

Introduction

This paper summarizes several years of research I have presented in publications and interviews.¹ The title plastically refers to the fact that m-learning can significantly contribute to the development of the number and quality of horizontal connections. At the same time, it can be witnessed that learning, accepted as one of the determinants of social hierarchies and acquired in traditional settings as a specific 21st-century phenomenon, is becoming relativized. This paper draws attention to new elements emerging in the social dimension (e.g. falling behind, marginalized social strata with communication problems) as an especially important praxis of social learning, and to the currently only partially existing awareness of the impact of communication. As a consequence, the system of learning outputs, which can be integrated in time, insofar as only the vertical performance in hierarchical social-institutional dimensions is taken into consideration, can be relativized quite fast at present and especially in the future.

A Changing Environment and New Paradigms

Today, a tendency for those who participate in learning to be increasingly willing to use ICT, breaking open the frames of mainstream education, is already evident. The literature on the relationships between mo-

¹ András Benedek, “New Vistas of Learning in the Mobile Age”, in Kristóf Nyíri (ed.), *Mobile Understanding: The Epistemology of Ubiquitous Communication*, Vienna: Passagen Verlag, 2006, pp. 121–131; András Benedek, “Mobile Learning and Lifelong Knowledge Acquisition”, in Kristóf Nyíri (ed.), *Mobile Studies: Paradigms and Perspectives*, Vienna, Passagen Verlag, 2007, pp. 35–44; András Benedek, “Tudásról és tanulásról egy mobillabb korban” [Knowledge and Learning in a More Mobile Age], interview conducted by Olivér Kovács, *National Geographic Magyarország*, May 2008, pp. 37–45.

mobile technologies and learning is abundant, and informative reviews are also available.² The topic is in the focus of workshops and projects, which clearly shows a growing interest.

The coming technology, whether we are talking about computers, or mobile phones, or new hybrid tools embodying a convergence of the two, will provide more and more possibilities for using the enhanced user displays by promoting personal communication functions, telecontrolling a sort of digital board within the frame of which we will orient ourselves, and others as well, in accordance with a new way of thinking and perceiving.³ This is not only implied by the popularity of interactive computer games, but by the success of programmes adapting the games to the world of education. According to continuously changing IT statistics, the number of mobile phone subscribers was 2 billion globally at the turn of 2006/2007, with a 50% rate of web access; there were 4.1 billion subscribers at the end of 2008,⁴ and it is reasonable to suppose that most of the sets used are capable of internet access as well.

The daily functioning of society is also influenced by statistical changes. The traditional processes of learning-teaching undergo significant modifications, and new paradigms are formulated. Leaving mainstream education behind us and taking into consideration a broader context and age group, it can be stated that the new technologies extend learning opportunities and transform learning methods. This is well exemplified by the increasing interest in m-learning. It is noteworthy that progressive cultural institutions find their place relatively easily in the new ICT pedagogical paradigm which makes knowledge available for many at relatively low per-unit costs thanks to new tools, assuming that they have proper resources. Thus, from the viewpoint of m-learning interpreted in a broader sense, those institutions which have websites for educational purposes are potential providers. They offer lists of resources for users, operate in-

² The following two reviews are perfect examples: *Big Issues in Mobile Learning: Report of a Workshop by the Kaleidoscope Network of Excellence Mobile Learning Initiative*, ed. by Mike Sharples, University of Nottingham, 2007, <http://mlearning.noe-kaleidoscope.org/repository/BigIssues.pdf>; *Mobile Technologies and Learning: A Technology Update and M-learning Project Summary*, by Jill Attewell, Technology Enhanced Learning Research Centre, Learning and Skills Development Agency, London, 2005, <http://www.m-learning.org/docs/The%20m-learning%20project%20-%20technology%20update%20and%20project%20summary.pdf>.

³ Laura Naismith, Petre Lonsdale, Giasemi Vavoula, Mike Sharples, *NESTA Futurelab Report 11: Literature Review in Mobile Technologies and Learning*, Bristol, UK: NESTA Futurelab, 2005, http://www.futurelab.org.uk/resources/documents/lit_reviews/Mobile_Review.pdf.

⁴ See <http://www.itfacts.biz/41-blm-mobile-subscriptions-in-2008/12765>, cf. also <http://www.itfacts.biz> and <http://blogs.zdnet.com/ITFacts>.

formation points, and form interest communities in virtual space.

A significant change in social patterns can be observed, since in terms of access to information there is no difference between people of different social positions and educational levels, which cannot be so readily said for the measurement system of traditional institutions (or even of public service). As opposed to the systems of social segregation “protected” by means of examination systems and educational levels, the new dimension of social networking is linked to mobile communication, and within this to free m-learning solutions as a form of learning.

In addition to the democratic character of access to education, from the viewpoint of didactics novelty can be found in the operation of structures in a demonstrative way in which understanding an “object” needs further information and knowledge. A knowledge network is formulated by this in which “movement” and finding your way depends on your “movement needs” to a significant degree; at the same time the encouraging effect, the help of horizontal structures, is significantly stronger than the usual effects, due to the fundamentally open-system character of the network.⁵ This medium can indeed be considered to be an organic learning environment whose characteristic property, according to Kristóf Nyíri, is virtuality which is capable of systematizing and transferring “the learning objects” to an increasing degree, as well as organizing communication between teachers and learners/students.⁶

Mobile Communication and Non-formal Learning

From the viewpoint of m-learning, the new efforts forming at the level of services provided by institutions mean that the “space” in which the elements of teaching-learning (*arousal of interest, transmission-acquisition of knowledge, demonstration-experience-experiment-research-practice, conclusion, systematization*) can be placed in some sort of didactic system and organized by means of fixed algorithms, is expanding both for teachers and learners. Of course teachers are affected by the change as well, since they need to find harmony in the use of different tools (traditionally the curriculum and textbooks, but realistically the possibility of acquiring knowledge in the new “environment”) in space, especially where mainstream education is concerned.

⁵ An increasing number of libraries and museums are digitalizing their collections, these institutions can become centres of digital sources; thus “learning objects” of significant cultural content and message will become learning objectives for all.

⁶ Kristóf Nyíri, “Towards a Philosophy of Virtual Education”, in Marilyn Deegan and Harold Short (eds.), *DRH 99*, London: King’s College, 2000, pp. 107–131.

A tendency is perceptible in the developed countries whereby non-formal learning forms are gaining an increasingly important role as compared to institutionalized education. This is true when these forms of learning do not involve degrees and qualifications, although the goal and content of learning is also of importance here. Mobile learning has been gaining ground among students in the course of basic education and later as well. We can assume that one of the fundamental issues of the near future for those concerned with the theory of teaching and learning as well as new instructional techniques is the development of learning and the improvement of related teachers' competencies. It can be stated that the relevant fields, organizational frames of educational programmes addressing teachers' competencies challenged by ICT technologies, could be further education, e-learning programmes, and internet portals developed for such purposes and functions.

Based on the previous years' analysis, it can be concluded that the weakening of traditional teacher dominance, fundamentally characteristic of classroom learning, is paralleled by high-intensity social communication, whose tools and technological base are potentially created by mobile communication techniques. The pedagogical paradigm shift necessitates the renewal of pedagogical methodology ingrained at the level of conventions. According to empirical examinations, new generations, specifically the modern individual, can easily make friends with the new – partially virtual, operating to a significant degree in a time-division system – environment, and turn the organic learning environment offered by mobile communication techniques into instrumental knowledge.

Potential educational models, and within them m-learning solutions, can be situated between two poles depending on whether significance is attached to individualization or to the dominance of socialization. One of these tries to open up the possibilities of applying the new techniques within traditional classroom and curricular frames, thus only partially forcing open the frames of pedagogical innovation. However, although the participating students experience these experiments in a positive manner (the application of GPS at field trips for location determination, collection of photos for purposes of documentation, etc.), the activity cannot be characterized by significant quality transformation, the expansion of the horizon of social connections. The other solution, which can at present be considered as progressive, renders learning and the “space” in which this activity occurs as increasingly personalized for users (learners), owing to mobile communication tools. The social space can also expand in new dimensions which are influenced by the topic and the environment to a significant degree, while at the same time personal involve-

ment is also significant. The constraints responsible for numerous inhibitions and characteristic of formal learning are not prevalent in this virtual learning space.

Examples: Forms of Social “M-learning”

A response to the critique that individualized tool use and an absence of community existence cause social closedness may be in order. Before we try to provide such a response, some more general remarks should be made concerning social aspects, and the present author’s mobile-phone-related sociological observations. In what follows, my aim is not to set up a new typology. I merely present observations for a social-professional discussion, in preparation for future research in the given field.

The horizontal character of mobile communication’s social dimensions, and its presence in the full spectrum of society is well illustrated by the following three examples:

- It can be observed among homeless persons, especially in the case of those living in cities, that although the material possessions of their lives can be packed in one or two carefully watched plastic bags, quite a lot of them use mobile phones while raking dustbins. Their communication is generally the provision of information about relevant “loot”, about a supporting social action or a dangerous event, about the identification of the known “when” and “where”. Although the content of the information is significant, my focus concerns the fact that the poorest and the most marginalized layers of society, even if only partially, are part of mobile communication.
- An official urban ritual, gradually becoming a social phenomenon, is the free clearance of bulky household junk in a street, or an area announced in advance from time to time. During this event, many families get rid of their “odds and ends”. In accordance with the original concept, the household-junk-as-waste is transported to waste collection sites by means of the usual waste collection technology. During the period when people put out the junk on the pavement in the early evening and before it is officially transported away in the early morning, specialized intensive activity bustles around the junk littered in the streets. Groups of people from social layers of lower prestige, for whom the junk is either directly valuable or implies the possibility of selling or reusing/recycling (e.g. collecting metal objects) are engaged in a special “competition” at night. Any “lonely warriors” stand no chance in this struggle,

while families or professional teams, well equipped with technology (car, communication tools, etc.), appear on the spots programmed in advance. The mobile phone has the function of calling attention to the “valuables”, mobilizing people either for guarding or organizing their loot, providing information about the possible seizure of the loot by the enemy, etc. Taking into account social layers, even though these groups are not in the worst position, they can by all means be considered as disadvantaged. At the same time, from the viewpoint of mobile communication practice, their expedient and efficient use of mobile phones is exemplary.

- Finally comes an example which might encourage us to seek further relationships; however, I will only undertake to outline the phenomenon. It is known that when discussing the spread of mobile phones, the statistical data of subscriptions, mobile card purchases, as well as the number of sets are examined and conclusions are drawn on the basis of changing tendencies. A factor of uncertainty involved in this practice is that sets are continuously exchanged because of wearing out or upgrading, the measure of which can only be guessed by means of sampling. Sets are exchanged in case of loss, or theft, about which relatively more data are available because of official reporting. My related social observation is that the incidence of mobile phone loss is nearly twice the average in the case of people struggling with addiction (drugs or alcohol) who become more unstable due to their life situations. Although this phenomenon implies 2–3 “set exchanges” in the case of those struggling with serious problems, the exchange takes place in each case in spite of significant financial consequences. Furthermore, the use of more modestly-priced sets and services is not observable despite its frequent occurrence. The answer to this phenomenon that these people belong to layers of higher social prestige and income than the average is too simplistic. It would appear that the answer is related to the fact that members of the given group need social communication by means of this tool as well, which is of high importance from the viewpoint of further studies. Indeed the questions are the following: how active and supporting social networks are linked to these sets, who initiates calls and how frequently, that is, who appears on the callers’ list or on the telephone register of the owner’s set.

Community and Performance

Returning to the more consolidated world of m-learning, we might conclude that one of the main directions of the development of mobile communication systems is just that the participants form informal groups of significant social cohesion by means of NetMeeting software systems on the basis of interests and identity of interests. This implies a new competition, new challenges for mainstream education. The question arises: *up to what age is it of primary importance to keep youths together, to look after them, and discipline them.* It can be supposed that the new technological tools will increasingly need more liberal educational forms, open cultures, and the formation of teaching-learning frames appropriate for the sociological conditions.

When approached from a social dimension, it might be supposed with reason that a new generation is forming (growing up), consisting of users committed to online learning. This generation moves in the info-communication space more freely than previous generations, and becomes better informed and more organized. By means of this knowledge, people can obtain more information and get more support from each other than from different institutions. This is why *the role of learners' communities will grow*, which is easy to project onto the future. These communities are primarily characterized by an identical sphere of interest, where learners interact with one another, learn together, and produce a shared supply of knowledge resources. Moreover, this emerging practice is not in contradiction with the learning opportunities of the recreated organization forms of higher education.

M-learning, as the most democratic tool of the formation of the new learning space, has managed to introduce a new dimension of space and time from the viewpoint of social access to the conservative world of education because of its significantly bigger penetration as compared to previous technologies.⁷ Though mainstream educators' aversion is still of significance, new approaches are encouraged by the technology and at-

⁷ On the basis of a Nielsen survey among UK and U.S. mobile subscribers it can be stated that a significant population (U.S. – 4 million, UK – 812,000 persons) is linked to community networks by means of their mobile phones, though the rate (1.6–1.7%) is modest. It is noteworthy that the figures, or the rates are more modest in the case of more conservative educational structures (e.g. 140,000 persons in Germany, which is only 0.2% of subscribers). See <http://www.nielsenmedia.com/nc/portal/site/Public/menuitem.55dc65b4a7d5adff3f65936147a062a0/?vgnnextoid=b03335bccf3c9110VgnVCM100000ac0a260aRCRD>.

titude shifts, and the increasingly stronger impact of virtual reality leads to the formation of a new organic learning environment in different levels of education.

The m-learning situation is a model of the new pedagogical paradigm to be examined in practice, which can be characterized by a conscious turning away from traditional classroom learning and the intensity of the technical and social elements of mobility. The continuous regenerative ability of integrated knowledge emerging in social networks is appropriately stable and continuously increasing in principle according to experience. In fact, outstanding individual performances in the case of individuals and smaller groups can probably only be considered as unstable knowledge performances as a consequence of social isolation in the long run. Although knowledge is still measured according to educational levels due to time-honoured traditions, these statements draw our attention to the fact that horizontally developing learning activity can significantly contribute to individual stability and continuous development in the social dimension. As a matter of fact, from a social point of view, m-learning is a happy-ending story within the frames of pedagogical construction. Of course, the participants' motivation for cooperation is conscious and higher than the average. Naturally, a given technology might involve limitations, especially if there is a problem of usage with the tool in the given group. However, this risk is increasingly minimized by means of the development of services and tools.

Properly built networks will have a decisive role in the further increase of the knowledge that can be acquired by means of m-learning. In the following decade, the networks being formed will probably not dissolve after reaching the first target, but might also accompany us throughout our lifetimes. This can solve the problem of further education and adult training much better than the present solutions. Formal knowledge can be complemented, or even substituted in cases by informal learning, that is, by knowledge acquired in a non-official way. The role of the individual, the network, and society can be imagined as the role of the cells, organs, and living beings. Each cell, that is, human being, produces something that is at the same time the subject of their activity and the source of their social profit. This functions as if we were composing an internet-based encyclopaedia in which we have written a few entries, but since numerous other persons write entries as well, we gain many more entries, that is, much more knowledge than we have put in. The new institutions of learning can be considered to be the nodes of the network, in which such "encyclopaedias" are combined at higher levels as well. A paradigm shift can be expected similar to that where the role of the lonely inventor

was taken over by research groups.

Modern scientific thinking can be characterized by the high value of social capital and the intensity of informal relationships. It is not accidental either that most scientific results of the past decades were backed by a community. Perhaps one of the members was good at one thing, another person was good at another, and the community achieved excellent scientific results by means of their cumulative knowledge. Isolated, outstanding performance, if not linked to horizontal social networks, that is, performance that cannot be placed into a social context this way, is of questionable usefulness. Figuratively, the engineer with excellent degrees but lacking references and work experience is only a cardboard figure. By contrast, the carpenter who has over an extended time delivered recognized and time-tested pieces of work is, one can assume, a valued and sought-after participant in different social groups. This example is not used to illustrate the difference between academic and everyday knowledge, but the attractiveness of network-embedded knowledge, which can be acquired only by means of mobile communication tools, the intelligent tool of future craftsmen.

