Needed: New Indicators of Success

Working Group 3.1

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Abstract Current indicators of success for ICT tend to focus on hardware, infrastructure and traditional measures of performance, linked to literacy and numeracy. The success of public ICT investment by government utilises such measures. Globally, current evidence does not suggest a significant impact. If investment is to continue, new indicators of success need to be realised, drawing upon new understandings of learning and what constitutes basic literacy and competence. IFIP could play a significant role in such developments.

1. NEW EDUCATIONAL VALUES

Government investment in educational ICT has been increased over the last few years in many parts of the world. This investment is based on the belief that 'computers are a good thing' and will increase the success of individual students and whole education systems, contributing to overall economic and social successes. This investment is bringing with it increasing challenges to demonstrate a clear return on the investment when budgets and politicians are subject to many competing demands, and the evidence of impact upon the traditional indicators of success is not readily available. If this is the case, are the indicators measuring the right things, and would they be the same across nations? The diversity of nations in itself provides a greater challenge, and impetus to reach consensus on indicators of success, identifying valid measures. The indicators should be appropriate for the information economy and the knowledge society. Are the current indicators

and measures appropriate, and if not what else should be considered and are they enough to cover all cultural contexts? Should the measures be based on an agreed framework of skills, understanding and knowledge that is right for the individual and collectively by societies? Should they be based on a broader framework of indicators of success for the impact of ICT on learning, building on the ideas of the four pillars of education proposed by the Delors Commission for UNESCO (UNESCO 1996)

The political, economic, cultural and educational values and context of the state, community and individuals impact significantly on the development of indicators of success. Within the UK, the heavy emphasis on standards requires indicators to be validated by national tests and quantitative data; qualitative data is less influential. For other countries this may not be a requirement. A UK Department for Education report (DfES 2000) used data from the external inspection reports of schools to provide evidence illustrating a significant impact on the results in national tests for 11 year old students when the ICT resources and teaching were of high quality. In Chile ICT is a key part of broadly based educational reform inculcating creative thinking and problem solving (Luz 2000) with overall social cohesion and development objectives. Clearly, the impact on an industrial economy will be different to the impact on an agricultural or knowledge economy. For each of these there may be differing indicators of success. Nonetheless, in confronting the diverse challenges of each and every society and its economy, learning with and through ICT has the potential to increase access to learning, to accelerate progression with learning and to create new learning opportunities.

Learning is being transformed in the context of a changing world. ICT is a catalyst and provides different, varied and new building blocks for scaffolding learning. Unfortunately current international indicators tend to measure infrastructure. For example, OECD reports compare countries by numbers of computers and Internet connections for schools. Although they continue to provide contributory or proxy indicators, such as levels of collective and individual access to a range of ICT in and out of school for students, staff and the wider community. Indicators of success need to move from solely referencing the provision of the technology infrastructure itself. A key task for school systems is to realise a range of indicators of success and progress within generic frameworks, such as the UNESCO/IFIP publication *Information and Communications Technology in Secondary Education, A curriculum for Schools* (2000).

2. THE FOUR PILLARS OF EDUCATION

The UNESCO (1996) report of the International (Delors) Commission on Education for the Twenty-first Century *Learning, the Treasure Within*, identified "... learning throughout life [as] the heartbeat of life..." as one keys of the twenty-first century. The Four Pillars of Education are the basis of the whole report, learning to know, learning to do, learning to live together and learning to be. The existence of such widely reported and acknowledged principles for learning offers a basis on which to build a series of indicators of success for the impact of ICT on learning and the management of learning.

Learning to know, by combining a sufficiently broad general knowledge with the opportunity to work in depth on a small number of subjects. This also means learning to learn, so as to benefit from the opportunities education provides throughout life.

Learning to do, in order to acquire not only an occupational skill but also, more broadly, the competence to deal with many situations and work in teams. It also means learning to do in the context of young peoples' various social and work experiences which may be informal, as a result of the local or national context, or formal, involving courses, alternating study and work.

Learning to live together, by developing an understanding of other people and an appreciation of interdependence – carrying out joint projects and learning to manage conflicts – in a spirit of respect for the values of pluralism, mutual understanding and peace.

Learning to be, so as better to develop one's personality and be able to act with ever greater autonomy, judgment and personal responsibility. In that connection, education must not disregard any aspect of a person's potential: memory, reasoning, aesthetic sense, physical capacities and communication skills.

3. NEW INDICATORS OF SUCCESS ARE NEEDED

Formal education systems tend to emphasise the acquisition of knowledge to the detriment of other types of learning; but it is vital now to conceive education in a more encompassing fashion. Such a vision should

inform and guide future educational reforms and policy, in relation both to contents and to methods.” (UNESCO, 1996)

The framework of the four pillars of education provides an opportunity to move from narrow ‘learning to do’ indicators to a recognition of broadening perspectives on competencies. The information economy and knowledge society requires digital, informational and critical literacy, building upon traditional literacy and numeracy and extending these indicators as they may currently be constraining rather than enabling change.

The requirements of industry and commerce go beyond basic ICT skills; they demand a number of ‘soft competences’ or behavioural skills such as being analytical, creative, and flexible. Employers look for leadership qualities, communication, planning and organisational skills, a commitment to excellence, an ability to work collaboratively and a strong professional attitude, which includes a willingness, and ability to continue to learn. Schools need to start to prepare students, so that at each stage of education and at entry to the workplace these skills are established making students employable and able to contribute effectively to society from the outset of their careers.

Additionally curricula need to adjust to the Information and Knowledge Economy. Indicators that this is not happening are witnessed in the ICT skills industry where there is an international skills shortage and in response vendor programmes are entering into the upper secondary and vocational educational sectors. The Cisco Networking Academy programme is one example of this. Students work on an instructor led e-learning curriculum with hands on practical sessions to teach them how to install, maintain and troubleshoot computer networks. The programme is taught in over 120 countries world-wide and involves over 200,000 students

The challenge will be to develop new approaches to assessment that are sensitive to the needs of lifelong learners and employment in the 21st century and that recognise and reward progress in learning. The work of Nicholson and White (2001) identifies the requirement to design learning environments such that the learner develops the ability to handle ‘fuzzy’ contexts “...those which do not have a well articulated knowledge base, a clear solution, a best strategy or a readily available basis for decision making.” As Delors identified, “...it is vital now to conceive education in a more encompassing fashion.” The future success of societies will depend on leveraging the intellectual capital of its people, which of course you can do without ICT. Hence we need to identify indicators of success that identify the contribution of ICT. Such indicators will ask questions of the contribution of ICT as a catalyst to assist acceleration, freeing teachers and learners from a focus on lower order skills. Students and school staff will require the tools and environment for learning.

So the need is to address both the learner and the teacher.

Little research has yet been done:

- On the influence of new information and communication technologies on learning
- And more specifically on the support they provide to teaching and the teacher
- And on the assistance they provide to a student in the learning situation.

It could be interesting to raise some questions about the nature and the extent of technological change on the subject one is teaching, on the primacy of methods over content, of the real implications of technology on pedagogy. Developing research on these questions appears urgent, especially the consequences of technological change on knowledge acquisition.

Traditionally assigned the task of transmitting knowledge, teachers who are deeply committed to the technological revolution are today faced with more and more wide ranging demands; they must or should be able to:

- Have knowledge at their fingertips
- Create their own professional approach
- Be capable of consulting research
- Awaken a critical sense
- Complete and sometimes replace the parental role
- Guarantee equity within the education system
- Transmit social values
- Supervise student projects
- Contribute to the production of tools, reports
- Contribute to the training of colleagues
- Be capable of doing original research
- Be open to permanent self-improvement (UNESCO 2001).

One of the indicators of a successful teacher would be a teacher who could incorporate the above in their work.

Our current challenge is to ensure we have success indicators for the more recently valued learning's such as collaborative learning, self-managed learning and meta-cognitive reflection; abilities such as problem solving, and developing concentration and memory skills and the ability to think; dispositions such as interdependence and global identity. Research such as that of Cuttance, AU, developing tools to examine cognitive and affective learning outcomes in technology rich and constructivist classrooms needs to underpin such indicators for success.

When considering the above, the group were conscious that we were quite small and only represented two countries. However we do feel that we have identified some key issues for further debate. IFIP could play a key part in this debate and should look to their current working group structure to support this. We would propose that each working group considers the

indicators of success when discussing other topics and prepares one paragraph per conference, which can be collected, for producing a larger report in the future. Thus the Open IFIP Conference on Social, Ethical and Cognitive Issues of Informatics and ICT should identify how we would judge if ICT has been beneficial in this area and produce a brief summary statement on this. Previous work by IFIP produced 'success stories' which demonstrate effective practice. The evidence gathering proposed above could lead to a similar publication to reach a wide-ranging audience.

What is also clear is that public schools systems will become even more accountable and – partly because of the necessary high investment – ICT will be under scrutiny more than most. We need to have evidence of success to persuade the policy makers that what often currently is a 'leap of faith' is worth continued investment and political commitment because ICT really is a 'good thing'.

REFERENCE

- DfES (2000) *A Preliminary Report for the DfEE on the Relationship Between ICT and Primary School Standards*. London.
- Nicholson, P. and White, G. (2001) *Teaching for Quality Learning Online: A layered design model for higher-order thinking*. Paper at WCCE2001, Copenhagen, Denmark.
- Luz, S. M. (2000) *Chilean Experience – Overview*. Paper Chile 2000, The Bookmark of the School of the Future.
- UNESCO (1996) *Learning: The Treasure Within (Delores Report)*. Geneva.
- UNESCO (2000) *Information and Communications Technology in Secondary Education, A curriculum for Schools*. IFIP TC3, Geneva.
- UNESCO (2001) *Winds of change in the teaching profession*. French National Commission for UNESCO, Geneva.