

OECD/CERI ICT PROGRAMME

Hungarian case study No. 1

A Case Study of ICT and School Improvement at the

ALTERNATIVE SECONDARY SCHOOL OF ECONOMICS, BUDAPEST, HUNGARY

1. Picture: The building of the Alternative Secondary School Of Economics, Budapest



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**ALTERNATIVE SECONDARY SCHOOL FOR BUSINESS STUDIES, PRIMARY SCHOOL
VOCATIONAL SECONDARY SCHOOL AND EDUCATIONAL INSTITUTE**

BUDAPEST, HUNGARY (<http://www.akg.hu>)

1. Overview of the present

“*We stand for the tadpoles!*” This is the title of the brochure given to parents who consider or have enrolled their children to this school. (Abridged English version: <http://www.akg.hu/english.htm> 1) Tadpoles are “frogs-to-be”. Just like adolescence, this phase in the development of a frog can be conceived as transitional, an awkward state before “real life” as a nature frog. Or else, this state can be experienced as a complete in itself, important life phase, full of valuable experiences and contributions. The staff of the Alternative Secondary School of Economics (further on: ASE) – intend to create a living and learning environment that is ideal for “tadpoles”. Students are not miniature adults, but individuals with special characteristics. Teachers, therefore, should not “prepare youngsters for adult life” but live together with them and support their development.

“It is the professional opinion of teachers within the school that adolescence is a temporary phase, just as any other phase in a person's life. Therefore, we have made it our personal goal that students lead a happy and balanced existence at ASE. Our most important basic principle is that a child is not preparing for life but is living it. Living in the present in no way means that the school functions without conditioning its students for adulthood. Simply, we are convinced that most of our daily life, with the exception of a few short periods, is spent in the pursuit of short-term successes rather than the achievement of distant goals. This means that the majority of our time is spent on experiencing the joys and sorrows of trying to solve the problems and conflicts we face in our day to day existence.” (György Horn, Principal)

2. Picture: Mr. György Horn, founding principal of the school



1.1 *What has been accomplished?* (Brief description of the school, its use of technology, and its primary reforms – accomplishments in ICT use and school improvement)

The full name of the school shows its multiple functions: *Alternative Secondary School for Business Studies, Primary School, Vocational Secondary School and Educational Institute*. (Abbreviation to be used in this paper: ASE) At the time of its conception in 1988, ASE had the distinction of being not only the first foundation school in Hungary, but also the first "alternative" institution offering an alternative to the centrally resulted and financed educational system of the country. During the first eight years (1988-1996) ASE has operated as an *experimental foundation school*, founded by the City Council of Budapest in co-operation with the Ministry of Culture and Education. Thus, in principle it was a state school, ensuring complete autonomy to its faculty and giving full sponsorship rights to all those with direct interest in its successful operation, ie. students, parents, teachers, and businesses that would later provide employment opportunities. Both the Ministry for Culture and Education the Budapest City Council took part in operating the foundation. Following the departure of the first graduating class in 1995, founding members of the school re-examined the Foundation Charter in light of the Public Education Act, and decided in favour of a foundation status; a solution which the ASE faculty found equally acceptable. From the beginning of 1996 the school can be regarded as a legally *independent organisational entity*, within the ASE Foundation. It is an open foundation governed by Board of Directors and welcomes new sponsors who find it worth while to support its educational innovations.

The school started its operations in 1988/89 (in the last of the communist era) as the first Hungarian private school with a *special curriculum focusing on basic business and management studies*. Financed partly by a foundation set up by firms interested in eventually employing its graduates, parents and the state, the school enjoyed a relative independence and prosperity right from the start. Before the start of the first school year, the teaching staff, lead by the founding principal still in charge, György Horn, worked for about six months to establish the pedagogical principles and develop new methods and content for teaching for practically all disciplines.

“The alternative quality of the school means:

- There are strong connections between our programme and the educational reforms characteristic of school models at the turn of the 19th and 20th century. (Educational innovations, e.g. by Montessori, Freinet and Steiner are generally termed “alternative” ways of schooling in Hungary. All these systems have been re-established in Hungary after the political changes in 1989. Remark by case study authors.)
- ASE wishes to provide educational alternatives for its students in a free, individual-oriented setting.
- Students have the opportunity to choose from among various programmes and subjects of study; they have alternative choices.” (from the Educational Programme of the school)

3. Picture: Two views from the neighbourhood



For the observer, the adjective "*alternative*" at the beginning of the name of the school has a twofold meaning. On the one hand, this indicates unusual, non-conservative pedagogical ideas, on the other hand it reflects three alternative modes of organising school life. These *three innovative organisational practices*, briefly described below, are symbolised with three big letters A in the coat of arms of the school.

a) First, "alternative" indicates a *different organisational structure*. There are no classes or grades (groups of students of the same cohort learning according to the same curriculum) at ASE. Instead, students are grouped in so-called "broods", "heaps" and learning groups. Also, the *content of teaching* and the *educational structure* is special.

"*Small schools*" are the basic organisational units to which students of the age and grade belong. There are about 56 students in a "small school". There are two "*heaps*" in each. *Heaps* are learning units that consist of about 28 students who learn compulsory, basic subjects together. The smallest units are called "*broods*". They take after the large family model, consist of about 10 students and a teacher, their "patron". They discuss all sorts of problems related to living and learning at ASE, support each-other in overcoming difficulties of time management, choice of subjects, preparation for exams and involvement in leisure time activities, etc.

The *organisation of the learning period* is entirely different from the usual Hungarian model for secondary schools. (For a description, see Case Study No. 2, Frigyes Karinthy Bilingual Secondary School in Budapest.) At ASE, the school year consists of two phases. The first phase is the

introductory or basic training period that lasts for 4 school years. Here, the *epochal system* used by the Waldorf Schools is in use. (Selected subjects are taught intensively for an epoch of approximately 3 weeks. One foreign language is taught in the first 2 years and two in the second 2 years of this phase. In this period, devoted to general education, the first part of the school day is devoted to disciplines of general education (maths, natural science, social science, theory of arts). During the second part of the day, special skills are developed: information technology and languages are taught. The third part of the day at school will be spent with physical education and creative arts. The second phase of the schooling period is the time of specialisation. Here, students have several *alternative disciplines* to choose from, according to their interests and abilities. Disciplines that are compulsory parts of the final examination, however, must be included in the study programme for everybody.

b) "Alternative education" offers a chance to choose from among *three types of training*: it prepares for college, gives certificates for a range of vocations and offers general training that may form the basis of further vocational studies.

ASE offers three alternative types of secondary education: first, the college model that prepares for entering higher education (subject to severe entrance examinations in Hungary.) Second, the school offers medium level certificates in different vocations that qualify for the most part for clerical jobs in business administration or certify basic skills in information technology. Third, ASE offers a programme in general education that helps launching a career through entering a post-secondary vocational school. (Approximately 80 % of students opt for the college model while 15 % choose to obtain a certificate and 5 % continue their studies in a vocational school.)

c) While most secondary schools emphasise the development of cognitive skills, ASE makes efforts *to develop a wide range of affective and psychomotor skills and abilities* of students

The description of all areas of skill development would be superfluous for the purposes of this paper, so we focus on information technology as a special field of development. *Business studies-the main emphasis of the school programme-needs high level ICT skills* so it was just natural from the leadership of the school to search for grants right at the start to provide ASE with an up-to-date computer infrastructure. (A detailed description of the introduction of ICT that happened right at the beginning of the foundation of the school in 1990 will be given in Part 2.) *ICT is considered as a set of skills highly relevant for everyday life.* In Hungary, basic knowledge about hardware and the history of computing used to be taught as part of the discipline called Technology while basic programming principles were included in mathematics education. As a result of experiments, a new discipline called Information Technology evolved gradually that focused on teaching the utilisation of ICT for learning, work and leisure. At ASE, however, this *basic skills-oriented approach* had been practised right from the start. In the first, basic training period typing is considered a central skill to be acquired because users mostly employ the computer to create and modify texts. Word processing and data management through charts and databases are also part of the first training period. In the second, specialisation phase students may choose to enter a study programme leading to a certificate in a vocation related to information technology and thus acquire further, more sophisticated ICT skills. (E.g.: Advanced Programming-a course recently replaced by two certification courses called Multimedia Development and ICT Programming.)

4. Picture A, B: Closing session of the Young Entrepreneur Project – students who had been running their own small business on school premises during the year give an account of their revenue.



In the school year of 1996/97, ASE changed its structure as a 4-grade secondary school. From 1990 till 1995, it used to accept students for the last semester of their elementary studies (at the age of about 13 years) and, after a 6-months preparatory phase, taught them for 4 school years. In September 1996, ASE became a 6-grade secondary school accepting pupils after their 6th elementary school grade (at the age of 12) and teaching them for 6 school years, till age 18. In both models, secondary education is concluded with final examinations but the later model offers 6 full school years of uninterrupted studies on secondary level. The "brood" system (groups of children of different ages and grades creating a family-type unit lead by a patron-teacher) was retained but cohorts are organised into "*small schools*" being taught according to the same curriculum. A new component of this system is the so-called *theme week* that is organised five times during the school year. In the course of these weeks, a selected topic is being studied by all grades from different angles in a variety of school disciplines.

Academic rigour is based on intrinsic motivation of students mostly. Until the last two grades there is an epochal system with no grading (that is, no numerical feedback). A written report on the accomplishments of students in different areas is offered at the end of the semester every January and a report complete with grades at the end of the school year in June. Students are not obliged to regularly attend classes but are supposed to write a test every third week from every discipline they have on their programme. If they fail they have to do it again until they prove substantial knowledge to continue studies. This type of evaluation is best for those who have a clear view of their professional future and are strongly motivated to succeed. For others, exams may give a warning signal. In the last two years of secondary school there are traditional 45-minute lessons and grades. There are 6 grades and 0 indicates no performance at all. (In other Hungarian schools there are 5 grades and 1 indicates failure.) If a student is graded 0 it does not mean the repetition of the whole school year (as it would in other schools) but till the year of the final examination all grades have to be above 0. All marks are added up to show the overall results of students. One who does not have the sufficient amount of points required for the continuation of studies will fail even if all his or her grades are above 0.

5. Picture: Students of a "small school" spend recess in their designated learning area



In conclusion of the introduction to this very unusual for Hungary educational institution and in order to describe the atmosphere of the school, we quote a larger passage from its Educational Programme:

“ASE IS A FREE SCHOOL.

We have given up the traditional instruments of institutional regulation, ie. House rules, systems of punishment and reward. These have been replaced with the free flow of information and the freedom of choice, emphasising the individual personalities of students, and taking into account their personal needs and concerns. The nature of this freedom changes along with the different stages of the students' life in the school.

- The lower-intermediate level (form/grade 7-10) stresses a direct, personal contact between students and teachers through co-operation on a day to day basis. ASE attempts to treat each student as an independent individual by helping with a family-style atmosphere, rather than using institutionalised approaches to regulate his/her daily life.
- Upon making the move to the upper-intermediate level, individual students begin to take on the rights and responsibilities of free citizens in the school. Freedom does not only mean the rejection of institutional regulations. It also means sovereignty, the right to enter into agreements, a role in the community and participation in its affairs (legislature, executive authority), and pedagogic assertion of interests.
- Typically, free schools provide sufficient living space, operating as institutions offering a specialised service. In the case of ASE, one unique characteristic is that the proportion of free decisions made by students depends on their age. Furthermore, they must shoulder the consequences of those decisions.

ASE IS AN INDIVIDUAL-ORIENTED SCHOOL.

One of the most important principles in our educational program states that the individual child is at

the centre of all operations. It is for this reason that we have developed activities designed to strengthen personal contacts and co-operation between students and their teachers (teaching epochs, creative clubs, the micro-school and systems of patronage).

We have not tried to define the average student. Instead we strive to assist each child in developing and successfully completing tasks suited to their own needs. This focus on individuals means that as a school we also take responsibility for socialising students, providing them with knowledge, developing their skills and setting an example of the values we uphold.”

6. Picture A, B: Teachers of the same discipline have study rooms equipped with computers and reference library.



1.2 *Who profits from the introduction of ICT?*

Information technology is taught for the first 4 school years as a compulsory and the last 2 school years as an elective subject. In Grades 1 and 2, 12 and 13-year-olds enter the introductory phase of their general training. ICT as well as all other disciplines is taught in an epochal structure. That means 3 weeks of intensive training with 85 minutes of ICT lessons every day. In the second period, Grade 3 and 4, ICT is taught for 5 lesson hours every week for the entire duration of the school year.

In Grade 3, typing and word processing is practised, in Grade 4, basic data processing and spreadsheet techniques are acquired. In Grades 5 and 6, the two last grades before the final school leaving examination, 17 and 18-year-olds who have a special interest in ICT will learn software management and basic programming.

Practically *all students and staff members profit from the introduction of ICT* in the school programme. Technical facilities are not ideal even in this school that is one of the best equipped with ICT technology in Hungary so teachers cannot make use of digital teaching aids and demonstration devices as often as they wish. Still, internal communication among staff and students as well as external one among administrators and the Ministry of Education, teachers and students of partner schools, teachers and their national and international professional bodies etc. Have been made much more flexible, frequent and efficient since the introduction of ICT. All teachers and students have e-mail addresses and, according to statistics provided by the school's system manager, most of them make fairly regular use of it.

7. Picture: Students at an ICT class



1.3 *How do the staff, students, and parents view these accomplishments?*

According to the 10 interviews made with the school principal, ICT specialists and other *teachers*, no one seem to doubt the importance of ICT for school reforms and beneficial effects on teaching and learning. Teachers may have their individual skill deficiencies but it does not seem to affect their conviction in the progressive role of ICT for teaching and school life in general.

The facilities of the school are well above average – in fact, this school ranks among the best equipped for ICT use institutions of secondary education in the country. Teachers' rooms also contain PCs to be used for preparations for lessons and communication. More than 70% of the staff possesses a computer at home and can be regarded as a regular PC user. The group of teachers who regularly use ICT in their teaching practice is constantly growing.

Parents seem to be well aware of the necessities of ICT literacy, support their children in the acquisition of new technology and welcome the efforts of the school to create an ICT-rich environment. As the school is regarded as one of the best for preparing for a career in business and has a highly competitive entrance procedure, parents who opt for this school for their children will be mostly university and college graduates with better than the Hungarian average financial means and are ready to provide their offspring continuous coaching and moral support for successful studies.

Many parents are well aware of the goals and objectives of the school, all possess and most have read its brochure containing its educational programme. The social group they belong to is naturally well aware of the importance of ICT culture for future career perspectives and highly appreciates school efforts in this direction. More than half of students possess a computer at home and are encouraged by parents to use it for educational purposes.

2. Overview of the past

2.1 *What led to these accomplishments?*

ICT has always been a top priority for development and has been regarded as a tool well suited to the reform ideas of the staff. The school took part in practically all national innovation and research projects and benefited from major donations by the George Soros Foundation, the World Bank, the PHARE Foundation and the funds of the Hungarian Ministry of Education. An active and diligent grant application policy by school leaders along with growing enthusiasm from staff and students constituted the basis for success.

The first computer laboratory was installed at the school in 1990. It consisted of 25 PCs (Type XT, with a 20 Mbyte Winchester, Hercules black and white monitor and DOS operation system.) Students learned typing during their first school year and Word 5.0, LOTUS and DbASE in their second year. In 1992, ASE decided to launch a vocational training programme. A second computer laboratory with 10 PC 286s was installed and XT machines in the first were exchanged for PC 286s. Vocations taught were PC Operator and Software Operator. Another important activity in 1992 was the installation of the *Practice Office*-a simulated office environment with 22 PCs where students could practice basic managerial skills.

8. Picture: Students in one of the computer labs engaged in individual work



In 1994, when the Windows operation system was introduced in Hungary, all PCs were exchanged for 486s and their operation system for Windows 3.1 teaching was carried out on a local Novell network. That was the first year of post-secondary education as well, facilitated by the Soros Computer Laboratory (18 student computers-486s with SVGA monitors-and a Pentium PC for the

teachers who could also make use of an LCD projector.)

In 1996, all machines have been exchanged for Pentiums. With the appearance of the Internet, both in basic and in special training and after school circles, graphic programmes gained in importance.

Computers in the 6 teaching labs and their use at ASE in 2000

Number/ laboratory	Type of PC	Training type it is used for
18	Pentium II	Multimedia developer
18	Pentium 133	Business ICT specialist, multimedia developer, PR referent, basic training in ICT for primary and secondary level
18	P133	Ict specialist, PR referent, basic training
14	486 SX	Library use
18	486 SX	Basic and vocational training: mostly typing practice
18	Pentium 133 PC	Free student use

Two systems operators and 6 information technology teachers maintain and develop the facilities. They belong to the Professional Community of Information Technology Teachers - a working circle within the school - and regularly discuss problems related to hardware, software and Internet use. The school is financed by a private foundation based on donations from companies and the contribution of parents in the form of tuition fee and individual donations. The *yearly budget* is 180.000.000 HUF, approximately 750.000 US\$. ICT development is supported by state and private foundation grants that amount to 10.000.000 HUF, 45.000 US\$ yearly.

9. Picture: Students in a computer lab furnished to hold traditional classes enriched with occasional ICT use



2.2 Who initiated the ideas, who shepherded them to completion?

György HORN, principal of ASE has been aware of the importance of ICT for the success of an innovative school and has done his best to support the spread of new technology in all areas of school life. He was instrumental in the conception of the Educational Programme of the school and soon realised that ICT is excellently suited to its goals.

Tamás FORGÁCH, senior ICT teacher and ICT Co-ordinator of the school holds an MA degree in Psychology and an akin research interest. He is one of the co-authors of support materials for this study. He has been instrumental in formulating the ICT philosophy of the school and the acquisition and maintenance of its equipment. As a programmer, he has developed an authoring system for educational software called "*Morsels*" that facilitates the production of materials for teaching and assessment by non-expert teachers through the use of multimedia. He is a regular lecturer at ICT in education conferences.

Zoltán NÓGRÁDI, another author of background papers and interviewer of staff, a capable young teacher who currently serves as Deputy Co-ordinator for ICT for the school, has also an MA degree in Sociology and is currently working towards a PhD in Education. His topic is the Net Generation-social, psychological and educational characteristics of youth regularly and competently using ICT technology. His involvement in the study of this subculture makes him one of the key figures guaranteeing that high level ICT use will always be one of the dominant features of ASE.

The Astrology circle lead by the teachers of Geography is considered an internationally acclaimed training programme for future astrologists.

Gábor LAKOS, German Teacher has been active in the use of software for German as a foreign language. He regularly shares his experiences with teachers of his own school-including teachers of English and Italian who may benefit from ideas of how to utilise digital teaching aids in language education) and teachers of other hungarian schools at professional meetings.

The professional community of science teachers at ASE has regularly been taking part in innovation projects focusing on the use of ICT in science education. (One of their recently accomplished projects is called "Open Textbook" and involves the development of 100 lesson plans with the use of ICT in secondary level science.)

István BARANYAI, teacher of Information Technology, is also the Editor of the student magazine "Subjective Recommendation of Leisure Time Programmes" (the title is much shorter in Hungarian: Szubjektív Programajánló.) The magazine is designed and edited by students using desktop publishing devices. Most illustrations are downloaded from the Internet and it offers a forum for young critics of the Film Club of the school to publish their reviews. This ongoing activity also ensures the continuation of creative use of ICT at ASE.

2.3 *What barriers were overcome in doing this?*

There were no particular barriers apart from some financial difficulties regarding permanently rising maintenance costs that were overcome by successful applications for grants and utilisation of gains of fee-paying courses for the modernisation of ICT equipment. Both school leadership and staff are unanimous in their appreciation of new technology and are doing their best to maintain the high level of ICT use in teaching and learning. (At present, they are active participants of the OECD/CERI Quasi-Experimental Study.)

3. The present

10. Picture: Scenes from the school corridors





In Section 1, we described the basic characteristics of the school. In this section, we give a more detailed overview of the special educational features of the school and characterise the use of ICT use in this school.

3.1 *Characteristics of the school*

ASE trains on three levels: primary, secondary and post-secondary. Its secondary level training programme includes a secondary grammar school and a secondary vocational school. Vocations that can currently be learnt are Multimedia developer, Business ICT Specialist and PR Referent. The school is located in an urban area near the centre of the 3d district of Budapest, surrounded by housing estates, in a lower middle class environment. As it is a special school that is considered useful for entering business studies, parents of most pupils are higher middle class. (An indicator of the income level of parents: only 10% applies for the reduction of the tuition fee.) There are practically no minorities at this school: one student is not a Hungarian citizen (she is Vietnamese), one has a double citizenship (he is Hungarian and Croatian), one has African ancestors. There are no Gypsy students at ASE. (This is the largest Hungarian minority, currently about 8 % of our population of 10 million.)

Types of training and number of teachers and students per training type

Training level	Number of teachers	Number of students	Boys-girls fiú-lány
1. 6-form secundray school			
7. grade-13 years of age	15	56	23-33
8. grade-14 years	15	55	28-27
9. grade-15 years	20	55	29-26
10. grade -16 years	20	52	25-27
11. grade-17 years	25	61	24-37
12. grade-18 years	25	82	36-46
Post secondary educat.			
13. grade			
Multimedia developer	8	28	
Business ICT specialist	6	15	
PR referent	8	27	
14. grade			
Multimedia developer	8	12	
Business ICT specialist	5	11	
PR referent	8	12	

11. Picture A, B, C: Learning environments of the school – homes for the various “nests” and special study circles



Perhaps the most unique characteristic of this school is that the staff did not formulate a detailed definition of goals and objectives for the whole school but has created a system of so-called *micro-schools*. These are units according to age level and have their own teaching programs and work schedules. ASE is made up of six "*micro-schools*". Each separate grade within the school counts as an individual entity within the larger one. 50 students and 6 teachers (usually responsible for teaching their own specialised subjects of study) form a grade and remain as one unit for six years, up to the time of matriculation. Micro-schools operate as separate units for several educational and organisational purposes. The training program within a micro-school can more easily be adapted to suit a child's individual level of progress. Daily tasks and decisions on issues regarding different students can be discussed on the spot in a flexible atmosphere. The faculty in a micro-school has six teachers who also remain the students' patrons for the duration of their six years of study in the school. Each micro-school forms a community with its own rules, work schedule and daily activities in accordance with the ASE order of operations. Micro-schools are provided with their own work-space, including an entrance hall, a small staff-room, two larger classrooms, and in some cases, a small kitchenette. It is the responsibility of each micro-school to furnish, clean, and maintain its work-space. Most subjects of study in the micro-school are taught by its six-member faculty, especially subjects taught according to an "epoch" schedule. Outsiders (teachers of different grades in the school) are only employed in the case of substitution or in subjects requiring a smaller number of lessons.

Students in the micro-school are divided into two *independent sections*, each of which receives parallel instruction in basic subjects within the "epoch" schedule (a three-week teaching period consisting of 85 and 60 minute lessons, see "Training and available qualifications"). Placement of students in different sections is based on communal discussions. The selection process for students studying together in the epoch system and the establishment of additional classes is determined by the needs of individual students, the requirements of the community, and the subject of study. *Epoch lessons* are conducted in the classroom space of each micro-school.

While stressing independence, ASE also strives to function as a unified school. Its training program focuses not only on individual requirements, but also on the common basic principles and operational mechanisms on which it was founded. The school has numerous programs that provide opportunities for students of all ages to regularly work together. All traditional events and celebrations in the school are organised by different micro-schools for the benefit of the others.

Students in upper classes have the opportunity to compile their own programmes from the electives offered by the school but influenced by students' needs. (For example, in case more than 6 students express their wish to learn a language that is not on offer at the school, ASE hires a language teacher for the group.) Each student has a *patron* from the day they first set foot in the school to the time they matriculate. "A patron is a professional teacher selected by a small group of students to assist and represent them throughout their time in the school. Fulfilling the role of "parent" in a school context, it is the responsibility of a patron to keep students informed and support them in their successes and failures. Patrons take part in the students' decisions, developing their self-knowledge and helping them to recognise their own individual talents. Students are encouraged to find the activities best suited to them, with an emphasis on forming possible long-term career goals. The pedagogical techniques adapted by the patron are appropriate to the age and personality of each child. They are meant to assist children in getting to know the world around them, acquiring a sense of values and norms conducive to co-operative relationships. (...) The 8-10 students under the patronage of a particular teacher form a "*nest*", which does not necessarily mean that they are a communal entity. During their time in the school, they will obviously take part in various programs together and will have common tasks to complete, but a nest is not a training unit organised for the purpose of study or

the fulfilment of assignments. The tasks of the patron:

1. Taking part in the decision-making process; decisions concerning individual students cannot be made without the participation of their patron.
2. Keeping close contact with parents; patrons inform parents on their child's progress and on issues concerning school programs and financial matters.
3. Patrons must provide time at least once a week to speak with students individually and also together as a nest. During these weekly sessions, students are informed about school issues and upcoming tasks.
4. Keeping contact with teachers, patrons assist individual teachers in developing a workload that is suitable to their students' personal needs and abilities. In turn, teachers inform patrons on their students' class work and their progress in specific subjects.
5. Each semester, patrons provide written evaluations of their students' development, including suggestions on how they might best progress in the months ahead. All evaluations are discussed individually with each student, and are also made available to the parents and teachers involved.
6. A patron represents the interests of individual students in the school and transmits their problems, if required.
7. Patrons must keep a continuous check on the attendance of their students. Their participation in activities outside of school during school hours, depends on the patron's approval." (From the Educational Programme of the school.)

A special feature of the school is its magnificent art education programme. Works of students preparing mostly for a variety of non- art related professions decorate corridors, room walls and even turn ceilings and windows into unique works of art.

12. Picture: The ceilings of the corridors are decorated with imaginary coats of arms



13. Picture: Windows are decorated with images characteristic for old European stained glass church and castle windows



14. Picture: The art room is a work of art in itself



The educational process of the school is organised in two phases. The *basic phase of training* (lower-intermediate, grades 7-10) is a period of general study, which takes a practical, problem-solving approach to life within the school. School disciplines are taught in separate blocks and acquisition of knowledge is based on personal experience. Marks (or grades, that is, assessment units) are generally not given during this phase.

The *second phase of training, including a period of vocational instruction* (upper-intermediate, grades 11-13), attempts to provide students with alternative, often specialised courses of study. The training programs are goal-oriented, with a broader range of study choices. Students are encouraged to develop their own unique work schedules according to their individual needs and interests. Independent study is emphasised. Although subjects continue to be taught within a block framework, the work of students now also includes graded assignments and tasks designed to meet various exam requirements.

ASE is open all day; regular programs are from 7:00 to 18:00. Evening programs include the activities of various creative clubs (ex. conversation circle on Mondays and the Film club on Fridays). Theatre rehearsals, different competitions, and sporting events also take place in the evenings, as well as on weekends. Additional room for study and extracurricular activities also stay open on an all-day basis.

The library is open from morning to the late afternoon. It has a fully computerised catalogue and Internet-based search facilities.

15. Picture A, B: The school library: its reading room and reception



The school club, theatre, and music halls are also available in the evening hours . The school gym and exercise room stay open on a continual basis, as required. This, however, does not mean that students have lessons all day; ASE tries to provide its students with opportunities, which they can take advantage of insofar as their micro-school programs, their age and their interests allow them to do.

16. Picture A, B: The school club is a converted cellar area designed in the so-called “organic” (folk art and natural materials based) architectural style very popular in the eighties in Hungary



ASE is a school without school bells... Work schedules within the two phases of study differ significantly, depending on micro-school. programs, the subjects of study and the instructors, as well as the interests of individual students. The following is only a rough outline of lesson schedules. Only the starting times are fixed, as each micro-school begins its day with its own communal activities and rituals, regardless of the grade in question.

17. Picture: School cafeteria



All students have physical education classes and language lessons. Lunch is an integral part of the daily schedule. Lunch facilities are provided by the school cafeteria, open from 11:30 to 15:00. Students' schedules are prepared to allow an average of at least 45 minutes for lunch. The cafeteria operates on a self-serve basis and offers two different menus. In addition to the cafeteria, students can also make use of the school snack-bar, open from morning until late afternoon.

3.2 *Use of ICT by specialist teachers*

ICT in Hungary is a separate discipline and is being taught according to a curriculum approved by the Ministry of Education. (The most recent version is called Frame Curriculum and has been approved in spring, 2001) ICT teachers at ASE have developed their local curriculum variant and use it in so-called "normal" and specialised classes. Specialised training includes "Multimedia developer" and "Advanced Internet user" curriculum versions.

Post-secondary training is offered in several ICT-related vocations for 18+ year-old students who are graduates of the ASE secondary grammar school.

ICT is being taught in computer laboratories only. There are no "theory" classes – lectures on the history of computer science or manufacturing with no practical, hands-on exercises are avoided. Teachers of ICT make use of computers 100% of their teaching time and students have an access in 70% of the total time spent in the computer laboratory.

18. Picture: Students engaged in group work during a project week



3.3 *Use of ICT by non-specialist teachers*

Teachers have all been trained in the use of ICT, but mostly informally by their colleagues, students or family members. Approximately 70% of them is a wholehearted supporter of the reforms. There are those who are hesitant because of their professional beliefs. As proponents of the Waldorf Pedagogy (an educational method based on the anthroposophic ideas of the German philosopher Rudolf Steiner), some teachers oppose the mediator role of machines in human communication and refuse to implement ICT as it may dehumanise the educational process. Others lack the necessary competence and are reluctant to engage in training. There have been several unsuccessful attempts at organising local training courses for staff but, apart from the language teachers who diligently engaged in it, there was not much interest. ICT teachers, however, constantly offer help for anyone in need (the atmosphere among staff members is exceptionally friendly) so every teacher can learn skills he or she currently needs. The majority of them is a more or less regular computer user (see chart below) and supporter of ICT in education.

19. Picture: (Pair work): Students often work in pairs on information retrieval and utilisation tasks

During classes, ICT is used regularly by only about 5 % of teachers. Those who use computers will have one period a week (that is, 45 minutes) per class with digital teaching aids or presentation devices in use. 70 % of teachers use the computer for preparing for their classes. They spend about 5 hours per week word-processing their tests, notes and overhead sheets. Flowcharts are being used by 5% of teachers who spend about 3 hours per month producing them. Browsing the Web for information is done by 50 % and requires an average of 8 hours weekly. Educational CD-ROMs are being used by 10 % of teachers (while more than 20% of them makes use of the CD entitled "Legal Rules"). They spend about 5 hours monthly selecting materials from CDs for classroom use. 70 % of teachers use computers for communication and spend about 5 hours per week word processing. 80 % is a regular e-mail user and send / receive mail for about 3 hours per week. (Cf. Appendix B)

Possibilities of using ICT in after school hours are generally good. There are 300 students and 80 teachers in this school. Teachers can use computers at all times (also during the night), students from 8.00-18.00 daily, including Saturdays, excluding Sundays. The Soros Computer Laboratory is

devoted exclusively to student use. Here, 18 PCs with constant Internet access can be found but there are more than 50 other PCs with an Internet connection situated elsewhere in the school. In the Teachers' Cabinets, there are 12, Internet-connected computers that may be used for sending and receiving e-mails or Internet search.

3.4 *Use of ICT for internal communication*

Most personal communication is still being done verbally, at regular meetings of teams of teachers teaching in the same micro-school. Weekly staff meetings offer a lively forum for discussing urgent management matters as well as continually refining the school's educational philosophy and practice.

Intranet and Internet use, however, is a more and more important vehicle for communication. The home page of the school is a daily updated source of information for school-based and national activities: competitions, festivals, campaigns, sports events etc. Students make regular use of the Net for updating their knowledge on what is going to happen at school and in the neighbourhood.

From September 2001, all Hungarian schools will be obliged to submit information about student statistics through the Internet, regular production of digital texts and charts will be expected from administrators as well as staff members.

20. Picture: The administrative staff of the school has also been trained in ICT use



3.5 *Incentives used for spreading ICT culture*

There was no need for special incentives as interest among staff members and students had been high right from the start. Need grew faster than facilities, so the only real incentive is the assurance of high quality use – better access or self-selected, high level training. The best incentive a student may get is provision of more frequent use of better equipment and larger storage space for a private home page. Teachers are enrolled to ICT training programmes of their choice, encouraged to participate in post graduate training courses (one even to a Ph.D. course on ICT in education) with tuition fee paid by

the school.

3.6 *Level of computer use by students*

Based on several national and international surveys (Monitor Survey for Learning Output for Hungary, International Assessment of Educational Achievement / IEA for an international comparison) ICT teachers and teachers who are regular users of ICT in their teaching have made the following estimates: about the level of student computer use at this school

- low level users: 40 %
- average level users: 40 %
- above average level users: 15 %
- excellent users: 5 %

21. Picture: Girls using the computer lab for doing homework



3.7 *Computer use by students and their parents at home*

About half of the *students* has a computer at home and makes regular use of it, mostly for playing games and word processing home works. About 20 % also have a modem-based Internet access at home (this is double the Hungarian average, about 10 % as of April 2000.) Those with an Internet access report regular use of IRC and chat channels and Web search. Using the Internet for communication and learning is largely restricted by its costs. Telephone connections for Internet access are extremely expensive in Hungary right now. (However, moderately priced Internet packages are currently being advertised by our leading telephone company so the situation may dramatically change in a few months time.)

As for *parents*, we have not conducted any surveys in this respect. We can only make guesses based

on self-reports by students on the Computer Attitude Scale. 20 % of parents can be considered regular computer users. There are two, extremely different "parent types": the professionals who support their children with machine and advice (the minority) and the benevolent laymen who are pleased with the efforts of the school but may not offer substantial help. There are practically no parents we have heard from the teachers of who are opposing the use of ICT at school. Most of them, however, are aware of the malevolent effects of game playing and visiting Internet sites with inappropriate content but consider this a problem of the home environment.

4. Main hypotheses

4.1 ***Technology is a strong catalyst for educational reform***, especially when the World Wide Web is involved. The rival hypothesis is that where true reform is found, technology served only as an additional resource and not as a catalyst, that the forces that drove the reform also drove the application of technology to specific educational problems.

At ASE, it is the second version of this hypothesis that holds. The founders and educational conception providers of this school have found *an important agent for their reforms in ICT technology* and made full use of its potentials. Reforms occurred not because of the introduction of computers, but the wide range of uses of new technology was a result of the reform-oriented environment. It would be unwise to overestimate the effects of ICT as a *catalyst for change*. Browsing the Internet has resulted in important educational innovations (for language learning or astronomy, for example) but *most of the uses of ICT are related to non subject-based, non-traditional teaching and learning*. (For example: newspaper publishing, doing creative artwork, composing music.)

4.2 ***The diffusion of the reform*** (and therefore of ICT) followed the traditional diffusion pattern for reforms and innovations, as outlined by Rogers (1995). The rival hypothesis is that technology functions differently from traditional innovations and reforms and that therefore different diffusion patterns occur.

The diffusion pattern of ICT use can be characterised as a *multi-focus, simultaneous development*. ICT was introduced at the same time for teaching basic information processing and communication skills and as an agent for improving knowledge in a range of disciplines. ICT teachers seem to have been the catalysts of change but several teachers of other disciplines joined them to help students become capable citizens of the Age of Information. As the principal has been supportive of ICT from the start and encouraged the use of electronic communication both externally and internally, even reluctant staff members needed to be introduced to the system and had to adapt quickly.

4.3 ***Successful implementation of ICT depends mostly upon the technological infrastructure and student ICT competence*** rather than upon staff competence in the integration of ICT into instruction. The rival hypothesis is that teachers mediate such applications when they are successful, and that their academic value relates positively to teacher competence.

At ASE, successful implementation of ICT depended both on an exceptionally good infrastructure and the simultaneous training of most staff members in its use. For several teachers, ICT clearly contributes to the raise of their professional level of excellence. They (teachers of Science and German, especially) are convinced that ICT has been beneficial for their professional development. They are intent on improving their teaching through regular use of ICT. Talented students serve as motivators for teachers to improve their own skills but cannot be considered as instrumental for the introduction of ICT. On the contrary, when entering school, students of ASE also enter an ICT-rich

environment where a selection of computer-based activities is on constant offer.

4.4 *Gaps in performance between high and low poverty students will be enlarged rather than diminished* where all students have equal access to ICT. The rival hypothesis is that equal access to ICT will lead to high poverty students closing the gap with low poverty students.

The school is one of the best secondary education institutions in Hungary as measured by the acceptance of its graduates in higher education. As there are about 8 applicants for every place available, access is granted through entrance examinations. Parents of high poverty students are mostly intimidated to send their children to a highly competitive school that intentionally prepares for a business career although basic knowledge and individual learning skills required for a successful entrance exam are obtainable in general education. Thus, there are very few high poverty students. There is a tuition fee (for the school year of 1999-2000 it was 500 US dollars or 120.000 HUF-per year, 150 % of the average monthly income in Hungary. This fee will have to be enlarged as the Ministry of Education has withdrawn its yearly financial support and the school will have to be run solely on a private basis as a charitable foundation.) Stipends are given to some of those who have difficulties paying. More than two third of the students have computers at home but those who have not are granted generous access in after school periods. *Gaps in performance at this school are therefore more related to individual interests and abilities not social status.*

High poverty students with special interests are encouraged to enter study circles described in this section later and are supported to overcome difficulties due to lack of individual practice time at home. Needless to say, if competence is equal, those students who have a computer at home will always be more advantaged than those who have not. *School may narrow but not completely diminish the gap. Talent development* in the use of ICT is important for the school and has always been given special attention. There are several students who are interested in ICT culture but, having other career plans, unwilling to enter a vocational training course. For them, there are *study circles*:

- "Astronomy" (study of the solar system through remote, computer-regulated telescopes, searching databases and information sites on astronomy, making observations and disclosing data through the home page of the circle. (This task was first done in pair work with students from the Internet circle described below.)
- The circle called "Creation for the Internet" was launched in the school year of 1996/97 in the computer lab furnished through funds from the Jefferson project of the George Soros Foundation. Students can have permanent, relatively fast Internet access. First they study the software environment, practice the use of search engines, then get acquainted with the graphical applications of the web and create their individual home pages with a rich variety of images including real-time video films. Utilisation of e-mail, IRC and other real time chat functions as well as participation in virtual adventure games, subscription for mailing lists offers a rich communication environment where anonymity may be protected-an aspect especially encouraging for high-poverty students who are often shy to make contacts.
- "Advanced programming" is aimed at the introduction to the utilisation of up-to-date programming languages for those who do not want to practice programming as a career but use it as a tool for more effective work.

5. Projection to the future

5.1 *How likely is it that these accomplishments will remain?*

As the school has several vocational training programmes for ICT-related vocations, upgrading of equipment seems to be inevitable. The scarcity of financial resources, however, may lead to an increase of fee-paying courses that use up most of the laboratory time and make the use of ICT in other areas almost impossible. Mobile demonstration units (a computer and an LCD projector) could be of help for teachers who intend to use digital illustration materials or presentations but interactive teaching would need at least 3 computers per school room-an ambitious plan that, at present, seems to lack financial resources.

5.2 *How easily could they be extended to other schools?*

ASE has a high above average ICT equipment level, a special teaching programme, an unusual organisational structure and an extremely reform-oriented, well versed in ICT staff. These conditions are far from being met in other Hungarian secondary schools. Their programme in general can and will not, therefore be generally adapted - parts of it, however, are already in use elsewhere. Educational software developed by the staff are being marketed and used, methods employed in their Astronomy or German Language departments for example are popularised at conferences and made use of by other schools.

The educational programmes of the school are being distributed through its own publishing house and bookshop that ships textbooks, teachers' manuals and reference works all over Hungary.

22. Picture: Office of the publisher at the school



23. Picture: Bookshop at the school, offering a wide selection of books written by staff members



5.3 *What resources are required for maintenance?*

Regular upgrading of hardware, acquisition of new software products and installation of mobile presentation devices and/or desktop PCs in all classrooms are among the major costs of maintenance and improvement of infrastructure. Spare parts for existing machines and regular servicing works also require a substantial budget.

This study offers a snapshot with a historical background on how ICT was introduced and further developed in schools. As only a small fraction of parents and students could be reached, no clear picture of the general acceptance and preferences of ICT use of the student body and their families could be formulated. In order to gain understanding of the *process of using ICT as a catalyst for better teaching and learning*, we need ongoing, longer observations under controlled condition. Therefore, we suggest the continuation of studies from 2002 onwards with this international selection of schools. With the help of a *longitudinal study of selected sites*, we could reveal how reforms are being sustained or else discontinued, how new technological challenges may or may not be met by the educational community, how students and teachers interact in their more and more digital environment.

6. Appendix A : Methodology; description of the amounts and types of data collected

Size and composition of the research team: a team of four researchers – all holding a teachers' degree also and acquainted with the work of the school since its foundation - was organised. Observers were trained, along with others working in the other Case Study schools, in two, full day sessions and given the Workbook Version 9b in Hungarian along with structured interview questions. The team was encouraged to supplement questions to the interview scheme to suit local needs. Previous experiences with the school and work connections with several staff members in the frameworks of

other ICT projects proved to be very helpful.

Amount of time spent at the school: 4 full days and 11 visits lasting 2-3 hours to attend special, ICT-related lessons and study circle sessions as well as interesting school events like art shows.

Amounts and types of data collected:

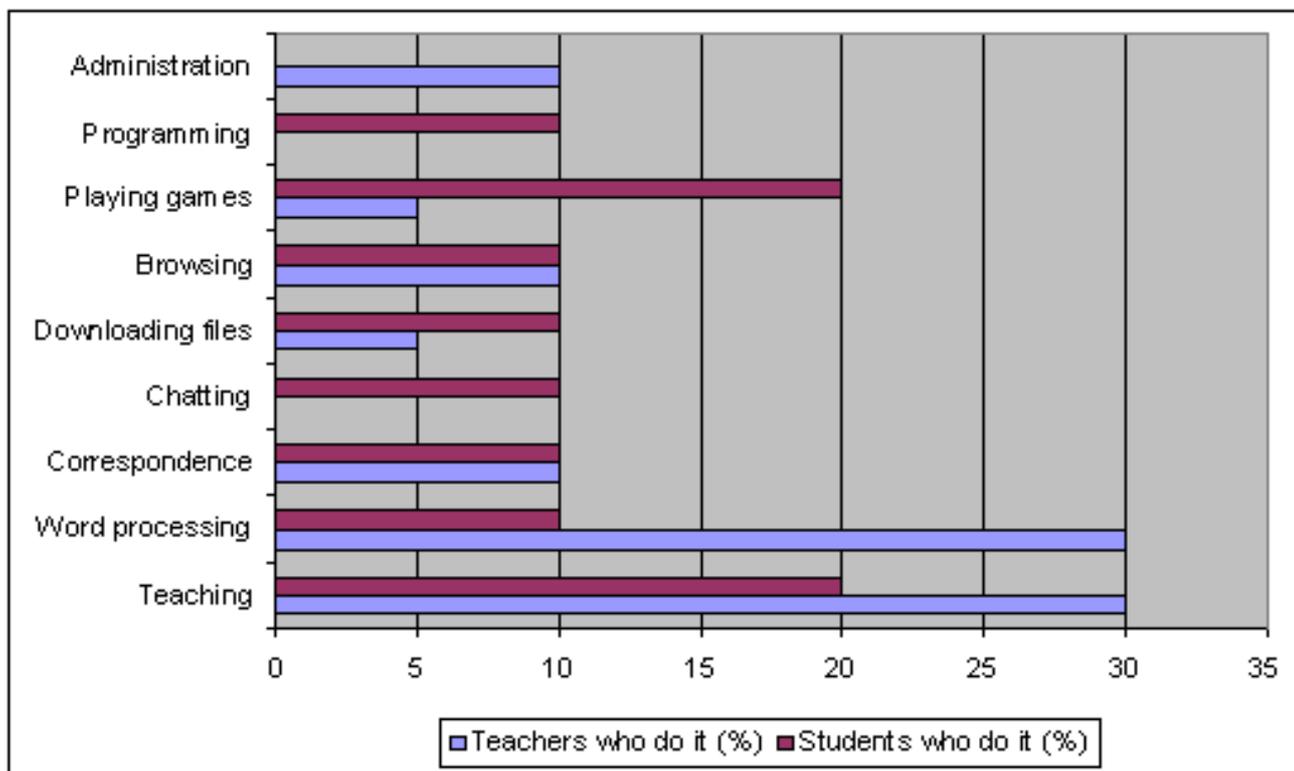
As mentioned before, members of the OECD/CERI Hungarian research team have been acquainted with the work of ASE all through the first decade of its existence. (The school is constantly being visited by teacher students of Eötvös University, home to the OECD research team, and hosts a range of professional workshops and conferences.) Thus, anecdotal evidence about the foundation of the school, level of teaching and learning, types of activities and general atmosphere were readily available. For the purposes of the study, the following data collection methods were employed:

- *Interviews* with teachers and school administration (10 interviews executed)
- *Interviews* with parents and students (15 interviews executed)
- *On-site observations* of classes (15 lessons observed)
- *Observation of written and visual communication* of the school (analysis of school home page, 20 home pages of students, 5 home pages of teachers related to special disciplines), school magazine
- *Analysis of digital teaching aids developed by staff*
- *Questionnaires of ICT use* given to all staff members, 85 % replied
- *Testing of ICT skills and attitudes* with Version 1 tests of the Quasi-Experimental Study of this research project (data were presented at the meeting in Poitiers in January 2000 and used for their further development. (90 students tested, age groups 13, 15, 17)
- *Critical reading of project applications and reports by ASE staff members* for grants donated by the school and by foundations.
- *Observation of student work* done with the help of computers (papers, presentations, tests, creative work, computer programmes etc.)

7. **Appendix B:** Tabular data and possibly graphs from the Teacher ICT Practices Survey.

Use of computers by teachers and students-based on the Teacher ICT Use Questionnaires

Activity	Teachers who do it (%)	Students who do it (%)
Teaching	30	20
Word processing	30	10
Correspondence	10	10
Chatting	0	10
Downloading files	5	10
Browsing	10	10
Playing games	5	20
Programming	0	10
Administration	10	0



8. **Appendix C:** Other supporting evidence (if any); e.g., examples of student work, school newsletters, inspector reports, newspaper articles about the school:

Examples of student and teachers work have been collected and are partly on show on the home page of the school: <http://www.akg.hu/>. Here, the digital version of the school newsletter, produced by students can also be seen, along with an archive displaying illustrations to articles and (very well-done) title pages of the newsletter also. Newspaper articles on the school are being collected and kept in an archive by the principal – some recent reports, along with television interviews can be seen and downloaded from the school home page.