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Learning and Teaching with Digital Tools

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Introduction

This paper details and explains some of the more notable societal changes caused by digital technologies. Different names are employed to describe the major social forces that have shaped society. Whereas the last century has been dominated by industrialization on, the last decades are often referred to as the ‘information on’ or ‘knowledge society’ to the extent that computers and digitalization on have changed society in profound ways. In this paper the notion ‘digital society’ is chosen. This is not contrary to ‘knowledge society’ but rather since the perspective focuses on emerging technologies, tools and devices that transform society, relations, ways of working and living together. Among these changes is the transformation of the communication through the growth of mobile technologies. Virtually every device in current use today includes mobile technologies that make it possible to access individuals, institutions and services whenever or wherever needed. Thanks to mobile communication technology, information can be found and work can take place almost everywhere. The focus is increasingly on education and training and more particularly on the ways in which digital and mobile technologies shape learning and educational outcome. Central are the consequences of these technologies, rather than technologies themselves, being agents changing key competences as well as demanding new digital competences. Another side is the effect on knowledge, professional demands and schooling in general.

Digital society

According to A. Hargreaves (2003), “we are living in a defining moment of education history, when the world in which teachers do their work is changing profoundly, and the demographic composition of teachers is turning dramatically”, and “teaching is now becoming a young person’s profession again”. He stresses that the knowledge economy, knowledge society is

driven by creativity and ingenuity. Within the digital society mobile connectivity is seen as one major feature. In the 1990s, as the Internet became commonly available, the growth of desktop and later of laptop computers gave rise to new dimensions of connectivity. These in turn spawned mobile networks and more advanced mobile phones – ‘smart phones’ – capable of accessing a growing number of Internet services almost anywhere. Devices such as iPhone and iPad (and their equivalents) offer a ‘full office’ in one’s pocket with e-mail, camera, GPS, books, news networks and almost any ‘cloud’ (Internet-based) service wanted. The new digital devices and services are increasingly embraced by publishers of books, music, films and, of course, the main news networks. The consequences of consumers turning ‘digital’ have resulted in dramatically reduced sales of hard copy newspapers, CDs, DVDs, and have prompted publishers to go digital. Moving from devices to services, or content, we will take a look at ‘what is delivered’. If there was nothing in the ‘cloud’, or on the Internet, the devices would not appear to be revolutionary. But within no more than a few years, use of new features like Face book (LinkedIn, etc.) and YouTube have become widely spread not only among individuals of all ages, but also among businesses and organizations who make extensive use of these tools in their marketing, strategy and ways of working. Internet services have had tremendous effect on postal services, banking, finance, and, as is becoming increasingly clear, on public administration. Today it is common for customers to perform tasks that only a few years ago bank employees typically handled – tasks such as processing bank payments, using automated forms that are not accepted if all boxes are filled in, and the like. Part of the job and responsibility is transformed to individuals. These changes have great effects on the way institutions are staffed and organized; the more so as there are frequently enormous economic and legal implications.

Learning and teaching

It should be no surprise that teachers who, like other professionals, are expected to be lifelong learners, must also meet the challenges of digital and mobile technologies. It is not simply a matter of mastering new technology; since the entire traditional paradigm has been up-ended, they must re-examine their profession and redefine their role of the teachers in the learning process. Understanding and mastering technology is the starting point of a process of creating a new school. Inasmuch as information – indeed knowledge itself – is not static, the need for learning must be considered the norm in a constantly changing world of new connectivity and mobility. It is not so much the devices that will be the challenge, but rather the creation of suitable and sustainable pedagogical models that are relevant to the demands of the coming knowledge society. If schools and societies are unable to do so, they will be left behind (Hargreaves, 2003). In fact, this is not simply a hypothesis: it is a demonstrable reality. Another reality is the retirement of the whole generation of teachers who underpinned national education systems in the 1960s and 1970s. It happens that their retirement coincides with the growth of the digital society and the

recruiting of an entirely new generation of teachers, newcomers who have grown up with this technology. Teaching, once traditional approaches transfer to information ones, is becoming the profession of the young. The major challenge will be to recruit young people to the profession and make them able to renew education according to needs, including redefining of the teaching profession. It is necessary to define new competency profiles that reflect skills needed in digitalized education. Students must become lifelong learners, being able to handle new devices and tools at whenever available and profitable and serving the purpose. Being innovative and creative, be able to imagine required skills become vital. To some extent, students will more than before experience that skills acquired on graduation may be ‘dead on arrival’. Lifelong learning will be an imperative for all professions, and need to be addressed by the education system. Education institutions must prevent self-destruction, throwing the baby out with the bath water, but rather open up to the real world developments of the digital society – changes must take place while saving vital educational values. M. Wesch’s formulation of the challenge is apt: “...the solution is simple. We don’t have to tear the walls down... just... begin working with students... answer real and relevant questions... [acknowledging] that we are enveloped in a cloud of ubiquitous digital information where the nature and dynamics of knowledge have shifted”. Throughout the world, the number of new devices keeps increasing. In fact, students not only constantly carry devices with them, but also, for all intents and purposes, never turn them off . They are constantly connected to the cloud, for good or for bad. It is remarkable that whereas laptops are in general use, smart phones, iPods and iPads have been generally ignored by educators, despite their potential as learning tools. Teachers can benefit from this technology not only as aids to teaching new skills, but also as means whereby students can navigate both enriching and dangerous environments. It is not only a question of when and how to use different technologies; it is important to decide when they should be shut off . Being aware of benefits and risks is a part of citizenship today. For this to become reality, teachers need forums, where they can exchange and develop ideas and share practical experiences. In the event, the Internet has both international and national forums. In Norway such a professional teacher portal can be found at www.delogbruk.ning.com (‘share and use’ see Google translator). Here teachers post ideas, materials, links, YouTube and the like. The portal is also a venue for discussion and debate similar to what is found in real life schools. Learning management systems (LMS) are local solutions for individual schools or groups of schools (local school authorities). Teachers and students can and will be real publishers – in a more far reaching way than Marshal McLuhan could have foreseen (see Levinson who takes his ideas and their consequences into the digital age in *Digital McLuhan: a Guide to the Information Millennium*). With tools like YouTube, social media and other cloud publishing possibilities, cultural diversity can be achieved in a powerful and meaningful way. Local and minority languages and cultures, like those of the Arctic, can and should be presented in the cloud, accessible not only to them, but for the world to

experience. In the global village these new voices should be welcomed. At a time when identity and understanding of UNESCO four pillars of learning seem more relevant than ever, learning to live together must be considered as a top priority. Education is and must be contextual in many respects. All nations have their own goals and corresponding curricula and, indeed, the digital society constitutes no challenge to this basic concept. It might turn out to be more crucial now than ever. At the same time, the European Union has defined eight key competencies, among which communication is given priority both in the mother tongue, and foreign languages. Others include digital competence, learning to learn, social and civic competences, initiative and entrepreneurship, and cultural awareness and expression. From the foregoing, it is evident that technology offers new dimensions to development of cultural awareness and entrepreneurship using opportunities offered by the Internet, or 'cloud' services. Social and civic competences are not complete in isolation from the Internet, by means of which one can learn about benefits and risks, and legal consequences of its use or misuse. Inadequate education and training related to digital competences may give rise to severe problems for individuals, as well as authorities and society. Part of the challenge is illustrated by the current Wiki leaks debate. What is clear is that with proper training and insights, the benefits will be considerable. Digital services will grow considerably creating jobs and opportunities in the future. Traditional services may also depend on digital developments.

Main elements of education challenges

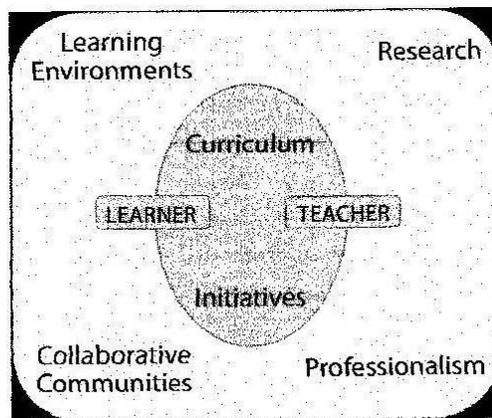
During the latest World Conferences for Computers in Education (WCCE), the education committee of IFIP prepared declarations with recommendations and focus on action: the Stellenbosch Declaration (SD) ICT in Education: Make it Work, 2005 and Bento Gonçalves Declaration for Action (BGDA), 2009 These documents are based on inputs from the experts participating in the Conferences, and are edited by IFIP members. The Stellenbosch Declaration mapped six major areas considered beneficial for harnessing of ICT in the service of education:

- Digital Solidarity
- Learners and Lifelong Learning
- Decision-making Strategies
- Networking
- Research
- Teachers

These areas should be addressed at three main levels:

- Societal level
- Learning and teaching level
- Technology and infrastructure level

Four years later the Bento Gonçalves Declaration for Action in a similar setting and process concluded with a model including the following elements while technology is not specifically mentioned in this model, it is the de facto substructure of the concept. Sustainable learning environments, collaborative communities, and research are not feasible in the absence of technology. The same can be said for curriculum, initiatives and competencies of teachers and learners. For learners BGDA concluded: “We must recognize the fact that young people see ICT as naturally given equipment. If we do not use that as a positive fact, we will lose the new generation”. Commenting on teachers – seems to ‘forget’ the new generation of teachers entering the profession – “Teachers have to have their own e-Learning experiences before they are able to use it in their own teaching process”.



It ought to be evident, that laptops or their equivalents must be considered normal teacher equipment to deliver relevant education for the new generation. The ‘one laptop per child’ initiatives are consistent with the foregoing argument. The curriculum perspective, implicit in the foregoing, includes both informatics and general digital competencies, both of which target learner potential. Needed are clearly defined behavioral objectives in digital literacy that can be fed into relevant courses taught in teacher training instructions. It should also be considered how to support development of learners’ creativity. Professionalism must be seen under the global perspective of mobility of ideas and individuals, and networks as global norm for collaborations between professionals, bringing together education and the knowledge society. Such professionals blend and create new ways of seamless lifelong learning and living. Learning environments with new technologies have different notions like virtual learning environments, personal learning environments, and learning management systems – all supporting or providing more support and individualization for learners. Technology has to be harnessed to support educational needs. Too often technology is focused, rather than content and educational needs. Taking advantage of digital connectivity should encourage a shift in focus from devices to content, what is accessible of ‘real

world' knowledge and resources. Needed now is therefore research on pedagogy, the content and form of digital literacy and the potential of networking. In addition, strategies to strengthen links between industry and education must be developed and/or reinforced. Finally, collaborative communities must be considered indispensable for the effective harnessing of mobile technology in the service of education.

Conclusion

Future is now. Technology that is new to some people is well known and even is in the past for others. This statement is certainly valid for the elder generation of teachers compared with the more advanced students living in a blended real and virtual world. Connectedness and instant access to information and institutions (including schools) are building blocks for our future. A large part of the population is daily 'playing' with the Internet, or cloud services, like Face book and YouTube. They are utilizing, testing and failing, probing the limits of what works for professional or for everyday purposes. Some have experienced enormous harm; others – individuals and businesses– have found a channel for effective communication. Many users have not learned how to use these tools (or channels) and, to the extent that they have been enrolled in appropriate courses, schools have failed to educate their students. Schools not addressing the challenges of the digital society have failed even more, considering the duty to prepare students for life in accordance with citizenship of today. To enable teachers for lifelong learning and develop schools to be learning organizations, they need the described instant connectivity. One strategy that recommends itself is to establish relevant pilot projects, each having a mandate in different fields but with an open profile, so that every school can follow its own line of work. Schools and teachers outside the pilots should be allowed insight and, to some extent, participation. School authorities should facilitate services and follow closely other developments in order to keep in touch with what is happening. Above all, there is a need to maintain critical reflections and accept that, whereas others might be leading in experimentation, warnings to other stakeholders may be necessary to contribute to constructive debates.

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