E-TEACHING READINESS OF TEACHERS

THE EFFECTS OF PERSONALITY TRAITS AND ICT SKILLS ON CHANGES IN TEACHING STYLE OF EXPERIENCED EDUCATORS

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Abstract

Analyses on the proliferation of Information and Communication Technologies in education unanimously position teachers as key factors for the success of ICT in schools. In spite of in-service courses, rigorously controlled for quality by government accreditation agencies, the percentage of teachers using ICT regularly in class as reported by international surveys has not increased considerably since the eighties. Pre-service courses include technological and pedagogical knowledge and practice but rarely focus on personality development. Our assumption is that the failure of in-service ICT teacher training courses to produce conceptual change among teachers towards the use of ICT is due to neglected personality factors. The UNESCO Centre for ICT in Education

EPICT, the European Pedagogical ICT Licence (www.epict.org) is based on collaboration of teacher teams mentored in a highly interactive e-learning environment by experienced peers. Learners must teach using ICT already during their studies that usually means a gradual modification of their teaching style by the end of the course. When adapting and piloting EPICT, our team decided to reveal how personality factors contribute to *e-teaching readiness* in order to identify personality traits of teachers enhancing or hindering ICT use in education.

In order to identify ICT-relevant individual characteristics reflected in technology acquisition strategies, response to different types of mentoring and quality of course tasks, we correlated the *California Personality Inventory* (CPI), measuring key factors of the self and correlated it with our own *ICT Competency Inventory* (ICT-CI) to reveal correlations between creative adaptation of ICT based teaching – learning methods and personality characteristics. Our sample included 120 teachers who undertook the EPICT course of 120 lesson hours. ICT-CI and CPI were administered at the end of the course. Questionnaires and semi-structured interviews as well as analysis of course tasks (showing level of success in the acquisition of "digital pedagogy" provided background information for a multi-level interpretation of results.

This paper points out personality features that may be associated with success and failure to acquire ICT skills on a level sufficient for educational use. The strong correlation between certain characteristics of the self an success in ICT use seems to suggest that integration of digital teaching aids and methods may be affected by targeting both the professional and personal self of teachers through a targeted teaching environment, course content, and mentoring methods. Our ongoing ICT courses, therefore, are designed to suit not only the initial level of technological skills but also the mindset of teachers.

Context: more efficient teacher training in ICT in Hungary –the inevitable next step for ICT-supported reforms

After the first generation of pioneers, who, in the 1980s, introduced computer programming as a compulsory discipline in Hungarian education, in the 1990s the second generation of "digital educators" initiated computer-

supported education for all disciplines on an experimental level. At the beginning of the new millennium, we were able to meet the third generation of pioneers – (or rather, the first group of settlers?) – who practised the use of multimedia PCs as a normal, regular part of their professional activities.

Teachers have been identified as key factors for ICT supported educational reform by several international surveys. CERI (Centre for Educational Research and Innovation) of the OECD (Organisation of Economic Co-operation and Development) has initiated, between 1999-2001, an international research effort to evaluate the results of the first phases of introducing CT in education. "Information and Communication Technology (ICT) and the Quality of Learning", (Venezky and Davis, 2002, Venezky and Kárpáti eds., 2004), a survey that included 96 school based case studies from 21 countries. The objective for the OECD survey was, in contrast to similar international school computing evaluation efforts, not to identify sites where students' ICT level is good but those where information technology became an important factor of school culture.

We found that being the "intellectual centre" of the area was the mission that inspired management and staff of our model schools to be on the cutting edge of educational reforms and to participate in the first large scale ICT projects in the country. Libraries as well as other facilities of our ICT model schools were used by community members (mostly parents and alumni), and also participants of various adult education courses in computing on offer there. These schools were also able to offer ICT in education courses for teachers in their region and soon became the focal point for pedagogical innovation of their area.

Even teachers with low level ICT skills were convinced about the progressive role of ICT for teaching and school life in general. *Building a team spirit* was found to be one of the most important added values of introducing ICT in all areas of school life. Many teachers remarked that pair and group work were an especially effective methods for computer-based tasks as it taught task management skills, evolves team spirit and is in line with the Net Generation idea of collective ICT use. Task sharing and discussion of results through e-mail 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 thus promotes learning new working methods while also acquiring new teaching content.

In the early 2000s, for the majority of teachers in model or in normal schools, *ICT was a medium used mostly for preparation for lessons*. During classes, ICT was used regularly by only about fifteen percent of the model school teachers and five percent of teachers of average schools. Those who use computers employed digital teaching aids or presentation devices one period a week (that is, 45 minutes) for one class. Seventy percent of teachers of model schools, however, used the computer for preparation and communication. They spent about 5 hours per week word-processing their tests, notes and overhead sheets. Flowcharts were used by five percent of teachers who spent about 3 hours per month producing them. Browsing the Web for information was done by fifty percent and requires an average of 8 hours weekly. Educational CD-ROMs were used by 10 percent of teachers (while more than twenty percent of them made use of the CD entitled "Legal Rules"). They spent about 5 hours monthly selecting materials from CDs for classroom use. Seventy percent of teachers used computers for communication and spent about 5 hours per week word processing. Sixty five percent were a regular e-mail users and sent / 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.

Most teachers in ICT model schools, however, considered computers inevitable for their work. Important aspects of ICT use at HU05 were *internal and external communication and data storage*. Many of the teachers we interviewed declared that the functioning of their school was largely dependent on the proper functioning of the PC network. Most teachers became so much used to computers for communication and information retrieval that they would consider the breakdown of the system a major obstacle. Another important agent of change turned out to be *bilingual education*. English language teaching aids (produced both in the UK and US) were in regular use and many of them were supplemented by CDs and web sites. Teachers found it helpful to use them. *On-line assessment* is still rare in Hungary. Several large databases containing tens of thousands of reliable and valid test items have been elaborated but not yet open to public use. Software products contained assessment elements but these were in most cases not suited to the needs of the Hungarian national curriculum. Thus, teachers, many of whom would be interested in trying out a test bank to develop responsive assessment instruments, used ICT basically for searching for and presenting learning content. (Kárpáti, 2002)

In the primary and secondary schools we visited during EMILE, an EU funded international school case study project, (Kárpáti, 2003 and www.emile.eu.org), we found that, pioneers of the first and second generation – those who helped install the first computers in the room of Technology in the eighties and coached fellow colleagues to embrace ICT culture in their disciplines in the nineties, were not so eager to keep on teaching novices forever. Newcomers were often selected on the basis of their dedication to ICT culture and not included in digital projects or offered tutorials when they came unprepared. This research showed that the key factor in the dissemination of achievements of ICT culture is not the level of technical infrastructure or staff / student skills in computing, but the innovative educational repertoire of teachers. Vocational skills training in the teaching profession proved to be key for the success of ICT.

In Hungary, the development of ICT infrastructure in schools has been rapid but did not run parallel with the in-service training of teachers in this area. If we compare results of two, quasi-national surveys, done at the beginning of massive proliferation of PCs in Hungarian schools and at the end of the second phase characterised by content development, (Kárpáti, 2002 a, b) In 1999, less than 20 % of schools had an intranet to shared learning resources within the walls of the institution. At this time, the majority of teachers (88%) used their computer as a word processor only, and less than 30 % of head teachers possessed an e-mail account. 20% of primary and 64 % of secondary teachers were entitled to send e-mail messages through the network of the school. The scarcity of good quality web resources in Hungarian made web browsing a language exercise, too tiring for many educators to undertake. Men were more frequent internet users and received three times as many mails as women. Within 5 years, by 2004, however, the ICT culture of Hungarian educational institutions has changed dramatically. 98 % of secondary and 79 % of primary schools was connected to the Internet with an intranet used as a major communication tool. All teachers were automatically assigned an e-mail account and school heads were supposed to deliver statistical reports and textbook orders online. The considerable differences in usage patterns between men and women, as witnessed in 1999, started to decrease gradually. The Hungarian Schoolnet established its Digital Knowledge Base (www.sdt.sulinet.hu) and presently provides about 30.000 learning objects in Hungarian for all public school disciplines. National as well as European e-content grants finance a variety of digital learning resources developed by teacher communities.

The failure of short, intensive and distant from school sites courses are proven by teacher competence studies. They show that, in the use of basic applications is still quite low in Hungary. (Tót, 2001) Most principals and teachers both on primary and secondary levels considered themselves beginners in ICT supported education. As large national school computer supply programmes started on secondary level, the self-perceived proficiency of secondary school staff members exceeded those teaching on primary level. The majority of teachers, however, were ready and willing to acquire ICT skills. (Cf. www.eun.org/insight for recent data on Hungarian ICT culture in schools.)

In 2003, the Hungarian Schoolnet commissioned a survey on student ICT culture that also revealed important data for teacher education. (Bényei et al., 2003) As a result of a massive expansion of internet connectivity, the introduction of the “ICT head quote”, a regular, government-sponsored financial support for schools to improve their computer infrastructure and digital learning resource library and financial allowances promoting the tax deducible purchase of PC-s for teachers and parents of school age children, 57 % of students in secondary education (ages 14-18) reported the use of the internet for homework and 35 % also in class for non-ICT disciplines at school. Peculiarly, however, the majority of students who reported regular PC and Internet use declared that it was them who opted for or initiated the employment of digital solutions for a task. Teachers only accepted their students’ suggestions but were intimidated to come forth with computer-based tasks. Evidently, teachers estimated both the ICT competency and access of their students lower than it was in reality. - An European survey also indicates similarly high student ICT use data. (EU ICT Survey, 2003) The sample was representative for students aged 15-18 in the EU member countries. Results showed that students employ a much wider variety of ICT applications than teachers. They are ready, able and willing to participate in a rich in ICT educational process, “only” teachers have to be prepared to fulfil this need and potential. (Fehér, 2004, Kvilon, 2002, Robers, 2002)

After the big initial training wave that took staff members in groups to a variety of government-sponsored training programmes, local *training of new staff* is another issue that has yet to be solved. As one of the newly appointed teachers in one of the model ICT schools remarked, "You either adapt quickly or fail adapting altogether." In

some cases, however, staff cohesion involved newcomers in ICT-related experiments. Taught by their peers, novices not only acquired ICT skills but also innovative methods of instruction. We found that school based training courses organised by staff members holding a Mentor Teacher Certificate in "ICT and Education" issued at post graduate course organised by the Hungarian Association of ICT Teachers were especially beneficial. This finding inspired us to join the EPICT consortium and establish a new, collaborative, school based form of in-service t4eacher education in ICT, the European Pedagogical ICT Licence, EPICT.

Examples of good practice for all the above listed activities that competent "e-teachers" have to master are to be found on the INSIGHT project web page (http://insight.eun.org) of the European Schoolnet (EUN). To quote just one example, the Republic of Ireland – a success story not just in economy but also, consequently perhaps, in education. The Irish ICT strategy and results of the realisation of its first phase may offer a wealth of good examples also for teacher education. (Schools IT 2000 – A Policy Framework for the New Millennium. 1998) The major pillar of this strategy is the Irish school network project entitled Technology Integration Initiative (TII, ScoilNet, www.scoilnet.ie)

One of its core elements is a comprehensive training programme for the preparation of Irish teachers of all disciplines in public education for the educational use of ICT: the Teaching Skills Initiative Two of its characteristics we find especially relevant for a desirable model for teacher training: at least one teacher per school is trained to be a mentor teacher to further train others, and special training programmes for different school types – from kindergarten to higher secondary level. Many countries offer courses for beginners and competitions for high end users – but the vast majority, those who have started but not yet excelled are frequently left unnerved by training institutions. Therefore, one of the most successful models for training "medium level" ICT users – practicing teachers with a basic training in computer skills and some experiences in their educational use, the Teachnet Project (www.teachnet.ie) may be of special interest for Hungarian course providers. It manifests a revolutionary approach to in-service teacher education because it invites participants to define both the content and the timing of their distant learning course.

Participants register for the course online and select a topic they intend to elaborate a digital teaching aid for. This topic may be a test bank or a presentation sequence, the only requirement is that it should be closely connected to the Irish national curriculum. First, the candidate for the course has to describe in detail the digital learning material to be developed during the course. If the idea is accepted, the future Teachnet member receives a small grant to cover his / her study expenses, a storage area on the project web server and a mentor to help – another practicing teacher with experiences in educational computing and a technical assistant to respond to questions concerning software and hardware use. Between 2002-2004, 200 learning objects were prepared, all suited to the Irish national curriculum. Several hundred of these communities is active up till now, two years after the end of the project, and maintains a very useful educational home page open to interested educators. (TSI, cf.: Attracting, Developing and Retaining Effective Teachers, 2003)

Another important result of the Irish teacher training project was that intensive involvement in *ICT-related pedagogical innovation proved to be an effective means to fight professional burnout*, reported by many of the participants at the beginning of the project. Researchers concluded that educators needed both technical and educational support for efficient use of digital technology in teaching practice, but pedagogical help has to come from a group of peers, not necessarily from a single expert or an anonymous helpdesk official. Irish teacher trainers realised that personality factors could be seriously enhanced and basic problems of professional existence overcome through the proper development of a course.

These aims can only be realised through intensive, well-structured pre- and in-service teacher education. (Cf. the report and recommendations by UNESCO on this topic: Kvilon, Euvgnehi ed., 2002) Teacher training was identified as a focal point for future ICT-based educational development also by the European Union by its research task force„Future Objectives for Education and Training", 2000-2004 Group C of this task force, „ICT in Education" formulated its suggestions, among which teacher training was on the top of the list. "Empower educational actors and train for the management of change. Educational actors, students, teachers, trainers, administrators and school directors need to be empowered through inclusive ICT education policies, which address the broad scope of learners and communities." (EU Directorate for Education and Culture, Educational Division (2003)

Piloting EPICT, a new e-learning course for teachers on ICT in education in Hungary

EPICT (European Pedagogical ICT Licence, www.epict.org), a new model for in-service teacher education, provides exactly that. Its aim is to furnish basic ICT skills in connection with current methods that they can effectively upport. This course is based on a blended learning method in groups of 4 or five, that can be formed both on the basis of an institution (staff members of a school) or on a shared professional experience (kindergarden educators, teachers of the same discipline, administrators, school heads, etc.) The course requires PC and internet access and a degree in education. As all tasks and exercises are closely connected to school practice, it is important that all group members were employed in education during the course. Four compulsory and four optional modules have to be learnt. Knowledge and skills are tested through group based, collaborative tasks realised in the authentic setting of the school of the participants. Technical and educational support is provided by the facilitator assigned to the group, a practicing teacher with high level ICT skills trained to mentor online. Focal points of the course are:

1. The role of ICT in the realisation of new educational paradigms
2. Development of ICT competencies of teachers
3. Planning for computer-supported learning
4. Usage of digital tools, teaching aids and resources
5. Use of ICT in school management and communication

All themes of the course have a pedagogical rationale. Participants work with ICT-skills related to these themes. Participants work in teams where teachers together develop material and learning scenarios for use in their own daily praxis. Teachers follow eight modules in the following order: Three compulsory - Four optional - Final compulsory. When reading the names of the modules, always keep in mind that the content is focussed on the pedagogical use of ICT in education, thus all modules cover both the aspect pedagogical integration and the ICT-skills.

Content of the European Pedagogical ICT Licence	
Compulsory modules	Optional modules (select 4)
• Using the Internet and Internet resources, search and evaluate data • Writing electronically • Communicating electronically • School innovation	• Using digital images • Using spreadsheets • Using presentations • Producing educational websites • A head start with databases • Models and simulations • Layout and dtp • Educational software • ICT and learning styles • ICT and reading (special needs)

	• ICT as a compensatory tool (special needs) • Games and learning

Figure 1: Overview of available modules (Gjørling, 2005)

1. Modules in a European Pedagogical ICT Licence are structured to meet this need so that teachers can select the elements that are most relevant for them. The contents can be used with any software platform. Each module is divided into the following elements:

    - Pedagogical introductions and articles
    - Best practice articles
    - ICT-skills exercises
    - ICT manuals
    - Inspirational links

The course has been in use in 12 countries worldwide (among them, Australia and 6 African countries, cf. www. Epict.org) and is currently been piloted and accredited in Hungary and Great Britain.

Participants of the pilot course for EPICT in Hungary are 130 primary and secondary teachers. They have been invited from among more than 450 applicants who volunteered to test the in-service course under accreditation that was offered free of charge for participatory evaluation. Participants include all teaching levels ranging from kindergarten up to institutions of higher education. The majority of teachers (61 % come from secondary education (grammar and vocation al schools, ages of students: 12-18), another 28 % from primary schools (ages of students: 6-14), the minority representing kindergarten education (8 %, ages of children: 2-6) and tertiary level (3 %, ages of students: 18-23+). Pilot participants represent major age groups of the teaching population almost equally to that of the Hungarian average: the majority, 47 % are between 30 and 40 years of age while 32 % are between 41 and 53 and 11 % under 30. Only a minority of teachers (11 %) are employed in leading positions (school heads and deputies, leaders of kindergartens). Men and women are almost equally represented (54 versus 46 %) and the same is true for the disciplines: 42 % teach humanities or, as junior level primary teachers, are specialised in this area, 48 % are teachers of science and maths and 10 % other disciplines including the arts or kindergarten education.

The training involves an *8 month blended learning course* taught for groups of 3-5 teachers. Groups were formed on the basis of schools of origin, as EPICT intends to promote ICT culture in schools as a whole and not just train lonely pioneers. For experimental reasons, we formed some groups based on discipline (that work very well) and rank (two for school heads, and one for kindergarten head teachers, that work in a less than satisfactory manner.) Learning content includes the complete selection of EPICT modules: three compulsory ones followed by 4 options selected by the groups of teachers learning together, and ended by the fourth compulsory module.

Every group has a *facilitator* – a qualified EPICT tutor experienced both in educational computing and public education. In order to get acquainted with the material, with fellow group members and facilitators, an *introductory day* for the whole course was organised in September 2005. After 3 month of e-learning in the virtual learning environment selected for the course, Moodle (www.moodle.com, http://moodle.epict.hu/). Another face to face occasion for the *introduction of the optional modules* and discussion of learning problems that occurred during the course was held in January 2006. In May of the same year, a third meeting for the pilot will be held to *introduce the fourth and most demanding compulsory module o*n school management and ICT.

Motivation and teaching through correspondence is a key component of personality development that facilitators also enrich through face to face encounters with their group if needed. Facilitators meet every month in

order to exchange their views on the progress of the groups, and act as a *case discussion session* for issues arising from the (un) ability of certain participants to cope with the requirements of learning in a virtual environment. *Group cohesion* and dynamics are another area often dealt with during these meetings, when common strategies of handling indolent group members that endanger the work of their peers as well as workaholics that do all tasks or make all decisions about module assignments by themselves, not letting others be meaningfully involved.

Complex measurement of results of in-service training: instruments to reveal personality traits, ICT competencies and educational strategies

The *California Psychological Inventory (CPI)* by CPP, Inc. (formerly Consulting Psychologists Press, cf. Gough and Bradley, 1996) is a published 434-item personality inventory is a self-report personality inventory and consists of several hundred yes-no questions and yields scores on features important also for success / failure in educational innovation, e. g. dominance and self acceptance and self control and socialization and achievement etc. Its 18 scales measure a broad array of individual difference variables: more interactional, socially observable qualities (like dominance and independence), internal values and controls, achievement-seeking needs, and stylistic modes (e.g., flexibility and masculinity/femininity). There are also 13 scales designed for special purposes (e.g., managerial potential, creative temperament). Three broad vector scales can be scored from the entire inventory: internality/externality, norm favouring /norm questioning, and self-fulfilled/dispirited.

CPI produces a personality profile of the individual on each of the scales in the test. Used in business for personnel selection, identifying creativity, and vocational and personal counselling; in schools and colleges for academic counselling, identifying leaders, and predicting success in various public service occupations; in clinics and counselling agencies for evaluating substance abuse, susceptibility to physical illness, marital discord, juvenile delinquency and criminality, and social immaturity; and for cross cultural and other research.

According to evaluation studies, (e. g. Craig, 2005, Hill, 2005, for recent overviews), this instrument provides a complex yet highly accurate portrait of an individual's professional and personal styles. In use with modifications for more than 50 years, coaches, counsellors, and human resource experts have been using this assessment tool to help create efficient and productive organizations, promote teamwork, build leadership competencies, and develop employees. With 434 items, the CPI instrument provides high level validity and reliability as a measure of personality and behaviour.

The complete collection of tools includes narrative reports; comparative profiles based on both gender-specific and combined male/female norms; and a comprehensive tool kit of in-depth case studies. Currently we are using the standard version of CPI, but intend to also experiment with its new versions that measure some of the features we found especially important more accurately. Hakstian and Farrell (2001), for example, developed a 36-item scale to measure Openness, using items on the California Psychological Inventory (CPI; Gough, 1957, 1987, 1996), Form 434. Items were initially chosen on the basis of content validity.

Our *ICT Competency Inventory (ICT-CI)* is a self report questionnaire that was developed by our team and standardised in another project measuring ICT readiness in about 150 schools of a district in Budapest. The ICT-SI is an index based measuring tool. (The concept of indexing is used for the data reduction method employed: several variables are composed in one index.) Our test comprises the following indices:

Index (1) – School access to ICT

Index (2) – Home access to ICT

Index (3) – ICT related attitudes

Index (4) – ICT related competencies

Index (5) – Educational use of ICT

For an easier interpretation of results, we have identified four domains for every index:

2. „low” (value range: 0,01–1),
3. „medium” (value range 1,01–2)
4. „high” (value range 2,01–3)

5. 0 value, indicating the non-existence of any interpretable data for the index. (E. g., low level ICT access means sporadic, rare access while 0 level indicates that the subject never has access to a PC).

These values will be used for correlation with the presence / absence of certain personality traits identified by the CPI later in this paper to identify teacher profiles that tend to success or fail with ICT.

The *Educational Strategies Questionnaire (ESQ)* is also a self report instrument that is employed at the beginning and at the end of the training course to see how educational strategies and beliefs of participants change as a result of completing course tasks and creating thus a new educational environment enriched with ICT. Comparative results of the first and second ESQ will be reported in another paper prepared after the completion of the pilot course in June 2006.

First results: participant success and failure after the 4 modules

The pilot course of the European Pedagogical ICT Licence is evaluated on three levels: the course itself as a set of teaching materials in an e-learning environment, (*contents*) the work of facilitators (*delivery*) and *student achievement*. This level is investigated thoroughly as we believe that failure of previous courses to prepare teachers for regular ICT use in schools was not due to their content or delivery, but their negligence of student needs, motivation and personality features. In this paper, written while the pilot course is still being taught, we report on one aspect of the assessment of student achievement only: personality traits revealed by the CPI test are compared with success / failure in ICT as measured by our competence inventory, ICT-CI.

In the table below, we highlighted those values that refer to a strong correlation between personality traits and ICT related skills, attitudes and competence.

	1. School ICT access	2. Home ICT access	3. ICT attitudes	4. ICT competences	5. Educational use of ICT
Tendency to dominate (Do)	0,023	-0,029	0,021	0,117	0,053
Status achievement (Sc)	0,081	-0,113	0,163	0,179	0,086
Sociability (Sy)	0,154	-0,104	0,153	0,222*	0,123
Social skills (Sp)	0,120	0,090	0,139	0,275**	0,015
Self respect (Sa)	0,059	0,039	0,055	0,094	0,034
Gen. wellbeing (Wb)	0,219*	-0,057	0,218*	0,256**	-0,074
Responsibility (Re)	0,035	0,018	0,007	-0,041	0,035
Socialisation (So)	0,005	0,000	0,119	0,096	0,017
Self control (Sc)	0,133	-0,031	0,222*	0,120	-0,064
Tolerance(To)	0,178	0,000	0,354**	0,351**	0,007
Establishing good relationships (Es)	0,179	-0,030	0,233*	0,262**	-0,149
Building a community (Cm)	-0,093	0,200*	-0,118	-0,139	0,230*
Achieving through conformity (Ac)	0,128	0,017	0,124	0,103	-0,054
Achieving through independence (Ai)	0,104	0,083	0,185	0,186	0,089
Intellectual efficiency (Ie)	0,183	0,016	0,238*	0,332**	0,002
Psychological sense (Ps)	0,175	0,020	0,036	0,128	-0,108
Flexibility (Fl)	0,163	0,014	0,162	0,306**	0,126
Feminine qualities (Fm	-0,067	0,076	-0,020	-0,103	0,114
Extraversion (Ex)	0,151	-0,033	0,162	0,271**	0,052
Friendliness (Fr)	-0,053	0,096	0,004	-0,039	0,179
Reliability (Re)	0,147	0,053	0,134	0,228*	0,055

Emotional stability (Es)	0,114	-0,030	0,115	0,226*	0,046
Intellect (In)	0,150	-0,016	0,142	0,208*	0,029

Pearson two-tailed correlation, significance levels: *: 0.05, **: 0,01

Figure 2: Correlation of ICT skills indices with CPI scales

In relation to personality traits, *participants in the course* with ***high level general ICT competence*** (individuals who possessed good skills, had positive attitudes towards computer culture and could also make good educational use of digital tools and methods) *were those who were found socially adaptive, tolerant and friendly*. Immersion in a culture that requires frequent communication, seeking and giving support, explanation of needs and understanding the explanation of others clearly requires social skills as much as technical ones – at least in the teaching community. Before focusing on the development of the latter, it seems inevitable to develop the former. Fortunately, there is ample proof that these features can be enhanced considerably through collaborative tasks and game-like activities.

Looking at some of the ICT competence indices in particular, this table shows that ***ICT attitudes*** highly correlate with the willingness to socialise and the ability to establish good relationships. Tolerance was found strongly associated with positive ICT attitudes – a feature that is inevitable for innovative and responsive pedagogy as well. Self-control and intellectual efficiency also characterise those teachers who managed to establish and maintain positive attitudes towards ICT.

ICT knowledge and skills (termed "ICT competence" as an index) was found to correlate strongly with most social factors that can be developed through a vast array of well-known methods, are often employed by teachers who, on the other hand, as students of ICT, may need to practice them themselves. Reliability, emotional stability and a good intellect may be considered more hereditary features, but flexibility and extraversion, that were also found characteristic for good ICT users, can be trained as well.

These findings served as a starting point for the work of our facilitators who could build their coaching strategies on their group members' characteristics of behaviour and ICT use. At the final evaluation, this analysis will be repeated at the end of the course. CPI and ICT-CI results of the participants will be compared with the level of their accomplishment. In order to identify individual achievement, not only the evaluation by the facilitator of the final task to be delivered by the learning groups for examination purposes after completing a module will be considered. Results of the log analysis of correspondence within groups in the Moodle e-learning environment (*collaborative activitiy*) and a content analysis of the work of individual participants represented on the group home page in the form of plans, draft assignments and background materials provided for the module tasks (*module specific achievement*) will also be assessed. However, evaluation of accomplishment will not calculate with previous knowledge and skills – a decisive factor for short courses that is likely to loose significance as skills of novices to ICT culture improve as a result of completing the course. The essence of development in a successful teacher training curse in ICT has to be an inspiring blend of personality and professional development. Methods employed during the in-service courses should be applicable or at least adaptable for classroom practice.

The need for a course like EPICT, blending collaborative educational practice with ICT skills development is amply proven through the Leonardo Thematic Monitoring Project, (Attweell et al., 2002) This study showed that the majority of the projects supported by the Leonardo Foundation between 1998-2001 have answered technological needs in the first place, through the development of new software applications and ICT enriched learning environments. Structuring the learning material in easy-to-acquire, motivating modules, planning for individualised assessment and evaluation were barely considered. It was mostly the cost-effective delivery of content through digital solutions that project efforts were focused on. The analysis of more than 250 projects

showed the dominance of the programmer over the educator. The success of a learning process, however, depends on the educational methods employed much more than on the technical level of the learning environment.

According to this study, successful e-Learning applications could be characterised, among others, through the following traits:

1. Learning was based on the constructivist or constructionist paradigm that makes use of the experiences of the learner in the construction of the content and methodology of education.

2. Learning based on individual discovery was central in the process of knowledge acquisition

3. Knowledge gained was structured into the pre-existing knowledge base of the learner. Controversies were revealed and discussed through mentoring. Problems were presented to learners not as handicaps for further inquiry but as challenges to be solved.

4. Content was authentic, open ended and interesting enough to motivate learners for further knowledge expansion. Resources for this were clearly pointed out.

5. Learning was constructed as an individualised process, where the e-Learner could always assume a central position.

6. Mentoring and facilitation of the learning process introduced pair and group work situations and contributed to the development of collaborative knowledge construction skills.

7. Methods of andragogy (an area of educational research focusing on the special needs as well as skills and experiences of the adult learner) were considered throughout the planning and teaching process.

Teacher training was revealed to be one of the key requirements for achieving the aims listed above. One of the most often quoted recommendations of this research project makes a clear statement about this:

"Teachers' training is needed because even at the highest level, university and college staff members are inexperienced in adult education. University professors with decades of teaching and research experience turn out to be unsuccessful and frustrated when teaching on-the-job courses. Course design for distance education is a set of skills that should be mastered even for highly qualified staff.

Even those with a natural talent for educating adults will face technical problems when cutting-edge technology must be used. For example, video conferencing requires totally different presentation methods than normal lecturing. Special training is required to develop illustrations and devise a suitable structure for such sessions. Technology develops rapidly, so trainers need ongoing updating." (Littig ed., 2003, pp. 57-58)"

The most important result of the Hungarian pilot course for EPICT is, however, that *in-service training for ICT in education should be enriched with personality development sessions*. The ability to work in groups, the belief in the innovative potentials of the self and an openness of mind to new ways of working is just as important for success in computer-supported teaching and learning as technical skills and abilities. These relevant personality factors may be considerably enhanced through training. A mentored, group based course can be a very useful method for accelerating personality development and may be also beneficial for the overall quality of teaching.

This assumption will be tested at the end of our teacher training pilot course when results of our second Educational Strategies Questionnaire (taken at the end of the course) will be compared with the first one (taken before the EPICT pilot) will be compared and correlated with CPI measures and EPICT course results. We hope that, in another paper, we can report positive change in not only the level of ICT skills but also in the quality of educational strategies and methods and personality traits of teachers. If our hypotheses about the interrelationships of personality variables and level of educational ICT skills will indeed be proven, we intend to enrich the *human potentials development value of our in-service ICT courses* and include such face to face events in the EPICT course. In September 2006, a new, 8-month experimental EPICT course will be launched for

about 50 Hungarian teachers participating in the CALIBRATE project of the eContent Programme of the European Union, co-ordinated by the European SchoolNet and aimed at enabling educators from 11 countries to use international knowledge repositories for developing teaching materials using special tools. (http://calibrate.eun.org/ww/en/pub/calibrate_project/home_page.htm) This project will follow teachers through their training into their practice and document how a bridge over troubled waters can be built, how pedagogy will (or will not) change as a result of a complex training of the self and the mind.

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	1. School ICT access	2. Home ICT access	3. ICT attitudes	4. ICT compe-tences	5. Educatio-nal use of ICT
Sociability (Sy)	0,154	-0,104	0,153	0,222*	0,123
Social skills (Sp)	0,120	0,090	0,139	0,275**	0,015
Self respect (Sa)	0,059	0,039	0,055	0,094	0,034
Gen. wellbeing (Wb)	0,219*	-0,057	0,218*	0,256**	-0,074
Self control (Sc)	0,133	-0,031	0,222*	0,120	-0,064
Tolerance(To)	0,178	0,000	0,354**	0,351**	0,007
Establishing good relationships (Es)	0,179	-0,030	0,233*	0,262**	-0,149
Building a community (Cm)	-0,093	0,200*	-0,118	-0,139	0,230*
Intellectual efficiency (Ie)	0,183	0,016	0,238*	0,332**	0,002
Flexibility (Fl)	0,163	0,014	0,162	0,306**	0,126
Feminine qualities (Fm	-0,067	0,076	-0,020	-0,103	0,114
Extraversion (Ex)	0,151	-0,033	0,162	0,271**	0,052
Reliability (Re)	0,147	0,053	0,134	0,228*	0,055
Emotional stability (Es)	0,114	-0,030	0,115	0,226*	0,046
Intellect (In)	0,150	-0,016	0,142	0,208*	0,029

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