

Pooh, whatever happens, you will understand, won't you?

Christopher Robin Milne

This paper aims to examine, from a pedagogical point of view, issues of teaching in the light of the spread of new technologies (mobile communication), based on research concerning the linkages between mobile communication and cognitive development. Our approach is special in the sense that it amounts to the investigation of the idea that mobile communication tools effect informal and non-formal learning, whereby real-time learning and knowledge of contemporary everyday culture significantly transform the learning potential of the individual through the application of these tools. That may substantially modify our traditional concept of education, which we may illustrate with Hannah Arendt's words: "Since the world is old, always older than [children] themselves, *learning inevitably turns toward the past*, no matter how much living will spend itself in the present."¹ Let us focus on this last observation, and turn it into a question: *Does learning actually inevitably turn toward the past?*

Nowadays one would be justified in assuming that in addition to the formal structures of teaching and learning, i.e. school, examinations, qualification schemes, the new possibilities offered by mobile communication open new horizons to the individual in non-mainstream education, or in other forms of learning that compensate for the dysfunctions of mainstream arrangements. In this current period of transition full of controversies, the spontaneous or systematic application of mobile communication tools in the learning process is a challenge for the technologist, the thinking educator, as well as for the user.

¹ Hannah Arendt, *Between Past and Future: Six Exercises in Political Thought*, New York: The Viking Press, 1961, p. 195, emphasis added.

New Tools and a New Space for Learning – Mobility and Communication

Movement in space and *communication* may reset the basic conditions in learning / acquiring knowledge, and in the development of human relationships. Possible examples include geographical discoveries on a macro-level, or, in our micro-environment, the initial explorations of a newborn expanding its personal range of movement. At any rate, we are witnessing ever broader limits to physical *movement*. At the same time, the mere fact of the discovery of America cannot be ascribed just to Columbus landing on the new continent. If there had not been any communication concerning that achievement through the technology of the time, nobody would have known about it. Just as an 8–10 month old baby enters new dimensions by standing up and taking its very first steps, and experiences new perspectives in the strict physical sense of the word, communication likewise becomes the fundamental instrument in expanding, as well as improving the quality and the quantity of partner relationships.

It is a sensitive area of research for developmental psychology to investigate the age-related components of how the ability of abstract thinking is acquired. But it is at least as sensitive an issue to clarify the relationship between virtual space and the physical environment. In the Mobile Age, the virtual reality of computer games and the navigation systems of cars have become learning objectives achieved particularly rapidly by our children. Moreover, if one studies the speed at which users come to master their mobile communication tools, and the close relation of that knowledge with social practice, one might realize, not without some irony, that the centuries-old system of traditional education and the performance in learning to use ever new generations of mobile communication tools compare just like the steam engine and Formula 1 technology. The analogy may be unusual for the objects I was comparing, yet, the most unusual feature about it is the time dimension of my comparison: unlike the two centuries that it took for the steam engine to develop into a widely used top technology vehicle, mobile communication has been radically transforming our daily lives over just the last decade. The new space that the new tools of mobile communication can open up in a physical as well as in a social sense has a clear effect on the transformation of the learning process, and on the new forms that learning is taking on.

The tools used in mobile communication have data-entry equipment with limited functionality. Mobile communication is very attractive for young people; that advantage could be capitalized on even at school. Pupils familiar with the HTML language could be easily introduced to

the details of WML in the framework of a study-circle or an appropriate course. The mission of the study-circle could be for instance the design of a WAP-version of the school's website (general information, important phone numbers, events, entry exam results, etc.).

Today, as image communication technologies develop, the situation is changing. The effect of the change is already felt in the domain of cognitive psychology, and I anticipate that sooner or later it will reach the domain also of philosophical thinking. Thanks to the development of computer software the language of images is becoming increasingly suitable for abstract/intellectual communication. Thinking is an activity that involves not only our brains, and not only our bodies, but also factors, structures, and institutions *external* to the human body.

Learning as a Set of Different Activities

Today we are witnessing the differentiation of the learning process at an accelerating pace. One important reason, never off the agenda of social policy decision-makers, is the slow transformation – both in terms of methodology and infrastructure – of traditional mainstream education. This differentiation occurs because the personal communicational environment of modern man, especially of youth, tends to transform much more rapidly. The learning process of the population, mobile in a physical sense and in the sense of frequently replacing their communication hardware, has transformed in a very informal way.² This is why life-long-learning, as a feeling, is of such great importance in that context. On the basis of the above, the following classification has become accepted concerning the differentiation/diversification of the various forms of learning:

- From the point of view of *forms of learning* it is actually worth including a number of activity types in the system. From the point of view of *regulation and funding* in various institutions – public education and higher education institutions, and in vocational training, assuming the appropriate legal framework – the learning process is formalized through study plans, programmes, certificates, diplomas, and qualifications. We therefore call this type of learning *formal learning*.

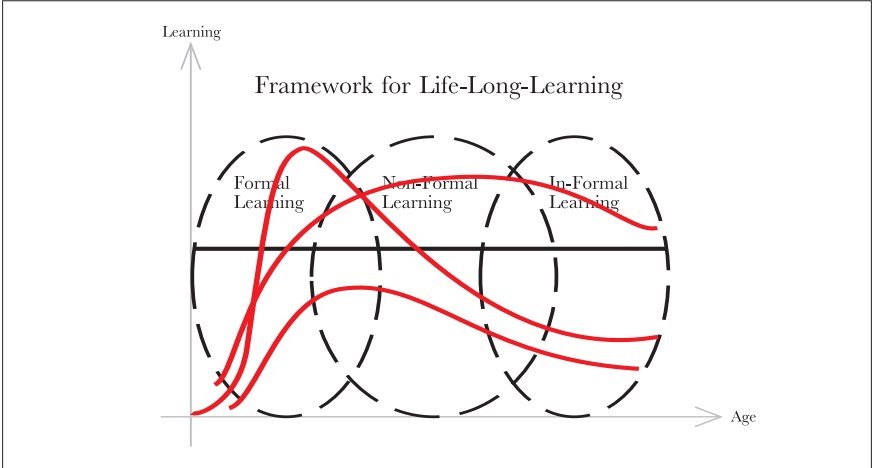
² Cassandra L. Book (ed.), *Human Communication: Principles, Contexts, and Skills*, New York: St. Martin's Press, 1980.

- *Non-formal learning* takes place chiefly in places other than educational institutions, or schools, and does not characteristically lead to any certificates, diplomas, or qualifications in spite of the fact that learning objectives and content are their indispensable feature. At the same time, it is significant that this form of learning should begin at the initiative of, and through an active role, played by the individual trainee/student.
- *Informal learning* is primarily associated with everyday life, and takes place in a family environment, in homogenous age groups, and in situations involving entertainment. This activity lacks learning objectives, neither the timeframe, nor the content have a specific structure; at the same time, as people spend a significant part of their lives in this environment, the knowledge acquired as well as the behavioural patterns learned will strongly bear on their lives.

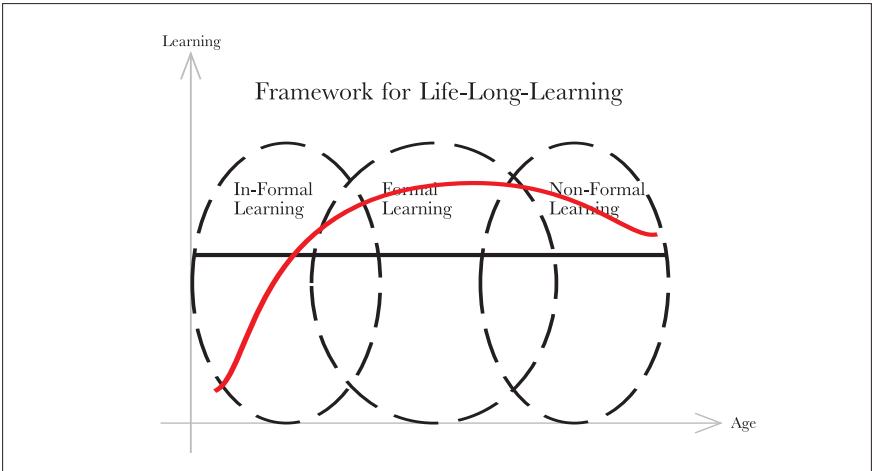
The differentiation of forms of learning has been identified as such, and gathered considerable speed particularly since the beginning of the 20th century. Before the process of differentiation of forms set off, the various institutions had been conceived of as constituting a hierarchy. Meanwhile, on the one hand, the adoption of mobile communication hardware in socialization takes place at an incredible pace, coming a very long way in just one decade, and, on the other hand, the centre of gravity of the learning “hierarchy” is being shifted to communication and learning in everyday life. Pedagogy has had difficulty recognizing that tendency, and is still seeking its own responses to it.

If one examines forms of learning in the light of age and levels of learning, one may assume informal learning, as well as formal (school-based), non-formal (organized further training) learning to be of different intensity in each phase of life. Also, this phenomenon is well characterized by the observation that the most interesting problems have more than one locally optimal solution. Even in the present framework three patterns of learning may be suggested. One is when at an early stage the school has a strong presence in the learning process (such as in the Hungarian education system³).

³ András Benedek, “Life-Long Learning in Transition to the Knowledge-Based Economy – the Hungarian Case”, Knowledge Economy Forum II, Helsinki, March 26–28, 2003, http://www.worldbank.org/eca/helsinki/keskiviikko/10_andras_benedek/ie.html.



Understandably, this is to the benefit of those who successfully move past the various points of selection, and make it to the top. At the same time, the opposite pathway is represented by those who drop out, and fail to gain entry to the centres of knowledge (secondary and tertiary education), and thus become rather exposed unless an alternative learning pathway⁴ is offered to them. There is a risk that they will not feel the need for learning or will not have access to education over a significant part of their lives.



⁴ *Career Guidance and Counseling: Theory and Practice for the 21st Century*. Regional Conference, Ministry of Education, Budapest, 2002.

The third pattern, qualifying as progressive, is the one that maintains learning activity relatively high in all stages of life, and offers specific arrangements to go with it (training schemes, information interface, access) accompanied by appropriate tools and up-to-date content. An important element in selecting values is the spreading of the life-long-learning philosophy, witnessed by all of us in the EU, and any developed country. That approach closely connects to the philosophy of the knowledge society and the knowledge economy, free from pragmatic, or conservative ideologies. This pattern is the one that best qualifies for the name *life-long-learning*, which shows the change of knowledge as a function of learning level and age. Theoretically, several learning paths exist. It is the joint responsibility of the individual and society to create the perspectives of life-long-learning in a given country. In the following we will show the change of those perspectives in the mirror of the economic changes of the last decade.

The teaching profession, and surveys carried out among the population, seek an the answer to the question of what key competences can significantly affect learning. Particularly intriguing, and also relevant from the point of view of mobile communication, are *reading skills*, and how effectively these skills can be improved.

The New Culture of Reading: Limits and Obstacles

The fundamental condition to acquiring the skill of reading words is that everyone should have an optimum level of letter-to-letter word-reading skill already acquired, thanks to which we will eventually read/recognize each word of our mother tongue. That is to say that teaching reading should not begin with teaching the global method of recognizing the shape of the word, but with teaching individual letters, reading strings, and abundant practice of letter-to-letter reading. An initial condition of learning fluent reading is that the reading of the critical word-stock should work routinely in accordance with the simultaneous word-recognition model. The most generally applied method for that is (apart from the repeated reading of the texts meant for teaching reading) a set of playful word-reading exercises to practice the reading of the critical word-stock.

The most striking outcome of a representative survey in Hungary by Czachesz and Csirik was that the skill of word-reading fails to develop until the 10th grade on a national average.⁵ The low skill-level reached

⁵ Erzsébet Cs. Czachesz and János Csirik, *10–16 éves tanulók írásbeli szókincsének gyakorisági szótára* [A frequency-based dictionary of the written word-stock of 10–16 year old pupils], Budapest: BIP, 2002.

by the end of the fourth grade hardly improves in further grades. That leads to the conclusion, generally accepted, that developing the reading skill is not just the task of the lower grades, but that the whole school system requires teaching methods introduced and regularly applied where the reading of the teaching material is being practised (a relevant experiment in Hungary is the “text-processing” teaching elaborated by the Szeged workshop).

A representative diagnostic survey of the development of word-reading skills reflects staggering differences among students. About 40% of 8th-grade pupils do not have the ability of fluent word-reading. Those pupils have merely struggled their way through primary school as a consequence of their demotivatingly low reading skills, and are quite likely to live the rest of their lives as functional analphabets. Incomplete reading skills result in an immense waste of time during the years at school.

The acquisition and development of reading skills takes about a decade in accordance with traditional classroom practice. However, good reading skills (decoding) constitute a necessary, but not sufficient condition for being a good/effective reader. It is an important fact that the chief difference between beginners and those with developed reading skills is not error-free and fast-decoding on the side of the latter. The real difference is at the level of cognitive, meaning-generating, conceptual operations. This is why reading researchers today warn that developing reading skills must be given particular emphasis not just in the initial years of schooling, but also in higher grades. One would be of course justified to ask what and how youth read at the age of 8–12, i.e. mostly at primary school.⁶ The answer, namely that they read primarily textbooks and traditional child literature, is only partially acceptable, and is quite a long way from the actual state of affairs. Statistics on cartoon sales seem to prove the opposite, and mobile telephone text and multimedia messaging systems (SMS, MMS) add new touches to the picture.

The new type of literacy characterizing the mobile age must not be allowed to become an alternative culture. A significant challenge today to the development of pedagogical thinking is integrating the technology offered by mobile communication, as well as databases accessible to all, and the new literacy into the learning activity of the individual and the community. A further important relationship is that the development of reading skills is primarily associated with content, but experts increasingly need to target text messaging, while focussing less and less on the

⁶ József Nagy, “A kritikus szókészlet folyékony olvasása” [The fluent reading of the critical word-stock], *Magyar Pedagógia*, 2004/2, p. 140.

development of abstract thinking. It is the specific benefit of mobile communication that the new generation of picture and text transmission technologies can significantly improve the amount of data transmissible and intellectually perceptible over a given period of time.

While the attention of mobile service providers is focussing increasingly on the use of visual symbols, the researchers of visual languages are discovering the screen/display as an area of application. Especially the small-size screen/display offers new application potential for iconic languages, and digital graphics. In the framework of network communication the possible relation of mobile telephony and image communication raises fundamental problems of psychology, linguistics, and pedagogy. In the case of written messages the clearer structure, the richness of content, and how well thought-out the text is partly compensate for the lack of the spoken dimension. One reason for the superiority of writing is exactly that written text has a visual dimension to it the spoken language does not. The richness and the clear layout of a written document may be further improved by the insertion of image elements.

Animated iconic language is a characteristic semantic system particularly suitable for communicating complex content on a small screen. We must regard the elaboration of such educational programmes, “languages” for the education system, as an inevitable pedagogical mission to be accomplished on an immediate and near-term basis. We must regard it a basic principle that static pictures correspond to the words, and animations to the sentences/phrases, in verbal communication. One may raise the following as a fundamental issue in pedagogy: how will the abundance of images loadable on displays today change the potential inherent in networked communication, and, in particular, what does that abundance mean to mobile communication? One group of possible answers is linked to communication activity offered by mobile communication technology.

Mobile Technology, Media and the Dissemination of Knowledge

Questions that are still open problems are of paramount importance in pedagogical research projects. Examples include writing and reading on/from hard copy and in a virtual environment; the effect of the multimedia environment and multi-sensorial thinking on communication in society; the community of interactive environment taken for granted by youth. All these issues spell out new questions one after the other in the age of mobile technologies, and new media.

- *In what way could society support skilled, flexible, and creative people, with opportunities for high-quality education and life-long-learning available to all, and a flexible and appropriate mix of public and private funding?*
- *Who and how can build dynamic information infrastructure, and a competitive and innovative information sector that fosters a variety of efficient and competitive information and communications services and tools available to all sectors of society?*
- *What is the point of establishing an efficient innovation system and business environment, science and research centres, universities, think tanks and other organizations that can tap into and contribute to the growing stock of global knowledge?*

Providing adequate answers is not at all simple. Mainstream pedagogical thinking is traditionally conservative. Its standpoint – simply put – is to impart structured, confirmed, and socially tested knowledge in a planned and scheduled manner. This philosophy is communicated in the long-standing institution of the school, extremely uncertain in handling the constantly variable overlap of present and future. Toffler called our attention to the “future shock” problem decades ago saying: “We who explore the future are like ... ancient mapmakers, and it is in this spirit that the concept of future shock and the theory of the adaptive range are presented here – not as final word, but as a first approximation of the new realities, filled with danger and promise, created by the accelerative thrust.”⁷

One important dilemma is the issue of communicating information and knowledge. It is a significant fact from the point of view of our subject that the new knowledge being shaped by mobile communication is heavily rooted in hardware. Such knowledge is more individualized than school-based knowledge, because the current content of socially relevant intellectual performance assumes the existence of underlying hardware. This, naturally, results in both dependence and exposure. Individuals must be much more complex in all areas, both individually, and socially, compared to the point of departure. Eiben and Smith suggest the term *emergence* to describe this.⁸ They claim that while the daily use of mobile communication tools, one could say, develops certain abilities in the individual, it is also capable of triggering a process whose outcome is suspected but not known for certain. Is that really so, i.e. are we really parts of

⁷ Alvin Toffler, *Future Shock*, New York: Bantam Books, 1990, p. 6.

⁸ A. E. Eiben and J. E. Smith, *Introduction to Evolutionary Computing*, Berlin: Springer-Verlag, 2003.

uncertain processes? Are these new questions, or the early versions of the answers?

As previously indicated, persuasive and informative messages can be differentiated on the basis of how specific the goal of the messages is. The use that the receivers make of information is usually of secondary importance. In fact, receivers may display the very same behaviour toward a persuasive message as they do toward an informative one. In education, receivers differ in their interests, motivations, and abilities, all of which will affect whether an exchange of information will succeed or fail.

Communication is a transactional process, and there has to be a mutual understanding on the part of both source and receiver as to the nature of the informational process. The following principles, if applied sensitively and intelligently, will allow sources to construct informative messages which will be accurately received by people of average interests, motivations, and abilities:

- Make the message as simple as possible with a clear statement of purpose. One of the major problems many of us encounter in constructing informative messages is that we try to tell our receivers everything we know about a subject. This may make us appear learned to them, but unnecessary details obscure the accurate transmittal of information. At the same time, we must be careful not to simplify our message to the point that it becomes boring to the audience or interferes with an accurate understanding of the subject.
- Phrase the message in the language of the receivers. Avoid using jargon and technical terms whenever possible. These may seem important, even necessary, to present the subject, but a little reflection will generally reveal more common ways of saying the same thing.
- Illustrate every major point with an example or an analogy. Most people feel much more comfortable with a new idea if they have some concrete/tangible referent for it. Purely abstract descriptions tend to fade and merge into an undifferentiated mass of memories. At the same time, make sure the example or analogy clearly illustrates the point – it may be the only thing many receivers remember.

The mobile telephone is becoming the decisive, ever-present environment of our old and new signs. The fact that infrastructure-type knowledge is of a material nature certainly requires no explanation as the essen-

tial feature of a market economy is the recognition that infrastructure shares the features of capital. However, there is particular significance in the fact that the infrastructure-like nature of the knowledge capital is of course relevant also at a social level. The infrastructural knowledge capital is realized primarily within the individual in the context of the knowledge society. And this gives rise to the recognition that pedagogical thinking must apply new approaches. It has become crucial for pedagogy to investigate the learning process from both a communicational and an IT point of view. This refers especially to *application cultures* that are built on the internet and mobile telephony. In this process one can regard mobile communication and the image theory of thinking as a new educational context in which atypical forms of learning may offer new and ever newer effective solutions to the development of social practice.