

Mobile Learning and Lifelong Knowledge Acquisition

Presumably, a significant new chapter in the history of human communication has begun. The mobile phone does not merely integrate all previous functions of communication, but its system of rules/norms is also less strictly bound to large social institutions such as the home, school, or the office. This new means of communication – more and more in practice as well as in theory – can be freely used in space and time, while it also carries the functions of all preceding media of mass communication.¹ Mobile communications, and the modest, at least in terms of its weight, mobile phone have changed the basic types of human activities in several areas of life. Studying the effect of this new device on education was also on the agenda for the T-Mobile research project launched at the beginning of this millennium. Several authors, including Milrad, Kárpáti, Katz, Hrachovec, Sharples, Mifsud, Peschl, and Srivastava,² undertook to give a comprehensive account of the topic during a series of conferences on research findings drawn from this project, and I also participated, discussing

¹ Paul Levinson, *Cellphone: The Story of the World's Most Mobile Medium and How It Has Transformed Everything!*, New York: Palgrave Macmillan, 2004.

² Marcelo Milrad, “Mobile Learning: Challenges, Perspectives and Reality”, in Kristóf Nyíri (ed.), *Mobile Learning: Essays on Philosophy, Psychology and Education*, Vienna: Passagen Verlag, 2003, pp. 151–164; Andrea Kárpáti, “Digital Didactics for Mobile Learning”, *ibid.*, pp. 175–187; James E. Katz, “Mobile Phones in Educational Settings”, in Kristóf Nyíri (ed.), *A Sense of Place: The Global and the Local in Mobile Communication*, Vienna: Passagen Verlag, 2005, pp. 305–317; Herbert Hrachovec, “E-Learning Nudism: Stripping Context from Content”, in Kristóf Nyíri (ed.), *Mobile Understanding: The Epistemology of Ubiquitous Communication*, Vienna: Passagen Verlag, 2006, pp. 103–110; Mike Sharples, “Learning As Conversation: Transforming Education in the Mobile Age”, *ibid.*, pp. 111–119; Louise Mifsud, “What Counts as Digital Literacy: Experiences from a Seventh-Grade Classroom in Norway”, *ibid.*, pp. 133–143; Markus F. Peschl, “Socio-Epistemological Engineering: Epistemological Issues in Mobile Learning Technologies. Theoretical Foundations and Visions for Enabling Mobile Learning Labs”, *ibid.*, pp. 145–157; Lara Srivastava, “Dissemination and Acquisition of Knowledge in the Mobile Age”, *ibid.*, pp. 159–168.

the effect of space-time shifts on the pedagogical paradigm a year ago.³ In a systematic overview, Cardinali argued that the main feature of this stage of development, within which mobile communications helped us advance from the educational application of personal computers in the 1980s to the conditions of the new millennium, brought about systems of *personal learning communities*.⁴ Drawing on these preliminaries, in this paper I will discuss the issue of lifelong learning and knowledge that can be acquired via this new technology.

New Approaches in Learning – Technological and Conceptual Shifts

Increasingly diversified in space and time by the devices of mobile communications, the practices of informal and non-formal learning, which show significant variation for each individual, make a considerable contribution to the enhancement of our everyday knowledge. Attempts to synthesize this knowledge raise intriguing questions, particularly because the more we acknowledge and pedagogically value this new type of individual knowledge, the less applicable traditional techniques will be. The first, introductory part of this paper aims to categorize, based on the synthesis of international trends and Hungarian research, the issues and tasks which emerge within the increasingly complex process of mobile learning.

Despite the asynchronism between technological development and change in social practice, by the dawn of the new millennium advanced countries had recognized that pedagogical frameworks can significantly determine a type of knowledge transfer which places the individual in the centre of lifelong learning.⁵ While traditional institutions of education mainly focused (and still focus) on transferring information, up-to-date learning options and

³ András Benedek, “New Vistas of Learning in the Mobile Age”, in Kristóf Nyíri (ed.), *Mobile Understanding*, pp. 121–131.

⁴ Fabrizio Cardinali, “Towards Narrowcasting & Ambient Publishing: New Mobile Location and Context Aware Formats for the European Content Industry Towards the Lisbon Target”, in István Simonics, Radoslav Pavlov, Tatiana Urbanova (eds.), *Technology-Enhanced Learning with Ubiquitous Applications of Integrated Web, Digital TV and Mobile Technologies*, HUBUSKA Open Workshop, 6th eLearning Forum, Budapest, 9–10 June 2005, pp. 9–15.

⁵ The strategy of lifelong learning had already influenced the development of new forms of adult learning before the new millennium. Following expert analyses prepared for OECD and UNESCO, the European Union raised this subject to the level of Community policy by accepting the Lisbon Memorandum, which set the task of implementing the framework of lifelong learning at the national level. The general conceptual framework for this set of issues was presented to the professional public in OECD documents

the lifelong approach to learning emphasize the development of individual abilities and learning skills. The core concept of the idea of lifelong learning is that people should be prepared and encouraged to “learn how to learn”.

Consequently, lifelong learning is centred around individuals, i.e., learners themselves. Hence the evolving longer-term strategies and action plans for large regions, including the EU,⁶ are definitely built on the new possibilities of applying information and communications technology (ICT). Now the shift where the frames of reference move from the narrow framework of school-based teaching/learning to the paradigm of lifelong learning is more visible than ever. The reason for this is relatively simple: in this period a social practice came to be which, despite its spontaneous nature, exerts a strong effect on informal and non-formal learning, as well as on our everyday knowledge.

The development of basic conditions for mobile learning demonstrates the transition of technological development and social practice from slow changes towards an increasingly rapid transformation and in turn reveals the structuralization of problems related to this activity. We can undertake to give a historical overview spanning a relatively short period because, when compared to the cross-generational history of classic didactics or the changes of modern education theory which took place in the last century, the history of mobile learning can be viewed within a single framework of rapid development encompassing approximately two decades.⁷

Such a historical overview should begin with the concept of electronic learning, or e-learning, which provides a framework for analysis. This new and efficient learning method, which combines traditional techniques with new possibilities provided by distance education and the internet, is much more than an experimental method of education. It has the advan-

(“Lifelong Learning for All: Policy Directions”, in *Education Policy Analysis: Education and Skills*, OECD, 2001, pp. 9–42, and “Lifelong Learning for All: Taking Stock”, *ibid.*, pp. 43–72). For an overview of its Hungarian aspects, see my lecture “Life-Long Learning in Transition to the Knowledge-Based Economy – the Hungarian Case” (*Knowledge Economy Forum II*, The World Bank and Finland, Helsinki, 2003), http://www.worldbank.org/eca/helsinki/keskiviikko/10_andras_benedek/ie.html).

⁶ See the eEurope 2005 action plan, http://europa.eu.int/information_society/eeurope/2005/index_en.htm.

⁷ For a comprehensive analysis of recent changes, see Ullrich Dittler, *E-Learning: Ein-satzkonzepte und Erfolgsfaktoren des Lernens mit interaktiven Medien*, Oldenburger Wissenschaftsverlag, 2002, as well as Ullrich Dittler, Helge Kahler, Michael Kindt and Christine Schwarz (eds.), *E-Learning in Europe – Learning Europe: How Have New Media Contributed to the Development of Higher Education?*, Münster: Waxmann, 2005.

tages of flexibility, accessibility, convenience, and it allows us to proceed in the curriculum according to our own schedule. More and more sophisticated internet technologies facilitated the development and diffusion of e-learning. In the beginning, e-learning websites were no more than collections of simple and static web pages which contained necessary information for some topic as a series of notes, and which were sometimes complemented with a contents page. Currently, we can find many such teaching materials, which utilize HTML hyperlinks, on CDs attached to various magazines or when searching the web.

In terms of education theory, foundations can be provided by e-learning, the essential feature of which is computer-based training. Its elements, the personal computer (PC) or more and more advanced data storage media (CD-ROMs and DVDs), in general use by the late 1990s, gradually created the technical conditions for the individualization of learning. From a pedagogical perspective, interactivity, the potential of flexible space-time management, and asynchronous learning became distinctive features of the new learning paradigm.⁸ In practice, by the end of the past millennium this theoretical potential had really become specific – and increasingly available for masses of people – due to the spread of web-based training. This type of training brought about first a new cross-curriculum and the certification of general computer “literacy”,⁹ then virtual seminars and educational institutions, formal and informal groupings first in higher education, later in further education and vocational training for adults. Understandably, these developments exert an increasing pressure on the traditional forms of formal education/training, and in some cases teaching and learning, which have been forced to remain unchanged for decades in the closed world of classrooms.

Methodologically, it is a novel element that broadband data transmission can make demonstration devices – such as overhead or video projectors – virtual without the organizer’s physical presence, or, live and real-time when he actually appears. Mobile communications devices can also help customize learning for individual users (students) as well as the space where such activity is carried out. In this virtual space of learning, the constraints which characterize formal learning, and cause many inhibitions, dissolve. A serious response to the critique that individualized learning, or, in broader terms, individualized work (as in the case of teleworking),

⁸ See *A Programme for the Effective Integration of Information and Communication Technologies (ICT) in Education and Training Systems in Europe (2004–2006)*, <http://elearningeuropa.info/doc.php?lng=1&id=4552&doclng=1>.

⁹ European Computer Driving Licence, <http://www.ecdl.com>.

leads to social isolation due to a lack of community life is in the making. The advocates of this response argue that today one of the main trends in the development of relevant systems is that participants, utilizing Net-Meeting software, constitute informal groups on the basis of common concerns and interest, which can be characterized as having significant social cohesion.

One of these trends appearing within the framework of the traditional pedagogical paradigm can be seen in the phenomenon that young people are eager to use information and communication technologies, which is also evidenced by the popularity of computer games. If such technologies were applied in the course of education as well, children would be more interested and engaged, since this system is interactive and provides room for creativity. If we go beyond the boundaries of formal education and consider this issue in a broader context and age range, then we can conclude that the new technology brings about more learning choices and changes learning methods. Nowadays, most cultural institutions have websites, offer virtual resources for users, maintain information centres and thus create interest communities of people who occupy different positions in physical and cultural spaces because they live in different geographical locations and at different cultural levels. The inclusion of objectified cultural entities or *objects* in a broader sense (books, documents, audiovisual materials, images and any other digitized resource) into webpages creates the option of e-learning.¹⁰ In terms of education theory, it is obvious that understanding any “object” during such a demonstration also requires further “pieces of knowledge”, information, structures, and activity patterns. Therefore an increasing number of museums, libraries, and archives digitize their collections, which transforms these institutions into repositories of “digital objects” or durable digital resources, and in turn sets “learning objects” carrying significant cultural content and messages as learning objectives.¹¹ Indeed, this medium can be seen as an organic learning environment whose distinctive feature is its virtu-

¹⁰ An example of this is *Learning Curve*, an online teaching and learning resource provided by The National Archives of the United Kingdom, widely used by teachers and pupils (<http://www.learningcurve.gov.uk>). For details, see Research Centre for Museums and Galleries, „What Did You Learn at the Museum Today?”, MLA – Museums, Libraries and Archives Council, www.mla.gov.uk. Hungary’s National Library (Országos Széchényi Könyvtár) offers a similar option at its digital “treasury”: <http://www.kincstar.oszk.hu>.

¹¹ From an international perspective, we can refer to two significant meta-databases for educational purposes: CanCore (Canadian Core Learning Resource), <http://www.cancore.ca>, and UK LOM Core (UK Learning Object Metadata Core), <http://www.cetis.ac.uk/profiles/uklomcore>.

ality. Such a virtual learning environment (VLE) can also categorize and mediate “learning objects” and organize communication between teachers and students.

Pedagogically speaking, if we have the classic structures of classrooms and classes in mind, mobile communications has a limited use in this virtual reality. However, the pictorial nature and means of mobile communications may provide solutions that are more practical than knowledge mediated by written text, since text can only transfer information which is independent of or detached from the given situation. Although person-to-person communication occurring in classroom-based education aims to develop the practical skill of locating something within a situation, and indeed – if we ignore the contrast between formal and non-formal learning – fixed context and fixed location are related, networked computers and mobile communications devices can create a shared space (of virtual learning) which lacks the limits of the classroom.

Rather than making a contribution to the ongoing debate about the optimal content of education and the ideal volume of a curriculum, I would like to call attention to the fact that mobile communications devices offer an extremely flexible technique when the curriculum is broken down into elementary information units (microlearning). Thus, the fundamental challenge to the pedagogical application of m-learning is, on the one hand, the problem of making devices which are, unlike the traditional tools of didactics (textbooks, printed guides, workbooks), portable and, on the other hand, the need to develop formats for them.

From Virtual Reality towards an Organic Learning Environment

From the perspectives of teaching and learning, the complex, customized combination of interactivity and multimedia has important new features. Manuel Castells argues that

perhaps the most important feature of multimedia is that they capture within their domain most cultural expressions, in all their diversity. Their advent is tantamount to ending the separation, and even the distinction, between audiovisual media and printed media, popular culture and learned culture, entertainment and information, education and persuasion. Every cultural expression, from the worst to the best, from the most elitist to the most popular, comes together in this digital universe that links up, in a giant, non-historical hypertext, past, present, and future manifestations of the communicative mind.

By so doing, they construct a new symbolic environment. They make virtuality our reality.¹²

Analyzing the issue of virtual reality and the new space of learning, which is made multifunctional by mobile communications devices, Kristóf Nyíri suggests that we should reconsider John Dewey's classic argument that "we need schools, artificial educational environments, because the young can no longer move around in the world of adults and thus learn spontaneously". Nyíri concludes that the typical patterns of knowledge acquisition are changing: lifelong learning becomes dominant, the sharp conceptual distinction between child and adult, a solely modern development, is blurred again, and formal institutions of education are gradually replaced by the virtual environment of open education. Thanks to mobile communications, it is characteristic of today's learning that "the medium in which the young play, communicate, and learn is increasingly identical with the world in which adults communicate, work, do business, and seek entertainment". The world of the internet and mobile phones clearly turns into a kind of *organic learning environment*.¹³ The development of an organic learning environment has significant social effects which force pedagogical perspectives and practices of organizing education to change. Today, more and more students have laptops, and almost all of them have some kind of mobile phone. Unlike PC and internet penetration, which is hindered by social inequalities, the mobile phone has spread in a more democratic way among young people. From a pedagogical perspective, it is particularly worth noting that the mobile phone has become accessible even for people who are threatened by social exclusion, such as those who were drop-outs within the educational system and who are not currently participating in traditional education or training, or the unemployed, or those who are working in a position which does not fit their skills, or the homeless. According to research estimates, the use of a personal digital assistant (PDA) may reach a mass scale in the near future, which will provide even more flexibility since these devices can store a large amount of content. PDAs can be used at museums, gal-

¹² Manuel Castells, *The Information Age: Economy, Society and Culture*, vol. I: *The Rise of the Network Society*, Oxford: Blackwell, 1996, p. 372.

¹³ Cf. Kristóf Nyíri, "Preface", in *Mobile Understanding*, p. 17. See also Nyíri, "Towards a Philosophy of Virtual Education", in Marilyn Deegan and Harold Short (eds.), *DRH 99*, London: King's College, 2000, pp. 107–131, and "Towards a Philosophy of M-Learning", in M. Milrad et al. (eds.), *Wireless and Mobile Technologies in Education*, Los Alamitos, CA: IEEE Computer Society, 2002, pp. 121–124.

leries, archives, libraries, during fieldwork, or at cultural heritage sites, and they can be linked to learning modules which were prepared by educators or cultural institutions. They can help in online seminars or consultations by connecting all students and teachers.

Young people's out-of-school leisure activities have been transformed by the developments going on in the technologies of the internet, mobile communications, and multimedia. It can be easily seen in streets, parks, and other public areas that mobile communications influences how the young (and, of course, adults too) play, maintain their contacts with their friends and families, and spend their leisure time. It is one of the pedagogical contradictions of our age that, despite these changes, thinking, learning, and communication still occurs in the world of words that fills the classroom.¹⁴ Students who learn and think in visual or multimodal ways have disadvantaged positions compared to their peers in formal systems of pedagogical assessment, and many of them fail to meet the requirements set at school.

Here we can return to Manuel Castells' strand of thought: "The *space of flows* and *timeless time* are the material foundations of a new culture that transcends and includes the diversity of historically transmitted systems of representation: the culture of real virtuality where make-believe is belief in the making."¹⁵ Consequently, it is the fundamental challenge to pedagogical thinking which tends to follow new paths; we have to find responses to it which can be applied within the frameworks of both school-based and informal learning.

Towards a New Pedagogical Paradigm

The development which I briefly described above, actually spanning fifteen to twenty years, poses a challenge for pedagogical thinking that must still be faced. The traditional concept/perspective of learning is forced to change in response to the following critical issues: The use of new communications devices has abolished *classroom enclosure*. Figuratively speaking, the world is omnipresent in every corner that is technically equipped for the use of communications devices. This change considerably

¹⁴ See Lynn V. Marentette, „Thinking, Learning, and Communicating through Multimedia: Views from a School Psychologist”, in Kristóf Nyíri (ed.), *A Sense of Place*, pp. 319–328.

¹⁵ Manuel Castells, *op. cit.*, p. 375.

¹⁶ Taking an example from everyday practice: a problem arose in 2005 when strict rules for secondary-school final examinations in Hungarian and tests at universities forbade students from bringing their mobile phones into the classrooms; students could no longer

erodes the existing norm systems and brings in new conventions.¹⁶ *Society becomes virtual in both space (real-time communication) and time (SMS and MMS messaging)*; the traditional role of the teacher seems anachronistic in this new environment, which, due to the socially sensitive nature of this issue and its effect on the population, could be considered a mere developmental contradiction unless we face the fact that currently there are no responses to these new challenges.

It is only one side of a particular paradox that would-be teachers can actually use – now as students, later as adults – techniques of mobile communications skilfully. This paradoxical situation derives from the fact, which is the other side of the phenomenon, that today this new communicational opportunity is not present in the teacher’s everyday activities even at an elementary level. To put it very simply: while mobile learning works at the individual level, no system of mobile “teaching” exists.

The relatively constrained world of educational systems has also avoided this phenomenon for a long time because classroom walls enclosed the process of teaching/learning, both figuratively and physically. As a result of evolving new practices which rely on mobile communications devices, communication has become an essential activity among the young, helping them acquire and share everyday knowledge with an efficiency that can even crack the conservative shell of pedagogical thinking. Mobile communications and the evolving forms of learning it supports gain particular importance especially in a system of lifelong learning, which provides identical frameworks for young people and adults. Here there is no sense in making distinctions between the young and adults, since (mobile) forms of learning can be developed for and applied to any age group.

Today, the diversification of learning and the explosive expansion of technical opportunities shows a curious synchronism. As a result of IT diffusion and increased access to broadband internet and mobile networks, the technical conditions of individualized learning are undergoing a transformation in terms of quality as well. In addition to classic “computer-assisted” individual learning (though this phrase sounds somewhat anachronistic today), understanding via mobile communications devices and the new visualization technologies is gaining an increasingly important role. The new elements of this education theory, shaped by mobile communications, are as follows:

measure exam time left (of the usual 2 to 4 hours) because they do not have watches: they are used to using the clock function of their mobiles.

- *Microlearning*, which allows the contextualized information to be obtained and processed through small pictures and texts in the most direct and customized way.
- *Functional networking*, which allows linked groups to be flexibly trained and maintained for various purposes and tasks, e. g., learning functions.
- *Direct access to databases*, which helps build up an integrated knowledge base; databases can be combined to create the foundations for complex activities of learning, understanding, and R&D.
- *Time-sharing optimization*, which, while providing for the spatial distribution of the tasks and functions above, allows us to distribute over time and thus optimize different activities in the operational world.

Presumably, the social practice which creates new schemes of cooperation and in turn new opportunities of learning via applying mobile communications and the internet is worth noting not only because it gives rise to new consumption habits and threats, generating significant social costs. It also bears future significance since these new devices and techniques will give an opportunity to improve efficiency and enhance the communication culture of society as a whole in many areas of life, including learning and the institutional reality of education. Obviously, we have to recognize that there are still many problems to be solved; for instance, we have to assess and structure demands for mobile learning and give a detailed definition of possible, in this case, *pedagogical*, responses. Further issues are related to the need of raising and generating demands (for mobile learning), revealing existing but hidden knowledge, and providing access for all.

To sum up: the change which can be associated with the definition of the structure and function, as well as the social relevance and acceptance, of knowledge acquired via mobile learning affects the very foundations of traditional pedagogical thinking. Although this problem can be related to the process of formal, school-based teaching/learning, its effects appear in a more and more significant social dimension, which forces pedagogical thinking to assume a wider framework. Change has an expanding effect on the framework of lifelong learning, adding new virtual dimensions. It can have a dominant role in non-formal learning by adults, where mobile learning in part serves a complementary function in balancing and managing cultural disadvantages, and in part is a learning tool and technique for enhancing efficiency in the process of acquiring the adaptation knowledge which is indispensable in our age.