



Case studies

10. Gárdonyi Circle of Multigrade Schools, Hungary

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This is one of 25 case studies produced for STEPS, the Study of the impact of technology in primary schools, to illustrate the impact of ICT, on schools, teachers and learners, and to highlight barriers and enablers to its effective use in the school. Further information can be found at <http://steps.eun.org>.



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1. CONTEXT OF THE SCHOOL

Multigrade schools are primary level institutions with undivided classes for the age group 6 to 10 years, and are mostly situated in small villages. The teaching staff consists of two or three educators only and, due to the per capita financing system, infrastructure (including ICT equipment and software) is of low quality. Through necessity rather than choice, these institutions still play an important role in primary education in providing access to 'Education for All' in many parts of the world – both developing and industrialised countries. There are 600 such schools in Hungary, and more than 10,000 across Europe.

Due to a declining birth rates, the upper classes of these schools (originally offering 8 grades, the national version of compulsory education) have gradually been closed down, and currently only offer lower level primary education for Grades 1 to 4 (ages 6 to 10 years). The staff consists of two generalist teachers who manage the work of two age groups (and grades) simultaneously. In most cases, Grades 1 and 3, are taught in one classroom while Grades 2 and 4 are taught in the other.

Educational attainment tests have identified these schools as being inferior to regular schools. This evaluation, reinforced by economic reasons, has led to regional authorities gradually eliminating small village schools, instead organising shuttle buses to take children to larger schools in neighbouring towns. Local authorities and parents, however, do not approve of the dissolution of the cultural centre of their village.

Movements against forced school eliminations have encouraged Multigrade teachers to show the potential of small, family-like educational institutions all around the country. In 2007, teachers of four schools decided to use ICT to turn their handicaps into assets, and developed a special Multigrade curriculum enriched with creative and flexible ICT use. In the framework of the Knowledge Practices Laboratory Project (KP-Lab), supported by a mentoring team of teacher trainers from ELTE University in Budapest, they established a Multigrade school community called Gárdonyi Circle. The project was named after the Hungarian novelist Géza Gárdonyi, author of the winning novel in Hungary's Big Book Competition, who was himself a pupil of a Multigrade school and fondly describes its benefits to his later career. Characteristics of these schools are shown in Table 1.

Table 1: Characteristics of the Gárdonyi Circle schools

School location	Number of pupils	Age group	Grades	Number of teachers
Felsőpetény	34	6-10	1-4	3
Kolontár	26	6-10	1-4	2

Szárföld	45	6-10	1-4	3
Vezeeny	54	6-10	1-4	2

The images, below, show two of the primary schools in the Gárdonyi Circle: Felsőpetény and Kolontár.



2. EXAMPLE OF PRACTICE

In the Multigrade classroom, ICT turned out to be especially beneficial for the provision of individualised instruction based on skills and abilities, interests and motivation of pupils. While one grade is being taught by the teacher, the other may engage in challenging, individually distributed interactive tasks at the computer.

The project has also helped to preserve local natural and cultural heritage, through a combination of digital photography, presentations and virtual exhibitions, allowing pupils of the Multigrade schools to integrate school life with village life and the wider culture of the community. Pupils developed projects about their immediate environment: they designed posters to attract tourists to their village, collected information on local customs and tales, and shared children's games characteristic for their area through correspondence with partner schools in the Gárdonyi circle.



Pupils also invited their parents and grandparents to collect memorabilia of folk crafts and trade in their area. Exhibitions were held in school rooms and community buildings, and older members of the community and donators of objects were asked to talk about their memories. Grandchildren of one time local tradesmen remembered how their ancestors used to produce pots and pans, and how the village nurse assisted with child birth carrying an old leather bag

(retrieved by her daughter for the exhibit). Ancient crafts were demonstrated and teachers explained their ethnographic and artistic value.

The most fascinating objects of the exhibitions were drawn, written about, photographed and filmed by children. The resulting digital exhibition was posted online providing a synergy between old arts and crafts and emerging technology.

3. IMPACT, BARRIERS AND ENABLERS

3.1 SCHOOL

ICT DEVELOPMENT PLAN, IMPLEMENTATION STRATEGY, ORGANISATIONAL CHANGES AND ATTITUDES

- **Impacts**

- At the beginning of the project, in 2006, the schools lacked even the most basic ICT infrastructure, and second-hand computers were used to establish the first PC corners in classrooms. As their innovative practices became widely known, two of the schools were able to benefit from development grants. All schools now have an ICT strategy, and teachers regularly participate in courses about new educational applications – see Teachers section below.

- **Barriers**

- The role of Multigrade schools is crucial, as they provide isolated communities in remote and disadvantaged areas both with pedagogy and community services. Nevertheless, due to their scattered geographical location, and the generally low socio-economic status of communities that maintain them, these schools represent a neglected aspect of the Hungarian education system. Development grants tend to target medium and large institutions in order to reach more students with new infrastructure; the low student population in Multigrade schools means they often miss out.

- **Enablers**

- As teachers have become aware of the potential of ICT for communication (both professionally and privately), they have been increasingly motivated, making regular ICT use a central part of their innovative practices.

RESOURCING

- **Impacts**

- Between 1999 and 2003, 90 per cent of schools benefited from the 'Sulinet' (Schoolnet) Programme of the Hungarian Ministry of Education. The programme equipped all primary and secondary schools in Hungary with a computer lab,

consisting of 10 PCs, a server, a printer or scanner, and internet connectivity. A wide variety of content is freely available via the Sulinet Digital Content Database, and this is a huge source of support for teachers.

- **Barriers**

- Unfortunately, small village institutions were the last to receive their computers and received only two to five PCs, and no printer. Only two of the four schools have a broadband connection; the others use local ADSL networks.



- **Enablers**

- Teachers sought partnerships with local businesses and managed to get some help in the form of maintenance or used equipment (although these villages suffer from economic decline more than any other area in the country). Pedagogical support from ELTE, software purchased to meet teachers' needs, and new, emerging computer-supported teaching strategies also acted as important enablers to keep the project going.

THE CURRICULUM AND ICT

- **Impacts**

- The most important new development in these schools was the introduction of CSCL (computer supported collaborative learning) methods for teaching mathematics and the arts using PowerPoint presentations, imaging software and computer games. Curricula for mathematics for all grades were redesigned and an integrated arts program (music, literature, drama and visual arts) was developed in co-operation with the ELTE team.

This enabled more authentic tasks, hands-on experiences and opportunities for collaboration across age groups and across schools in the Gárdonyi Circle. Teaching aids were co-designed by teachers, mentors and a graphic artist, and are now being turned into computer games.



- **Barriers**

- The educational tradition in Multigrade schools is based on 'being similar to traditional schools'. Frontal lecturing (while the other grade is doing exercises in silence) is typical, and there is little evidence of inter-grade co-operation. The introduction of ICT-supported methods therefore requires careful consideration.

- **Enablers**

- The KP-Lab project aimed to help teachers in the Gárdonyi Circle to start developing Multigrade pedagogy. Through training, the project aimed to help teachers to:
 - realise educational objectives with special regard to the development of collaboration and communication competences acquiring and utilising knowledge society skills
 - improve the level of teaching through more effective means of classroom management, visualisation of learning content and adoption of interactive methodologies for knowledge construction.

ASSESSMENT OF ICT AND ICT FOR ASSESSMENT

- **Impacts**

- Individual skills development strategies of teachers include the use of interactive task sequences. A successful national software series, 'The Goblins', has become a standard tool for skills assessment. Both teachers and children appreciate the edutainment features of the software, which is coupled with careful pedagogical design. Different sets of tasks (described in teachers' manuals) suit the needs of slow and fast learners alike.

- **Barriers**

- There are not enough digital teaching aids for primary schools available in the Hungarian language. The country is a small market for developers, and teachers often lack the necessary language skills, time and motivation to adapt learning content developed in a foreign language to support their own needs.

- **Enablers**

- The ELTE team has made products created by university research teams available for use by the Gárdonyi Circle. Products that prove to be useful will hopefully be developed into tools for the whole school community.

ORGANISATION OF SUPPORT

○ Impacts

- Many of the teachers interviewed stated that their school management largely depended on the proper functioning of the local internet connection and the PC network. Most teachers have become so used to computers for communication and information retrieval that they would consider the breakdown of the system to be a major obstacle.
- The schools are situated in small villages, so most informal inter-staff and teacher-parent communication is, and will continue to be, done verbally. Official communication between the schools and local, regional and national educational authorities, however, are more oriented towards ICT use. For example, educational statistics must be provided through databases, textbooks may be ordered online and information about educational events and in-service courses are mostly provided through email circulars or professional forum messages.
- Pupils make more regular use of the internet than teachers to find out what is happening in their school and the local community, so convincing their teachers and parents about the benefits of internet-based information searches.

○ Barriers

- Because of online data delivery requirements, small village schools in the Gárdonyi Circle have to devote the majority of their scarce ICT resources to administration. The best computer, the only printer and one of the few internet connection points had to be put to secretarial use instead of teaching.
- When teaching staff and management consist of the same two teachers, it is practically impossible to attend training courses organised in far-away regional centres or the capital.
- In bigger schools, the ICT teacher may be employed as a part-time systems operator, whereas a full-time ICT support person or a firm subcontracted to provide technical maintenance and repair may be available in larger schools. In small Multigrade schools, however, the primary teachers must acquire necessary 'computer survival skills' or wait for occasional maintenance services supplied by the regional educational centre.

○ Enablers

- No one from among the local policy makers, parents and teachers seemed to doubt the importance of ICT for school reforms and its beneficial effects on teaching and learning. Even teachers with low-level ICT skills were convinced about the progressive role of ICT for teaching and school life in general.
- The development of team spirit was found to be one of the most important factors for introducing ICT in all areas of education. Many teachers remarked that

computer-supported collaborative tasks were especially effective methods for pair and group work as they provide an environment for practicing task management skills, improve team spirit and are in line with the Net Generation concept of collective ICT use. Task sharing and discussion of results through email and real-time person-to-person communication, assembly of project components and presentation of results are skills of high importance for the world of work. ICT acts as a catalyst for all these skills and promotes new methods of working while also covering new content topics.

- The role of the school leadership is seen to be extremely important, and can be crucial from the outset of the innovation process. In the Gárdonyi Circle, headteachers now hand pick new staff on the basis of interest in computer-assisted education. Librarians are seen as important figures (and in fact the village library is located in one school), able to teach about information skills such as databases and online searching in an informal manner, while catering for their readers, young and old alike.

3.2 TEACHERS

ICT AS A TOOL FOR COMMUNICATION AND COLLABORATION

○ Impacts

- In the Gárdonyi Circle, teachers first became active ICT users then modernised their pedagogy to make full use of their newly acquired skills. This in turn resulted in increased professional self-esteem. One teacher remarked: “an internet connected laptop is the best remedy against burnout”.



○ Barriers

- In Hungary, Multigrade schools are considered a necessity rather than an asset, and colleges do not prepare pre-service teachers for teaching in multi-age, multi-ability settings. Remote village schools are often the only educational institutions in the neighbourhood and so have to accept pupils with a range of abilities, including those with mild- to medium-learning difficulties or special educational needs. Teachers have to teach a class of children with an age difference of 2-4 years simultaneously, who have to learn different disciplines with different methodologies in one and the same learning environment.

○ Enablers

- Teachers in the Gardonyi Circle Multigrade schools all have a degree in primary school education. Most also have, or will soon obtain, a degree in social

pedagogy or education for special needs. This allows them to cater for learning deficiencies in the classroom, often through afternoon remedial sessions. This twofold professional background helps them cater for a variety of learning needs, and also makes them also eager users of digital tools developed specifically to support children with special educational needs. Examples include speech therapy software, attention disorder correction tools and interactive exercises for pupils with dyscalculia or dyslexia.

ICT AS A TOOL TO IMPROVE THE QUALITY AND EFFICIENCY OF PLANNING AND ADMINISTRATION

- **Impacts**

- Online databases help village teachers to submit or download data necessary for school management without the need for long journeys to regional and national educational authority offices.

- **Barriers**

- Regular software maintenance is required to ensure that the PCs continue to function well. This can be a significant problem, and parental support is often sought.

- **Enablers**

- Teachers enrolled in EPICT (the European Pedagogical ICT Licence): an online professional development course that has allowed them to integrate with a large community of e-learners, so offering a source of potential assistance. Tutors also include their students in information circulars about new software solutions for planning and administration.

THE PEDAGOGICAL ROLE OF ICT TO IMPROVE LEARNING AND TEACHING

- **Impacts**

- Teachers of the Gárdonyi Circle have been tested for ICT skills and educational strategies before and after their first year of intensive computer use. Their competence survey results show that they now have enhanced ICT skills and enhanced competence in educational use of digital knowledge tools. Lesson observations indicate a significant increase in the use of collaborative methods, mainly multi-age, multi-skills, pair and group work and establishment of a new professional self, seeing their teaching setting as providing opportunities rather than barriers, and developing increased self-confidence and proficiency.

- **Barriers**

- More educational software products, better infrastructure and more time (paid or otherwise rewarded) would be needed to make full use of skills and knowledge acquired during the EPICT course.

- **Enablers**

- The KP-Lab Project has allowed teachers in the Gárdonyi Circle to realise educational objectives more effectively – with special regard to the development of collaboration and communication competences in acquiring and using knowledge society skills, and improving the level of teaching through more effective, ICT-supported means of classroom management and methodologies. Both objectives required integrated training in ICT skills and pedagogy.

ICT SKILLS

- **Impacts**

- In a survey conducted early in 2006 for KP-Lab in Hungary, teachers in the multigrade village schools were found to lack basic training and start-up resources to successfully introduce ICT in their educational repertoire. Therefore, Multigrade pedagogy on experiences was based on the 'Promoting Equity Through ICT in Education – The Gypsy ICT Project (2002-2005)'. In small villages, schools also serve as 'telecottages' – sites where mentoring in ICT is offered, along with access to computers and the internet. Therefore, teachers, students and community members may share tasks in projects and mutually assist each other in knowledge acquisition. This model was also incorporated in the mentoring strategy.

- **Barriers**

- Teachers in the Gárdonyi Circle, aged between 30 and 40 years, would have studied compulsory courses in educational technology while at college. ICT was introduced as a topic, but was not connected with methodology studies. Optional courses in educational applications of ICT began to be offered as experiments with ICT in kindergartens and junior primary schools gained acceptance (the focus previously being on senior primary and secondary level schools in the 1990s).
- Duration of both courses was one semester; they were practice oriented with hands-on workshops on the use of equipment. Apart from these, pre-service teachers could - but were not required – to study educational computing at optional introductory courses. For teachers of the Gárdonyi Circle, these classes were disconnected from teaching practice, so failed to immerse them in 'digital teaching' and also failed to leave a lasting impression. Competence development therefore had to start from scratch in the classroom.

- The OECD-Hungary study found that, for the majority of teachers, ICT was the medium used mostly for lesson preparation. During classes, ICT was used regularly by only 15 per cent of the model school teachers and 5 per cent of teachers at average schools. Those using computers employed digital teaching aids or presentation devices one period a week (that is, 45 minutes) for one class. 70 per cent of teachers at model schools, however, used the computer for preparation and communication. They spent about 5 hours per week word processing tests, notes and overhead sheets. Flowcharts were used by 5 per cent of teachers who spent about 3 hours per month producing them. Browsing the web for information was done by 50 per cent and required an average of 8 hours weekly. Educational CD-ROMs were used by 10 per cent of teachers. They spent about 5 hours each month selecting materials from CDs for classroom use. 70 per cent of teachers used computers for communication and spent about 5 hours per week word processing. 65 per cent were regular email users and sent and received mail for about 3 hours per week. Some teachers developed unique disciplines to teach new skills. These special ICT applications also helped students integrate their studies and ICT skills development.
- It is generally believed that younger teachers are more likely to adopt new teaching methods and tools than their older colleagues. Results in the OECD-Hungary survey disproved this claim. Major PC users were in their mid forties and an art teacher who became a national authority on software useful for secondary-level art education was well into her fifties when she first sat in front of a computer. ICT specialists were instrumental but there were teachers of different age groups and disciplines right at the start of the computerisation process. Women teachers seemed to be as active computer users as men, and no significant differences in the sex of student users of ICT were observed either (preferences for war games versus fashion websites are evident but, do not necessarily reflect different patterns of PC use.) A distinguished staff member, the leader of the extremely popular visual arts specialisation programme at HU05, learnt to handle graphics and CAD programmes in her fifties and started teaching them at once. Her art curriculum was an excellent example of the synergy of traditional and ICT-based creative methods.
- **Enablers**
 - All teachers in Hungary have to undergo 120 hours of in-service training (taking a few long or several short courses that add up to this figure) once every seven years. The EPICT course was offered to Gárdonyi Circle teachers to meet the requirements of their compulsory training. At the same time, with its wide variety of optional modules and a teaching methodology based on group work, the course has also taught them new methods of classroom management.

PARTICIPATION, MOTIVATION, CONFIDENCE AND PERFORMANCE

○ **Impacts**

- Multigrade education in Hungary mostly uses frontal and individual work. This means that most of the learning time is spent on individual tasks while students of each grade work alone in silence. ICT-based digital communication provides a means for continuous exchange of ideas and co-construction of knowledge without noise and interference for other groups. Edutainment features are also used in the new learning resources developed for KP-Lab. Children acquire basic numeracy skills through adventures with a family of bears, while visual communication is taught by inhabitants of an elf village: the characters of further PowerPoint resources co-developed by teachers, researchers and a computer-graphics designer.

○ **Barriers**

- Development of made-to-measure digital teaching aids is expensive.

○ **Enablers**

- The aim of the ELTE research team is to develop a Multigrade Teachers' Community that offers peer support in educational problem solving and sharing of professional experiences through collaboration with a team of researchers, local community stakeholders and developers of digital learning resources. Through regular meetings and a course in the Moodle VLE, they are involved in methodological debates, curriculum content decisions and review of good practice. This subsequently allows all village stakeholders, from parents to the village mayor, to see the results of an emerging multigrade pedagogy, and allows them to make informed decisions about the future of their school (and defend it from forced closure by regional authorities if necessary).

3.3 LEARNERS

ICT SKILLS

○ **Impacts**

- 40 per cent of those under 18 years of age in the Hungarian population now come from low, or extremely low, socio-economic status (SES) families. Therefore all teachers will need to promote social equity in education, involving multiple stakeholders in collaborative knowledge creation and validation of work.

○ **Barriers**

- Due to slow economic growth, constantly shrinking educational expenditure, and the decrease of the number of school age children in Hungary (a trend that is especially apparent in small villages), many Multigrade schools are closed each

year. Although often no longer manageable or sustainable, the closure of these schools is a huge loss for the local community. Young learners are forced to travel to distant schools, boarding the school bus at 07.00 in the morning and arriving home at 18.00. Not only are they exhausted by the end of the day, but also deprived of the company of family members, local friends, and relaxing after-school play. Having spent most of their waking hours in a remote township, they fail to connect with their community and as adults are likely to abandon it for good.



- **Enablers**

- During the pilot year of 2007/2008, the new, ICT-enriched and collaboration-oriented Multigrade pedagogy resulted in a substantial improvement in students' mathematics, reading and visual skills.

MOTIVATION, PARTICIPATION AND CONFIDENCE

- **Impacts**

- Pupils appreciate new forms of teaching that allow grades to be mixed for certain tasks. For example, in multi-age teams, siblings may collaborate on a school task – a delightful experience for many and an instructive exercise in group management for all. The regular instruction in ICT provided in the Multigrade Circle schools (only an option in Grades 1 to 4 in other schools) is equally well received by children and their parents: even very young learners are developing good ICT skills as a result.

- **Barriers**

- Lack of adequate infrastructure prevents teachers from introducing many new forms of ICT.

- **Enablers**

- Many parents – even those with a modest income – have purchased a PC for their children and consult teachers about which 'fostering software products' to install.

PARTICIPATION IN ALL ASPECTS OF SCHOOL LIFE: ACADEMIC, SOCIAL, PERSONAL

○ **Impacts**

- The project has disproved the generally held assumption that small schools are weak schools. On the contrary many of the modern educational methods, as well as curriculum models, can be more easily realised in a small school with a small staff of well-versed and dedicated teachers. If learning results can be further improved, this may help save small village schools that are considered ineffective and hence targeted for closure by the Hungarian educational authorities in the future.

○ **Barriers**

- Faster internet access would allow pupils to make full use of Web 2.0 solutions for community building and socialising.

○ **Enablers**

- Members within the Gárdonyi Circle organise exchange visits, preceded by email correspondence of pupils and teachers among partner schools. Mutual visits involve tours to local natural attractions, cultural monuments in the neighbourhood, group competitions and games, combining social and educational activities to promote interdisciplinary learning and feelings of pride and attachment to the local community. In this way, ICT can help to preserve traditional values of the Hungarian countryside, the Multigrade school and the community centre.

4. REFERENCES

○ **Sources:**

- Interviews with teachers and lesson observations.
- Schools were surveyed in September 2008. Data was collected on social and cultural background, educational achievement and ICT use of pupils, qualifications and ICT use of teaching staff, school infrastructure and local policy about school development.
- Kárpáti, A. (2004b): Travellers in Cyberspace - ICT in Hungarian Romani (Gypsy) Schools, Budapest, 2005. In: ed. Kárpáti, A. (2004): Promoting Equity through ICT in Education. Paris: OECD, 2004, pp. 141-156.
- Kárpáti, A. and Molnár, É. (2005): Mentored Innovation Model in Teacher Training – A Successful Method for Promoting Equity Through ICT in Education. In: Proceedings of the OCGW (Open Classroom Working Group) Conference of EDEN (European Distance Education Network), 15-20 October, Poitiers, France.

- **Further information:**

- Knowledge Practice Laboratory Project website (www.kp-lab.org).
- Gárdonyi Circle website (http://edutech.elte.hu/gardonyi_kor).
- Sulinet Digital Content Database (www.sulinet.hu).
- Description of the Hungarian educational system (<http://eacea.ec.europa.eu/portal/page/portal/Eurydice/ByCountryResults?countryCode=HU>).
- On the interdisciplinary arts education method: Kárpáti, Andrea (2005): Arts Bridge: The Art – Language – Music – Mathematics Project. In: Mary Stockrocki (ed.): Interdisciplinary Art Education: Building Bridges to connect disciplines and Cultures. NAEA, Reston, pp. 60–75.
- NEMED (The Network of European Multigrade Schools) website (www.nemed-network.org).

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