German talent development, because it is not sure at all whether that is one single and unified historical process.

2.2. Talent support in Germany, as reflected in the results of recent decades

The history of German talent support began with a university team formed by Stern at the University of Hamburg in 1916. The team analysed talented children. The national socialist government and the distorted eugenic theory of World War II put an end to the operation of the laboratory in 1933.

The history of talent support in Germany split after World War II due to the foundation of the former GDR and FRG. In the GDR the research activities laying down the foundations of talent development in the socialist system took place at the University of Leipzig. A so-called *Spezialen Klasse* (special classes) and *Spezialen Schule* (special schools) system was developed in the socialist part of Germany, in which disadvantaged yet talented children were also provided an opportunity to study. Talent development focused more on natural sciences and the Russian language, though musical talent development and later on sports also became priorities.

Between the 1940s and 1960s, in the former FRG, preference was granted mainly to talent development and selection on a genetic basis, but the role of the social environment in selection gradually gained importance from the 1960s on. In that part of the country there were always private schools which supported talent development, but in most educational institutions talent recognition and development was not the focus of attention. It should also be noted that there are only very few schools left from the former GDR talent development system in the current territory of the reunited Germany, although those schools used to be effective institutions.

Despite the fact that attentive pedagogical work was conducted earlier both in East Germany and West Germany, from the end of the 1980s the backlog of German students relative to the European average (Balázsi–Ostorics–Szalay 2007), and the importance of disadvantages due to the relative underdevelopment of talent support became clear primarily from the shocking PISA report. Thus, in the 1990s, a strong talent support line was developed with the involvement of the government. In this system, talent identification, selection and support and out-of-school talent support forms were regulated by law and fell within the competence of the Federal Ministry responsible for Education and Research (Bundesministerium für Bildung und Forschung, BMBF).

In addition, another powerful umbrella organisation, the *Bildung und Begabung* (Education and Talent Limited, B&B), was formed and financed by the state and from other sources. This institution focuses primarily on non-school-based education. The organisation of national competitions, '*Bundeswettbewerbe*' (languages, mathematics, international mathematical Olympiads), the *Deutsche Schüler Akademie* (hereinafter: DSA, German Students' Academy for secondary school students) and the *Deutsche Junior Akademien* (hereinafter: DJA, German Junior Academies for primary school students) talent support organisations are assigned to the competence of B&B. It is an important characteristic feature that, based on their nature, these talent development programmes offer opportunities also for students not studying in private schools to participate in talent development programmes.

DSA is a talent development organisation with nearly twenty years of history, offering an intensive, 16-day programme within the framework of which teenagers on the brink of completing their secondary school studies are able to experience the expansion of the boundaries of their own abilities, and can benefit from an environment which can inspire them during their further studies and work careers. For an outsider, the other programme, i.e., DJA, may seem a predecessor of DSA, although it was launched much later, only in 2003, and is targeted at younger people than DSA.

The correlation of the two organisations illustrates well the operation of the German talent support system. While DSA mainly belongs to the Bildung und Begabung organisation, financed and operated by BMBF and is also financed from the top, i.e., from federal levels, each unit of the DJA is an organisation established and funded by the provinces with only a minor contribution from B&B, though it is also committed to the Federal Ministry. The two organisations are related under the scope of the umbrella organisation (B&B) and there are several similar features in their programmes and methodologies, though it is not at all sure that any student who took part in a DJA camp at the age of 12–13 will automatically also participate in the DSA programme.

From the outside, German talent support seems to follow a rather impressive process. Early development opportunities are provided to children in kindergartens and, with the help of talent support at school, able students can join the talent development system while studying in the first form, because the internationally renowned talent development procedures (acceleration, enrichment, etc.) are also applied in German talent development. In fact, any student can participate in supported talent development programmes outside school after the age of pre-puberty.

An ‘ideal talent development career’ process would appear as follows in the German school system:

- Teachers recognise the high abilities of the student who is then provided additional lessons at school to develop.
- If the parents and/or the child wish(es), development opportunities are available also outside the curriculum or outside school. Naturally, these options involve a cost.
- After the age of 12, children can apply for the DJA federal provincial programme and take part in this talent development programme once during their school years.
- Subsequently and simultaneously, a talented student can still be involved in the various talent development services provided by the school, which are completed with an exam, and the student enters into the Sekundarstufe II phase of education. At this point, the student takes into account his

opportunities and abilities, and selects the type of school and the specific institution at which he would like to continue his studies.

- In most cases, grammar school education is chosen, which is ideal for (intellectual) talent development.
- At the age of 17–18, a talented student can participate in the DSA programme, attending only one summer course and then, having successfully concluded his studies with a maturity exam, the student can move on to the Tertiärbereich level, i.e., higher education.
- At this point, the potential choice is clear, providing that the student has performed well in the admission exam and admission interview, which are applied by all quality foundations.
- Depending on the chosen foundation, the admitted student either receives ‘only’ scholarship, or he is granted a scholarship and a special development opportunity. Generally, that involves studying in a group in which the student is assisted by an older student mentor and familiarises himself with the educational institution, meets contemporaries with similar interests, and attends various events and scientific conferences. Foundations offering talent development programmes expect outstanding performance from students in their studies and research, and in study contests. Often, particular student groups enter competitions as a group, and students may also be expected to establish voluntary student groups and to provide mentoring to other students requiring assistance due to their study results or social situation. While they participate in the programme, students travel a great deal within the country, and information exchange in their particular field of interest is especially encouraged.

Owing to the committed state support, the well-organised system and the involvement of private and political capital, the German talent support system has turned into an effective mechanism known and recognised by society over the last 20 years. All interested parties will find excess supply in the talent development market: this (excess) supply is favourable for quality competition because it clearly raises the quality of talent development services.

The following chapters describe the remarkable talent support programme of a foundation focusing on the development of young people with an entrepreneurial spirit and good talent for management.

II. THE TALENT DEVELOPMENT PROGRAMME OF STIFTUNG DER DEUTSCHEN WIRTSCHAFT

1. The role and importance of a talent development programme; research methodology

The Stiftung der Deutschen Wirtschaft (German Business Foundation, SDW) has existed for nearly 50 years and has objectives which are closely related to the concepts of globalisation and sustainable development in the current sense. Apart from its deliberate support provided to open-minded young people with an entrepreneurial spirit and familiarising themselves with the resources of the country, the Foundation also devotes much energy to the education of new generations, because it has recognised that young people should be supported not only at the traditional university level, but also at secondary level in grammar schools and vocational schools. It is also worth noting that the Stiftung der Deutschen Wirtschaft is almost the only large foundation in Germany which offers a lifelong guidance and career orientation programme to dropped-out students and that it also supports talented young people entering the labour market after the age of 18.

The Stiftung der Deutschen Wirtschaft (SDW) Foundation, seated in Berlin but affiliated also in Bonn, is one of the 12 largest foundations operating in Germany. Both its operation and programme are unique. According to its foundation programme, SDW is independent from political parties and was founded by one single natural person, Dr. Klaus Murmann, who has already withdrawn from the direct management of the Foundation, although several members of his family participate in the activities of the various managing boards of the organisation.

Talent support included, the activities of the Foundation currently focus on 4 major areas:

1. Studienförderwerk Klaus Murmann Foundation, which is the central component of the SDW;

2. Studienkompass, which can be translated as Study Compass, and offers professional career orientation and practice for secondary-school students whose parents do not have higher level qualifications;
3. Schülerakademie, which is devoted to the development and career orientation of secondary-school students;
4. Schulewirtschaft, which offers career orientation and advice to talented students who have nevertheless lagged behind during their school years.

Ever since its establishment 50 years ago, the SDW's most important objective has been the development and support of the entrepreneurial spirit and identity of German youth. Although, on the basis of its title and objectives, the Foundation seems to concentrate on the economy and money, its philosophy and mission involve much more than that. The primary objective of the Foundation is to develop the entrepreneurial spirit and intentions of talented secondary-school and university students, and to prepare the future managers of Germany to work independently. The Foundation tries to develop capabilities and abilities within the framework of strong group and network building. The expressed objective of the Foundation programme is to introduce talented students studying in different federal states of Germany to each other, and to integrate them into joint working groups.

The SDW has impressive data for the last few years: at the moment, more than 3,000 students take part in the above programmes. In addition, the Studienförderwerk supports approximately 1,500 talented students, of whom 250 are PhD students. The other 3 components develop approximately 1,700 talents in the country. In addition, there are also approximately 300 people who attend teacher training during their higher education studies and are granted support based on the so-called 'Train the trainer' principle.

The figures suggest that such a high number of students requires a huge organisational and infrastructural background, and a large amount of financial resources. The Foundation is not short of funding, though: according to the 2009 annual report, the Studienförderwerk programme received approximately EUR 10 million in grants from various public institutions and private organisations, and the Studienkompass component also received approximately EUR 1,300,000 in support from partner organisations.

2. Detailed description of the talent support programme

2.1. Programme of the Studienförderwerk Klaus Murmann Foundation

Students admitted to the programme attend seminars and courses at various German universities, organised and managed at each institution by the trio of a so-called Vertrauensdozenten (confidence lecturer), Vertrauensmanagers (confidence manager) and Vertrauensschulleitern (confidence school manager) contracted by the Foundation, but students can also attend other events organised by the Foundation and its partners, most of which fit the interests and professional development of the students.

There are three types of seminars and courses:

- 7-day technical programmes organised around a specific current topic (e.g., globalisation);
- 2-day weekend courses, within the framework of which students can study a particular topic through the presentations and exercises offered by practising experts (e.g., time management in the manufacturing process);
- young people organised into study groups arrange also for seminars in their specific professional fields for students attending the other programmes of the Foundation, and also throughout the whole territory of Germany.

There is competition among the study groups, taking place within the framework of the organisation and implementation of projects. The best group is granted not only recognition and prestige, but it is also rewarded financially at the end of the academic year.

2.2. Studienkompass programme

This programme of the Foundation is the result of the collaboration of several other foundations and the Bundesbank (the central bank of Germany). The objective of the programme is to offer secondary-school students coming from non-intellectual families an incentive to continue their studies in higher education. In this spirit, it provides support to talented students in the last two years of secondary school and during the first year spent in a higher education institution. This principle is also applied in other programmes of the SDW.

According to Dr. Michael Baer, the leader of the Studienförderwerk programme, this programme is quite successful because while in the German society only 25% of the students whose parents did not take part in higher education continue their studies in higher education institutions, the corre-

sponding ratio is 64% among the students participating part in the Studienkompass programme. For an outsider, this may seem a relaxed and loose form of talent development, but in fact it is a quite thoroughly developed training programme, implemented mostly through well-organised events. For example, students organised in study groups were able to choose from more than 170 events held all over the country in 2009. Those events varied a lot, from school visits through national and regional events and workshop activities to the processing of the most diversified topics. In fact, the latter represent the practical aspect of the programme. Some programme titles illustrate the opportunities well: 'Future planning', 'Infoscout', 'Study navigator', 'Study manager', 'Career planner'.

It seems that the reason why the programme is so successful is that it appeals to students through the most important issues of their actual development phase: Who am I? What shall I do in the world and society? Naturally, the more open and capable a student is in regard to fully understanding his opportunities, the more receptive he will be to studies that enable him to understand himself, that provide the experience of group events and participation in career orientation training, or an opportunity to meet prominent representatives of his selected profession. Through the programme, while students perform these activities, they also gain contemporary relational capital, which is perhaps one of the most important aspects of this age. To each new student admitted to the Studienkompass programme, a university student is assigned, who used to be mentored in the programme himself and happens to study at the university to which the mentored student also intends to apply in the future.

2.3. Schülerakademie programme

The Students' Academy programme is a similar type of education and support as the one described above, and it consists of two main programme components: MINToring and 'Zeig, was Du kannst!' The main objective of both programmes is to provide vocational training to the largest possible group of students. The target group of students is almost the same as in the previous programme, although the level of qualification of the students' families is not an aspect here. The above title may sound familiar due to the German Deutsche Schüler Akademie organisation (German Students Academy), though only its title is similar to the DSA programme.

2.3.1. MINToring programme

The title is an acronym, put together from the first letters of mathematics, information technology, natural sciences (in German: Naturwissenschaften) and technology, and refers to the mentoring process because this part of the programme usually provides training and study opportunities organised for secondary-school students by older students.

The purpose of this programme is to make talented students interested in the above disciplines and motivate them to more excellent performance in these fields through intellectual experiences which appeal to them. The survey results also reveal (Jahresbericht 2010) that although there are enough students who choose further study at technical schools specialising in the sciences referred to, there are very few who successfully complete them. Consequently, the main purpose of the MINToring programme for the mentors is to convince and retain those students through the lessons of their own experiences: the young talents are not only involved in the basic training programmes by the older ones, but they often jointly visit university lectures and workshops together as well. The various camps, lectures and projects organised by the Foundation enable talented teenagers to decide, during the last two years of their training and after an admission procedure, on their future specialisation, which in such cases always involves one of the scientific disciplines indicated above, or the borderlines thereof.

2.3.2. The “Zeig, was Du kannst!” programme

The subtitle “Erfolgreich ins Berufsleben starten” (Begin your professional career successfully) reveals that the programme, launched in 2007, offers support primarily to those talented students who will not necessarily go to university after their secondary-school studies, but will enter the labour market opting for some other career. This is why this component is the strongest of the four SDW components in career orientation and self-awareness training. Students are provided numerous opportunities to get acquainted with the practical world of the labour market and the profession which either appeals to them or best suits their abilities. The direct exchanges of experience with the representatives of various professions, and the training programmes, are aimed at the identification and development of the key competences of the students, enabling them to take their opportunity as fully and as soundly as possible.

However, the programme is still in its initial phase. In line with the 2+1 method, the first group will enjoy the last year of support in 2010, which will be special in many cases, because the majority of the supported students will join the labour market instead of continuing their studies; instead of “being wrapped up” in a higher education institution.

2.4. The SchuleWirtschaft programme

The motto of the latest programme of the SDW, “*No Child Should Be Left Behind*”, rhymes with the “No Child Left Behind!” programme title used in the United States (see the chapter on Boston of our book). This programme was established for young people who find it difficult to complete their school studies. Their problems vary greatly, but the programme nevertheless responds to them sensitively, regardless of whether or not these difficulties stem from social or behavioural causes.

2.4.1. SchuleWirtschaft characteristics

The SDW implements this programme in cooperation with the Bundesministerium für Familie, Senioren, Frauen und Jugend (BMFSFJ, i.e., the Federal Ministry of Family Affairs, Senior Citizens, Women and Youth). The general purpose of SchuleWirtschaft is to prevent young people struggling with problems from being pushed to the periphery of society, and its specific goal is to make sure that these students do not become unemployed.

This is the first of the 4 SDW components addressing migration problems and students struggling with the social implications thereof and trying to support them in close cooperation with other youth protection institutions and programmes which are already in place and active in Germany.

The project of the programme was launched in the autumn of 2009 at 10 locations in 7 federal states under the title of “Unternehmen: Jugend. Zusammenarbeit mit Zukunft” (Undertaking: Youth. Work together for the future).

The training begins with the strengthening of the motivation base. Students take part in Future Camps, which offer them self-awareness development and career orientation in order to help them recognise their key competences, and sessions where they meet various representatives of the world of business.

Naturally, in addition, students take part also in competence development training during which they can confirm to themselves that they chose the appropriate occupation, and can also visit plants and factories. The most important aspect is that they are able to test themselves in the real labour market by taking on probation jobs. A training course under the title of PROFIS-Program Führungskompetenz in Schulen (PROFIS – School management competence development programme) is an independent course, though at the same time forms part also of the programme, enabling teachers working at schools to develop their relevant capabilities through meeting representatives of companies and the business sector.

2.5. Selection, identification and acceptance system at the SDW

Apart from the training and support system, the SDW also has an effective selection system, because an increasing number of students apply for its programmes each year. In 2010, e.g., approximately 2,000 applications were received though only around 1,000 people were able to take part in the Foundation's programmes.

In the first step of the annual selection process, the Foundation sends a call for applications to Germany's schools providing secondary education. It is an important requirement that students must apply individually and that each applicant can try only once. Eligible applicants are German citizens (or young people having been registered in the German system of social services for at least 5 years), who have

- satisfactory educational results;
- maturity exam at the end of the curricular year (a maturity exam is a prerequisite of admission in the Studienförderwerk programme, while the other components specify school types providing maturity exams);
- good communication skills and flexibility; and
- a strong entrepreneurial attitude and approach.

According to the SDW philosophy, any student who has initiative skills in various aspects of life, and is motivated to perform social or voluntary work for improvement purposes on a continuous basis, complies with the foundation's "Unternehmen in Unternehmung" philosophy, i.e., is an entrepreneurial, active, purposeful and willing person, and is therefore eligible for support.

As the increasing number of applications proves, many German students satisfy the above criteria, and hence the selection process must be continued through a second round. This is always conducted by an expert who works in the Foundation's talent development programme. The admission tests are carried out in assessment centres, where applicants not only complete a test but also take part in some team work; they must write a composition under the title of "What does future mean for you?"; they must give a short presentation and take part in an interview. However, contrary to its title, within the framework of the admission test, very few tests are applied to assess the students' intelligence and other capabilities because there are very few standardised tests that can identify the capabilities which are really important for the SDW's purposes. That is why a decision was made in 2011 to adopt the IQ test used earlier by another large foundation, the Stiftung des Deutschen Volkes (German National Academic Foundation), because practical experience has shown that this test predicts the estimated suitability for Foundation programmes with sufficient accuracy.

It is important to note that regardless of their total scores, all applicants to SDW programmes take part in an interview after the admission process, during which they are given detailed verbal feedback on their performance.

Despite the careful selection, the SDW leaders feel that the admission process for their programmes should be more sophisticated and more effective in several aspects. The analysis of the last few years' results revealed, e.g., that students from non-intellectual families are significantly under-represented in the Foundation: while their ratio in German society is around 50%, the respective figure is 35% among students admitted to Foundation programmes.

2.6. Summary of the programmes of the Stiftung der Deutschen Wirtschaft

The Foundation was established on the basis of a thoroughly elaborated concept and a long development process. However, it achieved its current form only in the previous 5 years or so. The target groups of its support programmes no longer include only university students, but also secondary-school students. The programme components launched in recent years, such as, e.g., Studienkompass and SchuleWirtschaft, well illustrate the social sensitivity and future vision of the programme, because they provide opportunities for disadvantaged young people to integrate into the leading groups of society and to achieve better financial positions and have more optimistic future visions and career plans.

It is quite certain that German society will benefit from the results in the long run, and hence it will prove and implement the Foundation's philosophy based on enterprise and the entrepreneurial spirit.

III. OPPORTUNITIES AND CONDITIONS FOR THE APPLICATION OF THE STIFTUNG DER DEUTSCHEN WIRTSCHAFT TALENT SUPPORT PROGRAMME IN HUNGARY

The success of the SDW is based not only on its programme, but also on its excellent relations. Although it is a private foundation, it receives a lot of support from the competent federal ministries and even more support from prominent actors in the economy. Its executive officers include a number of individuals who hold important positions in society and in the economy, while its practical teaching staff consists of not only university teachers, but also experts working in the business sector.

This network provides sufficient financial, intellectual and relational capital for maintaining the high quality of the programmes and also flexibly adjusting to the challenges of German society and the labour market. This latter aspect is of key importance in the operation of the Foundation because, regardless of its philosophy of entrepreneurial spirit, it undertakes the training of future managers, which is perhaps one of the most risky investments in the country considering its long-term and somewhat uncertain returns.

It shows the flexibility of the Foundation that, prior to the economic crisis, and later on during the crisis, it added new programme components to its activities, focusing specifically on the under-18 age group with a risky behaviour, but also including talented young people over 18 who do not wish to take part in higher education.

The SDW programme structure is not complicated, as in all 4 components preference is given to independent work and supportive mentoring, as well as the development of key skills and competences. For students, the spatial and chronological framework of the Foundation is provided by the series of technical programmes (which are additional to the everyday school activities of the students), the number of which can exceed even 100 a year (!), and participation in which usually involves actual professional activities. Contacts developed there, as well as the presence of age peers from similar situations and backgrounds and with similar capabilities are inspiring, while the organisation of study groups by educational institutions becomes automatic.

Naturally, the most important issue for the Hungarian experts is whether the above model or any component thereof could be established and applied in any form in Hungary. The higher education form of Hungarian talent support works and is shaped mostly in the mentoring–tutorial system, which is gradually becoming coordinated by the increasing number of talent points, networks and talent development centres, and is surrounded by various, non-institution-based organisations and foundations which pursue their activities through recognised scholarships. For the time being, harmony and consistency among the various universities is still low, at least in this area, and whenever supported talented students meet, such meetings mostly take place in situations motivated by and organised for different reasons, during which they often become each other's competitors in the course of their professional development.

Pre-higher-education talent support focuses on grammar schools. The network of talent points, which has recently reached nationwide coverage, but functions with doubtful efficiency, is an important aspect of talent development. Within the framework of talent development in grammar schools, the AJTP (Arany János Talent Support Programme) stands out in Hungary, enabling disadvantaged students to study in good quality schools, and focusing also on personal development alongside education.

An organisation and a programme (Association of Hungarian Talent Support Organizations and the Genius Programme) have also been established to create a framework for the above endeavours, based on which teachers are trained and research methods and techniques are applied in practice on a continuous basis. The question is: where could we add a programme bringing the benefits of the SDW to this structure, and how and to what extent could this system model contribute to the enrichment of Hungarian talent development?

It has already been suggested that the answer is not in the technical or methodological details of the programme structure, because Hungarian talent support experts also possess the knowledge referred to in relation to the 4 programme components. We can also conclude that the financing and material conditions are already in place (or at least could be provided) in Hungary for talent development, and that the entrepreneurial spirit also exists.

What is missing though is the creation of contemporary relational capital for talented people within the framework of talent development, including also international professional relations. It would be important to develop a theme-based network of training events, camps and presentation series (the list, of course, can be continued) supported by companies and institutions operating in the business sector, in research and in education, and to extend the special talent-oriented lifelong guidance and career orientation services to the whole country. Talented students should participate in these programmes and training

activities not only passively, but should also actively organise and shape them. They should be actively present and involved in the programmes, either individually or with their mentors or with their study groups. In this form, the presence of the teacher and an older peer-age mentor would not only be natural in the development of an adequate personal relationship and mental hygiene, but their involvement in talent development could also provide prestigious opportunities to participants in the business sector.

Perhaps this type of future vision does not require any great change in the mindset of Hungarian experts, currently involved in talent development.

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Talent Development Traditions and New Endeavours in Great Britain in the 21st Century

I. INTRODUCTION

“The United Kingdom of Great Britain and Northern Ireland consists of England, situated in the middle and in the southern part, Wales, in the west towards the Irish Sea, Scotland in the north of the main island (or Great Britain) of the British Isles and Northern Ireland in the north corner of Ireland. However, the country is commonly referred to as the United Kingdom or Great Britain all over the world.” (Szegeci 2007, p. 79).

1. Social and economic characteristics, and the political structure of Great Britain at the turn of the millennium

1.1. Social and economic features of the country

Being an island, the social and economic development of the country shows the characteristics a bit of an outsider. Although accession to the EU was approved in a referendum in 1975, tradition still reflects the idea of being different from the continent.

The country is a constitutional monarchy, ruled but not governed by the king/queen (currently Elizabeth II). The monarchy is politically neutral; it cannot pass laws or make unilateral decisions, it cannot impose taxes; it does not have the right of disposal over public funds. In the British parliamentary system, the power of legislation lies with the Parliament in Westminster (the House of Commons, the House of Lords and, formally, the Queen). The executive power is concentrated in the House of Commons and is operated through offices and

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ministries controlled by ministers. The Prime Minister is usually the leader of the majority political group of the House of Commons and is formally appointed by the King/Queen. The legislative, the executive and the independent judiciary power are all subordinated to the British Constitution which in fact does not exist in the form of one single written document, but consists of clearly separable components.

The public opinion surveys regularly indicate that the majority of British citizens, and primarily the young, are indifferent to politics, yet they vote from a civic duty and habit. Many consider the monarchy old-fashioned, anti-democratic, expensive, aristocratic and a brake on change, because it reinforces hierarchy and the division of society by class. Others, however, attribute to it a symbolic value to it as the embodiment of national unity, representing stability and continuity, free of political manipulation. Those people feel that the monarchy conveys British national values externally, fulfilling ambassadorial functions (Oakland 2010).

Nevertheless, the economic indicators of the United Kingdom responded sensitively to the unstable international economic situation and the change of government which took place a few months ago. The new Conservative–Liberal Democratic (ConDem) coalition, which replaced the Labour Party in government after 13 years and entered into office on 11 May 2010, brought not only new promises, but also fears to the United Kingdom, which is endeavouring to overcome the economic crisis. Economic experts also publish controversial analyses and conclusions. According to the pessimistic prognoses, the Government's deficit-cut programme will affect all sectors apart from the health sector and foreign aid, and therefore education will not be left unaffected either (Underhill 2010). Compared to the education-policy actions taken by the previous government, which entered into power in 1997 under the election slogan of "Education, education, education", this programme suggests a series of retreats. What makes long-term planning uncertain is that it is not clear for the education sector, including those responsible for talent development, what the new Government will support.

However, in their projections concerning British economic growth, optimistic analysts underline that compared to other European countries the United Kingdom is more open to foreign investment. In terms of trade, the island country lies in fifth place according to the World Bank index and is considered the sixth largest economy and also the sixth largest industrial manufacturer in the world. In terms of global competitiveness, it is ranked twelfth by the World Economic Forum, which position can be maintained with special products, excellent quality and uniqueness. According to the WEF report, the productivity of the British economy can be enhanced with the sophisticated and innovative

use of the most cutting-edge technologies. The country relies on a highly qualified workforce and has flexible labour laws (Underhill 2010).

1.2. The population of Great Britain

The United Kingdom has a population of 59,600,000. According to the latest census (2001), 92.1% are white and 7.9% belong to some ethnic minority. It is important to note that according to the British statistics, the non-white population is referred to as ethnic minority! This group of the population increased by 53% from the former census (1991). Even so, they still represent a small percentage of the total population and 50% of them were already born in Great Britain. It is remarkable, although not surprising, that 50% of the ethnic minority, and only 10% of the white population, live in London. In the North-eastern and Southwestern parts of the country, the ethnic minority makes up only 2% of the population.

It is impossible, or at least not easy to talk about a British nation. Scottish, Welsh and Northern Irish people traditionally consider themselves to be of Celtic origin, while some English describe themselves as Anglo-Saxon. Immigrants, coming from other countries, also insist on their roots to a greater or lesser degree. In that case, some consideration must be given to the question of what it means to be British (Britishness) in a multi-national country, in a changing Europe and in a globalising world. Public opinion surveys indicate that the feeling of cohesion is getting stronger among young people and those who were born in Great Britain. To be British is no longer identical with the old, historic values of English dominance. For the currently growing generations, being British represents common values which include tolerance, the ability to take opportunities, progress, value creation, respect to each other and honesty (Oakland 2010).

In our Europe, where xenophobia has become a programme and the willingness for inclusion has definitely weakened in many countries, British politics and the general public cannot be considered extreme (Keresztes 2010). In 2009, Great Britain was still the second largest net includer after Italy. Although, according to a recent survey, 65% of the Brits feel that the current degree of immigration is harmful to the country and the Prime Minister also intends to deliver his campaign promises related to the limitation of immigration, in a European comparison Great Britain is still one of the more tolerant countries (MacShane 2010).

2. Traditions and characteristics of British education at the beginning of the 21st century

2.1. Background

The current problems and contradictions of British education (including, especially, education in England and Wales, as education in Scotland and Northern Ireland is different) stem from the history of education. The intervention and control of the state began late. Religious schools had been common for a long time. Boys were trained in institutions to be priests back in the 5th century, but the Church extended its educational and teaching activities also into secular life. The thus established educational structures later appeared also in the public education system. However, until 1944, there was no state-controlled complex national apparatus for free and mandatory primary and secondary education. The educational system established then maintained its selective nature for a long time, and its special eleven-plus exam, i.e., the exam taken by 11–12-year-old pupils completing their primary school education, strengthened the dominance of middle-class children in grammar schools specialised for further education and, consequently, also in higher education. This caused considerable social division in education.

In 1964, the Labour Party Government in power decided to eliminate grammar school selection and the eleven-plus exam. They introduced standard secondary schools (comprehensive schools), where each child was automatically admitted after the completion of his/her primary school studies. This enabled children of different social backgrounds and abilities to study under identical educational conditions at the school which was closest to their homes. There was an intensive battle among the experts and politicians arguing for selective *versus* common education. In the end, the nationwide implementation of comprehensive schools failed. The Conservative Government formed in 1979 retained the division, i.e., the local government authorities could still decide to operate grammar schools. There are still 166 grammar schools in England and Wales. The “comprehensive *versus* selective education” debate has not yet been concluded. Although 87% of secondary school students participating in public education attend comprehensive schools, public opinion surveys indicate that only the minority of parents support the comprehensive schools, the majority prefer selection and various school types: in other words, these parents agree with a test for admission to the next level of education.

2.2. The current system of education

Public education is free and mandatory between the ages of 5 and 16 years. For students attending a secondary school from September 2007 on, this means that they either remain at school, or take part in some accredited training until they reach 18 years of age. (According to the law, from 2013, nobody can be employed full-time below the age of 18.) 93% of children of mandatory school age attend some public school. According to age, it could be:

- pre-school (between 3 and 4 years of age) (ISCED¹ 0) – used by 64% of children;
- primary school (between 5 and 11 years of age) (forms 1–6, ISCED 1, 2);
- Secondary school (between 11 and 16 or 18 years of age) (forms 7–14, ISCED 2, 3, 4, 5).

All public schools are operated by the local authorities; they apply the same national curriculum, and they are all controlled by the same supervisory agency. Most children attend the school that is closest to their home, but the law permits the free choice of schools. There are quite large differences depending on the economic region in which the schools are situated. There are some institutions with outstanding results, while some schools situated in neglected parts of large cities often lag behind significantly. Selection has developed among the comprehensive schools enabling students progressing better in their studies to achieve better exam results in special forms.

Though only 7% of the British children aged between 4 and 18 years attend independent schools, and that category must be treated separately. The main difference between an independent and a public school is that parents of children attending independent schools pay a tuition fee. Very few students receive a scholarship from the school. There is fierce competition for admission, as for many parents it is important to send their children to an independent school, and they are willing to pay even a high price. There are also insurance schemes which assist children of less affluent families finance their independent school studies.

Another important specificity of independent schools is that they are not obliged to follow the national curriculum. Nor are those institutions required to

¹ The international standard classification of education covers the full range of school education (pre-school, primary and secondary school, higher education). The currently used *ISCED-97* system was approved by the UNESCO General Conference at its 29th session in November 1997. This classification system facilitates the description, comparison and analysis of the different structures of the national education systems of the various countries, which developed as a result of a long historic and cultural process (András Forgács <http://oki.hu>).

employ only teachers who obtained their diploma at a high-level educational institution. However, the national supervisory agencies exercise their supervisory rights also towards independent schools, in order to control the level of requirements. Naturally, there are also differences among independent schools in terms of both reputation and quality of service. They are often criticised for being elite schools.

The breakdown of independent schools by level of education (and age) is as:

- kindergarten (between 2 and 4 years of age) (ISCED 0);
- pre-preparatory school (between 3 or 4 and 7 years of age) (forms 1–2, ISCED 0, 1);
- preparatory school (between 7 and 11 or 13 years of age) (forms 3–9, ISCED 1, 2);
- public (non-state) school (between 11 and 13 or 18 years of age) (forms 7–14, ISCED 3, 4, 5).

2.3. The secondary-school examination system

The national curriculum defines a specific set of examinations for secondary schools. These examinations exist in all types of schools in England, Wales and Northern Ireland:

- GCSE – General Certificate of Secondary Education:
at the age of 16.

The final mark is based on the results of the written examination as well as on project work and the regular evaluations prepared in the preceding years. The exam can be taken in any set of freely selected subjects. In general, students choose 6–7 subjects.

- AS – Advanced Subsidiary:
at the age of 17.

In terms of preparation, the purpose of this exam is to ensure development and transition between GCSE and A-Level exams.

- GCE A-Level – General Certificate of Education at Advanced Level:
at the age of 18.

This exam is taken by students who intend to continue their studies in higher education. Good results are very important, because there is fierce competition for admission to the most fashionable universities.

Apart from the exams listed above, there are numerous other special and technical exams.

The examination system is also criticised both by parents and experts. Some people think that there are too many exams and they are concerned that they distract children from other school activities. Many parents monitor the published exam results tables and try to send their children to schools where the workload will be greater and better results can be achieved.

There are mixed opinions about British education. The standard of public-access schools differs significantly. Some reach the quality of independent schools, but the quality is often quite low in poorer areas which are situated far away from economically prosperous areas. In general, girls achieve better results and, among the immigrant children, those arriving from Asia perform better in their studies (Project Britain 2010). It arouses a great deal of concern that, although according to the results of the 2006 PISA surveys conducted in 57 countries, the results of the United Kingdom were better than the average of the OECD countries in natural sciences and were the same as the OECD average in reading comprehension and mathematics, all the average scores were lower than the results of several developed industrial countries (e.g., Australia, Canada, Japan and Germany). Based on the comparison of the test results in 2000 and 2006, the United Kingdom is one of the “stagnating” countries (PISA 2006).

2.4. Higher education

In 1960 there were 23 British universities. As a result of the expansion in the 1960s and the reforms launched in 1992, several higher education institutions were upgraded to university status. These days there are nearly 100 universities and 60 other higher education institutions in the United Kingdom. According to the 2003 figures, 1.2 million students studied in full-time courses and 690,000 students studied in correspondence courses in higher education. 207,000 students attended some post-graduate training (Oakland 2010).

Universities can be classified into four categories. The oldest universities (Oxford, Cambridge) existed already in the 13th century. They were joined later by other universities (e.g., St. Andrews, Aberdeen and Edinburgh). The second group of universities is the so-called “redbrick” universities (Leeds, Liverpool, and Manchester), founded between 1850 and the 1930s, while the third group of universities were established after World War II and in the 1960s (Sussex, East Anglia and York). The fourth group is also referred to as new universities. In 1992, some technical colleges were granted university status. Apart from universities, the various colleges and, since 1969, the Open University are also part of the higher education system.

Universities are independent institutions with full academic freedom; they appoint their teachers and decide on the admission of students. However, in

practice, they heavily depend on government financing through the Higher Education Funding Councils. The Government tends to intervene in the operation of universities more and more directly, causing great dissatisfaction among university teachers, who feel that a growing number of less qualified students are also admitted to the expanded university network and, in addition, although there are more students, there are no more tutor statuses created, and the salaries do not grow proportionately either.

The education indicators have improved significantly in the United Kingdom over the past few years. More than one-third of young people study until they achieve university qualifications. The ratio of people with higher-education qualifications is increasing rapidly in the age group of 25–34 compared to the figures for other OECD countries (Education at a Glance 2003). However, decisions according to which the tuition fees, already considered high by many, are to be increased further raise doubts about any further improvement of the indicators. The disturbances in London in November 2010 were also in response to that suggestion.

3. Talent development in the United Kingdom

The issues of talent development in the United Kingdom are closely related to the general education problems of the country as described above. Based on a heavily segmented society, the concept of talent development and its accessibility varies a great deal even for the general public, depending strongly on the position of the individual in society. Class awareness in the case of prestigious schools kept for the elite in the society is expressed in the preservation of traditions; in the working class it is in the ideal of equality, while the influential charity and parent organisations relate to the middle class. Consequently, interest in high-ability people strongly relates to a social class and often creates a conflict of interest between the different classes of society. Despite their long traditions, the English boarding schools in fact do not contribute a great deal to talent development based on the national school system. In these schools, high ability is a target rather than a basis for differentiation, and involves lessons that are tailored to the ability profile of the individual students (Persson et al. 2000).

In addition, the countries forming the United Kingdom also differ in their education systems, their definitions of talent and high ability, and the solutions offered to the students concerned – as already referred to in relation to the background of the current British education system. While in Northern Ireland talented students in practice attend grammar schools, in the other three countries the law specifies the services to be provided to talented students. In all three countries, talent development is covered by the act setting out the tasks of,

and regulating, inclusion. The most sophisticated regulations and services developed by the government in relation to the public services are specified in the Welsh and English legislation. The relevant act sets a requirement not only for the identification of high-ability and talented children, but also for the extension of education over and above the ordinary curriculum. In line with the Gagné model, the law refers not only to the usual efficiency in subjects, but also to other specific talents (social, perceptual, managerial-organisational, sports). With this approach, many more young people can be deemed gifted than based only on the ordinary distribution curve of intellectual abilities used as the starting point (Raffan 2009).

The Welsh Assembly Government provides quite extensive and systematic support to talent development. This includes the advisory activity related to identification, the publication of the “Curriculum of Opportunity: Potential into Performance” document, and the organisation of training and support to all local government authorities and schools in developing their own programmes for gifted students, in which they have already achieved outstanding results (Raffan 2009).

In England, explicit steps were taken to promote talent development as a national matter back in the early 1970s (e.g., the first World Conference of Talent was held in England in 1973). In 1997, the change of government brought dramatic changes to the situation (Persson et al. 2000). The Government made a declaration that talent development must be a priority of the education policy. Not much later, in 1999, the House of Commons established a committee (Education Select Committee) to assess the status of the education of and provision of services to talented young people in the country. According to the results of the survey, talent development was deemed inadequate in most English schools. “Steps must be taken towards quality services”, declared the Ministry of Employment and Education after the survey (Mönks-Pflüger 2005). The main principles of talent development, which became part of the national strategy, were set out then. Those principles were expressed in the following statements:

- “There is no single solution for the satisfaction of the needs of gifted children.”
- “High-ability children should also enjoy their childhood.”
- “The main stress must be placed on improving primary school services.”

This led to the launch of the Excellence in Cities programme, supported by the state, in September 1999, the expanding network of which included 1,600 institutions by 2003 (Balogh 2004). The following requirements were set for each school:

- to select 10% of the most gifted children;
- to appoint a talent coordinator;
- to have a talent development strategy in each school;
- to give opportunities to students to develop their talent both during and outside lessons.

Cooperation with partners and network operation were also important elements of the programme. This programme inspired other, more targeted programmes later, including the Dual Exceptionally Project and the Creative Arts Project. These projects required even more intensive cooperation from schools. From the mid-2000s, more thorough identification procedures, curriculum development, and evaluation and control were identified as the main directions of development, focusing especially on secondary schools. However, most of these programmes are no longer active (Raffan 2009).

The 2010 change of government raised questions also for experts engaged in talent development: What can the strategies of the new Government bring to schools and, more specifically, for talent management? Tim Dracup (2010), an independent talent consultation expert and the founder of the G&T Voice independent non-profit organisation, projects the following options:

1. the economic restrictions will reduce the priority of talent development;
2. general support will focus more on equality and alignment than on selection;
3. less external support should be expected apart from voluntary donations – more initiatives will be required in this field;
4. the resources allocated from the out-of-school budget will be less, or not at all earmarked for specific purposes;
5. higher autonomy and flexibility in the professional activities of the institution and its employees;
6. the partner relations and cooperations initiated and led by the school can be in a critical situation;
7. increasing expectations among parents and students.

II. NACE TALENT DEVELOPMENT GUIDELINES AND PRACTICE

1. The origin of the programme; research methodology

In terms of good practice focusing on talent development, the activities of the NACE (National Association for Able Children in Education), a charity organisation, are among the most complex and extensive activities with the longest history in the country. The NACE built a relationship with numerous partner organisations and is the only independent organisation of teachers and schools which survived all political changes during its 27 years of existence, not only in England but also in Wales, which in itself is a good reason for the awareness of the programme. Its operation assists the activities of teachers, advisors, supervisory agencies, schools and local government authorities. The organisation is extremely open: individuals, too, may apply for membership. It is also one of the few programmes which combines the principles and practice of inclusive education and talent development without any detrimental effect. The organisation keeps its members up-to-date with numerous publications, conferences and training courses, promotes professional dialogues, creating opportunities to learn from each other.

In our research we were helped by institution managers, the former and current president of the organisation, programme operators, students and teachers. Within the framework of on-site reports, consultations and participation in sections of the conference organised with NACE support, we took a look at the activities of the schools, and we learned about the main principles, objectives and promotion opportunities of the schools that joined the association.

1.1. The NACE mission and its origin

The NACE was founded and first chaired by Johanna Raffan. She has many years of teaching experience, including 25 years spent in kindergarden, primary school and middle school as the head.

Johanna Raffan explained the NACE's mission as an initiative to make school work more effective for able children during school-time, thus also improving the quality of the work of the other children. As a believer in the inclusive approach to talent development, she is convinced that because children spend almost the entire active part of their day at school, it is the responsibility of public education to provide all the services that are required for their development during this time. Personalised teaching/learning also belongs to the basic philosophy of the NACE. Each child must be given the opportunity to progress according to his own interest and to the learning style that suits him best.

Johanna Raffan recalled the conditions of the foundation of the NACE, explaining that it made many people worried that promising children were lost one after the other, despite the existing government initiatives for talent development. This is why she decided that it was time to bring together the experts sensitive to the problem. The organisation set a target of providing a challenge and opportunity to such children to make progress. Identification, planning and training itself, by way of enrichment programmes, are important aspects of talent development. They wish to see able children make progress according to their abilities and not their age, and reach a high level in their respective special fields without having to learn everything equally in each subject.

In terms of the interpretation of talent, they consider it important to define the words “gifted” and “talented” used in the English language. Children achieving high performance in theoretical subjects and general knowledge can be described with the term “gifted”, while the word “talented” should be used for children with outstanding performance in arts, sports and special subjects. According to Johanna Raffan, the NACE focuses on both categories, seeking potential.

There is no prescribed programme in the NACE's work applicable to each student. There are no prescribed instructions either. The teacher has a great deal of freedom of decision-making. The identification of talented children is also the teacher's responsibility, because it is fully up to the teacher to decide who is talented, and who should be taught accordingly in the future. The supply of tangible resources seems excellent. There is also a wide selection of manuals and conference materials. There are also NACE programme descriptions and a collection of external ideas.

However, in terms of human resources, Johanna Raffan admitted that the NACE had no highly or specially qualified experts. There is no specific requirement for colleagues participating in talent development to join particular complex training programmes. The main principle is that any interested

colleague should obtain the necessary information from further training books and personal consultations, depending on his own professional ambitions.

1.2. Partner organisations of the NACE

The activities of the NACE include maintaining contact with other talent development organisations in the country, and the institutions of the Ministry of Education:

1. Ofsted – the Ministry’s agency supervising education.
2. DCSF – a government agency specialised in the relationship between the child, the school and the family.
3. QCDA – government agency responsible for curriculum development.
4. BECTA – government agency responsible for the use of computer technology.
5. The Welsh Assembly Government.
6. Excellent East – a semi-autonomous organisation, dedicated to talent development of children aged 4–19 since 2007; it also organises conferences, further training and summer schools. The Government intends to terminate its operation in March 2011; to the dissatisfaction of many people.
7. Villiers Park – a charity organisation, which was first dedicated to the assistance of learning of disadvantaged children, and then extended its activities to talent development. It provides courses for children aged 14–19.
8. London Gifted and Talented – a talent development organisation founded in 2004, the services of which are now used also abroad.
9. The University of Cambridge.

With regard to international partners, the ECHA and the World Council for Gifted and Talented Children should be noted.

1.3. NACE publications

The NACE is the leading supplier of talent development literature in the country. Its publications are supported also by recognised leaders of the profession. The contents of their manuals are determined by the basic philosophy of

the NACE. They try to implement a full system of personalised learning, in which each child can achieve the best results regardless of his background or talent. Their books also provide assistance for a teaching practice which is sensitive to the different learning/progress methods and interests of the children.

1.4. NACE further training

The NACE trainers work together with schools, school networks and local government authorities across the whole country on a daily basis. They give advice, assist in planning, chair teachers' board meetings, deliver training and also collaborate with teachers in the classroom. Their courses cover a wide range of topics: management, leadership, subject-specific methodology issues, school development issues, etc. Their work is subject to quite strict quality assurance requirements. The senior advisors have direct experience in talent support and are aware of the latest research results.

The country-wide objective is to make sure that each school has a leading teacher who coordinates the talent development programme. Those teachers must participate in special training. Johanna Raffan informed us that it was difficult to find such teachers, although the required course is not a second diploma or a university course either. Consequently, and unfortunately, this work is for the time being only an empty title in many schools.

In future, the NACE intends to enhance its activities, but at the moment it faces numerous worries and uncertainties.

2. Good practice: Challenge Award

The schools accepting the teaching philosophy of the NACE, and applying a teaching practice that is in line with it, are granted the Challenge Award established by the NACE. This award is based on the self-assessment of the activities of the whole school, and continuous development, providing that the following ten basic requirements are met.

1. An overall working strategy of the school, which contains the plan of lessons for high-ability and talented children.
2. Identification strategies and related criteria.
3. Planned tasks for improving the performance of high-ability and talented children.
4. A diversity of teaching/learning strategies, flexible application of the classroom model in satisfying the requirements of high-ability and talented children.

5. Regular review for the purpose of identification of underperformance and support of children in need.
6. Commitment of the complete teachers' board to train themselves to ensure the development of high-ability and talented children.
7. Establishment of special programmes for the development of especially talented children.
8. The availability of the required resources at the school, e.g., ICT.
9. Involvement of parents.
10. Continuous/regular monitoring of programme implementation.

Schools must apply for the award. A prerequisite of the application is that the assessment of the national supervisory agency (Ofsted) should be higher than a specific level over the last three years. Any objection made by Ofsted is a reason for exclusion. Schools applying for the award prepare for the assessment for 3–5 years, and the assessment procedure involves a considerable cost to the school. Anybody who has such plans regards talent development responsibly. Once a valid application has been submitted, the NACE requests one of its official assessors, especially trained for the task, to perform the assessment. The assessment of the application is a two-phase task. In the first phase, the portfolio prepared by the school is assessed. The documents must clearly reveal that the ten basic requirements are fulfilled by the school. If the portfolio passes the test, the second phase of the assessment procedure can take place.

The assessor sets an audit date when he visits the school based on a specific scenario. This work takes a complete day at school. The assessor meets and interviews parents, teachers and children taking part in talent development. 6–8 lessons are observed at the school,

Casterton Business & Enterprise College

“At the beginning of the school-year, the school offers a special programme to us, able students. We each receive an activity plan, in which we can decide further. This is how our subjects are formed. As we become older, we can make our own decisions and have other opportunities. This year, we produced the film, and became a feature film school. We worked with a BBC producer, and our film will be shown in the whole country. We have very good experiences at this school. And hope that we will be able to work even better in future.”

Winchmore School, London

“Our school has a complete talent development programme in which learning is a permanent challenge. Each able child has his own plan, which consists of his ideas, a self-assessment of subjects and the targets set by parents and the student. Each student participates in an emotional intelligence development programme. There are not only classroom lessons, but also university master lessons. We visit the University of Cambridge. Disputes, business and scientific contests are organised for us. We have been to Barcelona, Paris and Dorset on trips. We are especially good at languages, theatre plays and music.”

depending on the size of the institution. At the end of the day, the assessor presents to the school management a summary of what he saw, and reveals whether or not the school was granted the award. The written assessment must be prepared within ten working days.

The conditions and the assessment procedure clearly indicate that it is a true challenge for interested and participating schools. The importance of the award is also illustrated by the fact that it is presented in the House of Lords. At the moment, there are 190 award recipient schools in England and Wales. The award can also be lost, and it needs to be accredited every four years. The children are very proud of being able to participate in such a programme. Their statements (see in boxes) reveal they understand that they have been selected on the basis of their talent/ability and they highly appreciate the additional efforts of their teachers and other experts, and reward them with outstanding performance.

2.1. Scaltback Middle School, Newmarket

This school is exemplary in terms of its approach to talent development, its activities and results.

It is situated on the outskirts of the town of Newmarket, in a pleasant environment. At the moment it has 400 pupils, mostly children living in the district. Admission is also granted based on special application, but that is not typical. The school cannot be deemed a collecting place for talents and high-ability children either. The school data reveal that admission takes place without any special selection. In the institution,

- the ratio of genders is 50–50%;
- 5% are in the care of the local authority;
- 50% are children of divorced or separated parents;
- 15% are disadvantaged pupils;
- 5% are children of recently arrived families of other nationality (children of Polish, Italian, Portuguese, Lithuanian and Greek origin);
- 25% of the children face learning difficulties (impaired hearing or vision, autism, etc.).

The school has 23 teachers teaching two subjects each. Their activities are assisted by ten teacher assistants and a 10-member administrative staff. The school also maintains a permanent relationship with a psychologist and with social workers, as it cannot afford to employ its own experts.

The Scaltback Middle School fully complies with all the criteria of the Challenge Award. The discussions with the children and the head teacher, the atmosphere of the lessons, and the external and the internal layout of the building all confirm the high-quality work taking place at the institution, with modern tools and child-centred methods.

They have been applying the NACE philosophy and talent development principles for ten years, but the overall commitment of the teachers' board and the endeavours to satisfy the Challenge Award criteria have been present in their work for five years.

The head teacher's views on talent development and the school's practice fully comply with Johanna Raffan's philosophy. Children are not selected and they do not separate or pick out pupils on the basis of any data collection or survey. The teachers of specific subjects are responsible for detecting ability and then for elaborating appropriate activities for the child. The entire teachers' board takes part in this work. They do not apply any specific talent development model, yet the features of the Renzulli model can be observed in their activities the most, because they prefer enrichment programmes conducted in school time. They also highly appreciate Gardner's talent development theory, and believe that each child has a hidden ability. They do not focus on any specific talent, but are open to any ability they come across. The head teacher told us that most talents discovered by them relate to sports, arts and music.

In everyday schoolwork they focus on practical activities, during which children have the opportunity to freely show and express their talents. During the lessons the teacher is clearly a facilitator, motivating children according to their interest level and ability. The teachers say that they would like to raise children who are happy at the school and retain their independent learning style after leaving the school as well.

Let us take a few interesting examples for illustration. There is no mandatory reading. Children choose (with the assistance of teachers) the reading material they wish, which will be processed later. Lessons are dominated by differentiated exercises; children often work independently or in small groups and not as a class. Children with outstanding performance in any topic or subject are given more and/or different tasks and they are able to work with less teacher intervention. This gives them a higher degree of independence. There are also regular project assignments, the products of which decorate the whole school.

The head teacher of the school, Elaine Wilson talks proudly about the Enrichment Day. It is organised once every 6–10 weeks, when the whole school goes on an excursion. On these occasions children can individually and freely study and examine a particular thing in the field.

The other special feature of the school is the Extra Day, which is held on Saturdays. This day is dedicated only to clearly talented children also within the framework of a project. On such occasions they do some actual research on specific things. In the recent past successful projects have included researching the ‘Big Bang’ or ‘Jack the Ripper’. Such days involve a cost, which is funded partly by the parents and partly by the school.

Among the teaching staff nobody has a qualification entitling them to undertake talent development. The teachers did not take part in any specialised higher-level training. However, they regularly attend conferences and further training courses, and always share all new information with the teaching staff. They know the NACE publications, and are informed about the latest research results.

The free atmosphere of the school, the well-trained and nice children, the helpful teachers, the well-equipped classrooms and abundantly decorated walls appeal to all visitors to the school.

2.2. How does the programme respond to the issues of British society and education?

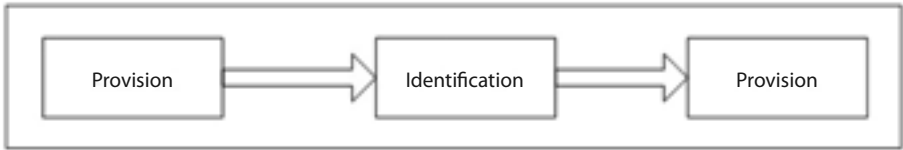
The programme reflects ideally the Europe-wide requirement to give priority to talent development. The simple recognition of facts is not enough any more. Specific programmes are needed: the NACE also responds to this challenge. It provides the opportunity to each member of the school generation regardless of the child’s social background or origin, or the areas in which he performs well. This is a democratic approach opening doors to a lot of children with different interests and intellect. Naturally, this involves risks, but also gives motivation to each conscientious teacher, as can be observed in the Challenge Award schools.

The limitation to school-time is quite commendable as it is in line with inclusion and the principles of talent development by which each child is provided services that fit their individual requirements, and because it also seeks to avoid the excessive use of the children’s time and any consequential excessive burden. However, it is difficult to maintain that as the children’s statements clearly indicate when they refer to the enrichment programmes that took place outside the school. The Scaltback Middle School also proudly proclaims its weekend events. Criticism of the school system reveals that these solutions are not opposed by parents or children. There is a great demand for the acquisition of (theoretical and practical) quality knowledge. Gifted children and their parents are partners in these endeavours.

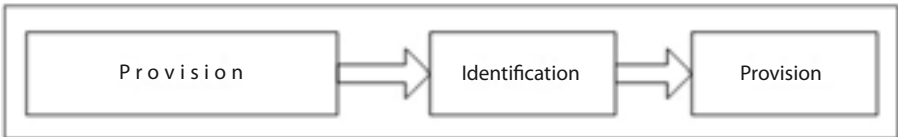
3. The lesson of the programme: Talent development and inclusion

What does the inclusive approach to talent selection and development mean? For the purpose of pedagogy – and in a narrower sense of the concept – inclusion means the joint training and education of children impeded in learning for some reason (e.g., disability, ability disorder, social disadvantage) close to their homes (Réthy 2000). This approach is contrary to segregated education and segregated schooling, which separates certain groups of children into special educational institutions. However, as time has passed, the pedagogical concept of inclusion has broadened, and these days refers to a much more general philosophy of diversity, and to the respect and valuation of students from different cultures. Inclusion is a higher degree of integration in terms of quality, in which reception becomes inclusion. It does not only mean that children different from the majority are present, but that they are also provided individual development and progress according to their special needs. In this wider sense of the concept, inclusion and talent development do not exclude each other (Hymer – Michel 2002).

It is the main principle of practising teachers and theoretical experts connecting the two types of educational tasks referred to above to create a long-lasting background with diversified opportunities for as many children as possible in order to create a wide scale of participation from which talented students can emerge. These experts argue that children from different family backgrounds do not have the same chance in the selection process, because there may be significant differences in their previous learning/practical experiences. Activities provided and encouraged by parents can result in spectacular progress also in students who otherwise lack outstanding ‘natural abilities’ and interests. On the other hand, putting a young child born with particular inclinations, but not practising them, into an early identification situation could have a detrimental effect. However, the joint presence of the two tasks does not mean that norms have been lowered or pedagogical services have been diluted: instead it refers to a sophisticated and systematic approach, which takes into account the aspects of talent identification and talent development, such as family background, commitment to the task, need for a good manager or coach and the time investment required for the establishment and maintenance of certain skills. During inclusion, students may be offered various activities in the course of which their commitment to the task, their readiness to learn and their ease at the activity can be observed. Consequently, the opportunities need to be enriched for a long period and in different ways prior to identification (Gray-Fow 2005). In summary, the best approach is illustrated in the chart below:



However, the following chart expresses even more the importance of initial



professional services and care:

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Centres for talent development in Israel

I. INTRODUCTION

1. The State of Israel

The modern State of Israel was established on 14 May, 1948. The majority of the population are Jewish by religion, mostly immigrated to Israel from Europe after the Holocaust. Immigration is still in progress. Another large group of the population is made up of Arabs. In accordance with those two major groups of the population, the official languages of the country are Hebrew and Arabic.

Today, approximately 7 and a half million people live in Israel on a territory of 20,770 km², who – although may have a common religion – belong quite often to totally different cultures. In addition to the Muslim minority, the country is populated by Jews who emigrated from Europe and their descendants, though there are a number of Jews who emigrated mainly from Ethiopia (almost 120,000) who, naturally, have brought with them a totally different culture. It should be noted that according to demographic data, the number and ratio of the Jewish population within the country has been in constant decline since the mid-1980s, while the number of Muslims has shown a continuous increase: today, every 5th person living in Israel is a Muslim. 2% of the population are Christians, with the Druze, representing 1.5% of the population, one of the smallest minorities, and we should not forget about the Bedouin minority either.

In the capital, Jerusalem, the holiest places of Judaism, Islam and Christianity are situated close to each other or, in many cases, in the same places. That

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provides the basis for the multicultural character of the country and that was why the Old City of Jerusalem could be added to the UNESCO cultural world heritage list. On the other hand, in many areas of life, social groups maintaining different principles remain separate from each other. In some cases that separation is geographically apparent, with people living behind walls or in separate parts of the city, while in other cases it is only present in the school system, in apparel or in customs. As we shall explain later on, in such a society divided into different parts, it is talent development where the collaboration of different groups sometimes representing contradictory interests has been established at least partially.

It is telling in terms of the economic situation of the State of Israel that in 2009 it held the respectable 49th place in the world in respect of its GDP. It is also worth mentioning that the OECD accepted Israel among its members in 2010. The country spends about 8% of its GDP on education every year.

2. General features of education in the country

Since the amendment of the Education Act in 2007, mandatory school age in Israel is from age 5 to 18 for all children. Families can choose from among four different forms of mandatory education: state schools, religious schools managed by the state, ultra-orthodox (haredi) Jewish, or Arab schools. Most children study at state schools and only the more religious families opt for educational institutions where the teaching of religion has preference. At haredi schools, youngsters study mainly about Judaism according to the religious Jewish laws or halacha. Naturally, Muslim students study according to curricula important and prepared for them in studying Islam and the Koran.

The idea that the separation of Jewish and Arab students in education is not necessarily a positive thing started to gain momentum in the 1980s. The first settlement where Muslim and Jewish youngsters could share a classroom was Néve Shalom, then followed by the opening of several private schools based on the same concept, many of which have received government support.

It is unfortunate that Arab students drop out of education twice as frequently as Jewish children; most schools are characterised by a lack of classrooms and they often face financial problems. To overcome those difficulties, the Ministry of Education prepared a 5-year plan in 2007 under which the proportionate financing of Arab education was raised from 18% to 25%.

The public education system consists of three levels following the kindergarten. Children aged 6–12 receive primary education in the first 6 grades. The nationwide selection of gifted and outstanding children takes place at a rather

early age, in the second and third grades, with the help of cognitive tests drafted by the Szold Institute on appointment by the Ministry of Education.

The next level of public education covers the next 3 years, and then come the upper grades, again for 3 years that prepare for the maturity examination. That is how mandatory public education covers the period from kindergarten age until the end of grade 12.

The subjects of the maturity exam (bagrut) include literature, mathematics, Bible studies, Hebrew language and literature, English language, history and civics, or biology, physics, chemistry, art history or other subjects also according to pupil choice. Arabic, Druze and Christian schoolchildren naturally study the heritage of Islam, the Druze or Christianity instead of Bible studies, and their school education is usually in the same spirit.

After graduating from high school, Jewish students have mandatory military service that is three years for boys and two years for girls. Young people have an option to stay in the Israeli army (Israel Defence Force *צְבָא הַהֲגָנָה לְיִשְׂרָאֵל* /IDF/), prolonging those years. In that way they can enjoy higher education free of charge. It is easy to understand that high school studies and the (problematic) motivation of the students are greatly influenced by the fact that some years are lost in terms of education.

Young people intending to further their education in Israel can choose from eight state universities and a number of colleges. While public education in Israel is generally considered mediocre or even poor in terms of certain indicators (Balázsi et al. 2010), the faculties of science and engineering of the country are considered top level globally (Academic Ranking of World Universities 2010). The Hebrew University in Jerusalem is outstanding even among state universities; it is one of the most highly renowned institutions of the country, ranked among the 100–200 best academies of the world, and even has a place among the 10 best universities of Asia (Academic Ranking of World Universities 2010) almost every year. The operations of the education system – or at least tertiary education – are well characterised by the fact that about half a dozen Nobel prize winner scientists and scholars have graduated from there since 2002 and the number of scientific papers per capita is also the highest in Israel.

At the time of the establishment of the State in 1948 and in the ensuing period, adults and children with varying levels of education arrived in the country from all over the world. At that time, the educational policy of equal input and equal achievement, backed by a socialist-type government, did not promote special education for talented children, but provided uniform education for all. The difference between students arriving from many backgrounds and having different gifts and talents was obvious, so the legal framework for the

development of children with learning difficulties was created in the Education Act of 1953 (Burg 1992). The same has not taken place to this date regarding the gifted and outstanding students.

3. General features of talent development in the country

The history of talent development in Israel is closely related to the process of change in educational policy and public thinking from one decade to the next regarding the issues of equality, excellence and elitism in the framework of educational policy.

Although the most important objective of educational policy was – both in the 1950s and 1960s – that students should strive for equal achievement, the two decades were still driven by two significantly different ideologies. In the 1950s professional and public thinking was driven by the idea that educational policy should provide the same for students belonging to different social groups and representing different talents and performance, leading to equal school achievement in the long term and – in that way – to social equality as total as could be imagined. On the other hand, the 1960s was mostly characterised by the concept that differentiated spending could lead to equal achievements. The latter, however, really meant the principle of supporting those in a disadvantaged position and those dropping out, and the intention that major spending on education should serve their social development. Under that ideology, even the possibility of educating the gifted seemed an act to be condemned on ethical grounds, saying that it would be unfair to give more to those who already have more (Rachmel 2010a). All that coincided with the idea of communal equality that strongly characterised the Israeli society in the decades after World War II which had led to unique forms of lifestyle, such as the system of the kibbutz.

Nevertheless, by the 1970s a major shift had occurred in thinking. The idea that equality in education and further on in society really means equal opportunities that can be used by individuals according to their own abilities and merit had gained momentum. The start of talent development can be linked to those teachers of maths, among others, who noticed the talent of their students and helped them in their careers with personal tutoring. Later on, initiatives by parents led to the establishment of associations both in Tel Aviv and Jerusalem to support excellent students and their parents. The Minister of Education declared in an address to Parliament in 1971 that all children, including gifted ones, have a right to evolve their abilities to the maximum degree. Two years later, in 1973, a unit in charge of the development of the gifted was set up within the Ministry of Education and a pilot of six special school

classes for the talented was launched (Burg 1992; David 2009, Rachmel 2010a). Since then, talent development in Israel has been progressing dynamically although not without contradictions.

Several forms of talent development have been generated in Israel both in school and out of school over the past decades.

The private organisation called the Israel Centre for Excellence through Education, which set up its school named 'Israel Arts and Science Academy' in 1990, parallel with the talent development exercise of the Ministry of Education, has achieved international renown in the field of talent development. At that boarding school operating with a low number of students – not more than 200 –, specialising in sciences, technology, information technology, music and other arts, the future leaders of Israel are trained in the field of the sciences and arts. The spirit and openness of the school is well-illustrated by the fact that secular, modern religious or orthodox Jewish children study there just as well as immigrants and Arab, Druze, Bedouin and Muslim students who can speak Hebrew. In addition, the Israel Centre for Excellence, that liaises with talent development specialists and institutions in Singapore, South Korea, the USA and other countries, will not only provide an exceptionally high standard of education for its own outstanding high-school students, but also generates educational programme packages for talent development that are available from the Centre for other educational institutions in Israel or to be purchased by foreign countries for their own talent development schools. The Centre generated a talent programme termed Excellence 2000 for children from grade 5 of the primary school or the lower secondary, i.e., those aged 10–15, which has been adopted in Singapore and the USA.

The Hebrew University Secondary School also enjoys high reputation among the schools of academically gifted children. Several leaders of the State of Israel have been students or teachers at the school. It is one of the numerous educational institutions in Israel that prefer the method of acceleration to run side by side with other methods of talent development.

Due to their high academic level, the schools for Russian immigrants have gained importance over recent years not only in educational affairs in general, but also in terms of talent development. The teachers of those educational institutions, such as the Shevah Mofet High School in Tel Aviv, are all highly qualified and often they are people who used to be university professors, researchers, and leading experts or head teachers in the Soviet Union or in Russia before their immigration.

The Jerusalem Academy of Music and Dance located on the campus of the Hebrew University is also a decisive institution in talent development in the field of arts.

In addition, the special talent development classes, units and similar forms of school talent development provided in specialised training, also play an important part in talent development in Israel's schools.

In addition to school-based talent development, several institutions and programmes ensure development and enhanced knowledge for gifted children. The Weizmann Institute (Subhi–Maoz 2000) has gained international acknowledgement for setting out and managing programmes for young talents in the field of science. Both they and other institutions offer gifted and motivated children summer camp training in scientific work. There are also maths camps, science clubs for young people, sessions preparing for the science Olympiads, research opportunities for schools and similar arrangements all over Israel (Subhi–Maoz 2000).

Thanks to the Department for Gifted Students at the Ministry of Education, a detailed system of categories related to different levels of excellence has become generally recognised and accepted in Israel and, accordingly, well-diversified development systems have been established in the mainstream of talent development in the country. The highly gifted belong to the top 1/1000 of student cohorts with an exceptionally high intelligence level, for whom specific development programmes are organised. The group of gifted students represents the top 1–3%; they spend one day every week at one of the 53 pull-out centres nationwide, of which the centre at Karmiel will be introduced in detail. Outstanding students represent the top 8%; their improvement is optimised with the help of mainly local school programmes.

In Israel, gifted students are mainly identified with the help of intelligence tests. This is possible also because a relatively large section of society accepts and supports the idea that intelligence is regarded as the criterion for being gifted and that tests are the best way to measure it. Psychometric measurements have been performed for many decades using internationally well-known tests (for instance, the Wechsler test), or by other measuring techniques developed by private research institutes in Israel (the Szold Institute and the Karni Institute). The tests compiled by the Szold Institute are taken at a very young age in international comparison, in grade 2 for the whole school population (or a year later in grade 3 in the case of Arab school children). (Arab students have been completing the test forms of the Karni Institute since 2009. They, as well as the children of immigrant families, can use their mother tongue, while children with learning difficulties are given more time for the exercises than other candidates.) The tests are taken in two rounds: students achieving the best results in the first round (top 15%) are recommended to complete the tests of the second round that are more selective. The best will consist of students having achieved at least 98.5% performance in the tests measuring linguistic, mathematical and

spatial abilities, abstract thinking, memory, analytic and generalising skills (Rachmel-Zorman 2003).

Due to the early recognition of talent, special development of the gifted and outstanding children can be started at a really young age. On the other hand, it should be kept in mind that the early identification of talent is especially effective in areas where the signs of talent can appear at that age and the blossoming or peak of which is considered to be reached in young adulthood. In addition to languages, music and some other areas, mathematical talent is such that it is also the foundation for most talents appearing in the field of sciences or in the area of technology or information technology. In other words, the early identification of talent based on cognitive abilities can be applied well in technocratic countries building on high intellectual value added, such as Israel or, for instance, Singapore. The same areas of talent are important also for the Israeli army. Since the State of Israel has been at war continuously ever since its establishment, it is extremely important for the military to find – possibly with great accuracy – outstanding talents in the field of sciences and technology. The army has been offering its own talent programme termed Talpiot to youngsters gifted in physics, maths and the (natural) sciences since 1979; young people selected can also attend university while they are doing their military service.

On the other hand, not everybody shares the view that intelligence or cognitive tests are absolutely safe to identify talent. According to Erika Landau, a talent specialist of international renown in the fields of creativity research and development, decisive characteristic features, for instance motivation indicators or the ability for creativity are omitted from the identification of the gifted. Accordingly, her own talent identification and development focuses much more on those features of potentially gifted children. Therefore, the activity of the institution led by her for some decades called ‘The Young Persons’ Institute for the Promotion of Creativity and Excellence’ can be regarded as an alternative to talent development managed by the Ministry. Nevertheless, the two opinions are getting closer to each other, albeit slowly. Nothing can prove this better than the fact that major efforts have been made over recent years by the Ministry to include motivation factors and other personality characteristics into the identification of talent, side by side with the intelligence tests used previously.

Another problem of the identification of talent based on intelligence is that the results, despite their relative objectivity, cannot be completely regarded to be independent of the socio-cultural background of the children. To compensate for that factor, a solution is applied in Israel that cannot be regarded internationally general: the intelligence tests are nationwide, but the results are aggregated region by region and the students achieving the best results in their own regions are invited to participate in talent development programmes. In

other words, the students who are intellectually the most talented locally are participating in local talent development, and it is not a nationally aggregated ranking which decides. It is an important momentum, because that element of the system is, or can be, a major balancing feature between national and local levels in terms of talent development.

Test-based talent identification is disadvantageous to children who mature more slowly. Therefore, the Ministry of Education has been applying another round of tests at a later date, before entry to high school. At that time, children are measured by a cognitive test generated by the Karni Institute. Test-based intelligence measurement is also disadvantageous to gifted children from families facing major social or cultural disadvantages, such as Ethiopian children who have immigrated/been resettled over the recent decades. To replace the talent identification test, which has been proved inappropriate for them because it lacked cultural sensitivity and was linguistically incorrect (in Hebrew), the institution of a famous Israeli psychologist, Reuven Feuerstein, the 'International Centre for the Enhancement of Learning Potential' has developed a new kind of talent identification process² (Kashti 2010).

Distance education talent programmes set out at a very high level by the Ministry of Education also contribute to the development of children of high ability coming from disadvantageous backgrounds (Rachmel et al. 2005). For instance, under the programme 'Virtual School' the talent department of the Ministry operates three virtual talent development schools in a joint endeavour with The Open University. They offer 10-week-long courses to high-school talents in a number of fields, for instance, mathematics, environment protection, ethics or traditional Arab medicine. Many of those youngsters live and get their education in the peripheries of the country. Although the programme is operated in virtual space, the children get regular opportunities to personally meet and consult with their instructors who send them their exercises and evaluate their performance. It is another important feature of the programme that the leaders of the programme also keep the parents of the talented children informed during the course regarding the topics, work and successes their children have been involved in (Rachmel 2010a).

² Unfortunately, we were unable to obtain more information about the method of measurement, although it would be interesting to learn how the Reuven Feuerstein Institute succeeded in developing a culturally applicable testing process to identify Ethiopian talents.

II. PULL-OUT CENTRES IN ISRAELI TALENT DEVELOPMENT

1. Pull-out talent development

1.1. General features of the pull-out talent development

The 'pull-out' method is a popular form of talent development in many countries, because it is a bridge between segregating (separated talent classes) and integrating (students developing in their own heterogeneous classes) methods. The version applied in Israel is managed so that students study in their own primary school for most of the week together with their peers, but they also participate in various enhancing programmes one morning a week at pull-out centres established by the regions. In Israel, this form of talent development is typically popular among students in grades 3–6 (or sometimes grades 7–9) at primary school because, at high school level, gifted children are more frequently taught in special classes or schools. One of the two forms can be found in every settlement/region. In many cases, the place where a child lives will identify the type of talent developments (he) can participate in. For instance, children living in a small village have no option; they can either accept or reject the given programme.

Talent development managed by the state reached 12,538 children in 2009, 63% of them were instructed in pull-out centres, 21% in special classes, 8% in distance education and 3% via acceleration (e.g., university studies started earlier) (Rachmel 2010a).

A major advantage of the pull-out method is that a gifted child will regularly meet his or her peers with similar abilities, while he/she will not be removed from his or her own contemporaries. In that way, a negative effect termed 'Big Fish Little Pond' (Seaton–Marsh–Graven 2009) can be prevented, i.e., when a child who is excellent in his own age group will not belong among the best but in the middle field or even among weaker students in the class of the gifted (Szenczi 2008). Children often find it difficult to manage such a situation; the self-image of children may be damaged, and they can lose their motivation to learn. However, children remaining in the pull-out system can experience their excellence again and again in a natural, heterogeneous medium.

Another advantage of the method is that gifted students can face intellectual challenges matching their demands – at least once a week – and can take part in specific courses delivered by highly qualified experts (teachers, scholars or artists). Some researchers, however, regard the restriction in time to be a major disadvantage of the method. Cox explains: ‘pull-out is a part-time solution to a full-time problem’ (cited in Vaughn–Feldhusen–Asher 1991), since those children are gifted every day, so they should be faced with similar challenges all the time.

It is often a problem, which can lead to conflicts with the sender schools, that students must continuously make up for the studies they miss from time to time. In the USA it was attempted to reduce students’ workloads by not allowing new material or test writing on normal classes on pull-out days. In the Israeli talent centres the curriculum is usually independent of that at school or is loosely related to a standard school curriculum; this can be regarded as both its strength and its weakness.

Despite various deficiencies or internal contradictions in the system, pull-out has been the most popular talent development method in Israel for about 30 years. At present 53 centres operate in the country (14 of them serve the talent development of Arab students alone) covering over 6,000 gifted children.

1.2. Selection to the pull-out centres

Students are selected in grade 2 in accordance with the methods described earlier; the programme starts in grade 3, with 1–3% of the age groups’ population.

1.3. The content and the structure of the pull-out programme

Students can select from a wide range of courses including sciences, social studies and arts subjects. Developing social empathy is very much in focus. Children studying at the centre regularly undertake voluntary work in the local community.

The Ministry of Education sets basic principles for the centres, while teachers are free in terms of the content of their programmes. It is highly attractive to talented teachers as well, while offering an opportunity to improve their creativity.

Classes at the centres vary in length, but usually take 75 minutes with 15 or 30-minute breaks in between. School starts at 8:30 in the morning and typically ends after 3 or 4 classes. Pull-out centres provide talent enrichment; their objective is to improve creativity, problem finding and problem solving, self-expression, communication, self-knowledge and confidence; it is not simply the provision of

academic knowledge but teaching methods of study and research that will enable students to acquire knowledge independently later on, in a lifelong learning process.

Class work is typically undertaken in teams. Students may work in pairs or in larger groups depending on the nature of the project. The time scale of the work is also variable. It may occur that an hour, several weeks or even a whole school year is/are available for the students to solve a task. The number of children is typically 12–18 in a class as compared to over 30 children in a class at a normal school. The lower number of students allows for quality teaching and study.

1.4. Teachers working at pull-out centres

Most teachers are part-time and are generally employed by several centres in parallel. Some of them have teacher qualifications, others are artists, scholars/scientists or craftsmen.

In Israel, there has been no institutionalised training for teachers of talented students until the recent past, but people with good reputations recognised through various channels were invited to work at the centres. A post-graduate 2-year course on the topic was first launched at the Jerusalem Hebrew University in 2006. A decree issued by the Ministry of Education in 2010 on the education of gifted students now provides that teachers will need to have a qualification in talent development to work at the centres or in talent classes beginning from the school year 2014/15. Teachers who have been working in the field for at least 10 years are exceptions to that rule. 60-hour training courses are intended to be offered to trainers leading different programmes but lacking pedagogical qualifications (for instance, artists).

In Israel a school counsellor works in every school, including talent development centres. In regard to their qualifications, as well as their roles and responsibilities, counsellors are half way between a pedagogue and a psychologist. They are available at the school all day, and they provide emotional support to children, helping solve various conflicts, and they liaise closely with the parents and with the school counsellors of the sender schools. They also provide practical assistance to students who turn to them with any problem.

2. The Karmiel Centre for Gifted Students

2.1. The city

Karmiel, one of the youngest and most beautiful cities in Israel is located in the north of the country in the Beit Hakerem valley surrounded by picturesque hills.

It is termed the heart of Galilee because since its establishment in 1964, it has become an industrial, commercial and cultural centre for the region. Another telling name of the city is ‘the city of cohabitation.’ At the beginning of the 1990s most immigrants arriving from the post-Soviet states were received in Karmiel. The citizens endeavour to maintain good relations with the neighbouring Arab settlements and qualified Arab families are pleased to move into the city; their ratio has already reached 20%. It is of interest that the about 50,000 citizens from 80 countries use 74 mother tongues.

Karmiel has been built along the principles of conscious town planning using state-of-the-art building technologies. The city is famous for its cleanliness and the size of its green areas (there are 64 public parks in the city). Residential areas have been separated from industrial sections so that a healthy environment can be preserved, although the city has high-standard industrial facilities.

2.2. Education in Karmiel

The infrastructure of educational institutions and their provision with instruments is of a high standard. Kindergarten education has been given special emphasis. There are four lower and four upper secondary schools and vocational centres in the city. The core of the educational system consists of nine state-managed primary schools, a state-managed religious school (also including a secondary school), an independent primary school (for children of orthodox families), the centre for gifted students, an experimental farm, a training centre for nurses, several kindergartens and a college.

2.3. The operation of the Centre

The Karmiel Centre for Gifted Students accepts 290 students of grades 3–9 selected by the Szold Institute. 190 children belong to the ‘gifted’ (the top 1–3% of child population) and 100 to the “outstanding” categories (3–8% of children). The two groups may participate in different programmes: ‘gifted’ children in morning pull-out programmes, while ‘outstanding’ ones in afternoon enrichment programmes. There is no free movement between the two programmes for the students. If a teacher thinks that a child rated ‘outstanding’ could find his place among the ‘gifted’, he will advise the parents to request a repeated Szold Institution test from the Ministry of Education. If the performance of the student is appropriate, then he can be transferred to the group developed in the pull-out system.

The centre has been operating for 15 years for ‘gifted’ children, and programmes for the “outstanding” groups have been organised for three years.

As described above, Karmiel is a real multi-cultural city. A high number of Druze children (50 gifted children) also attend the talent centre. Since their mother tongue is not Hebrew, the programmes are delivered in Arabic in the first years employing teachers whose mother tongue is Arabic, then the children will be integrated into Hebrew-language education.

2.4. Financing

The budgets of all centres, including the Karmiel one, are based on three main pillars: state, municipality and parental contribution. In Israel the state will not pay normative funds for students, but institutions receive less quotas by teachers funded by the Ministry subject to the various programmes managed. The local municipality pays for the maintenance costs of the building; other expenses (for instance, instruments or trips) are covered by a parental contribution that is a centrally determined amount applying to all centres. A system of applications is also in operation; extra budgets can be applied for in terms of certain programmes, and the municipality also helps find sponsors for the projects.

2.5. Connections with other centres

The country has been divided to several educational districts; Karmiel is in the northern region where five similar centres operate. The directors of the centres meet every month to exchange their experiences, discuss problems and share best practices. These are open meetings where also teachers frequently participate. All centre directors meet several times in the course of a school year and they also take part in three-day training courses every year.

2.6. Connections with sender schools

The Karmiel Centre for Gifted Students keeps contacts with almost 30 schools. A list of the children selected into the talent development programmes is forwarded to the centre at the beginning of every school year. In general, 1–2 children are involved from each grade. The day when the children visit the centre is not changed from one year to the next, so schools can easily harmonise their schedules with the operation of the centre. The relationship is not always free of tensions, but the director, Mr. Nadler will do everything in his power to ensure smooth cooperation. For example in 2010/2011 he has made an offer to school headmasters that he and his colleagues would deliver presentations to the teachers about gifted and outstanding children; so far two schools have accepted the offer. Cooperation between the school counsellor of the centre and the

counsellors at sender schools also helps. The centre is responsible for arranging children's transport, and minibuses are available to take the children to the schools for the programmes and back home in the afternoon.

2.7. Connections with the parents

Connection with the parents is uninterrupted; parents may visit any of the programmes on a pre-arranged basis and they are regular visitors to the exhibitions or events closing one or the other project. Joint programmes are organised every month for the parents and the children, and presentations are made for the adults with invited speakers, mainly on topics of psychology.

The relationship with the parents is extremely well managed by a special project-week arranged every year, where all the programmes are delivered by the parents and grandparents. According to the director of the centre, Dr. Menahem Nadler, huge spiritual assets are hidden in the individual families, which are not necessarily to be discovered by the students in the course of their everyday lives. Parents are also very busy and do not always have the time to transfer their knowledge to their children. At the project weeks, parents and grandparents can make presentations on topics related to their work or their hobby, chosen by them. The topics offered are collected before the programme is launched and students will choose from a wide range of topics in accordance with their interests. Here are a few topics of the presentations at the last project week:

How were films produced fifty years ago?

How did I become a champion at the Paralympics in a wheelchair?

How does a computer transform pictures into digital information?

The programme has been arranged for three years in succession and it is a huge success both among parents and students. On the one hand, the knowledge of the students is enhanced and they may become interested in one trade or another and, on the other hand, it has a positive effect on the relationship between teachers and parents and even more so between children and parents. Students can find their mother, father or grandparents in a new role and they have every reason to be proud of their families.

2.8. The NASA project

Gifted and outstanding students at the Karmiel centre can select from a number of interesting programmes, but the most special of all may be the NASA project.

The innovative director of the institution, Dr. Menahem Nadler 'imported' the programme three years ago when he became the director of the Karmiel centre (Nadler 2010).

2.8.1. The aim of the programme

The initial idea of the programme came from a millionaire couple in Turkey. Their objective was to bring children living in different parts of the world together so that, working in a joint project, they could learn about other cultures and might start lasting friendships, bridging different continents. Since then the programme has become successful in several countries. At present, the primary objective of the project is the creation of contacts and improvement of communication among students, in addition to developing a number of other skills and competences that are impacted via the varied activities involved.

2.8.2 The introduction and management of the programme

Initially the programme was not drafted for the gifted only, and in other parts of the world children of average ability also participate. However, in Israel, the director of the Karmiel centre transformed the programme with the help of a co-worker (Dr. Alon Levy) for application to gifted students. Two other centres in the country also organise such programmes for their students.

The project lasts a year. Only children studying at the institution can participate in it; those that were selected into the pull-out programme in the second grade by the Ministry of Education based on the test of the Szold Institute. Students in the sixth grade sit a written and oral admission test in English, because knowledge of the language is necessary to maintain contact with students in other countries. According to information from the teacher leading the programme, however, every interested child is accepted – one of the objectives of the programmes is the improvement of linguistic skills – the admission test is in fact aimed at arousing their sense of responsibility.

It is a general belief that physics is not one of the school subjects generally favoured, not even among boys and even less among girls. A major asset of the NASA project is that students study less popular subjects in such a way that they hardly notice it. As the leader of the programme, Dr. Alon Levy explained: 'We play and at the same time we smuggle in physics and other natural sciences by the back door.' (Levy 2010). It is highly successful, which is proven by the fact that the same number of girls as boys are taking part the programme this year and they have selected a development programme for the next year after the programme is closed down where they can study the rules of physics in more detail.

Students do not study only physics and astrophysics, but astronomy as well; they will learn how to measure distance in space, what is weightlessness like, and they get an insight into the basic principles of space flight. In the course of the one-year project they have to design a space trip beginning from constructing the spaceship, passing through research performed at the target station (collection and analysis of rock samples) to the return to Earth. In the course of the project a

number of physical experiments are conducted, students learn the physical parameters of certain types of materials and, in a game, with their parents they build a functioning spaceship as a closing task. Improving creativity and problem solving skills is very much in focus. For instance, when they are discussing the means of return from space, students are given the task of dropping an egg from the third floor so that it doesn't break when hitting the ground. The students of the NASA have to solve the same problem when they are designing the return of the space capsule to Earth.

The NASA Centre in Turkey proposes several annual topics the group can select from at the beginning of the school year. Those projects are not protected by copyright, the users can freely change or further develop them, but according to information by the head teacher at Karmiel, they are set out so well and in so much detail that it is not worth changing them.

A 'sister class' of the Karmiel group operates in the USA, in Virginia, and students are in intensive working connection with its members. They discuss actual issues by e-mail every week including successes or failures in solving different interesting tasks. Students can meet real space researchers, the NASA scientists, in virtual space three or four times every year, talking to them in video-conferences and listening to their presentations. The teachers participating in the programme are also in close contact with each other; video-conferences are arranged every month to discuss current issues and exchange experiences.

The peak event of the NASA project which both students and teachers look forward to and prepare for all year is at the end of the school year. It is an exceptional experience when all students taking part in the world-wide NASA programme collect together at a centre in Turkey for a one-week meeting. There students can meet NASA researchers personally, they can listen to their presentations together and participate in joint projects. The most popular element of the one-week programme, in which Hungarian talents might have a chance to participate, is that students can sit in life-size spaceship models and can gain experience of space travel in various simulators (more details on the Internet: www.gftse.org).

2.8.3. The place of the programme in the educational work of schools/institutions

The programme is an afternoon enrichment exercise within the centre. Participating children are 13–14 years old, i.e., in grades 7 and 8. Younger children are not interested in astronomy or space travel while their linguistic skills are not good enough to participate in the programme. Work is done once a week in the afternoon for one and a half hours. Students participate in their own four-hour

programmes in the morning at the centre and they stay on in the afternoon for the NASA project.

Since Karmiel is a multi-cultural city, the same will be reflected in the composition of the group of children in the programme. For instance, in 2010 40% of the students participating in the project were Druze. In team work, nationalities are spontaneously separated; Jewish children selecting Jews, Druze children selecting Druze for their pair. The teacher leading the programme consciously undertook to promote the creation of mixed teams, although that is sometimes hindered by language, because Hebrew is not the mother tongue of Druze children, so they do not speak it as well as Jewish children of that age.

2.9. Efficiency measurements; results proven scientifically

It is a general feature of all talent development centres including the one at Karmiel that no efficiency measurements are performed and there are no competitions or exams.

Students work on shorter or longer projects and each project is closed by creating something; that can be a piece of work, a piece of art or a paper of scientific merit. The Department for Gifted Students of the Ministry of Education intends to change the situation step by step. A programme will be started within the NASA project and if it is successfully completed, students will receive credits that are taken into account when calculating the results of their maturity exams.

2.10. Monitoring the future career of talents

A systematic monitoring of talented youth has not yet been established. Information is received about them via informal channels until the beginning of military service, the end of high school. In the future, the Ministry of Education is planning to set out an effective follow-up system.

2.11. The future of the programme

The programme is being continued at the institute for interested students in the next school year: the topic will not be space research but the rules of physics.

The programme is also spreading outside the walls of the institution; Karmiel teachers are to launch the NASA project in another centre at a neighbouring city.

Due to the fast deterioration of inter-governmental relations between Turkey and Israel, it is in question whether or not the programme can be maintained in the long term and if it can, what modifications will be applied.

III. SUMMARY

Talent development in Israel is very rich and multi-focused. The existence and operation of the pull-out centres deserves special attention internationally. The core points of the Israeli programme are as follows:

- how an age-cohort of the country can be measured in its totality in terms of intellectual gifts and at a rather early age;
- how a talent development system can be set up that retains gifted students in their own peer communities and at the same time allows them to remain in their mainstream educational institutions (integration), while
- it also segregates them to ensure development together with similarly gifted peers; and
- the system will also provide them, in addition to intellectual improvement, with enhancement in creativity, social skills and their whole personalities.

That puzzle-like task has been solved in Israel via the pull-out centres.

Ever since the first pull-out centre was established (Ofek School for the Gifted, Jerusalem, 1979), the population of Israel, teachers, parents, families and children have become familiar with, got used to, accepted and come to like the system, in which also, naturally, some have discovered many errors or shortcomings.

The pull-out centres have great freedom in respect of the training they offer: except for a *core curriculum* recently introduced, they can deliver projects in their institutions that match local needs of talent development and local characteristics. The institutions also have great freedom in employing the teachers for the courses. It is not a requirement that trainers working at the pull-out centres must have teachers' qualifications; but it is required to set out professional, exciting programmes representing an intellectual challenge and improving creativity. A number of teachers are free-lancers; they are contracted by the centre for one project or another and it is also typical that the same trainer heads the same (or very similar) projects in a number of centres. As a result of the above, the selection of people delivering the courses is very much based on personal information: the directors of pull-out centres exchange information

with each other, this way learning who should be employed for which kind of programmes.

As is clearly visible, the whole system is highly flexible and it is up to the personal professional understanding and professional vision – if it may be so put – of the directors of centres of talent development, which teachers will be employed to deliver courses on what kind of topics at the talent development centres led by them. The assessment of teachers' work is also subject to the same subjective elements in many respects; all the more so because the evaluation of work going on is in fact based on personal impressions. There are so many variables in the development of those children that it would be impossible to identify by objective measures why and how a gifted student trained in that way is improving; or what exactly is the result of the work of this or that teacher. In fact, no other national assessment or measurement of the programme has been made, except for one or two satisfaction surveys. A more systematic approach has recently been started.

Professionally speaking, it must be said that maintaining a programme of talent development for several decades in such a way is not risk-free: if the persons participating in the system do not possess sufficiently sophisticated professional understanding, or they are not properly responsible in their work in terms of taking the needs of the future society into account, a lot of money, time, energy, good intentions and noble actions can be wasted. According to our experience, the pull-out programme in Israel *has avoided* those dangers. The centres offer extremely exciting opportunities to talented children, teachers are highly devoted and their work is really effective. Children are not only motivated at the centres, but they remember those programmes even years later as the great, decisive, positive experience of their school years. It is also a component in the flexibility of the system and in the achievement of quality work that a teacher can be dismissed easily if he or she does not meet the required standards and can be replaced by other more efficient teachers.

All that should be taken into consideration for a possible application of the method in Hungary. Another feature to be taken into account is that we have never had intelligence measurement tests across the whole education system as the economic situation of the country does not always allow the operation of high-cost development programmes for decades without exact output measurement and our schools are less flexible in allowing their students to attend another educational institution for one day every week over many years.

On the other hand, it can be stated that the profits from the pull-out programme in Israel are significant; children are faced with real problem-solving tasks in the course of their training once a week. They become independent,

while obtaining a great deal of experience in team work; their debating and critical skills improve and they continually have to meet major intellectual expectations. It is also a major advantage, already mentioned above, that the form of education discussed provides the advantages of both integrated and segregated talent development while significantly reducing their disadvantages.

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Talent Support in Southeast Asia: The Singapore Example

I. INTRODUCTION

1. Singapore

1.1. The social and political setting

Singapore is a Southeast Asian city-state on a territory of just 700 km², lying one degree north of the Equator. Before British colonisation, present-day Singapore was a scarcely populated fishermen's village at the southern tip of the Malaysian peninsula. It began to grow rapidly after the 1819 treaty concluded by Stamford Raffles, representative of the British East India Company, with the Sultanate of Johor on the construction of a port on the small island and the establishment of a settlement to serve it. Since then the history of Singapore was one of immigrations and steady efforts to ensure social and economic development. Thanks among others to its port, the country became an important economic centre of the area within a century and, as a British Crown Colony, it even operated a significant military base. It was all the more unexpected that in 1942, during World War II, the Japanese troops invaded this small country, which had gained a priority strategic importance by then, with relative ease and in a very humiliating way for the British.

As of 1945, Singapore became a British Crown Colony once again, but only until 1959, when it won the right of self-administration. Subsequently, the inhabitants of the country decided to join the Federation of Malaysia, but intensifying conflicts soon broke up this alliance, and in 1965 Singapore became

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an independent country, irrespective of, and even against, its will. The country came to be governed by the People's Action Party (PAP) and its leader, Lee Kuan Yew, an educated and ambitious young politician and charismatic person who led it for 30 years "from the third world to the first" (Ju 2003).

1.2. Economy

Thanks to Lee Kuan Yew, what used to be a weakly developed city-state in the early 1960s grew into one of the strongest economies of the world, with a per capita GDP corresponding to almost USD 40,000. The economy was raised step by step, by a series of central government measures. In the "period of survival" (Ju 2003), from 1959 to 1978, first the port was modernised with a petrol processing facility which has represented a uniquely advanced technology still unmatched in the vicinity. At the same time, a secure banking system, attractive to American and other investors, was created as well.

Singapore set its eyes on the future already in the years of rapid economic growth, and planned how to step over to the stage of intensive economic growth and on to further heights from there. In the period of "efficiency-driven" economy (1979–1996), production shifted from the labour-intensive industries to branches requiring higher-level specialist skills, laying down the basis for Singapore's development into the first model examples of the knowledge-based and knowledge-intensive economies by the late-1990s. Today's Singapore, an engine of growth of the globalising economy, plays a leading role in a series of knowledge-based industries such as biotechnology, for example.

Obviously, public education and in particular talent support had a key role in the process. However, one must not forget that rocketing economic growth in the past decades was due also to the contribution of the approximately one million guest workers and immigrants arriving to Singapore, many of whom were highly qualified professionals with outstanding talents even in international comparison, and actually included several Nobel Prize winners (OECD 2010).

1.3. Population

The goal of Lee Kuan Yew and the PAP was not only to make Singapore a vibrating economy and a decisive development centre of the region, but also to realise all that in a society which develops in peace and harmony, and in which the 74% Chinese, 14% Malay, 9% Indian and 2–3% Arab and Western citizens all have a *Singaporean* identity and work for a single common goal: the unbroken development of Singapore.

The country, with its no more than 5 million inhabitants, is not only a multinational but also a multilingual community. The members of the Chinese and the Indian populations have dozens of different mother tongues and dialects, whereas the language of tuition is English and that of the ceremonious, symbolic, state events – e.g. the national anthem of the country – is the Malay (Göransson 2010; Gordon Györi 2011). The religious landscape is similarly colourful: Buddhism predominates (42%), and the Islam and Christianity are present in approximately equal ratios (15–15%). There are also Hindi, Taoist and in very small proportions Jews, and people of other religions in Singapore.

What represented a major challenge to Lee Kuan Yew at the start of the history of independent Singapore was not so much the national, linguistic and religious diversity of the country, but much rather the social, economic and cultural inequalities and, more specifically, the predominance of the Chinese community in almost every respect. In order to create a cohesive society in the long term, those in power had to establish and consolidate legal equality, and assert the dominance of the meritocratic principles, that is, the idea that the social position and progress of the individual must be determined first and foremost by individual performance, and not by other factors (family background, religious affiliation etc.). To ensure that performance had to be made comparable in society in general and in education in particular, and such systems and functioning mechanisms had to be established which guaranteed adequate social support and recognition for the capacity/ability for higher performance and for higher performance itself. It follows logically from the above that, in addition to the establishment and preservation of equal educational options, Singapore considered the identification and special education of talented and gifted children a priority goal, a pedagogical activity which, instead of meeting with the resistance of the state or with hindrances due to the professional ambivalences of education-policy experts, has been given strong and even intensifying support. One could say that Singapore is a talent-friendly society.

2. General features of the education policy of the country

2.1. Structure and levels of education

Education starts at the age of 7 in Singapore. The so-called grounding period lasts for 4 years, and there is a 2-year orientation phase built upon it. In these years, the emphasis is on English language (the tuition language), on mathematics and the mother tongue, which are joined later on by the natural sciences subjects. From the 5th form children study in groups broken down by subject.

In the first four years of secondary education, the subsequent level, students are distributed in several streams. There is a “Special Stream” which gathers the top 10% best-performing students. Children in this stream learn English and their mother tongue (Malay, Chinese etc.) at the highest linguistic level. The Special Stream is followed by the “Express”, the “Normal Academic” and the “Normal Vocational” streams, respectively, the academic quality of which decreases in that order. Nevertheless, a normal Singaporean school has 2 educational streams operated side by side. For example, a special and an express or an express and a normal academic stream coexist within the same institution. That is, if the performance of a weaker student improves or, *vice versa*, that of a better student deteriorates, it is possible to refer him or her to the other educational stream within the same institution.

On the model of British education, some 30% of students aged 17–18 (OECD 2010) enter the so-called upper secondary school or junior college. The subject structure, lesson types and educational contents of this two-year stage prepare the youth for higher education (Gordon Győri 2006). The rest go to poly-technical (43%) and technical (22%) schools. Note that in Singapore vocational education is also of very high quality, so much that certain experts actually attribute Singaporean development (among other things) to the outstanding performance of this line of education (OECD 2010).

2.2. Selection mechanisms in education

Singaporean education is characterised by a system of very difficult examinations at almost every level. What is crucial for our topic is that, since 1984, there has been a two-turn talent screening survey already in the 3rd form of primary school, designed to identify intellectually gifted/talented children.

Children subject to normal development, i.e. not talent development, take an exam called Primary School Leaving Examination after the sixth form, followed at the end of secondary school by the GCE-O (Ordinary) Level of the Cambridge certificate and, at the end of junior college, by the GCE-A (Advanced) Level certificate. Measurement of the performance of Singaporean students by the Cambridge examination system ensures international comparability of their results.

2.3. Schooling indicators

Contrary to its current rivals, i.e. Korea or Japan, where illiteracy had disappeared in almost 100% by the beginning of the 20th century, when Singapore, the “Lion City” won independence in the early 1950s, the larger segment of the

then 2 million inhabitants could not read or write. Currently, 10-year compulsory education is completed by 95–98% of every generation (OECD 2010). So there is a major gap between the schooling of the older and the younger generations. Linguistic skills are no exception: whereas a far-from-negligible part of the older generations is fluent only in their mother tongue – which may well be a certain rare dialect of Chinese or Tamil –, and speak Singlish, a special Singaporean version of English characterised by the simplest possible grammar (Gordon Gyóri 2011), a major part of the youth are fluent in English which is the first language of education.

As indicated by the data quoted above, only a minor part of the generations in the 11th and 12th forms of secondary school, i.e. those at junior college, actually prepare for university studies. Singapore has only a few institutions of higher education – the National University of Singapore, Nanyang Technological University, Singapore Management University, the newly-founded Singapore University of Technology and Design, and Singapore Institute of Technology – and, consequently, admission is highly competitive. These are among the best universities of East Asia, even if they are only in the top 100 worldwide or rank even lower.

2.4. Strengths and weaknesses of the educational system

According to the relevant international surveys, Singaporean public education has been among the most effective for decades (OECD 2010). Student performance in mathematics has been outstanding. In the 2003 *Trends in Mathematics and Science Study*, 44% of Singaporean students produced such results as the top 7% in other countries (Gordon Gyóri 2006; Kwang–Kheng–Goh 2008), and they have always been among the first also in natural sciences surveys (OECD 2010). Interestingly, although less than 1% of students take part in education where the first language of tuition corresponds to their mother tongue – since English is the mother tongue of only 1% of the population –, Singaporean students are regularly among the best in reading comprehension. Nevertheless, the linguistic issue is a crucial problem of the education system of the country, mainly related to students with lower performance.

3. General characteristics of talent development support in the country

3.1. Organisation and management of talent support

Experts are of the opinion that in no other country is education and the economy so closely intertwined as in Singapore (OECD 2010). Since the city-

state has always been governed by a strongly centralised political administration, the government could insist on the close linkage of economic development and public education. Since the late-1970s the education system has given priority role also to the identification and special development of intellectual talent, especially in mathematics, natural sciences, technology and informatics, to assist Singapore shift in favour of a knowledge-based, knowledge-intensive economic development.

The centralised nature and priority position of gifted education is witnessed by the fact that the Ministry of Education operates a big talent support division with specialists who treat the relevant pedagogical issues from curriculum development by subject and knowledge area to psychological guidance to gifted children. The most important programme directed by the division is the Gifted Education Program (GEP).

Talented/gifted children are identified nationally in the 3rd form of primary school (that is, screening covers every student in 3rd form, unless the family refuses participation), which is an unusually early age in international comparison. First a GEP Screening Test is used, which is followed by a Selection Test (Phillipson et al. 2009) completed only by the short-listed top 8% of students based on the screening results (Geok-Geok 2010). The Screening Test comprises papers in English, mathematics and general ability, and measures intellectual abilities.

The results of the surveys in 3rd form (or some other results) always identify a few exceptionally gifted children. They are offered Individualised Education Plans which comprise special options ranging from early schooling to form-skipping, from acceleration in some subjects to individual education (Phillipson et al. 2009).

The top 1% identified by the screening/selection procedure in 3rd form, some 400–500 pupils, are capable of/eligible for participation in the GEP at one of the 9 Singapore schools where the programme has been introduced with the permission of the Ministry (Gordon Györi 2006). Those in the next 2–5% may go to the talent enrichment programmes designed by the schools. These High Ability Learners (HALs) can choose subject-specific development programmes organised by the Ministry of Education.

In 2004, the secondary-school GEP was transformed into the so-called Integrated Programme. This essentially means that gifted students are provided education in the form of a six-year programme, and at age 17 they can continue their studies in one of the junior colleges without any admission examination. They skip the GCE-O (General Cambridge Examination, Ordinary Level) exam, compulsory for others at age 16, and go on right away to GCO-A

(Advanced Level), or they can take the IB (International Baccalaureate) examination, which makes them eligible for admission to even the best foreign universities (Yoong et al. 2009).

The gifted-education programmes designed for the three categories of students (gifted, high-ability, exceptionally gifted) are accompanied by regular measurements and research. The one for the exceptionally gifted is subjected to regular reviews, and the progress of the children is recorded in individual case studies. Under the GEP, the programme-related experiences of the participants – students, teachers, institutions – are surveyed recurrently. The examination results and the career of gifted students are subject to monitoring/follow-up. The relevant experiences and opinions of high-ability learners and their environment are explored, and data are collected on the participation of these children in centrally organised programmes and on their results at academic contests (Geok–Geok 2010).

3.2. Typical forms of gifted education

One of the distinctive traits of Singaporean gifted education implemented in the framework of formal schooling is that it is more systematic and centralised than in any other country of the world. The GEP, for example, is a programme designed by the Ministry, and its introduction at schools is conditional on a Ministry permission. Nevertheless, there are some developments initiated by the schools themselves – as the gifted-education programme of the National University of the Singapore High School of Mathematics and Science, to be presented in later parts of this chapter –, and there are some joint development projects of institutions of education and the Ministry of Education. It is not rare for the latter to be pilots to be rolled out to other schools if they meet the expectations.

3.3. Access to gifted education

As Professor Péter Csermely, a leading Hungarian talent support expert put it concisely in his blog summary worthy of public attention, Singapore is a “gift-nurturing state”, a “gift-nurturing society” (Csermely 2010a). The attribute aptly expresses the positive attitude to the “gifted issue” and to gifted persons of Singaporean political administration and society at large. Csermely highlights the following features of the gift-nurturing state:

- Gift support management has been carried out at ministry-division level for several decades.

- Organisations and institutions carrying out gifted education as a priority task are being created.
- The Taxation Act provides tax exemption for costs incurred in connection with the relocation of foreign talents to Singapore.
- Events presenting the performance of gifted people enjoy duty exemption.

The list could be continued endlessly. As for the general climate of social acceptance, it is typical that the reverberating slogans of the city-state keep referring, directly or indirectly, to the value of giftedness, or that *Straits Times*, the (semi-official) daily of the country devotes two articles daily to this phenomenon or at least mentions it, and giftedness as a value appears even in commercial ads (Csermely 2010a).

Singapore is characterised by strong meritocratic values, and gifted education is accessible to all, irrespective of family, religious, sexual or other differences. As a matter of fact, however, children from middle-class Chinese families predominate in the gifted education programmes. Over and beyond the fact that the Chinese are by far the largest ethnic group in Singapore, the PISA post-calculations have confirmed that the success of individual education is not independent – not even in a society professing such highly meritocratic core values – of the socio-cultural background of the family (OECD 2010).

II. THE PROGRAMME

1. A new educational institution in Singapore for the mathematically gifted

1.1. Gifted education in mathematics

As in the United States and several other post-industrialist societies, gifted education in mathematics, technical sciences, IT and the natural sciences is a priority issue in Singapore, too. This implies exceptionally intensive development because, as mentioned before, even the average Singaporean student produces outstanding performance in these subjects compared to age-peers in other countries. Note that Singaporean students have outstanding results also in tasks which require problem-solving skills and creativity (Pereira-Mendoza–Toh 2002).

For decades, the economically developed countries have given special emphasis to the development of education in the STEM areas (science, technology, engineering and mathematics). Obviously, these knowledge systems provide the basis of post-industrialist society and in particular its knowledge-intensive developments which show the fastest progress and promise the highest returns. Note that these are also the basic areas of up-to-date military/defence developments.

Neither is it difficult to see that STEM typically embraces the most important knowledge systems of technocratic societies. Despite the key role assigned to STEM in the US, no one could call the US simply a technocratic society, whereas the same attribute is frequently applied to South Korea or Singapore. Indeed, the humanities have played a rather subdued role traditionally in the development of Singaporean education ever since the foundation of the city-state, and they have been assigned to second rank in gifted education, too.

At the same time, the top executives of the educational administration and the politicians as well as other members of society knew that this imbalance was a major deficiency of Singaporean education and in particular of gifted education. Furthermore, that beyond a certain point this unilateral approach would (might) represent a major hindrance not only to social, but also to economic development. For this reason, significant developments have taken place in this area in recent years. A system of gifted education in the field of arts has been established and consolidated. An institution called the School of the Arts (SOTA) was opened in 2006, which has two distinctive features worth highlighting here. On the one hand, it is a complex educational institution for artistic talent manifesting itself in music, dance, theatre and the fine arts. On the other hand, special emphasis is given to intellectual development, i.e.

the academic subjects, as mirrored by the fact that the school allows (and expects) its students to take the International Baccalaureate (IB) examination at the end of their studies, which ensures automatic admission to a major part of the highest-quality universities of the world.

Another key feature of Singaporean gifted education in mathematics is that intensive development starts at a very early age, in the 4th form. The GEP has its independent mathematics development programme, which offers more extensive ability/skills development and deeper knowledge than normal education. The goals of the programme are the following:

- to provide grounding in the development of mathematical thinking so that it could be transferable to other areas;
- to develop critical and creative problem-solving thinking in a targeted way;
- to make students creative users and further developers of mathematical knowledge and skills;
- to develop the mathematical reasoning skills of the gifted, and hence the professional communication of mathematical problems;
- to develop the skills of gifted students to apply elegant and diverse solutions to mathematical problems both in writing and in speech;
- to develop the students' leadership, team-work and cooperation skills in the area of mathematics (Gifted Education Branch 2004; Khong 2009).

To reach the above goals, the GEP in mathematics systematically rotates task types suitable for the promotion of the development of such skills; students are encouraged to look for new types of solutions to the same problem; situations stimulating the development of reflective thinking are created at the lessons, and Paul's model of mathematical understanding is applied (Khong 2009).

In addition to curricular development, many extra-curricular forms are used in the GEP and beyond. Education outside the GEP and more difficult mathematics problems than the ones discussed under GEP there are provided for example by the master courses in mathematics and the enrichment classes in advanced mathematics.

The master courses are short, three-day events, which are always followed by a support programme headed by a mentor. In the support stage, students, with the mentor's assistance, process a topic of algebra, graph theory, combinatorics or some other area which they find personally interesting, a major challenge and suitable for the intensive development of problem-solving skills. Eligibility for master courses is limited to GEP students and to a small number of HALs who meet the admission criteria.

Schools providing GEPs are obliged to have mathematical enrichment classes for gifted students in the 5th and 6th forms. This means two extra lessons a week for a year, adjusted to the content of the GEP core lessons, and enriching and deepening knowledge acquired there. Gifted students who take part in national and international contests – such as the International Mathematical Contest of the Raffles Institute or the international student competition in mathematics or informatics – are selected from among the master course and enrichment class trainees (Khong 2009).

Other mathematical talent development forms outside the GEP lessons include mathematical knowledge enrichment days or a programme entitled “mathematical campaign”. The first is a one-day programme organised by the Gifted Education Division of the Ministry of Education for students in the 6th form to boost their collective-task-solving skills and, concomitantly with the development of the problem-solving skills, the skills of understanding, reasoning and communication on mathematical phenomena. The Mathematics Campaign, on the other hand, presents tasks to 5th form students in the form of mathematical problems related to real life (to weaken the notion that mathematics is useful only in the abstract world of formulae, to answer precise questions), encouraging them to do complex estimation and daring associations in several steps to solve life-like tasks (Khong 2009, p. 367). There are also mathematics contests for young talents, such as the mathematical project work contest or the mathematical game design contest (Geok–Geok 2010).

Below we shall present the gifted education programme of the National University of Singapore as an example of the education of secondary- and upper-secondary-school students gifted in mathematics, and as a best practice in Singaporean gifted education.

1.2. Gifted education at the National University of Singapore (NUS) High School of Mathematics and Science

In Singapore, high-ability secondary-school students can take part in gifted education in three ways. Some are involved in GEPs organised in their mainstream school by teachers trained at relevant courses of the Ministry. Others attend similar education in secondary schools belonging to the system of institutions of gifted education. The third group goes to schools specialised in some area of education for the very able (Geok–Geok 2010) such as the NUS High School.

The National University of Singapore High School of Mathematics and Science (NUS-HSMS) is the second school in Singapore specialised in one subjects after the Singapore Sports School, and the first to provide specialised

gifted education in academic subjects. In addition to mathematics and sciences, students are provided high-quality development also in the humanities subjects.

The NUS-HSMS is a 6-form, co-educated so-called “independent” school (for more detail on independent schools, see Gordon Győri 2006), with an education profile including mathematics and natural sciences. It was founded by the National University of Singapore, its parent institution, in 2005 (NUS-HSMS 2008, 2009, 2011). The institution has soon become very popular, which has made it possible to select the very best: of an annual 1,700 applicants, 170 talents remain after the two-round admission examination in mathematics and natural sciences who can start their studies in the NUS School in the following year.

The School offers an integrated gifted education programme (see above) to some 1,300 13–18 year-old students who receive a special secondary-school diploma upon completion of their education there. This is not a traditional national or international baccalaureate certificate or a similar final examination certificate, but a real diploma which, as a document certifying a special qualification, is accepted not only by the Singaporean institutions of higher education as the equivalent of an admission examination, but also by the American Ivy League universities (that is, the premier American universities such as Harvard, Yale, MIT or Stanford), and also in Oxford and Cambridge.

At NUS-HSMS, six-year education is divided into two-year phases: two foundation years, followed by two years of advanced studies, and then two years of specialisation (NUS High School of Mathematics and Science 2011). The school operates a modular education system, the same as the founding university (National University of Singapore High School of Math & Science, 2008; National University of Singapore High School of Math & Science, 2009; NUS High School of Mathematics and Science 2011). The educational structure comprises four module types and a supplementary module which is of special relevance for our topic. The central modules are compulsory. The optional modules focus on one or several topics of the central modules in more detail. The enrichment modules target students who aspire to have especially broad and deep knowledge and skills in a specific area. Finally, the highest-level (honours) module covers topics from a specific scientific discipline on a level corresponding to Bachelor-level studies at university (BA/BSc levels). The content and levels of the modules are hierarchically structured; students who manage to complete one of the highest-level modules and pass the relevant examination are provided a special certificate to testify that, in addition to the diploma of the school, they completed this special level as well (“Major with honours” diploma). But they can progress even beyond that level: the highly gifted can take bachelor-level courses directly at the maintainer institution, the

National University of Singapore, and will receive university credits upon concluding them. Thus students with exceptionally high abilities can obtain a series of university credits already at secondary school and they can complete at least Bachelor education at the university at an accelerated pace. At the same time, they can remain in their own secondary-school-age community, while pursuing university studies.

Preparation for scientific research is a key component of the NUS–HSMS education programme. It takes place under the Da Vinci research programme (NUS High School of Mathematics and Science 2011).

In the 1st and 2nd academic years the 13–14 year-old have creativity development programmes such as the Innovation Programme, the Solution of Problems of the Future and others. Students in 3rd and 4th forms (aged 15–16) must complete a research methodology module, and complete a minor research project under the guidance of a mentor teacher. Outstanding students can also do the research on an external practicing site, e.g. the Science Mentorship Programme of the parent university, or under the Nanyang Research Programme or the Young Defence Scientists' Programme. Subsequently, in the first half of the two years of specialisation, every student must complete an advanced-level research programme (Advanced Research Project) in some special mathematics or the natural sciences (National University of Singapore High School of Math and Science 2009). This work is mentored by leading researchers and university professors. The research process and the results must be summed up in writing, and students must include their work in their comprehensive school-work portfolio. Furthermore, they have to present the research in one of the various scientific programmes of the school.

The research project scheduled for the specialisation years is taken so seriously by the School that students in the 5th form are highly preferred to move in to the institution, accommodating 500 students, and live there for a year and work on the research project (NUS–HSMS 2011). Beyond the fact that this internationally rather unusual condition obviously helps gifted students aged 17 concentrate on scientific activity, it has at least two other important objectives: to make it almost inevitable for the youth to be in continuous contact with their peers in the year of intensive research, to enhance the possibility of a shift towards some integrated professional area, and to socialise the prospective leading professionals of the future generations to the fact that research is no longer a lonesome activity, but one of a social kind, carried out (also) in teams. This year is also an important basis for the grounding of a professional network for the future scientific work of the young generation (for more detail on the forms of gifted education which promote professional networking, and their

human and professional significance see, in the Hungarian technical literature, Csermely 2005; Csermely 2010b).

Since the core activity of the School is gifted education in mathematics, the NUS-HSMS educational system does its utmost to make modular education and the highest-level courses available in this subject. It is a sign of fast progress that such topics as equations of higher degree and 3D vectors or matrices are taught on average 2 years earlier than in other schools. In this school the relevant knowledge and skills are taught in the introductory two years, i.e. to students aged 13–14. In the next 2 years students are introduced to e.g. trigonometry, series, many aspects of the functions – function algebra, graph functions, functions of trigonometric values (National University of Singapore High School of Math & Science 2009), and vectors, and the theory and practice of mathematical demonstrations. In the final year, students acquire extensive knowledge in advanced-level integral calculus and under the sign of specialisation, they may choose several other sub-topics from the higher-level mathematical courses.

Promotion of individual progress is a key component of the mathematical gifted education system of the school. Students who aspire to master the mathematics curriculum at an accelerated pace may apply to do so after the completion of an assessment test. Those who pass the test are eligible for admission to the accelerated modules. The latter, however, almost always clash with some of their regular lessons. Therefore, students usually do the accelerated modules outside their class, in independent study mode (ISM). Although this way they must learn alone, they have an opportunity to regularly consult the subject teachers in their class. Nevertheless, although they process the material alone and at an accelerated pace, the content and method of the relevant examination are the same as for all other students.

III. SUMMARY

The example of Singapore has many lessons for talent support in Hungary. It is noteworthy, for example, that this small city-state implemented gifted education in the past decades in exceptionally close cooperation with the economy, and in a more programmed way in comparison to other countries. This was backed by the fact that Lee Kuan Yew personally and his staff constituted an outstandingly well-educated political elite with excellent international higher education experiences, and an up-to-date vision of the future of the country. Since their vision of the future was to raise Singapore to the vanguard of knowledge-based economies globally, education and the economy, the bases of social development, have never been separated, and efforts have been made to make the entire system, economy as well as education, as meritocratic as possible.

In this context, there were no serious obstacles to the appreciation of either the home-raised talents, or those invited from abroad, even if the middle and higher classes of society sometimes saw gifted education as a threat to preserving their privileges in the future. The very early start of talent identification in the 3rd form of all schools for school-based gifted education purposes would most probably be rejected in Hungary both by professionals and the general public.

The Gifted Education Division of the Ministry of Education, with a staff of several dozens including subject curriculum developers, gifted education specialists with education-policy experience and many other specialists, has been the key factor of the development and the centralisation of the design and maintenance of the national system of gifted education for more than 2.5 decades. It should be noted that no such division of a similar structure, dedicated expressly to gifted education, has ever existed in Hungary at ministry level (although the imperative need for it has actually come up recently).

The GEP is a strongly centralised gifted education programme. It is developed by the Singaporean Ministry of Education and, consequently, the schools which adopt it with the Ministry's permission must conform to the system designed by the Ministry. At the same time, the HALs' programmes devised for the top 2–5% of students are worked out and improved by the local institutions and, while the Ministry provides far-reaching support to such bottom-up

initiatives in the form of in-service education for teachers and similar activities on demand. Similarly to the Gifted Education Programme, SBGE (School-based Gifted Education) programmes were also introduced by less than a dozen schools in the past years.

The results of the major comparative educational research projects, especially the PISA and the TIMSS surveys, highlight the outstanding efficiency of Singaporean education, especially in the areas of mathematics and natural sciences. There are some areas where the majority of Singaporean students rank as high as the best-performing high-ability student groups of other countries of the world (Kwang–Kheng–Goh 2008; OECD 2010). This is an excellent basis for the special development of the gifted. Nevertheless, the performance of high-ability students is demonstrably influenced by their family and socialisation background: even in the meritocratic Singapore, middle class origin is more frequent among students characterised by high performance than among those with average or weak results. Even so, however, this effect is clearly smaller than in Hungary.

The gifted education programme addressing primary-school pupils is transformed into a carefully structured integrated education programme in secondary schools. Integrated education is very different from the other school programmes for the same age groups. Among other things, students must take the advanced-level Cambridge exam at the end of the 12th year, and must work toward the lower levels (GCE-O, etc.) earlier. Nevertheless, the fact that Singaporean students take several internationally important and gauged, standardised examinations several times during their educational career provides a very good basis for the continuous international comparability of school achievements in the country. This helps the later identification of intellectual talents and the monitoring and mapping of their progress and performance.

Some schools offer other gifted education options than the GEP. For example, the NUS-HSMS is such a school. Education there is defined by a modular system (not common in Hungarian public education, maybe except for vocational training), which is ideal for the flexible, yet uniformly high-level development of intellectual abilities. It is not typical in Singapore either for schools to operate under a modular system, but it would be even more difficult to adopt such a system in Hungary, necessitating the radical alteration of the entire education/training/evaluation system.

In Singapore, at least at the context of NUS–HSMS, modular education guarantees excellent and flexible options for the faster university progress of the exceptionally gifted, and for their separate education which, however, implies no pull-out from their own age community. The NUS–HSMS education prog-

ramme provides for the university-level tuition of the highest-ability 13–18 year-old students, on the condition that this is integrated with their secondary education, as in the US, under the AP programme. The development and reasonably efficient application of such or similar pathways will be a key component of the future tasks of Hungarian gifted education.

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Anna Cseh*

Programmes of talent identification and talent management in Slovenia

I. INTRODUCTION

1. The society and economy of Slovenia

We, Hungarians, know either quite a lot or shamefully little about our neighbours. In many respects, we are just now getting acquainted with Slovenia as an independent entity.

In terms of its area and population, this country – small even relative to Hungary – is about one-fifth of Hungary. Despite its smallness, it is a turbulent area both geographically and in terms of its history. It is situated on the border of the Alps and the Mediterranean region, with a short but splendid shoreline to the Adriatic Sea. Its culture has been enriched by Italian, Austrian, Croatian and Hungarian influence.

The most important events of the 20th century history of the two-million southern Slav people started in 1918, with the disintegration of the Austro-Hungarian Monarchy. The former Austrian province became independent under the name of Slovenia; subsequently, the Serb-Croatian-Slovenian Kingdom, later Kingdom of Yugoslavia, was established in two steps the same winter, which became Yugoslavia from 1929. Yugoslavia became a republic in 1943, and both its name and the state federation were transformed several times later on. In the course of the major geo-political transformation at the end of the 20th century, Slovenia announced its independence in 1991. In 2004, it became a member of the European Union as one of ten newly admitted former socialist countries, then it joined the euro zone in 2007.

The country which opted for a step-by-step privatisation boasts a success story which has been one of the most acknowledged from among former

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communist countries. In Central Europe, the per capita GDP is currently the highest there. It was 27,600 USD in 2009, which ensured Slovenia the 50th place in the rank of the countries of the world (CIA 2010).

Its major export items are mainly engineering products. On the other hand, the country is, in effect, a post-industrial society, because over 66% of the GDP is provided by services, in which winter and summer tourism plays an important part. Its development is promoted by excellent infrastructure and a well-trained workforce. The recession, of course, could be felt there as well; unemployment increased to 9%. Part of its inherited industry is fighting a losing battle against China and India (CIA 2010).

2. Guidelines of education-policy in our days

Since it became independent from Yugoslavia, Slovenia has placed its legislation on new foundations. The compilation of the Constitution was followed by Acts on Education in the mid-1990s. A separate Act deals with the educational institutions of the different levels including their financing. At present, a Bill on Teachers' Career is in the pipeline.

Educational policy, which used to be highly centralised, makes efforts to grant schools and local organisations more independence. The National Core Curriculum identifies the key criteria of public education, but it allows teachers to freely select their methods and the details. The latest educational laws and directives guarantee national minorities a bi-linguistic education, so that Slovenian, Italian or Hungarian youth can learn each other's language and get to know each other's culture. It is underlined that all children including those with special educational needs, the talented and the disabled alike, have a right to receive education corresponding to their abilities. The interactive relationships of students, teachers and parents are in focus, as well as the promotion of student activity. Efforts are made to reduce the workload on schoolchildren. The importance of the holistic development of students' personality and the part of school education played in preparing for real life are emphasised. Foreign languages, information technology, healthy lifestyle and music teaching have a priority (Ministry of Education 2010).

It is an interesting element of Slovenian educational policy that two separate ministries have been responsible for education since 2005: the Ministry of Education and Sports is in charge of primary and secondary education, while the Ministry of Higher Education, Science and Technology is responsible for higher education.

2.1. The school system

Mandatory school age in Slovenia is from 6 to 15 years. There is no mandatory preparatory year at kindergarten before school, but children often start school at the age of 5 and a half, because the start-of-school age means the year in which they become 6-year-old by December 31. Almost 100% of schoolchildren attend state schools, although parents may opt for private schools as well. In justified cases, the status of 'private student' may be applied for, and neither there are objections if a schoolchild does not want to attend the school closest to his or her home.

The 9-grade primary school is divided into 3 cycles. In the first 3 years, the same teacher works with the children. Because of the young age of school starters, a kindergarten teacher also helps the youngest ones to integrate in the 1st grade. In the second cycle, a new class teacher is supplemented with colleagues teaching foreign language and physical education. In grades 7–9, there are specialised (subject) teachers to transfer knowledge.

The educational reform launched in 2006/2007 modified the mandatory nationwide exams closing the different cycles. The exams at the end of the 3rd grade were cancelled, to protect the youngest ones from the stress of being tested. Closing exams are optional at the end of the 2nd cycle, while they are mandatory at the end of the 3rd cycle.

In its structure, the system of secondary education, which offers a wide range of options corresponding to different abilities and social backgrounds, is highly similar to the earlier structure of Hungarian public education. Although it is not mandatory, almost all children continue their education in secondary vocational school or vocational secondary school followed by technical school or high school. Secondary education lasts for 2–5 years. It is closed by a maturity exam of 5 subjects (Ministry of Education 2010).

2.2. Higher education, university education

The Act on Higher Education was prepared in 1993 and has been amended four times since then. It also regulates the introduction of the Bologna System in Slovenia. The country is proud of its four universities, 37 faculties, three arts academies and ten independent institutions of higher education. The first full-time course is free of charge for Slovenian and European Union citizens. In addition to bachelor's, master's and PhD degrees, students who passed their maturity exam may opt for mostly two-year-long tertiary vocational training.

There is a difference in the training of primary-school and secondary-school teachers. It is an important rule that teacher candidates must spend a year as

school trainees after defending their thesis, and they can only receive their degrees afterwards (IAU 2006).

2.3. Special training for teachers committed to talent support

In Slovenia, training for talent support has been integrated into normal teacher training; it has been part of the psychology and pedagogy courses. Beginning from 2011, it will be an optional subject in master's and PhD training. It is a large step forward that a two-year talent support master's course starts at the University of Ljubljana from 2011.

The Institute of Education of the Slovenian Republic has been arranging specialised training courses of 25–72 hours for primary school teachers for 14 years. Minimum two teachers of each institution have taken the courses so far. 30 so-termed 'multipliers' of the Institute of Education, the travelling ambassadors of the profession, are continuously present as advisors and deliver training courses at local schools. In 2004, the Institute organised a national network of senior teachers of the topic; in 2009, the Federation of Talent Development at Secondary Schools was established. Special training is offered to school psychologists by the Centre of Psycho-Diagnostics Instruments in Ljubljana. In 2009, a research centre was set up at the University of Ljubljana specialising in talent support (Bezič 2009).

II. NATIONWIDE IDENTIFICATION OF TALENTS AND TALENT SUPPORT IN SLOVENIAN PRIMARY AND SECONDARY SCHOOLS

1. The birth of the programme; the methodological features of the research

Talent identification and talent support to be applied in the whole of public education is the most acclaimed best practice of talent support in Slovenia. It was launched as an exciting experiment in 1996, and an impact analysis of the programme, which became nationwide almost 10 years ago, was closed in spring 2011. 450 primary schools take part in everyday work.

The objective of the programme is to ensure that special talent support at schools should start as soon as possible at primary schools, in accordance with a well-built system. The Concept was adopted in 1999: A document entitled 'Tasks of talent identification and talent management' for the students of 9-grade primary schools (hereinafter: Primary School Concept) creates an opportunity for each student to be selected as a talent at any time. In accordance with the Act on Education, talented students are considered being in need of special education, so educational institutions have to provide them with individual development plans and matching teaching.

The National Council of Curricula set up a committee in 1996 with the objective to prepare a primary school concept for the work to be done with talented students at primary schools. A draft was compiled in cooperation with five primary schools in the course of four years, which was adopted at the 25th session of the Special Council of Public Education of the Slovenian Republic on February 11, 1999. In line with the Act on Education, it provides the legislative background for talent support in Slovenia (Primary School Concept, 1999).

The concept 'Education and teaching of talented secondary school students' is the next component of the system built step-by-step. It was adopted by the General Educational Council of the Slovenian Republic in 2007 (Secondary School Concept, 2007).

2. The structure and practical implementation of the Primary School Concept

2.1. The Marland concept

Out of the numberless definitions of talent, the committee opted for the Marland concept identified in 1978 in the American Act on 'The education of the talented' as a starting point. This definition (Mező 2004) makes a general difference between children who are gifted, and children talented in one of the following areas: general intellectual abilities, special learning abilities, creativity, leadership ability, visual or performing abilities and psychomotoric skills. The report declares at the same time that experts must identify talent. It also emphasises that talented students need individualised training and activities in addition to normal school education for optimal development.

2.2. The identification of talent at primary schools in Slovenia according to the Primary School Concept

2.2.1. Nomination

In the course of the first three years of primary school, teachers will observe children in their classes; then nominate them at the end of the 3rd year for in-school talent identification according to a given set of criteria. It means that children do not have to struggle with tests in grade 3. School advisors will register children who are excellent in at least one of the following: academic performance (extremely important!), arts or sports performance, success at competitions, hobbies. Lacking the above, the opinion of the teacher or the school advisory service can be taken into account. The school advisor will talk to the parents, inform them about the criteria of nomination and request parental agreement for registration. In that way, parents become collaborating partners from the first minute of the common work. In the case of 3rd-graders, 90% of parents agree to the nomination of their children (Bezič 2009).

It is a really reasonable element of the *Primary School Concept* that nomination can occur in any grade, taking into account the different development of students or the potential biased discretion of the teacher. The process continues also at secondary schools. At primary schools, 1/3 of children is nominated on average, but there are major differences. The differences may result from the prestige of a school, the abilities of students, the commitment or weak-heartedness of the teacher. In Ljubljana, the number of children registered with the school advisory service may reach 50% (Bezič 2009)!

2.2.2. The identification of talent

Psychologists test the children in grade 4 between September and December. Intelligence is measured using the Raven Positive Matrix Plus test, creativity with the Torrance test. All this takes place with the preliminary approval of the parents.

Using standardised evaluation forms, teachers will evaluate the children with the help of Likert scales in the six talent manifestation areas described above. The process is extremely prudent, because all teachers of a student must provide an opinion for the first four areas, and at least two special teachers are asked about artistic and psychomotoric abilities. This is a major difficulty for a small school, because they have to employ third-party experts and have to meet the criterion that the given teacher must work with the children to be tested for at least three months.

The reasons of taking the tests in groups need not be explained. On the other hand, if there is a major contradiction between teachers' opinion and the result of the tests, a psychologist will test the abilities of the child using the WISC III individual test.

After three months of common work, the new teacher of a child will also evaluate his or her abilities in line with a given set of criteria. After comparing several different measurements and evaluations, 25% of children prove to be identified talents (Bezič 2009), which means they have achieved 90% performance in at least one form of measurement.

2.2.3. The individual development programme

This is the point where actual talent support can start. The teacher/headmaster and the other teachers – jointly with the advisor – prepare an individual development plan for the child (INDEP), which is then reported to the child and to the parents by the advisor. It will be interesting to find out from a comprehensive study why only 60% of parents sign the programme. Are they so satisfied with basic education, or are they afraid of overloading their children, or is it simply a lack of care by the parents?

3. Embedding talent support in education

In the 3rd cycle of primary school, the range of forms of teaching applied in the education of talented students is expanded step by step, adjusted to the age group and the acceptable workload of the children. It is common practice that children are divided into groups according to their class performance in maths, Slovenian language and foreign languages in every class, both in cycles 2 and 3. Children will learn the same subjects differently in terms of depth and detail by

setting different objectives, standards, and methods applied. As for the other subjects, teachers use internal, flexible differentiation in grades 4–7. Talented students make up a separate team and work on different tasks in one-third of a class, in accordance with their field of interest and level of knowledge. Since they remain in their initial community, they will not be isolated from their peers, which would represent a major psychological burden at that age. In addition, students can be given individual tasks, can receive individualised teaching, be granted accelerated progress, parallel teaching or can participate in special team work after school on thematic days. Creative workshops, research camps and preparation for contests are given special emphasis. At the same time, the programme also takes care that the intellectual and emotional development of children should be balanced.

In grades 8–9, in addition to internal flexible differentiation and other earlier forms, external differentiation is also applied. Talented students can study optional subjects, they can prepare seminar papers and do independent research work.

Intensive cooperation with peers and teachers is facilitated by the fact that about 10 children work together at special talent development sessions, while the number of a standard class can be as high as 28.

4. Promotional feedback

In the 2nd and 3rd cycle, personal meetings of students, their parents and the school advisor become more frequent, because students require more and more personal advice regarding the selection of their career. In public education, teachers offer an hour a week for parental consultation. Teacher–parent meetings are held once a month. In addition, the school advisor will interview those taking part in talent development at the end of each school year; their parents are also asked to give their opinion on how the individual development plan has been implemented, how the system operates and they are asked if they have any requests for change. Advisors and coordinators evaluate, document and retain the opinions supplemented with the evaluation given by the teachers and the assessment prepared by them. At the end of grade 9, students prepare a summary of their work until that time and their plans for secondary school.

Those documents, however, remain with the schools, because a huge, unmanageable database would result if all data were to be collected by the Institute of Education. The annual action plans of the schools and their year-end reports include the tasks and results related to talent support. The reports will show how much a school has been able to implement the principles of the Primary School Concept; it will measure the changes in academic performance and will summarise competition results.

Four descriptive analyses have been received by the Institute of Education so far. The data of the fifth evaluation, which has been much more in-depth than before, are still being summarised when this chapter is being written. The study will analyse the processes of 10 school years since the programme was started, its results and the work performed in accordance with individual development plans. It will examine differences between the students taking into consideration how much time they spent in the programme; it will analyse also the differences between boys and girls, and the ratio of children with a disadvantage.

The success of the programme is illustrated by the fact that most children taking part in talent support and provided with special education attend high school, while the national rate of high-school students in Slovenian public education is only 35% (Bezič 2009).

5. Systematic development: roll-out of talent identification and support to secondary schools

A pilot programme of talent identification and talent support was launched in 11 secondary schools in 2007. The theoretical background was provided by the document entitled 'Concept of teaching and education of talented secondary school students' prepared specifically for that age group (hereinafter: Secondary School Concept, 2007). The principles and processes of the programme are identical to those of the 'Primary School Concept' relating to primary schools. Therefore, we shall call attention only to the differences.

The draft identifies the following professional and ethical principles:

- *The principle of the student's well-being:* The action plan and its implementation are to be to the benefit of the students; they cause no unnecessary stress and tension for them, they do not stigmatise them, on the contrary, they promote their individual development and the expansion of their knowledge in the field where they have proved talented. The individual development of students is given special attention, as well as the promotion of their personal and social development.
- *The principle of independence:* The participation of students in implementing the action plan is voluntary. Their activities after school in addition to mandatory classes of secondary education are voluntary, as well as the monitoring and evaluation of their own talent.
- *The principle of protection of personal data:* Both students and their parents or their representatives have the right to protect their personal data, and to have access to the relevant documents in accordance with the provisions of law and professional directives.

- *The principle of professionalism:* All leaders and members of management, teachers and advisors, mentors and other experts must make arrangements that the matching of educational–teaching tasks and the identification of talents should take place in accordance with the ethical principles of the trade (Secondary School Concept, 2007).

Students who took part in talent development earlier will take their documents with them to their new schools, including their own reports about their previous work and their plans for secondary school. The process of nomination and identification of talent for new entrants takes place in the same way as at primary school, with the addition that children can nominate themselves in addition to being nominated by their teachers. The third way of nomination is if a student achieves good results at national or international contests or arts programmes.

Talents are identified, of course, much faster than at primary school. Nomination and identification takes place a month after the relevant criteria have been met or after students were admitted to the secondary school.

Major differences between the institutions, mentioned already above, are even more explicit in secondary schools. 80% of students are identified talents in an elite high school in Ljubljana or Maribor. On the other hand, teachers at vocational schools assume that there can be no talented children in their schools. The opinion that high intellectual ability is the only real talent is still widespread (Bezič 2009).

Dusica Boben and the Ljubljana psycho-diagnostic centre had re-drafted and upgraded teachers' evaluation scales several times using the experience of five years by the time secondary schools were included in the national work carried out with talented students. Beginning from 2009, teachers in grades 1–6 use ten different scales to measure different areas of talent. Visual arts and acting have been divided into parts (music, painting, literature, and theatre). Film also enters from grade 7 on. An earlier scale of four has been expanded to seven to improve its sensibility and reliability. Quality assurance is also facilitated by accurate guidelines covering all details including administration and converting tables prepared for school advisors (Boben 2008).

Individual development plans prepared after the identification are signed only by 10% of selected students at the secondary schools participating in the pilot programme compared to a rate of 60% at primary schools. Psychologists explain this sad result partly with problems of the teen-age period (Bezič 2009).

6. Training forms in secondary-school talent support

The Secondary School Concept offers all forms of enrichment of talent and of acceleration that are deemed necessary by international experts for the given age group to achieve optimum development of the talented students. They are the following: study groups facing higher requirements, mandatory subjects, optional (elective) subjects, modules, special after-school (extra-curricular) workshops, acceleration – i.e. early entry, skipping/omission of a grade or certain subjects –, class exams, subject tests, further education, preparation for competitions, individual curricula for more than one grade of a subject (curriculum compacting), attending lectures at institutions of higher education, parallel programmes, Saturday school, summer schools, camps, parallel schooling, high-standard training, contests, courses and personal advisory services (in the fields of learning techniques, career orientation or personal development), programmes promoting personal and social improvement (team forms of training and advisory services).

Those forms of education guarantee that students' individual and comprehensive development, their social integration and the promotion of their independence and sense of responsibility are taken care of. Schools must establish an environment that provides their talented students with both emotional security and intellectual challenge (Secondary School Concept, 2007).

The government will provide talented students with a so-called Zois scholarship from the first grade of secondary school – on the basis of students' earlier performance – until the end of their university education; i.e., students are motivated financially. Two major criteria of receiving this scholarship are outstanding school performance and good positions at national contests.

Since the secondary school programme is still in its pilot phase, it would be too early to expect a summary. The Author would like to remark, however, that the advisory committee is in the process of drafting specific quality assurance indicators for Slovenia, which will be introduced in all secondary schools.

7. Financing the programme

In accordance with the acts on education and the relevant decrees of ministers, the government fully finances the costs of the forms of education related to talented students and the expenses of visiting students. The central budget, however, finances only a part of the expenses of summer schools, research camps, arts festivals or private arts teaching. Since the programme will only be introduced in a larger group of Slovenian secondary schools later on, the issue of financing will also be settled then. Nevertheless, the government provides

additional funding for coordination, for the costs of mentors and individual development plans beginning from the next academic year.

Despite the possibilities provided under the law, schools still require civilian help. Just as in Hungary, in Slovenia it is general practice that schools have their own foundations that look forward to donations by parents and corporations. Most of those funds are devoted to the expenses related to talent support.

8. Institutions and actors responsible for the implementation and operation of the Primary and Secondary School Concepts

The schools are the venues of the large-scale development programmes described above. The major actors are headmasters, school advisors, teachers and programme coordinators at schools. School advisors are usually psychologists: 33% of advisors at primary schools and 75% of them at secondary schools are school psychologists. They are responsible for the identification of talent and for keeping full-scale records of the school data, tests and results. Coordinators are often not the same as advisors. In those cases, coordinators are responsible for talent-development teaching, for Individual Development Plans, for analysis and the organisation of team work.

A special professional team of the Institute of Education of Slovenia is responsible for developing and implementing the strategy of talent support, and for its coordination in terms of the work carried out at primary and secondary schools. The Institute also deals with the development of school curricula and school advisory services. It arranges specialised in-service/extension training for teachers. It analyses the practical implementation of talent support programmes, the frequently encountered problems, and makes recommendations to solve them.

An Expert Committee of Talent Development was established in 2002 from the members of the preparatory committee, the experts listed above, and researchers of Ljubljana University. A special department at the Ministry of Education and Sports supervises the administrative and legal framework of the work with talented children. Experts selected from a list of school inspectors are appointed to evaluate professional content, or to review the work of teachers and prepare a report if the suspicion of quality problem arises.

8.1. The part played by the civilian sector in the programme

Parents are the civilian actors directly most affected. As mentioned earlier, their opinion and approval is an essential part of talent support from the first minute.

They are often involved in pedagogical work: they lead special groups or work as assistants side by side with a teacher.

On the other hand, cooperation with the municipalities should be much more active. Owing to the very strong central control (by ministries and the Parliament), municipalities cannot play a proper part. In Slovenia, there are no civic initiatives or foundations specialised in talent support. Former talent support student clubs have ceased to operate and, unfortunately, no parent initiatives have been launched, either.

9. Major results and priorities of the programme so far

In her presentation in 2009, Tanja Bezič (2009) underlined that 7% of schools face problems in the course of nomination. It is mainly due to the fact that some teachers find it difficult to recognise the signs of talent. 30% of schools are faced with funding problems in the course of talent identification. 60% of schools gave the self-evaluation of having been able to implement the Primary School Concept in practice at a high level, while 18% of schools struggle with major shortcomings.

In the opinion of the expert committee, one of their most important tasks is to provide intensive professional support to at least half of the schools in preparing their individual development plans. The area of talent support must be strengthened in teacher training in the near future, with particular attention to the application of digital teaching. It seems necessary that a national council be established in the field of talent support to connect education, culture, science, the economy and the NGOs. The Institute of Education should also be strengthened. Research and international cooperation should be given more emphasis as well (Bezič 2009).

10. The Brestanica project

The implementation of talent support according to the Primary School Concept was coordinated by a teacher working at the Brestanica Adam Bohorič Primary School, Urska Übleis. Her paper (Übleis 2007) deals with finding the relevant forms of teaching and summarising the work performed in the academic years of 2005/2006 and 2006/2007.

At the beginnings it was stated that – although the teachers' body was fully aware of the importance of talent support –, the proper forms of training were not found, and teachers tried to back out of the work. They felt they did not have either the proper insight or the necessary training for performing such a specific task. Therefore, the establishment of forms of activities were set as a goal that

could promote the complex optimum development of students and the professional development of the teachers at the same time.

In the past, talented students were encouraged to attend special classes, take part in competitions or perform at events, but in that way their specific needs were not satisfied properly. Not enough attention was paid to provide incentives to improve the internal motivation of talented children, to meet their emotional and social needs or to promote their intellectual development and creativity.

To remedy the above problems, the school prepared a programme of three parts, which can become the basis of several years of talent support provided it is continuously expanded and upgraded. It should be suitable to create the framework of cooperation with two other schools in the neighbourhood.

In the first phase, in accordance with the Primary School Concept, the nomination and talent identification of children took place and individual development plans were drafted. Children worked on projects from September 2006 to January 2007. They could select topics in history, the arts, technology, literature or linguistics. The exercises took place in the afternoon. Children were highly ambitious and did high-standard work. The teachers could discuss their experience and the necessary modifications every month.

In the second phase, the school organised individual work for the students matching their area of interest or talents. They could visit different institutions and meet professionals there. That phase, however, was not a specific burden on children, because it only meant one or two occasions.

In the third phase of the annual work, all students took part in a common summer camp. The school focused on creativity and the strengthening of motivation in the course of preparing the camp. Foreign students studying in Slovenia, the participants of international exchange programmes, the representatives of different organisations and volunteers were also invited to take part in cooperative teaching, field work and debates.

The closing event of the camp was the presentation of the whole year's work. The students presented their work performed in the three different phases in the presence of their parents.

Urska Übleis summarised the following success criteria at the end of the two-year experiment:

- the teacher team gained a comprehensive picture about systematic cooperation with talented students;
- the objective to make relevant professionals approach the issue openly, ready for cooperation and change, has been attained;
- the tasks drafted provided proper challenge for the children which they could solve with extreme motivation;

- the relationship of students and teachers improved significantly;
- parents became partners in the talent support efforts of the school.

The collection of the data of the two-year work, their registration and processing took place in accordance with the provisions of the Primary School Concept. The school closed the project successfully. They received answers to their research questions, and then they designed an independent talent support system based on those recognitions, which is presented in parallel with other forms of education. Students are observed in the first three years. In grade 4, the selected children work on a joint project and on an independent project. They prepare projects in grades 5 and 6, and take part in camps according to their individual areas of interest. They carry on individual work in grade 7, and take part in camps with their teachers. In grade 8, in addition to their individual tasks, they work with third-party experts at the camps. In grade 9, they visit institutions and take part in camps again.

All participants of the programme including children, parents, teachers and third-party experts joined the programme voluntarily. In 2007, a cooperation agreement was concluded with one of the neighbouring schools (Übleis 2007).

III. SUMMARY

Slovenia is probably the former Communist country most committed to development. The Republic, which became independent 19 years ago, considers education as the primary criterion of making progress. The extreme importance of the sector is marked by the fact that the operation of each component of its school system is regulated under separate Acts. A core curriculum based on wide-scale professional consensus was set up for primary schools applying state-of-the-art principles of pedagogy.

A programme of talent identification and talent support was launched in Slovenia 14 years ago. Following a four-year pilot period, it was rolled out to the whole country. Any teacher of a student may launch the process of nomination in the course of 12–15 years covering mandatory primary school education and non-mandatory secondary education. With regard to programmes operating on the basis of talent identification based on a single nomination, the sympathy or antipathy or even – let us be frank – the apathy of a teacher can be decisive. The Slovenian system makes efforts to prevent talented children from remaining unnoticed or slip across the net of identification. Systematic work immediately starts with identified talents in accordance to tailor-made individual development plans. Educational institutions make efforts to keep talented student motivated and committed to learning using the guidelines of programme and curriculum development received from the Institute of Education and the collaborating universities and to applying modern tools of pedagogy. The Primary and Secondary School Concept offers flexible application of different forms of teaching. It also means that talented children will not be confined to their own schools; they can start working with other institutions or third-party experts at an early age. On the other hand, the two concepts take care not to overload the students, and keep their emotional and intellectual development balanced.

Slovenia offers an excellent example of how a former socialist country with moderate financial resources but a lot of will has been able to provide material and human resources for talent measurement and talent support affecting the age groups of 8 to 19. The system is still struggling with teething problems, but hopefully it will overcome them soon. Both the government budget and the private sector should increase the resources devoted to talent support, because

testing in itself requires huge amounts of money. It is also a problem that the number of teachers holding the specific qualifications is low both in absolute numbers and in terms of their ratio at schools. A strategy of the active cooperation of the municipalities and NGOs also needs to be drafted.

A summary report in preparation about the experience of talent support at primary schools will provide an answer to several questions. If Hungarian education-policy makers would consider launching a national programme of talent identification and talent support covering the whole public education, experts and decision-makers should use the Slovenian example. Taking into account the experience of 10 years of operation there would greatly facilitate the elaboration and implementation of a similar primary-school talent concept in Hungary.

The adaptation of such a comprehensive programme would be welcome by the experts of talent support and by a part of the teachers in Hungary, because at present only isolated efforts are known for talent identification. On the other hand, providing the necessary financial resources requires long-term government decisions and also the commitment of the corporate and private sector. The relevant special training of teachers should go hand in hand with setting up the programme in a step-by-step system.

Regarding the varied application of training forms, Slovenian educational policy and the flexibility of its schools are exemplary. Hungarian institutions are more rigid than that; taking into consideration the individual needs of students at a primary school will require a long transitional period (if we consider realities). According to international surveys, the results of the Hungarian school system urge changes anyway. The systematic elaboration of talent identification and talent support and the application of a nationwide programme would provide a good approach to improve our performance in the long run.

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Links between of Spanish Public Education and Gifted Education: Example of the ESTALMAT Programme

I. INTRODUCTION

1. The cultural history of Spain

The historical and social development of Spain, the southwestern *limes* of the European Union and the bigger of the two states on the Iberian Peninsula, is quite special: there is probably no other country where the combination of Latin, German and Arab traditions have had such a long-lasting and major effect on culture.

At the southwestern frontier zone of the former empire of Charlemagne, Christian kingdoms emerging on the ancient Iberian, Greek, Phoenician, Roman, Vandal, and Visigoth settlements were confronted with fierce Islam invaders in the 8th century. The ensuing fights, sometimes waged on battlefields, and other times in the realms of economy and culture, have created, over a period of almost eight centuries, a slowly uniting Christian kingdom of such strength that it has exerted a decisive influence on the development of the entire modern world. With the spread of the Islam, science developed by leaps and bounds on the Iberian Peninsula. The meeting points of the Arab, Jewish and Christian cultures became buoyant cultural and scientific centres, especially in the areas where the Moor monarchs patronised them (Brett 1985). The town of Toledo excelled: Latin sources and Islamic and Christian scientific works were translated, copied and interpreted there. This intellectual vigour has been preserved for a long time, even after the Christian re-conquering of the town in 1085, and it served as the basis for the tradition of the preservation and Spanish adaptation of foreign-language cultural relics. The Salamanca University, one of the oldest of its

* Bolyai Workshop Foundation

kind in Europe, was founded by King Alfonso IX in 1218, i.e., at the time of the “Reconquista”, when the territory occupied by the Moor invaders was taken back.

The battles fought for keeping the Empire together and the concomitant sacrifices have diverted the development of Spanish society from that of mainstream European scientific, cultural and economic life, and social mobility lagged far behind that of the European countries in the vanguard of bourgeois transformation. Spanish national consciousness, unified in the Napoleonic Wars clashed with the autonomy strivings of the other linguistic communities (mainly the present-day populations of the former kingdoms of the Peninsula), and the ensuing conflicts have lasted to this day.

Spanish society was shocked in 1898 by the battle, ending in defeat, with the United States of America, in which the country lost its last overseas colonies. The shame of failure and the trauma of defeat brought to the surface innumerable internal conflicts generated by the controversial development of the country and culminating in the cathartic and bloody outbreak of the Civil War of 1936–39. The general global economic trend of the post-war era brought economic development coupled with slow democratisation also to Spain, which was recovering from the ruins of the Civil War and successfully avoided World War II. A new, democratic Constitution was enacted (1978), which made constitutional monarchy the legal form of the Spanish state, and decentralised the previously strongly centralised administration. It gave extensive autonomy to the provinces and regions aspiring for that, first of all to Catalonia, Basque Country and Galicia. On 1 January 1986, the country acceded to the European Union.

Thanks to the new and democratic public administration system, currently the country comprises 17 regional autonomous communities (each with an independent parliament), and the two Spanish autonomous cities in Africa, Ceuta and Melilla. Galicia, Catalonia and Basque Country have their traditional autonomy, own language and respective education concepts. This, of course, has changed the education system as well (García-González 2005).

2. Economic bases, European integration

Spain used to have a developed agriculture and light industry, but by the end of the 1980s, its heavy industry, especially ship-building and mining (coal, iron, etc.) had been modernised. The banking sector and the industrial companies have rapidly integrated into the European framework, and SEAT (first as part of the FIAT, then of the VW group) became one of the most significant motorcar manufacturers of the Union. REPSOL, the national petrol company is a market leader globally, and its presence in South America highlights the interests of the

country on the territory of its former colonies. Spain managed to exploit the advantages of joining the NATO and the EU. The infrastructure, settlement structure and energy economy of the deprived countryside regions underwent spectacular development. Thousands of urban-type modern settlements with every comfort mushroomed in the place of the small villages, interconnected by an up-to-date suburban railroad, highway and motorway system. The agglomeration zones around the big towns showed especially rapid development. The masses moving out of the big towns forced not only the development of the transportation system of the fast-growing settlements of the agglomeration, but also the deployment of their educational system and institution network.

2.1. Demography, immigration

In 2009 Spain had a population of 46,000,000 (including some 4.5 million immigrants). Officially, 72% of the population are Spanish, 17% Catalan, 6% Gallego (Galician), 2% Basque and 2% Gipsy. Others: some 1%. Note that South American immigrants usually drift to the Spanish segment, whereas a major part of people from Morocco and other African countries stay in Spain on a temporary basis only, and are therefore more difficult to cover by the relevant statistics. There are three big groups of immigrants: South Americans, Africans and Europeans. Most people come from the Spanish-speaking countries in South America and from Northern Africa, but in recent years many have come from the new Member States of the Union, and many others immigrated from Romania, including many Gipsies. Immigrants imply severe education-policy, social and security problems, but at the moment there is hardly any comprehensive and effective integration/assimilation activity, especially not as far as the new immigrants are concerned. Lately, since the breakout of the financial crisis, ten thousands of Spanish residents with dual, especially Argentine/Spanish, citizenship, have moved back to their native country in the hope of a better living.

2.2. European identity in foreign-language teaching

Since its accession to the European Union, Spain has adjusted its educational structure and principles to the most advanced European systems, while taking into consideration the specific Spanish characteristics. Foreign language skills, practically nonexistent thirty years ago, underwent substantial improvement. Previously, French predominated and German occupied the second place, but to date English is the most generally known foreign language. At the turn of the 1970s and 1980s, a big wave of language school foundations swept across the

country, due mainly to the massive demand for English tuition. The Spanish-speaking youth contributes almost half of the trainees of the summer language courses in Britain. It is remarkable that the level of the foreign language skills of the Spanish youth lags far behind the corresponding rates in the Nordic or the Benelux countries, and is closer to that of the Central European countries which have joined the EU recently.

Linguistic identity has remained a source of tension, especially in Basque Country and in Catalonia. The cultivation of the mother tongue has intensified in the autonomous community areas, occasionally to the extent of the repression of the official language in public life. In Barcelona, e.g., one can manage without any problem from kindergarten to university with the exclusive knowledge of Catalan. However, with the development of the audio-visual media, Spanish-language radio and television programmes have gained decisive predominance over those broadcast in the regional languages, and many fear that the latter will lose importance as a result.

All in all, there is general interest in learning foreign languages, and the country has taken substantial measures to ensure that its young professionals be able to meet the international requirements in that respect as well.

3. Structure of the Spanish education system

Similarly to most European countries, education in Spain has mostly been provided by Church institutions ever since the Middle Ages. The global segregation process has changed the structure of education linked essentially to the Roman Catholic Church in Spain, an EU Member State already, so that its development has remained organic and continuous: no major shocks have occurred since the Civil War, but state control, especially in the areas of the examination system and of quality assurance, has been enforced more decisively. Nevertheless, apart from the improvement of the quality of foreign-language tuition, the slow change of the Spanish education system has produced no globally significant turn in effectiveness. (As opposed to Spanish sports life, where programmed sports development yielded outstanding results over a short time. After the organisation of the Barcelona Olympics, public attention, limited previously to a few sports, mainly football, turned towards sports in general, and the coach as well as player results improved also in such non-traditional areas as tennis, motor sport, volley-ball, basketball, water polo, etc.)

To date, public education predominates, with a decisive weight of around 70%, in primary- as well as secondary-level education. Its quality differs considerably by region and by settlement type. Generally, parents insisting on quality education tend to have their children admitted – if they can afford that – to

private schools or Church institutions of long standing. The decentralised nature of the Spanish educational system manifests itself in self-determination at regional level, and also in a remarkable degree of institutional autonomy. Its typical characteristics include not only relatively strong parent control, openness to top-down initiatives, tolerance towards the students, but also a cautious attitude to innovation and a tendency to avoid conflicts.

3.1. The Spanish education system

In Spain compulsory education starts at the age of 6. There are some pre-school institutions for the 0–3 and 3–6 year-old, but these are not compulsory. Children are obliged to go to school up to the age of 16. Compulsory primary school education lasts from age 6 to age 11.

Lower primary school receives children aged 6 to 8. It is followed by middle (ages 8–10) and upper (10–12) primary school. From age 11 on, pupils who do not wish to take a maturity exam may study at institutions of vocational education.

One foreign language is taught from age 8 on. Modern world languages, mainly English, French or German, can be chosen generally everywhere.

Secondary-school studies can be completed in two systems. In the first, students aged 12–16 study and receive a final (so-called ESO, Enseñanza Secundaria Obligatoria) certificate of secondary-school (secondary-level) education. Unless they want to continue their education in an institution of higher education (university), they can opt for two-year vocational secondary school. The so-called university preparation stage, i.e., the second (upper) cycle of secondary-school education, lasts from age 16 to 18. This provides a complete maturity exam which makes its owner eligible for further education. Spanish secondary-school students with maturity exams can continue their studies, theoretically, at every university of the European Union, but they must pass also the admission exam of the targeted university to be admitted to a university at home. The preferred foreign destinations are the French, German or British universities. Nearby Portugal is also a relatively frequent choice, as well as the more renowned universities of South America due to the linguistic contacts. Contacts under the Erasmus scholarship programme also concentrate on the European universities, and most Spanish students apply there.

Students who have completed secondary school can continue their education at any of the 52 public (including 48 general) universities of science of the country, or its 14 private universities, or they can choose one of the 4 Catholic, 3 other Church or 2 special universities. Tuition at the 75 universities is governed in general by the Bologna principles: 3-year Bachelor training followed by 2-year specialisation (MA) and a PhD programme.

It follows from the decentralised nature of the country that the Spanish educational system is operated by the municipalities and the autonomous communities. The Ministry of Education defines no more than the general guidelines of the national core curriculum. Within the big autonomous communities of the country, there are also smaller communities, municipalities which enjoy autonomy (comunidades). Regional education is organised by the autonomous communities; they maintain the school system and resolve the special problems encountered locally. They are responsible for implementing the quality assurance system of public education, the integration and catching up of the groups lagging behind and of the immigrants, the satisfaction of local demand for vocational education, and talent support provision. The teaching staff employed in public education must have a relevant degree, and must demonstrate their ability and competence at a multi-level exam to be employed as teachers. Public vacancies can only be filled by applicant teachers who passed this examination. (In several autonomous communities, teachers with such certificates must be employed.) Teacher training therefore is subject to certain requirements, and its key elements are the life career model, continuous professional in-service training and quality assurance. The national tuition guidelines are defined by the Ministry of Education on the basis of the results of the Spanish Royal Academy of Sciences and its professional societies, but implementation is assigned to the competence of the autonomous communities and the institutions themselves, which enjoy considerable freedom within certain limits. The most modern global achievements in pedagogy and education/training quickly make their way to Spanish education, but their roll-out often takes place with considerable delay and in a far-from-efficient form due probably precisely to the rigidity of the system caused by the excessive degree of autonomy.

3.2. Talent support in public education

Under the Spanish Education Act it is mandatory to provide exceptionally talented children opportunities to progress matching their abilities. This opens the way to flexible tuition, i.e., progress at a faster pace than is usual for school groups of the same age. The 2003 Amendment of the Act treats flexible tuition time and its integration into the school system in more detail. Enhanced talent support is given increasing attention in Spanish education policy. Similarly to the other EU Member States, Spain regards talent support as the pledge of improved competitiveness and, consequently, talent development programmes are being implemented in almost every autonomous community. It is all the more justified to allocate energy to this cause as the country has permanently lower-than-

average, and even deteriorating, results in the PISA surveys. A comparison with Hungary, a country in the geographical centre of the new Eastern EU Member States in three typical areas shows that Spain performs worse than Hungary (and most Central European countries) in all three areas. According to the PISA survey, Spain ranks 31st globally in natural sciences (Hungary is 21st), 32nd in mathematics (Hungary is 27th), and 35th in reading literacy (Hungary is 27th) (OECD 2010).

Although there are several well-known methods of screening/identifying students with exceptionally high abilities, as yet the Spanish school system uses none of them in a systematic and compulsory way. There are several national programmes to provide interested students applying on a voluntary basis well-organised special tuition, often supported centrally or by the private sector. However, at places where there are no teachers dedicated to this cause, nor institutions interested in talent development, identification, testing and specialised support are only options the exploitation of which depends on the assiduity of the parents of the talented/gifted students (Fuente 1998).

4. New perspectives in talent development

Since the start of Spanish democracy in 1975, the country has done its utmost to catch up with the other European countries. Over 35 years, an almost brand new state was created, the value system, public thinking, organisational system and programmes of which are modelled essentially on the common values of the European Union. Spanish education has been adjusted to the European standards. As a result, it devotes increasing attention to the very able, mainly according to the German model. The Spanish Public Education Act acknowledges the right of students to have the highest-level public education matching their talents/gifts, and it makes special reference to obligations related to those with outstanding abilities. Almost every major university has a special panel devoted to the theory and practice of talent research, identification, assistance and support. There are numberless new programmes in this area, and Spain has joined the international and European systems of talent development.

In 2001, Dr. Javier Tourón, Professor in Navarra, founded CTY España, the Spanish sister-institution of the American Johns Hopkins University's Centre for Talented Youth, active since 1979. Spanish participation in talent support experienced an upswing in the wake of Tourón's activity, and in his person Spain has already filled the Presidential mandate of the ECHA, the European Council for High Ability. Talent support/development has become a regular scientific discipline in Spain; there are university workgroups and publications, academy-of-science societies, foundations and professional teacher communities in this

field, and the relevant achievements are regularly presented at domestic and international conferences (Tourón 2005).

The Estímulo del Talento Matemático (ESTALMAT – Stimulation of Mathematical Talent) is one of the oldest and most successful talent development programmes of the country, and the most successful one nationally. It was launched in 1998 in Madrid, by the Faculty of Mathematics of the Complutense Universidad. It is an outstanding example not only of talent screening and support, but also of the cooperation and coordinated and dedicated activity of every actor of Spanish pedagogy.

II. THE ESTALMAT PROGRAMME

1. Inception of the programme and the circumstances of its creation

In Spanish education, mathematics has for long been the subject students in public education feared most and understood and loved least. Comparative surveys were conducted in the 1990s to find out why the mathematics performance of Spanish students was so low (Calderón 1998; Guzmán 1983b). In comparison with the countries at the other end of the spectrum, the weekly number of mathematics lessons is conspicuously low in Spain; in Japan, for example, children have 8 mathematics lessons a week in general secondary schools, whereas in Spain the corresponding average is only 3. Teachers of mathematics are often frustrated and depressed, students lose the thread of the explanations very early; they seem fatally unable to understand the subject; they cannot catch up, and mostly focus on survival of the period of compulsory mathematical education. In the classes, talented and motivated students interested in the subject suffer from the retroactive force of the majority, and they are disillusioned since they cannot progress at the pace matching their abilities. The mathematics panels asked the Ministry of Education to raise the number of mathematics lessons, to have separate tuition for talented/gifted children and to introduce innovative and more effective methods, i.e., to introduce changes similar to those realised in the humanities, under the educational reform in mathematics. The results of the PISA surveys confirmed that Spain was actually running the risk of accumulating a fatal backlog relative to the OECD countries by doing nothing to improve its mathematical education and to identify and provide special education to talents in this area (OECD 2010).

The issue was examined most thoroughly by Miguel de Guzmán, Head of the Department of Mathematical Analysis of Complutense University, Madrid. Upon his proposal, the Municipality of Madrid consented to the launch of a voluntary education programme to identify 12–13 year-old young talents in mathematics at the schools, and to provide them special education on a weekly basis in the territory of the Madrid Municipality. The essence of this concept was to complement school-based education with a special mathematics programme comprising many playful elements in order to keep up the mathematical interest of the genuinely talented creative youth, to let them experience the joy of team work, and to make them fall in love with this subject once and for all.

The ESTALMAT programme was created with the support of the Madrid Municipality, and the cooperation of the Faculty of Mathematics of Complutense University, Madrid, the Spanish Royal Academy of Sciences and the Vodafone Spain Foundation. Its scientific background is provided by the Royal Academy of Sciences, and its methodological system by the Faculty of Mathematics of the University. The Madrid Municipality and Vodafone Spain provide for the integration of the programme into the educational system of the city and in part also its funding. The main goal is the timely identification of mathematically talented children, and assistance, in the form of regular collective training, to help them unfold their special mathematical talent. This is not an elitist, but a talent-saving programme, and as such it could well expect to enjoy the support and technical arsenal of the Municipality. Miguel de Guzmán modelled his two-year system on a combination of Escuela de Selección Obrera, the School for Selected Workers, a talent support pilot of the republican era before the Civil War; on a Hamburg-based talent support system, quite effective since the 1980s, and on the practice of the American Johns Hopkins University. The big pilot started in 1998. Many doubted the potential for success of a series of voluntary sessions organised outside the school and based exclusively on the interest of the children, but it was obvious from the start, already in the selection phase, that there was enormous demand for the envisaged special education, and parents welcomed the possibility.

2. Commencement of the programme

The programme started as a pilot targeting exclusively the age group of 12–13. Mathematical abilities, the components of problem-solving thinking, attention and perseverance are manifest already at that age. First of all, high-ability children with an affinity for mathematics had to be recruited from the schools of the Madrid Municipality. The Spanish Royal Academy of Sciences addressed a letter to mathematics teachers at the schools concerned, inviting them to recommend the programme to their best pupils. Simultaneously, talented children with an affinity for mathematics were sought via newspaper ads. In the recruitment period of the first year, 70 children applied from the district of Madrid. 25 children were selected through a multi-stage selection procedure for participation in Spain's first modern voluntary mathematical talent development programme, created with the assistance of the best professionals and most renowned institutions of the country. On the first weekend of the course, the selected children were invited to a two-day kick-off camp at a municipality-owned guest house in the vicinity of Madrid, where they got acquainted with one another and learned many interesting things about the programme. The organisers paid

special attention to the involvement and briefing of the parents in order to win their support and cooperation (ESTALMAT Madrid 2011).

The programme was absolutely free for the children, and involved sessions from 10 to 13 every Saturday. Special attention was paid to one of the key principles of the programme, namely that no child was not to be pulled out of, or alienated from, his/her school community. The aim was not to create a new, closed, mathematical „racing stable”, but to maintain the affinity of the children for mathematics, to create a new community which they liked, and to provide deeper mathematical knowledge and enhanced skills via the learning-by-playing technique. Student contacts with the universities and specialists of their chosen subject established via the teachers promoted their orientation, career choice, and regular sessions with motivated peers of identical interests boosted their school progress. The founder of the programme, Miguel de Guzmán, stressed from the starting year that for the system to become really effective, its funding had to be guaranteed for a longer period of time, and the programme itself had to be rolled out to other parts of the country (Guzmán 1983a). It followed from the gratuitous nature of tuition that no mandatory requirements could be imposed on the children. To ensure the continuity of the programme, a major role was assigned to teachers holding the lessons, their motivating capacity, pedagogical talent and personality, and the pedagogical values of the specified topics: this is the essence of the programme. The personal approach is crucial, so it is imperative to have authentic teacher personalities. Teacher selection and continuous community development are the innovations which made the ESTALMAT programme a nationwide success, despite the early death of its founder in 2004.

3. Funding of the programme; role of the corporate sector

Although the ESTALMAT has been called to life by the relevant social and professional demand, its launch was difficult due to funding problems occurring already in the planning phase. Without supporters or adequate experience, no actor of the programme could assume the costs implied by the preparation of the teachers, the drafting and delivery of the letters of invitation, contact keeping with the schools and the applicant students, the multi-stage screening of the applicants and, finally, the regular weekly activity. Finally, in response to the urgent calls of the designers and supporters of the programme, the Royal Academy of Sciences granted 15 million peseta for 1998, and so the programme could start. Thanks to that, the 25 children selected by that time could have special sessions of 3 hours every Saturday for two years at the Faculty of Mathematics of the Complutense University. They were taken to the sessions by their parents, instead of spending their time playing football or watching TV, as

other children did. The teachers worked with them in groups of 8 or even, occasionally, of 3. The children looked at mathematics as their favourite game, their hobby. The cooperation of the Spanish Academy of Sciences and the University, and also the initial successes have raised the interest of the Madrid Municipality, and in a short while the programme could continue with significant municipal support. Vodafone, one of the largest multinational companies in Spain, joined in the construction of this integrated system. The participation of Vodafone Spain Foundation enhanced the prestige of the programme and provided it a financial stability which led to ESTALMAT being embedded in the Spanish educational system. The commitment of such a major telecommunications company has made it clear to all that this educational programme had perspectives and could be useful also in economic life. Both the parents and the schools came to understand that their efforts were investments into the future of the country and their children, since even the giants of the corporate sector were willing to provide them considerable support. The relationship with Vodafone gave the children not only motivation and financial safety, but also the opportunity to get acquainted with demanding intellectual design and work processes which gave them a hint as to the interrelationship of mathematics and economic life (for more detail, see ESTALMAT Madrid 2011).

4. National roll-out of the programme

From the moment of its inception, the pilot programme which was a success in Madrid was meant to be rolled out nationally. The goal was to create a National Talent Centre Network that would assist with the identification and development of mathematical talent nationally. Miguel de Guzmán dreamed of a network capable of mobilising the entire profession, of enhancing the prestige of this subject, of improving the quality of education and offering wider perspectives to teachers, that is, one that would boost the innovation capacity and hence the competitiveness of modern Spanish society.

Upon completing the two-year course, students obtain a final certificate, a so-called „ESTALMAT Diploma”, in possession of which they can remain in touch with the system, with their teachers via the Internet, and take part in common sessions once a month. Surprisingly, and probably due to the most prudent selection, there were hardly any drop-outs in the first two forms. Consequently, the pilot was deemed a success by all of its founders and financiers.

The success of the Madrid pilot has soon raised attention nationally and the biggest universities of almost every autonomous community area set out to adopt it. In 2003, with the help of the Vodafone Spain Foundation, the programme was extended to Catalonia and Burgos, and in 2005 to Western Andalusia (Sevilla) and the Canary Islands. The administration of Canary

Islands, and the society of its mathematics teachers named after Sir Isaac Newton provided full support for the introduction of the programme. In the same year, it was also introduced at several university seats of the autonomous province of Castile and León, in Valladolid, Segovia, León and Zamora. In the next two years, Eastern Andalusia (Granada) joined it as well. The Society „Miguel de Guzmán” in Castilia-León, named after the founder of the programme who had deceased in the meantime, became one of the main engines, organisers and promoters of the spread of the programme. The first selection examination was organised in 2007 by the ESTALMAT programme of Galicia. In 2008, also Cantábria joined. To date, ESTALMAT is present in most provinces of the country (see *Figure 1*).



Figure 1. The spread of ESTELMAT in Spain (Ministerio de Education, 2011)

Within the provinces the provincial mathematics societies and the universities are the most active in adopting the programme, in identifying the talented youth and in convincing school teachers. With the extension of the programme, Spain took a major step forward in the identification and development of

mathematical talents. This has been demonstrated in a most spectacular way in a few years' time at the national and international mathematics contests.

5. The design of ESTALMAT

The long-term success of the programme depends on whether the quality of organisation, background work and work with the children can keep up the interest of the children and their parents, of society and of the profession. The foundation are provided by university teachers and by the mathematics teachers of the institutions of public education. Their cooperation in the specification of the curriculum and the management of the groups determines the success of the entire programme. Therefore, the preparation of teachers and of the system for receiving the children is at least as important a component of the programme as the compilation of good curricula, the selection of the children, and the implementation of the sessions. In addition to the organisations mentioned above, the Consejo Superior de Investigaciones Científicas (CSIS), a national scientific organisation which coordinates and rates scientific researches and sometimes assists with their funding is present as a partner in every autonomous community.

Adequate inter-university publicity fora had to be created as well. As for the internal publicity of the mushrooming ESTALMAT organisations, the Internet was the lead actor there. Information on every ESTALMAT programme is displayed on the portal of Estimulo Talento Matemático at www.estalmat.org. In addition, every centre has its own public forum, mainly on the Internet. The number of applicants to the programme grew in direct proportion with its popularity: today, there are more than 500 students in the ESTALMAT programmes of the autonomous communities.

5.1. Admission procedure

Every ESTALMAT education programme adheres to the recommendation of the founder, whereby there can be no more than 25 students in a form to be launched irrespective of the place where it is organised. Since the roll-out of the programme in 2003, the final order of the admission examinations and the selection process have crystallised as well. Children who arrive at the gates of the programme with the recommendation of their teachers or in some other way, write a special and rather extensive 2.5-hour test designed to reveal their problem-solving skills, mathematical talent, concentration capacity/span and creativity. Older and younger applicants write the same test, since the tasks do not relate to specific mathematical knowledge already acquired. The tests are, of

course, written anonymously and handed in in a closed envelope with an identifier. This is followed by a most circumspect personal hearing, including a discussion not only with the children, but also with their parents. (Without adequate family background and support, the child cannot meet the requirements of the programme on a continuous basis.)

5.2. The ESTALMAT's way-of-life effects

In addition to the weekly sessions, regular mathematical seminars and conferences are held for the children and teachers who take part in the programme. The ESTALMAT Student League was created in response to students' demand. The League undertakes to tighten the student-professional contacts established during the two-year educational programme, thus trying to ensure that they are maintained subsequently. The long-term goal is to create a professional network which provides lifelong assistance to its members at scientific, organisational and integration levels, and promotes the rise of the social prestige of mathematics. The ESTALMAT programme and the Student League carry on a lively scientific activity, providing their members information on Spanish and international mathematical events, calling their attention to problems to be solved, to professional programmes, scholarships, tenders and contests. At the end of the two-year course, the leaders of the territorial autonomy and the managers of the sponsor institutions hand over the ESTALMAT diplomas at a ceremony covered by the local and the national media, and by press publications dedicated to mathematics and to university life.

5.3. Internal structure of the programme

Every territorial programme enjoys full autonomy, but there are some professional guidelines which outline the recommended topics. The essential requirement is that the tasks and problems to be solved/processed must relate to the previous knowledge of the students, who should be able to understand their relevance at once, and must promote the consideration of new problems which can capture their attention for a longer time. A major part of the proposed problems should lead them on to the deeper layers of such issues as the virtual world of computers, the design of video games, the main principles of geometry, the problem of the dimensions, the mathematical concept of physical phenomena etc. Interesting topics, collective thinking in small groups and success based on team work are a great motivating force that drives the students (Universia España 2011).

Table 1 presents the ESTALMAT topics of the academic year of 2010/11 in the territory of the Valencia Municipality.

Table 1 ESTALMAT topics in the academic year of 2010/11 (Source: <http://personales.upv.es/almon/Calendario Primero 2010-11.pdf>)

Serial no.	Date	Topic
	2. 10.	Initial camp
	16. 10.	Official opening of the course of 2010-2011, with lunch
1.	23. 10.	How to start? Strategies, I
2.	06. 11.	We learn to become mathematicians, I and II
3.	13. 11.	Strategies, II (numbers and parity) Computer geometry
4.	20. 11.	Calculation techniques, I The art of the snails
5.	27. 11.	Introduction to the graphs; I Pythagorean triples
6.	11. 12.	Probability, I and II
7.	18. 12.	Mathématiques à l'esprit (Maths in a sprint)
8.	15. 01.	Logical games, I and II Elementary, my dear Watson
9.	22. 01.	The start of the rope, I Computer geometry
10.	29. 01.	Entangled with the graphs, II Plane geometry, I
11.	05. 02.	Visit to a scientific centre of the CSIC
12.	12. 02.	Mathematics in the cinema
13.	19. 02.	The mysterious world of the fractions, I and II
14.	26. 02.	Calculation techniques, II Space geometry
15.	05. 03.	Sundials Excursion
16.	12.03.	Arithmetics of the clock Beauty of the golden numbers
17.	09. 04.	Start of the rope, II Optimisation
18.	16.04.	Mathematics Olympiad
19.	07. 05.	Polygons Plane geometry, II
20.	14. 05.	Arithmetics of the clock The problem of the point and the process
21.	28. 05.	Closing session Farewell lunch

As can be seen, the syllabus also includes community-building elements such as the excursion, the visit to the research institute or the welcome/farewell lunch. An entire session was dedicated to the Mathematics Olympiad, because Spain set out to catch up with the nations in the vanguard of mathematical education with great élan. Although the programme was designed purposely to raise scientists who are not alienated from their community, it insisted on giving them the opportunity to acquire competitive knowledge and to motivate them accordingly. Considerable publicity is given to assistance to students to prepare them for the mathematical contests open to them through the close cooperation of the programme with the school teachers responsible for preparation. Appropriate information and motivation – these are the key points. Once you get the feeling of contests, it is almost addictive: students cannot be refrained from participation and from making constant efforts to increase their knowledge. As in first-class sport, positive personality development processes are triggered, which make the student capable of holding his ground among the best.

6. Impact of the programme on the development of Spanish mathematical life

Mathematics in Spain saw a rapid development in the past decade. Progress in the areas of talent identification and support was reflected almost instantly by the achievements and international activity of Spanish mathematicians. Spanish participation at mathematics contests showed especially marked development. In 2006, the country hosted the International Mathematics Congress, and the performance of Spanish children at the Mathematics Olympiads has improved. In 2008, Madrid organised a Mathematics Olympiad for students, where the Spanish team won three bronze medals and three commendatory diplomas. Four members of the six-strong Spanish team were members of the Madrid-based ESTALMAT programme. Although Spain does not carry sufficient weight to influence the ranking order of the countries as yet, the first results of systematic work and growing commitment to natural sciences and mathematics – as reflected also by the identification of and support for mathematical talents in the context of the ESTALMAT programme – are perceptible already. Today it seems quite natural that central, regional and municipality support is allocated to this area, which shows that the impact of the Barcelona Olympic Games on sports life is not a unique phenomenon. Spain would like to occupy a top position among the most advanced countries in every area, and makes serious efforts to ensure that in the areas of education, research and talent development support.

III. SUMMARY

Spain realised but slowly the loss of its world power position in the Middle Ages and the early Modern Age, and it became more or less isolated in Europe, lagging behind. Under the effect of the external and internal constraints (opportunities) associated with democratic change in the 20th century and accession to the European Union, however, it set out to catch up fast. It took special care to adopt European best practices while developing its economy and social life. In a short while, as a member of the Union, it was faced with the shortage of professionals and especially of well-educated technical professionals, and the absence of a teacher and civil servant stratum capable of complex orientation, with adequate foreign language skills, flexibility and commitment to lifelong learning. The modernisation of the educational system seemed the only way out.

Spain has managed to adjust its school network to the European average through the steady improvement of public education, its modernisation, the enhancement of the appeal of the teaching profession (a competitive salary as compared to the national average), and a decentralised and well-functioning quality assurance system. It has made serious efforts to enhance the social prestige of language learning and to ensure the foreign-language skills of future Spanish professionals. Today, teaching is an attractive career and it offers a secure living in Spain, the professional prestige of teachers has been on the rise until recent years, and the opposite tendency, encountered today in the public education of the most advanced countries, has manifested itself but slightly. Spain is one of the preferred destination countries of legal and illegal migrants. The resulting problems have exceeded the load-bearing capacity of the country. Public education and public health care especially are laden with problems. Bridging courses and quality education require more and more energy and, concurrently, the children of the immigrants, in need of bridging and special treatment, represent a growing share of the pupils/students and exert steady pressure on the system which develops under the constraint of adjustment to the main trends in European education.

Teacher training might represent the basis of the quality education of the generations of the future. Relevant, major, efforts notwithstanding, there are wide gaps in teacher quality, often even within one and the same municipality.

In the lower forms, arts education (singing and music, folk dance, flamenco, etc.), in line with the national traditions, is quite effective nationally, and talent identification is taken more seriously than before, although that is not quite general as yet. In public education, mentor-type teachers are a rarity; the mentoring programmes have made some progress only recently. The idea that the school not only provides foundations and later on a vocation, but prepares students for lifelong learning is permeating Spanish society but slowly. The folk high school movement typical in Denmark or Finland has not taken roots yet, but there have been many civil and church initiatives modelled on the example of the Nordic countries.

The ESTALMAT programme, which pays such attention to children talented in mathematics as would be difficult to provide in the context of traditional public education, has been called to life by the desperate situation of mathematical education. The children selected for the two-year training course focus on mathematical problems presented according to a well-compiled curriculum, in three hours a week, on Saturdays, in small groups, with mentors. The success of the course is guaranteed by the cooperation of the children's schools, the regional self-government, the Royal Academy of Sciences, the Supreme Scientific Research Council and the Vodafone Spain Foundation. The participating children are given an insight into mathematical issues, but they can also acquire comprehensive knowledge on the operation of society, the importance of science and the relevance of community work, performance and diligence. They can work with peers with similar lines of interest and, although they keep studying at their respective schools, they can start their young adult lives with considerable professional contacts. In the life of most school-age children, these things occur later or not at all. The Spanish public education system, although based on European models, still reflects the rigidity of the Prussian system, although this aspect may not be so striking at first sight due to the decentralised nature of the country. The system is characterised by considerable inertia, but the very constraint acting in favour of talent development shows that, with adequate motivation, it can be flexible and inclusive.

The subject-specific Talent Point Network represented by the ESTALMAT system in the country provides a comprehensive picture of the conversion to practice of the Spanish theoretical achievements to practice in the area of talent development support.

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Csilla Fuszek*

Programmes of the Boston Center for Technological Literacy

I. INTRODUCTION

1. The society and economy of the United States

Immigrants are still arriving to the United States, the country of legendary opportunities, from all over the world even today; to the country that is the 3rd largest in the world with a territory of 9.83 million km² and 3rd largest in population with 310 million people. Thanks to the various groups of immigrants, it has one of the most multi-coloured societies in the world in terms of both nationalities and cultures. The United States of America has no legally identified official language. The administration uses English as its official language, but it also allows many linguistic communities to use their mother tongues in their communication with administrative bodies. The form of governance of the country that consists of fifty states and a federal district is that of a union of independent states.

Of all western European cultures, historically the British culture influenced the country most, as the foundations of the American culture originate in the English language, the legislative system has been taken from Britain and the origins of the basis of the school system established in the United States can also be traced back to England. Thanks to the high number of immigrants with Spanish as their mother tongue, today the cultural impact of Spanish is increasing.

The economic, cultural and political influence of America has been decisive all over the world for at least a hundred years. In terms of technological development, the United States is unambiguously first in the world. It occupies a prestigious 11th place in world rankings in terms of GDP with a per capita figure

* Csányi Foundation

of USD 46,000. In spite of that, the proportion of people living below the poverty line in the country can be estimated at 12% (CIA 2010).

The considerable independence of its states, its multi-cultural nature and the huge social differences between its various nationalities are basic criteria in the determination of the educational policy established in the USA and, as a result, the educational system itself.

2. General features of education in the United States

There may be no other country in the world whose educational institutions have appeared in as many films as those of the US; as a result, almost everybody in Europe has some sort of – in many cases fairly stereotypical – picture of the system of education in America. Colourful school programmes in the afternoon, sports events arranged between schools, excellent universities, the successful performance of students from disadvantaged ethnic groups even at national level, etc., are recurring elements on the movie screen. At the same time, that reflects the fact that general and mandatory education is a really important social institution in the United States.

Although education is of outstanding importance, it is a characteristic feature of the American Constitution that it includes no guidelines regarding education; on the contrary, the 10th Amendment to the Constitution – indirectly – exempts education from the scope of authority of the Federal Government and delegates it to the competence of the States (Zsigmond 2006). In other words, education is not regulated at federal level, i.e., the legislatures of the states, their public administration or the local communities are responsible for the determination of educational programmes (Gordon Győri 2003). Even mandatory school age may vary, subject to the given state, up to the age of 16 or 18 (Info USA 2010). Despite the system of local responsibility, and as a result of the mobility typical of the society (students and teachers), common values and priorities (democratic forms of government, freedom, respect for the Constitution and the American symbols, etc.), as well as the basic structure of education, school programmes and curricula are quite similar to each other in the various states (Zsigmond 2006).

The backbone of the system of public education is a 12-year primary and secondary education that can be preceded by one or two years spent in a kindergarten. In addition to public-education institutions, private schools, which require government licence and accreditation, may operate in every state. Private schools are not funded from public moneys and the Act on public education does not apply to them, though those schools may also receive state/federal subsidies for specific purposes.

According to 2006 data, 89% of American students had some form of secondary education (US Education System 2010). In effect, that means graduating from high school, which verifies the successful completion of the required courses. Universities apply their own systems of admission and young people can obtain four different levels of degree (associate, bachelor's, master's and doctorate).

Division and poor central regulation resulted in the fact that the performance of American students in maths and sciences was among the poorest in the 1970s and 1980s. Benő Csapó and Anna Zsigmond also point out that the practices of the states and school districts significantly changed as soon as the weak points of the educational system in the USA had been revealed by major, international, comparative studies. Beginning from the end of the 1970s, the states introduced competence tests measuring basic knowledge content and skills; their content was expanded during the course of the 1980s, and tests have been rolled out extensively (Zsigmond 2006). Following major and regular endeavours, in which the findings of educational research have been given an increasingly important part, the American educational policy has now reached about medium level in terms of performance (Csapó 2007).

The test system has been a decisive element of educational policy, confirmed in the Act on public education signed on 8 January 2002 by President G. W. Bush (No Child Left Behind – NCLB 2002).

In the Act, emphasis is placed on the application of proven effective methods, while it continues to reiterate the constitutional principle banning the Federal Government from regulating the contents of education or the system of requirements applied at schools in the individual states. Its core elements include the principle of performance, accountability and responsibility for school success (or failure), which can be identified by measuring the performance of students (and teachers) (Zsigmond 2006; NCLB 2002).

Since, in accordance with the Act, the states themselves will identify the content of the education and standardised tests, several test systems exist in parallel with each other. Such are, for instance, the Regents Examinations in New York state, the Florida Comprehensive Assessment Test (FCAT) in Florida or the Massachusetts Comprehensive Assessment System (MCAS) in Massachusetts. If a child does not show progress in accordance with the tests, the school must undertake to help him or her to make up his or her shortcomings and increase his or her knowledge to the appropriate minimum level maybe within the framework of a summer catch-up programme (NCLB 2002).

3. General features of talent development in the country

Talent development appears only indirectly in the federal Act on public education: “In America no child should be left behind. Every child should be educated to his or her full potential” (NCLB 2002). The objective of the set of initiatives stipulated in the Act is, as mentioned earlier, to increase the level of knowledge in terms of the whole American nation.

In terms of theoretical and practical research related to talent development, the United States is one of the best in the world. A number of excellent talent development programmes, research centres and talent development schools have been operating in the country for the past fifty years – it is practically impossible to list all of them. Due to the size of the States, one or another good practice in talent development can be tested through an extremely high number of schools/students, which is almost unimaginable in the Hungarian context. Such are, for instance, the primary and secondary schools explicitly focusing on talent development and applying the SEM model (School-wide Enrichment Model) developed by Renzulli. Currently, several hundred thousand children study at institutions of that type in the 40 states and 450 school districts of the USA (Field 2008).

Various chairs or centres specialising in talent development, headed by internationally acknowledged experts with several decades of research background, can be found all over the States. Such is the Center for Gifted Education in Virginia headed by Professor Joyce Van Tassel-Baska. Another one is in Ohio, the Neag Center for Gifted Education and Talent Development, hosting the research team of Professor Renzulli at the Connecticut University, or – also in Ohio – the research team led by Professor Piirto at the Ashland University, to mention just a few outstanding examples.

Due to the size of the country and its previously mentioned multinational character, research and talent development programmes cover an extremely broad range in terms of their objectives and standards. Typically, as a result of the Act ‘No Child Left Behind-1’, an increasing number of programmes are arranged for disadvantaged linguistic–ethnic minorities of different backgrounds. One such is, for instance, the Wisconsin Center for Academically Talented Youth established in Madison in 1991, which is focusing more and more on the talent development of disadvantaged students.

The Center for Excellence in Education established in 1983 should be given special attention among talent development institutions. The centre mainly promotes the career of students in secondary and higher education who are especially talented in natural sciences, engineering, technology or mathematics.

It also supports international cooperation in the teaching of natural sciences and technology (Center for Excellence in Education 2010).

The National Center for Technological Literacy was established with a similar, but even more ambitious objective in 2004, aiming to find children interested and talented in technology throughout the whole territory of the United States.

II. THE PROGRAMME

1. National Center for Technological Literacy

The National Center for Technological Literacy (hereafter: NCTL or Center) was established within the Boston Museum of Science in 2004. It closely collaborates with other centres and museum programmes located in the Museum. Its activity can also be assessed independently, in the context of the educational system of both Massachusetts and the whole of the United States. The parent institution, an independent non-profit institution, receives its funding from the government, as well as from corporate, foundation and private donation sources, and has a tradition of almost 150 years. It is currently first in the world among museums dealing with the natural sciences. It absorbed the Boston Computer Museum into its organisation in 1999 and opened the Gordon Current Science and Technology Center in 2011.

In 2003, the Dean of the engineering faculty of Tufts University, Ioannis (Yannis) N. Miaoulis – who is both an engineer and a passionate pedagogue – became the Chairman-Director of the Museum. The NCTL is the result of a well-designed mix of the earlier work of Miaoulis and the traditions of the Museum.

In Miaoulis' opinion it must be ensured that extremely creative students receiving a high standard of education apply for engineering studies in order to preserve the leading role played by the United States. It is also at least as important that the engineering faculties not lose their students to the benefit of the arts faculties (Boston Museum of Science 2010).

The problem is well-known also across Europe and in our country, Hungary, too: fewer and fewer students are interested in engineering and the natural sciences. Efforts have been made and research is being done in several of the countries of the European Union to reverse that trend. In effect, we are witnessing a major loss of talent in the field of engineering and natural sciences in Europe.

2. The part played by Miaoulis; background of educational policy

Due to the fact that education is being regulated at the state level, the background of the operation of the NCTL can mainly be found in the educational

policy of the State of Massachusetts. In the study published in 'Holistic Engineering Education', Miaoulis termed it 'a turning point' when in December 2000 the Massachusetts Board of Education determined that the local curricula should include a new study content called 'engineering studies and technology' (Miaoulis 2010). At the same time, it was also approved that the requirements related to the new curricula should be incorporated in government tests (MCAS) measuring the success of education.

Miaoulis had already had experience with the introduction of study content, because he had been a member of the Board of Education in 2000, able to learn about the difficulties related to the implementation. The decision of the Board had not been uniformly positive, because the proper resources for implementation had been lacking. Although experimental curricula directed to raising the interest of children in engineering were also launched in the 1990s at various universities across the United States, they were isolated and did not represent a uniform system with the requirements of public education (Miaoulis 2010).

The objective of Miaoulis was that the NCTL, the institution established by him in 2004, should start its operation with no less a goal than promoting the implementation of the new study content: 'engineering studies and technology'. The Center had to develop curricula, teaching materials and textbooks with a more innovative content compared to earlier ones, using the resources of the Museum, and providing the necessary teacher training as well.

In addition to the development of curricula and teacher training, i.e., the successful implementation of the study content, the third 'mission' of the institution has become that of influencing educational policy both in the various states and at federal level. The Center had two major means to achieve its goal: the first was to provide continuous information for the decision-makers at the different levels of educational policy, and the second was to hold together and build a network of different institutions (primary and secondary schools, universities and museums) thinking along similar lines and aiming at similar objectives (Boston Museum of Science 2010; Miaoulis 2010).

3. Research methodology

Unfortunately, I was not able to study the operation of the Center on site or to visit the schools using the curricula developed by the Center and linked to American public education on site, though I had an opportunity to meet Mr. Miaoulis in Europe and to listen to his ideas and future plans.

After our personal meeting, the Chairman-Director sent me his most important articles, papers and 25 different publications (textbooks and study programmes) of the Center related to public education so that I could study the

operation of the NCTL more in detail. That is why I have been able to present a close-up shot of the operation of the NCTL. Those interested in the work of the Center and the Museum can be greatly assisted by the website of the Museum (<http://www.mos.org>), which is extremely well edited and documents both of scientific results and of the individual steps are involved in spreading the new subject.

4. Why is it worth getting to know the work of the NCTL?

In most countries, centres similar to the NCTL, related to the natural sciences, and offering out-of-school educational programmes, are referred to as the flagships of talent development. There are similar centres for the natural sciences all over Europe; in many cases, they are independent institutions, such as the Palace of Miracles in Hungary, and institutions of the kind can also be found, for instance, in Switzerland, Germany or Poland, where the Warsaw Copernicus Center involved in the development of scientific talents opened its gates in 2010 (<http://www.kopernik.org>).

The NCTL, which is explicitly organised to teach and introduce engineering studies, the man-made world and its technologies, is unique in the world in several aspects. Its objective is to offer a tangible experience of the relationship between technology and the natural sciences both to children and to adults. With a high standard, child-centred approach it focuses on an area of education that, in effect, is still omitted in many places from the curricula in most American states and European countries. Therefore, children who are interested in those directions or are talented in those fields are not given opportunities to develop their talents. Miaoulis believes that it is of key importance – because it is a token of the competitiveness of America – that education be able to arouse the interest of as many students as possible in engineering studies and engineering work (Boston Museum of Science 2010).

The complexity of the activities of the Center and its manifold effect on public education are outstanding. It is wonderful that a non-profit organisation develops teaching materials matching the curricula of primary and secondary schools, and provides extremely high level funding of several millions of dollars to publish high-standard textbooks. In addition, it helps teachers working in public education with systematic extension courses built upon the developed teaching material and providing them with a forum to share best practices.

All the activities of the Center are directed at improving the level of education, ensuring that the subject ‘engineering studies and technology’ is being presented to students in an interesting way. Its operation is much more than that of other excellent institutions with a similar goal; through public education it multiplies the impact it would be able to achieve on its own.

I think it is very telling that the NCTL can work so effectively and can exercise its influence on federal public education in a country where the structure of the educational policies of fifty federal states and the presence of almost sixteen thousand school districts renders the implementation of fast and effective central change or reform of education almost impossible (Zsigmond 2006).

5. General introduction to the operation of the NCTL

As mentioned earlier, the NTCL on the one hand operates as an independent unit within the Boston Museum of Science, but it also fits organically with the other projects of the Museum. The independent tasks of the institution are embodied in practice in K-12 programmes related to public education (K-12 is a traditional reference to the 12 grades of primary and secondary schools).

At present, the operation of the Center is based on the following four pillars of projects/programmes, which are comprehensive in themselves: the Gateway Project, the Engineering Curricula, the Educational Standards and the Professional Development Programmes. The four programmes constitute a system building closely one upon the other and developed in parallel to each other; with time, the projects begin to continuously exercise an influence on each other.

All of the projects have the common objective of increasing awareness of the importance of engineering studies in society, the fact of how important it is to find talented youth who in those areas of science may have an extremely important part in economic development later on. In a comprehensive publication on the results of the Gateway Project, Miaoulis also emphasises the importance of providing each child with the opportunity to have a career that is both attractive and represents an intellectual challenge. To achieve that, it is absolutely necessary that children be given an opportunity to learn about engineering sciences already at a very early age – even in kindergarten (Opening the Gateway 2010).

6. Description of the projects

6.1. The Gateway Project

Thanks to an anonymous donor, the Gateway Project is one of four projects currently operating. Its longer name is ‘Gateway to the education of engineering studies and technology’. In practice, it is nothing other than networking among school districts in the State of Massachusetts, coordinated by the Center. The objective of the networking is to create a forum for the heads of the school districts and for the teachers to share and discuss the problems encountered in

the course of implementing engineering teaching content and curricula developed by experts in public education. Colleagues are given opportunities to present their best practices and primary experiences. In addition, the project also provides opportunities for interested colleagues to build contacts with each other.

In the first step of coordination, the Center contacted school districts that had already proved themselves in teaching engineering curricula, could present success and had good practices. The officers of the Center asked consultants to establish teams of the teachers successfully teaching the subject and of the heads of education working in the area. Then the Museum hosted 10 teams during the summer holidays, providing a week-long opportunity for colleagues to analyse the challenges of engineering curricula and the successes achieved in teaching the subject. Over the next two years, another 40 school districts joined the work, which has been followed by one-day meetings and online fora ever since.

The Center funded the first three years of the project from money obtained from federal resources, and then it was continued with private donations. Now, 65 school districts in the State of Massachusetts have joined the project with one team. Almost 300 teachers have been involved in the programme and with their help over 397,000 students, 40% of the students studying in the State of Massachusetts have been reached.

The set-up and structure of the project also termed 'Gateway model' has been begun to be applied by other centres, federations and associations dealing with the teaching of science or mathematics (Opening the Gateway 2010; Boston Museum of Science 2010).

The results of the first 10 teams have been presented in the publication of the Museum *Opening the Gateway* (Box 1).

Problems of real life – Fall River School

"...one environmental engineering class recently tackled the faulty design project of a nearby landfill that was polluting a local stream. Their data and recommendations proved so persuasive that they were used as a part of a class action lawsuit against the landfill. Another engineering class is working with a local engineering firm to develop a system of 're-naturalising' some of the former wetland areas on which the campus athletic fields were built.

According to Christopher Boyle, director of the science and engineering department, these real-world projects reach students who are unmoved by traditional lecture-style classes. Students care deeply about the projects, because they are working to solve problems right in their own backyards, which motivates them to tackle the tough science and math concepts that otherwise might seem intimidating. 'It used to be that it was up to the students to find their own way to stay interested in what they were learning. But now we know more about how students learn and we know that you need to design lessons that have a built-in-hook. It is just a more effective way to teach.'

Box 1. Opening the Gateway (quotation)

6.2. Engineering curricula

The second and maybe the largest project is the development of the engineering curricula and their continuous upgrading. Over the past few years, experts contacted by the Center have developed engineering teaching content that can be used from the first grade of primary school until the end of the secondary school. The teaching materials can be easily integrated into the programmes of different subjects as enrichment elements, while they are also in line with the test requirements used in public education.

It is worth discussing what the term 'curriculum' exactly means in the American context, because the term is used in Hungary in several ways. In this project, curriculum means the books, textbooks, teachers' manuals, workbooks, curricula, class plans and all teaching and game packages based on the study content that can be used in real life, as well as the elaboration of possible contact points with the different subjects. The most marked element of the project is represented by book and textbook packages developed by the experts. In developing the curricula in practice, engineering accuracy and care was again clearly proven.

As a first step, the colleagues of the Center collected and reviewed all possible study materials and curricula available and applied in the instruction of 'engineering studies and technology'. They found 625 different sources altogether that had been read through with the help of third-party helpers. Development started fully in line with the government requirements of the subject. As a result, online materials, textbook families, teaching packages and game packages have been born. Later, based on the materials collected, a methodological center was established (Boston Museum of Science 2010).

The study content in the textbooks is built on modelling the process of problem solving from primary-school age until grade 12. The books can only be used applying the methodology of the steps of problem-based learning (PBL). The first step in every case is posing a question, identifying a problem; the second step is collecting preliminary information and looking for the best solution, as well as imagining the solution and its creation in practice, testing the work/solution in real life, and finally further development of a solution via feedback. Naturally, the process is always applied in a manner corresponding to the given age-group.

The developments completed are centred around three major age-groups. The largest family of books and the related teaching aids are for children in grades 1–5: their common name is 'Engineering is Elementary' (EiE) curriculum. The second package is for children in grades 6–8; this is the 'Building Math'

curriculum, and the development of test books and teaching aids for students in grades 9–12 termed ‘Engineering the Future’ has also been started.

6.2.1. EiE curriculum

The first curricula have been prepared for the youngest children, so at present they are the most wide-spread both in the state and throughout the US. 20 books were published between 2005 and 2010 together with related other teaching aids. According to the Center’s June 2010 figures, today over twenty thousand teachers and almost a million students use those teaching aids at various locations in the United States (Boston Museum of Science 2010).

Engineering studies and technology do not appear as separate subjects for young children, but are built into the content of other subjects – mainly other sciences and mathematics. It is an important objective that children should be able to test their knowledge obtained in real life and to feel that what they have learned has an importance and use in everyday life.

The study contents for children in grades 1–5 have been published linked to twenty textbooks. Those contents can be easily fitted into the curricula of the various schools. The officers of the NCTL have set out a guideline for that insertion. The study content in the books can be easily combined – in practically any country – with current curricula; they are not specific to the United States and they could be used extremely well in enrichment programmes.

The structure of the books – even for the youngest – strictly follows the steps of problem-solving thinking, built logically one upon the other. Each book elaborates on a different area of engineering, including agrarian, environmental, architectural or audio engineering work, to mention just a few. Each area is linked in the curriculum to an area of science, but also to a specific country and culture as well. Children represent every part of the world from Ghana through Australia to India. In each book, they must solve a real problem related to their own country and life situation; a problem that can be modelled easily for them.

The books are story-like and, as children have to solve a problem originating in real life, they find the story exciting and arresting. The text is not at all like that of a textbook, everything is presented from the children’s point of view.

Let us see an example from one of the most popular books:

- children study about the wind in this part of the book;
- element to be incorporated: civil engineering – making a windmill;
- the story of the textbook developed by the Center (the story of two friends in Denmark) helps children to relate the problem to real life, to a situation

exciting for them, and so they can learn about the process of engineering creation;

- children also make the windmill presented in the book in practice (Engineering is Elementary project 2005–2008).

The textbooks are supplemented by teachers' manuals, class plans, worksheets and also posters in many cases; online materials and others are always supplemented by a series of tests in line with the educational standards of the State (Boston Museum of Science 2010).

The class plans related to the textbooks observe the same system in the case of every book. A preparatory lesson is followed by four (possibly) double lesson in which children get an opportunity to creative work with their hands or to field work depending on the actual study content. Every book helps the teacher make children aware of the phases of engineering creation – in effect, the elements of problem-solving learning and the following practical implementation. It is also possible that the teacher call attention to the importance of various other areas of science in the course of work to help enliven, for instance, the teaching of mathematics (Engineering is Elementary project, family of textbooks, 2005–2008). Matched to the abilities of students, the worksheets connected to the textbook have been prepared at two different levels (A and B).

The study material embedded in the books is unusual, exciting and informative, encouraging students to create, to think and to learn cultural values. They encourage a way of thinking that in the end will help understand the man-made world around us. It allows children to gain experience about their environment through working with their hands. It improves sensitivity to problems and makes scientific knowledge meaningful in everyday life.

6.2.2. Building Math curriculum

At the moment, only three textbooks using the relationship of maths and the different engineering sciences have been completed for children in grades 6–8. The Center closely cooperated with the Tufts University in the State of Massachusetts in developing the content of the books. The three books can be used well in enrichment programmes – they have been designed that way –, but they can also replace the actual maths textbooks (grades 6–7–8) in places where they meet the standards of the states.

Again, it is the study content which brings science alive. Maths exercises are given meaning as children have to face 3 practical challenges in every book. A challenge requires a minimum 5–6 days' work depending on the level of the students. Everything can play a part in solving the problems, from maths

exercises to field work, from school teamwork to completing the tasks individually, at home, subject to the intentions and standard of learning of the students and the teacher. Solving one problem or another can be taken out of the whole and can be interpreted separately to enrich a part of the curriculum.

Close relationship with other sciences (geography, biology and physics) is a great merit of the content of the three books. The series is built around three adventures; one takes place in Mount Everest, another one on the banks of the River Amazonas and the third on a remote Pacific island. Although the adventures are fictitious, the related challenges are problems arising in real-life situations and the solving of them improves children's mathematical thinking.

Let us see a few examples: you have to get anti-malaria medicine to a small village on the River Amazon while keeping it between certain temperature limits. In Mount Everest, a camp for mountaineers must be built to withstand the hardships of the weather or you have to cross a crevasse on a glacier safely or build a water reservoir on a remote island.

Just like the previous one, this textbook family, too, is built on the principles of problem-solving engineering thinking; i.e., it breaks down individual or team-work thinking into its elements, and it motivates children while allowing them to improve their creative–innovative thinking in the broadest possible sense (Building Math products 2007).

Several tens of thousands of students have been able to use this family of books in a pilot programme over the past three years, and in 2008 it was awarded a prize by the Association of Educational Publishers (Boston Museum of Science 2010).

6.2.3. Engineering the Future curriculum

A single textbook supplemented with four workbooks has been prepared for secondary-school students. It is just one book, but it includes study content that can be used for several academic years. The steps of problem-solving thinking and practical implementation are consequently present in each chapter.

In the book you can follow the creation and practical implementation of inventions and technologies built into our everyday life, such as the Internet or the solar cell, via the life of their creators or the engineers participating in the creative team. The story-like form written for the youngest pupils returns as real stories providing a framework for the content of the three families of textbooks.

The book also provides an insight into the lifestyles of dedicated researchers. It makes no secret of its goal of trying to find the scientists of the future, while wanting all children to acquire a basic technological culture that can be prescribed as a minimum for almost everybody.

In addition to the intention of the textbook to spread popular knowledge and describe lifelong careers, practical design work still plays a part, though it is given special emphasis only in the workbooks.

In its introduction, the textbook explains that the operation of the Museum and the Center is focused on raising public awareness in regard to basic technological culture, without which you cannot be properly informed or make decisions as a responsible citizen in today's world. Children must understand the impact of technology and inventions on their everyday lives and they must also be aware that they will be the engineers of the future both in a practical and an abstract sense.

The structure of school classes recommended by the books allows students to respond to the life stories and fate, and to discuss ethical or philosophical questions related to science and scientific life (Engineering the Future 2008).

6.3. Educational Standards Project

The three projects of the Center represent close cooperation with the Massachusetts Department of Elementary and Secondary Education in developing tests and standards in compliance with the NCLB Act that are mandatory in the State. It should be clear from the above what immense knowledge has been concentrated in the Center during the course of participation in the various projects and their implementation. It is a logical consequence that such knowledge must be reinvested into setting state standards and continuously developing the measuring tools.

Cooperation with the Ministry is supplemented by assistance provided to the implementation of the subject mainly in the school districts of the State of Massachusetts. That can be realised in several ways, for instance, via the Opening the Gateway Project mentioned earlier.

That work of the NCTL is not restricted to the State of Massachusetts: the work to spread the above curricula (textbook packages and teaching aids) covers the whole territory of the United States. Naturally, that goes hand in hand with an effort to influence the educational policy of other states mainly via changing the test requirements. Miaoulis indicates that the introduction of new study content in all states, i.e., at federal level, requires a great deal of effort and comes up against numerous obstacles (Miaoulis 2010). The work of the NTCL in that direction and its achievements can be followed on a map to be found on the Museum website.

6.4. Teacher Training

It is a logical consequence of the above that you need properly trained teachers to teach technology and engineering sciences; teachers who are prepared to deliver the programmes developed by the Center both in terms of methodology and the content of the study material. In practice, the lack of professional and methodological training is one of the major obstacles to spreading the new study content.

The structure of teaching aids and the various curricula are extremely teacher-friendly; their use however, requires an approach totally different from traditional methods. Teaching the subject is possible only through applying the methodology of the project, using problem focused instruction, being both practical and academic at the same time.

The Gateway project of the NCTL described above greatly contributes to the methodological regeneration of teachers, but it is clear that the projects of the Center related to public education must be supplemented with teacher training and other methodological assistance provided to support teachers in their work.

In addition to the Gateway project, teacher training related to the Center is established in three ways. The Museum jointly with Lyman Library has set up an *Educator Resource Center*. You can find here everything from curricula to teaching materials or from class plans ready-made for classes to tests.

Several times a year, the NCTL arranges *intensive workshops* lasting 2–2.5 days mainly for its textbook packages developed for the youngest children. Consequently, the workshops are mainly for primary school teachers, to help teachers get familiar with the textbook packages. Other workshops are also organised in which teachers work on one or another study content together.

The above opportunities, however, are open only to practising teachers. It has become clear that teacher training built on the new type of study content is also required so that it be possible to send schools those teaching engineering studies at a higher level. The Valley City State University (VCSU) in North Dakota has found a real partner in the NCTL. At the University, teacher training based on and supplementing the excellent textbooks and teaching materials developed by the NCTL allows both vocational, bachelor and master degrees. In addition to the VCSU, the Center maintains close professional contact with three other community colleges in the State of Massachusetts.

III. SUMMARY: THE MOST IMPORTANT LESSONS, THE NECESSITY AND CHANCES OF IMPLEMENTATION IN HUNGARY

As can be seen, the activity of the NCTL is highly complex. Its professionally high-standard projects are valuable also individually, but they are even more important in a comprehensive system, because they are able to exercise a more concentrated impact on educational policy. They try to reach actors of all levels in education, from the highest level federal and state decision-makers to children at school. It is exemplary as a non-profit organisation – an outsider to public education – and has dared to undertake this task logically, building carefully and testing its steps in practice. Similarly inestimable that the institution is able to mobilise considerable private funds to implement its projects and to improve the level of education, which would not be possible in the government-managed educational sector.

Such a large-scale enterprise, naturally, could not be implemented without the professional and financial background available to the Center and its parent institution. We can understand that several institutions in the United States apply only certain parts of the whole programme, such as the methodology of the Gateway project and the various curricula.

In Hungary, of all NCTL programmes, the study contents in the engineering curricula could be ‘marketed’ most easily. In the framework of enrichment programmes out of school, in thematic camps, at special group work events offered by museums or cultural centres, excellent talent development programmes could be operated using the textbooks developed by the NCTL, while one or another part of the study material could be integrated into science classes at school with a minimum educational organisation.

The authors of these books always combine the discipline of thinking with the joy of creation in solving a real problem or life situation, i.e., with good teachers the most important elements of talent development could be implemented in the course of the educational process.

Also, textbooks presenting technologies to be found in our man-made world would be of material importance not only in America, but in our Hungary as well and could promote an increase of interest in subjects of the natural sciences.

The use of the books will only be really successful if solving their tasks is combined with the proper methodology. Colleagues less trained in terms of methodology could use the books as a kind of guideline or aid to learn the stages of problem-based teaching (Molnár 2004). The long-term objective of the NCTL is to establish an approach by which everybody could be familiar with the technology of the man-made world around us, because in addition to a basic scientific knowledge, a core technological knowledge is now increasingly necessary. However, that can only be spread if the educational policies of the various countries approve it as a strategic objective.

Many years ago a young engineer who had accidentally found his way into her school was asked by a young girl for help. That was the starting point of the story. The young engineer of the past, Mr. Miaoulis plays a key part in the establishment of the large-scale project of the NCTL. His passion is to offer every child an opportunity to discover engineering studies and to learn about the world around us, as a creative person becoming the driving force of realising a major idea in practice.

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New Trends in Talent Support:

Lessons in Good Practice from nine countries¹

The revelation that knowledge and expertise are the most important raw materials of the 21st century and that the big battles are no longer fought for new continents and mines (Hámori–Szabó 2004), but for what lies hidden in the depths of the human mind has led to the appreciation of talent, i.e., the revaluation of the phenomenon called “gift” or “talent” and of the persons possessing them, described in the various languages and approaches by such attributes as “talented”, “gifted”, “exceptional”, “very able”, “exceptionally high-ability” “high-performer”, to quote only a few. The potentials, constant efforts and prospective performance of such people make them the main vehicles of what will hopefully become a more liveable and more human future.

In Hungary, now a regular Member State of the European Union, civilians as well as politicians, professionals of pedagogy and laymen, individuals and institutions have worked hard since the democratic turn in 1989 to re-position talent to its rightful place. It is common knowledge, however, that it is not enough to make plans for decades ahead and ensure their reliable and stable funding, to tune society to the importance of talent, to devise or set up organisations to provide more systematic talent care than ever with the contribution of the best professionals unless one commands a clear view and understanding of the context, i.e. the international environment into which all those endeavours should fit in.

This is the reason why the Association of Hungarian Talent Support Organisations decided in 2009 to send small research teams to countries within and without the European Union under the Hungarian Genius Programme to

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collect best practices in the area of talent support. This volume is a summary of the results, i.e. the best practices of the talent support systems of nine countries. This final paper is an attempt to sum up the results of explorative research and to integrate from a somewhat wider perspective the phenomena of which the country studies could only present some partial components.

Systems and methods

One of the main lessons of our exploratory research is that there is no such thing as a good method *per se*. To optimise the efforts, talent support methods are embedded everywhere into systematically designed and maintained, continuously upgraded systems. There are major differences by country in terms of the levels where such systems are established, their nature, and the identity of those who can structure and maintain them. Apparently no state can afford the luxury of not having at least a vision of how to support talent or how to ensure its social usefulness, but the extent to which it reserves the right to develop and represent that or delegates such rights to society is conducive to major differences. In the United States of America, for example, there are only a few – but highly important – components assigned to central, federal competence, whereas in Israel and even Singapore there are many. In Germany the initiatives of the individual provinces play a major part beside the policies and systems developed by the Ministry.

Even in countries where talent support is not determined by the will of a strong central state/administration, the actors themselves prefer having such endeavours driven by their inner logic and systematic deployment, instead of the random juxtaposition of the efforts of schools, foundations, free market institutions and others. Apparently, the stakeholders of talent support have realised that this is not, and neither should it be a one-man business. And, *vice versa*: in countries marked by strong centralisation, care is taken to give the local initiatives some elbow room to let them add their own creative, spontaneous value-generating initiatives to the big whole.

Consequently, one of the key lessons of our research is that the individual methods will only “hang in the air”, to the extent of blocking any interpretation of what they are about, unless we get to know and understand the other, interrelated system components and the system into which they fit. And, *vice versa*: we shall not understand much of the systems themselves unless we know how the methods which stem from them take shape and work. The talent support systems and methods are interdependent and they interpret each other.

Levels of the talent support systems

Which is the “real” level where talent support systems should fit in? At least five levels are distinguished which, although they apparently show a linearly narrowing tendency in the list quoted below, are actually in a much more complex, mutually reinforcing and challenging relationships with one another: there are global, continental, national, community and individual levels.

It is important to identify these levels, because our studies suggest that no level of talent support can function without taking the others into consideration. It may depend on individual-level decisions whether a talented child will unfold his or her talents in or out of a certain educational institution. These days neither the child, nor his family or the persons responsible for his education can disregard, for example, the demands of the global labour market, or what it can offer to talented people in terms of vacancies and returns. The same aspects are present at the continental (e.g. American, Asian, European and other) level; at the national/country level, where the main components of the resources and the markets are concentrated and regulated, and also at the level of the nationalities /ethnic communities, narrower than the national ones or cutting across them, or at the level of the ideological or indeed the professional communities, or other civil or organisational networks.

The national educational system is a leading actor, but not the only actor, of the national-level talent support systems.

National system of education and talent support; the issues of equality, equity and the search for balance

This level is especially important for us, because our investigations demonstrated significant changes there in the past decades. Previously, the national educational systems (the educational administrations) may have deluded themselves with the prospect that mass education, extending also to the higher levels of education, will solve the talent support issue by itself in any of its development stages and at every level of education, but that is no longer considered a realistic option. Whereas in the 1960s and 1970s one could come across the vision that the highest possible quality of education and, within it, individualised school-based development or differentiated education realised at the lessons would be basically sufficient for the development of gifted/talented children, nowadays it is quite realistic to take a multitude of other actors into consideration, whether they are active in the free market, in non-formal education or elsewhere.

This inevitably represents a challenge to education-policy experts (and to politicians in general), to practising specialists and also to civilians faced with

questions, including e.g.: if market initiatives represent a threat to equality and equity in talent support, to what extent is it their task to bring that closer to a state of balance and what instruments might be available for them for that purpose?

During our surveys, we have not encountered a single national educational system and in particular no talent support programme where equity and equality were not explicit issues: they were present of the educational-system level as well as in local documents, in writing and in the oral communications of the programme participants in professional or informal discussions. The fair equilibration of the opportunities of talented/gifted individuals who are raised in families having a more or less favourable cultural/financial background; of the residents of minor vs. major settlements; the members of national/ethnic minorities or the majority; of immigrants or aboriginals, boys or girls was equally present in the strivings of the profit-oriented programmes, considered definitely elitist by many, and in the utterances of Finnish, German, Austrian or British colleagues working in public education. Talent support actors seem to be fully aware of their *social responsibility* concerning the fate of talented individuals. This is especially true for talented persons in a seriously underprivileged situation. It seems to be important for the society and for every organisation to witness and actively contribute to narratives which tell about the rise of talented persons that despite every hindering circumstance, and thanks to the joint efforts of the individual and his or her environment, to talents can gain their due social, professional and human positions.

Nevertheless, the more open and diverse the talent support options of a given country, the more marked is the reshuffling and re-interpretation of the relevant roles and responsibilities of the state, and the more frequently the actors put one another into “position”. If the state can no longer assume a certain role in talent support, that role may easily become a function offered in the market segment, and it is not rare for the state systems to make attempts to impose legal regulations on functions that the market strives to assume and win for itself, to prevent the processes concerned from slipping out of their hands. Note that in this struggle where the parties are at least as interdependent as they are rivals, they have conflicting long- and short-term interests. Apparently, whereas the states have longer-term visions pointing towards a more stable future for talent support, the market actors tend to advocate criteria which focus more on individual demand and are closer to reality. It is no accident that mutual interdependence has actually been recognised at many places, and some countries, e.g. Germany, work out talent support forms in which the state, municipal and profit-oriented parties can all assert their respective positions and promote the development of talented children in unison in an efficient way.

Talent support as the critique, developer and renewer of established social and educational relations

In line with the above, the documents analysed during the research, the interviews made with professionals and even informal communication showed that the talent support programmes, the institutions and also the individuals involved in talent support are all imbued with a lofty sense of responsibility, a kind of professional/human sense of mission. The belief that the persons and the cause for whom/which they work are essential from an individual as well as from a social point of view. Our experience was that this attitude contained also some critical, system-reforming and system-developing components. (Sometimes these are actually the subject matter of a given talent support programme, as in the case of the Austrian practice presented in this volume.)

Many experts are of the opinion that the talent support options should be sensitive to the errors/deficiencies of society/the educational system, i.e. the components which may withhold non-average children from optimising their abilities. If mainstream education is not sensitive enough to individual differences, talent support must emphasise that aspect; if it cannot pay sufficient attention to personality or creativity development, then talent support programmes must stress that point, as if the essence of talent support were to fill the gaps of mainstream education, to remedy its errors, to provide a model example as to the maximisation of talent realisation through a really efficient and good system and pedagogy.

Consequently, many regard talent support and its activists as the vanguard of the development, improvement and reforms of educational policy. They might be extraordinary, unusual or, on the contrary, more conventional than their peers in mainstream education, but they are certainly pathfinders with an eye to a better future.

Talent support as a national defence resource

Apart from the relevance of sublime human and social ideas, our investigation has made it very clear that some countries assign special importance to talent support due to its relevance for national defence. As indicated by the examples of many advanced countries – the US, Israel, Germany, Singapore –, the fact that although those gifted in humanities and in the arts are considered important, the main, primary, resources are allocated to the identification, development and preservation of those talented in STEM (science, technology, engineering and maths), has a dual meaning/significance. The STEM areas themselves are important for two reasons: on the one hand, their development level is in close

correlation with the economic base of knowledge-intensive societies and, on the other, this economic segment is responsible for the basis of advanced national defence realised through advanced military technology. Our research showed that whereas in some countries – e.g. Finland, Slovenia – the system of talent support institutions has no strong ties with this area, in others military talent identification and development are intertwined or some of their components function in parallel, and this is professed relatively openly.

What is a *real* talent support method?

Both in the field work and the summing-up phase of the research, our work-group was frequently faced with the need to decide whether or not a certain project represented a *genuine* talent support method and system. We came across the following variants:

- courses embodying development methods suitable for any student, but available – due to the scarcity of the relevant resources and/or the slow pace of the educational reforms – only to a limited group of students (in our case: the talented/gifted ones); the methods concerned, currently used exclusively for the high-ability elite, will, in time, become general methods of education;
- courses suitable for the development of most students but, typically, in later ages;
- methods which are generally used in education to date, applied in the talent support programmes exclusively to groups of selected students characterised by similar abilities and interests *and* higher-than-average results; in this case, the talent component of the talent support programme refers to the participants being labelled “talented”, and the efficiency of the programme derives from that, and not from a special feature of the pedagogical method itself;
- in a minor part of the programmes it was found that the methods applied there would undoubtedly be unsuitable for the development of any other student population due to their excessive requirements and the foreseeable difficulties of potential implementation with young persons characterised by an average or slower pace of progress.

Considering the above, it is difficult to define what is *really* a talent support method, and this uncertainty aggravates and sometimes blocks the decisions of children, parents and politicians as to what to choose, what to support from among the options available under the collective term of “gifted/talent support”, or to choose and support anything at all. The same confusion makes the

research of the talented/gifted as well as talent development, i.e. comparative studies of efficiency, virtually impossible.

Search for equilibrium in the identification and development of talented/gifted children

Our research has confirmed the general presence of yet another type of search for balance in addition to the ones referred to above: the search for the balanced development of high-ability students in as many areas as possible. None of the best practices under scrutiny focused on the development of a single knowledge area. Whether the projects targeted mathematical, artistic or other education, the designers and implementers of the system and methods concerned took deliberate care to ensure the emotional development of the young talents; the development of their cooperation and constructive competition skills, leader's skills and social sensitiveness, and sense of responsibility, irrespective of the area where their talent manifested itself. Talent support today does not target an abstractly conceived talented individual, but someone who unfolds his personal talent in social space, in the interest of himself, and for the good of the public.

Although some of the most advanced economies – e.g. Israel and Singapore – tend to select children in need of/capable of special talent education via the testing of a limited range of abilities/skills – intelligence and cognitive ability testing –, generally, the (targeted) practice is to use more complex systems not only in the area of talent support, but also in talent screening/ identification which defines and underlies talent support in many respects. The methods include some which, instead of relying on forecasting-based methods of talent identification, apply talent identification coinciding with talent support (Ren-zulli model / Mönks–Boxtel 1998/) and/or where parents, teachers, peer students or even the children themselves can nominate talented/gifted individuals for inclusion in the talent support programmes.

Exact and non-exact components of talent support

Let us start out from the last remark of the above section. Some talent support systems – or rather the public, social or for-profit actors in their background – find it difficult to decide what must be based on research or economic evidence (that is, methods justified by research or methods with proven economic results), and what can be undertaken irrespective of such evidence. To return to the previous point: the more diverse the applied talent identification methods, the more precise the mapping/coverage of the abilities/personality of the children will be, yet, concurrently, it is inevitable that measurement components

interpreted by different logics will allow for different degrees of precision and imply significantly different predictive values. Similarly: the more components are covered by the talent support programme itself, the more difficult it will be to identify the causal relationships and the interrelationships of the various components in the outcomes. If it is possible to define their totality in an exact way at all – in most cases, the excessive number of variables and components prevents that.

For this reason, it was rather surprising for the researchers, but as a matter of fact it is rather worthy of reflection, that we have found national, regional or local programmes in almost every country (e.g. in Israel, Germany, etc.) which, although they have been active for decades, probably at considerable costs, have never or only rarely been subjected to a thorough impact analysis. In several cases, the programmes were accompanied at best by satisfaction surveys, and in a few cases by follow-up surveys of further education and jobs/careers.

The fact that stakeholders have been willing to allocate considerable funds for decades to internationally highly significant talent support programmes the effects and efficiency of which have been demonstrated hardly or not at all, suggests that in talent support it is not enough to think in terms of programmes the effectiveness of which can be demonstrated certainly and directly: with some courage and a more far-reaching vision, the legitimacy of other kinds of programmes must be accepted as well.

Talent support methods; links between talent support in secondary and in higher education

Of course, no educational system invents specific talent support methods alone, by itself. The basics, that is, acceleration, enrichment and extension, segregation and integration were present in one form or another in every talent support system studied by us. Some structures and methods, on the other hand – such as the Talent Search Programme designed by the American Johns Hopkins University – “migrate” from one educational system to another, and their special local versions are created everywhere. Of course, there may be major differences by country in whether talent enrichment, for example, is realised primarily in the form of school-based extra-curricular sessions or via the programmes of for-profit service providers.

However, our research found that one of the possible basic methods mentioned above apparently plays a much bigger and more systematic role in talent support in our days than previously, and that is acceleration. Joan Freeman (1998), among others, says as a conclusion of her own exploratory research that there are many kinds of acceleration in the world of school-based education and

in other fields of talent support, but what strikes us is that one of these has become especially important in present-day talent support. Although several educational systems allow clearly talented young children to start schooling at an early date, with age exemption, and it is feasible practically everywhere for the talented/gifted students to skip forms, the really interesting current trend relates to how talented students can move on from the uppermost level of public education, secondary school, to tertiary education.

However, before discussing the importance of this phenomenon, let us first see another highly relevant feature.

Integration and segregation in gifted education

Maybe the question itself is put in a wrong way, but ever since gifted education/talent support within or without the school system has been an agenda item, it has always been asked whether integrated or segregated education of talented persons should be given preference (National Talent Support Council of Hungary 2009). One of the reasons why the question cannot be answered is that an almost infinite series of professionally well-grounded arguments can be listed both for and against both alternatives. The main argument in favour of segregation is that it ensures the collective education of children of identical abilities, which is most stimulating intellectually and emotionally; no one is oppressed by the wide gaps between the children's abilities, and the teacher can work more evenly. Many, however, consider this highly dangerous and even harmful socially – especially because of the danger of elitism, however it is interpreted –, and because the children concerned do not experience and gain a sufficiently varied array of social and human experiences to ensure their emotionally and morally rich and balanced development. Integration has the advantage of keeping the talented/gifted in their proper environment in terms of age and social setting, which may boost their more harmonious emotional and moral development, while they themselves can exert a stimulating and motivating effect on those who develop slower. However, this may make the progress of the talented themselves slower and less effective compared to a special educational environment in which everyone has similar abilities; they may be bored and lose their motivation due to the non-optimal workload, etc. (Freeman 1998).

In view of the conclusion that the problem with this dilemma is that both alternatives can be affirmed and denied simultaneously, some educational systems set out to apply such forms of talent support that combine the respective advantages of integrated and segregated education, while trying to repress their disadvantages. Typically, this is what the Israeli talent centres are about: high-

ability students spend most of the week in their own average age-specific communities at school, but for one day a week, the talented/gifted students of a town or district leave their mainstream school and integrated education to take part in special education designed explicitly for them, provided in talent support schools, in a segregated form. Another example is that of the summer talent support camps organised in Germany, which offer segregated development to gifted children, but only over a short time of a few weeks.

Acceleration: the link between talent support in secondary and tertiary education

Almost every system under study comprised certain forms designed essentially to let gifted students start their higher educational studies as soon as possible, without having to leave their age group (the country papers do not cover all of these systems, but some are referred to or even treated there). The point is not that talented secondary-school students study at university courses (by the way, this is possible in most educational systems). Rather, the essence of most of the forms concerned is that talented students can study such subjects at secondary school and once they complete the courses concerned and have them certified, they are equivalent to credits earned at college or university. This is the case with the AP (advanced) subjects and unified federal AP examination system (not discussed in this volume) in the US, or with the NUS High School's highest-level education system in Singapore.

Obviously, this kind of acceleration is open and commendable mainly for children talented in the natural sciences. This is a “fast lane” by which students with high ability in IT or mathematics can have a BSc diploma earlier than usual (since they acquire part of the grounding credits of Bachelor studies), and thus enter Master level education earlier. However, since part of the globally renown big universities already offer also integrated MSc–PhD programmes to students capable of faster progress in the natural sciences areas, this makes it possible also for young students to conclude their doctoral studies as early as at age of 21–22. Considering the characteristics of the STEM areas discussed above, this circumstance is not to be underestimated either from the point of view of the talented individual, or from that of the societies and economies concerned.

New trends in non-academic talent support

Both professionals and laymen find it easier to accept that children gifted in sports or arts are provided special education, and the threat of elitism casts less of a shadow on that than on talent support in the academic areas (mathematics,

informatics, etc.). However, such forms of gifted education also have their own hazards and difficulties. A sports injury or a disease may put an end to a promising sports or artistic career, and the future of the young talent becomes highly uncertain, because it may happen that during the years spent with sports, music or painting, he failed to acquire sufficient knowledge and skills in the academic areas to ensure or at least give him a chance of a secure future.

It seems that the programme of the recently opened Singaporean talent support institution, the School of the Arts (SOTA), has been designed with a view to eliminate the duality of artistic and academic talent support. The School plans to offer, as of 2011, students in the last two years of the 6-year SOTA education a possibility to take the International Baccalaureate (IB) as well. The IB is a secondary-level final exam accepted even at the best universities of the world, that is, the future of the SOTA alumni is secured even if they cannot or do not want to continue their artistic education after secondary school.

Parent involvement in talent support

It is an important novelty that several talent support programmes of the countries studied by us showed the intention – albeit we did not highlight that in every chapter – to involve the parents in the talent support process. With considerable over-simplification, one might say that it may take two forms, basically, with a single, common goal.

In one typical situation one of the parents of the talented child is also talented in the same area. For example, the mother of a talented young violinist is an excellent violinist herself. In such cases, efforts are made to involve the parent in the talent support programme – for example by delegating to her a few lessons or a minor master course, or participation in workshop discussions with them.

In the other type of parent involvement, the parent is not a talented professional of the field concerned; on the contrary, the parent may even be undereducated. In such cases, the parents may be involved for example to give background support in certain programmes – concert-going, visits to museums –, or they may be asked to be present at a session, etc. This type of parent involvement has many advantages, first and foremost the fact that parents for whom the given special field or high-quality training as such is unknown can experience what the world of talent support, distant for them in terms of its subject matter or in general, really is about.

The parents' familiarisation with this world, their first-hand experiences of talent support and especially their active contribution to some of its moments and hence to the success of the venture might be one of the most important motivating factors, especially as far as the underprivileged talented children are

concerned, which ensures that they remain in this type of education in the long run.

Development of talent development

Anyone with some first-hand experience of the education of talented children or adults knows that such an activity has a major development impact also on the developer himself. Furthermore, it is common knowledge that the school as (hopefully) a learning organisation and education policy as such can profit in a similar way from the most professional approaches to gifted education. Development in this sense is mutual: talent support ensures the intensive development of the developer, since the situation itself requires continuous improvement from what is a high professional basis anyway, to satisfy the needs of the target population concerned. The above reference to the “most professional” approaches, however, is no accident: as pointed out by Anders Ericsson et al. (Anders Ericsson–Krampe–Tesch-Römer 1993), relevant professional development demands conscious, purposeful and professional practicing, not just any kind of practicing.

The same applies, *mutatis mutandis*, to the development of talent support and talent supporters. Conscious, purposeful and professional activity is the basis of progress. This, in turn, requires an organised approach and, naturally, an organisation of some sort. It was this conclusion which led to the decision taken by the Hungarian Parliament in 2008, namely that, given the development priorities of the country, Hungary should embark on a National Talent Programme, a talent development support programme of several decades, and laying down the relevant financial, and also organisational bases. The executors of the initial steps of the programme took unprecedented care to deploy subsystems linked into a network, the members of which not only know about each other’s existence, but also know how to learn from one another, because this is the basis of any conscious, purposeful and professional development.

It follows from this logic that the limits of a learning system are not and cannot be stable. As indicated already in the beginning of this section, this is the reason why in this research we could not – and did not want to – avoid learning from other “systems”. Of course, we looked for such examples, best practices, of talent support which carried significant development content and, indeed, the study of the best practices of nine countries, some within, others without the EU – the United States of America, Austria, Finland, Israel, Great Britain, Germany, Spain, Singapore and Slovenia – has taught us many useful lessons. One might think that this was the essence of our learning process.

As a matter of fact, however, the main lesson was the revelation that, despite the many lessons taught by each of these efficient development methods, there is no VIP shortcut in talent support that would provide 100% guarantee to achieve certain pre-defined results. And there is no shortcut and guarantee in the sense either that one should simply step on any of the pathways described in this volume to soon reach a “talent support Canaan”. No. We must not forget what was said above, namely that the type of conscious development/self-development in talent support referred to by Anders Ericsson inevitably requires, *inter alia*, an individual understanding and strategies deriving from that. We must understand what would give us most impetus, considering our objectives, i.e. the further development of our talented/gifted students and the further development of talented/gifted individuals in general. And this is where the lessons of this research must and can be put to use. We know and understand that such revelations and the consequent efforts are a must to be able to produce “best examples”, i.e. something worthy of learning for others, whether within or without the European Union.

But would it be possible to measure somehow whether all that was really useful? Although such questions provoke, almost automatically, the repartee – *How could such things be measured?* –, our answer is nevertheless affirmative: the current efforts can be justified by the productive life of our talents, and the positive development of the economic and social/societal relationships. The present and the future, the individual and the social good are interdependent.

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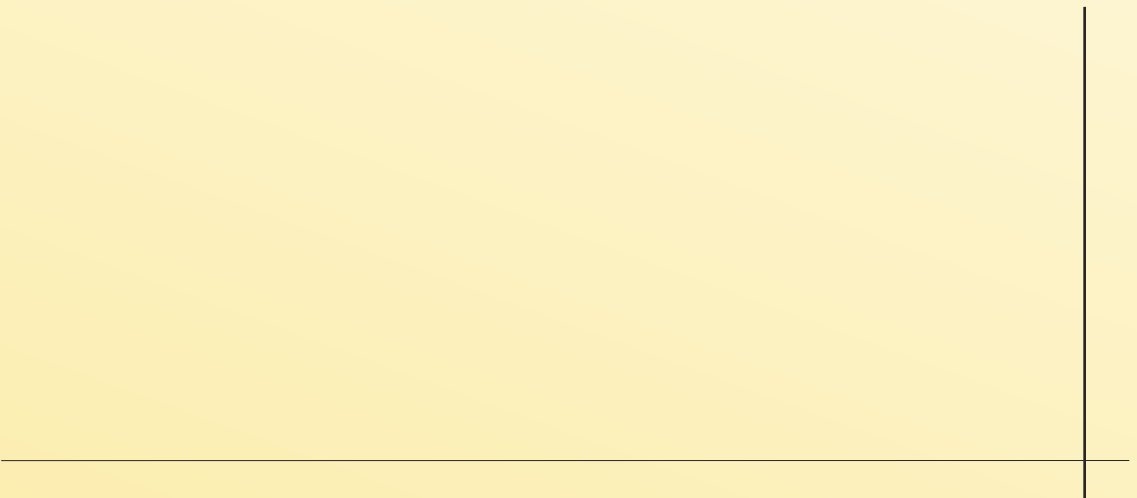
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Appendix



FINLAND



The LUMA Center



The Päivölä School



Students in Päivölä School

GREAT BRITAIN



... Students can be given individual tasks...



There are regular project assignments, the products of which decorate the school

GREAT BRITAIN



During lessons the teacher is a facilitator who works with the children according to their interests, level and abilities



Children with outstanding performance are given more and/or different tasks and they work with less teacher intervention

ISRAEL



Project work in a pull-out center



NASA Project 1



NASA Project 2

SLOVENIA



Learning by playing in Domžale Rodica Primary School



Presentation of the finalised books at the extra curricular creative writing session (at the same school)

UNITED STATES OF AMERICA (*Boston*)



Ioannis (Yannis) N. Miaoulis



Teacher training

