THE NEW MILLENNIUM LEARNERS: EMERGING ISSUES FROM THE FIRST EXPERT MEETING (FLORENCE, 5-6 MARCH 2007)

Hosted by the former Italian Institute for Innovation in Education (INDIRE), now the National Agency for School Autonomy, the first expert meeting of the New Millennium Learners Project (NML) was held in Florence on the 5-6 of March, 2007. 28 experts from 15 different countries were present. Along with academics working in this field from a variety of disciplines, ranging from sociology and political science to media education, there were also representatives from the IT industry, some policy makers, and three Foundations (Fundación Chile, Knowledge Foundation, and the MacArthur Foundation).

The opportunity of the expert meeting was also used to offer a dissemination activity on the project addressed to Italian teachers on the 7th of March. This activity was attended by some 300 primary and secondary school teachers from all over the country.

Main objectives of the expert meeting

The meeting had four substantial objectives:

1. An exploratory function. First of all, it was intended to act as a kick-off meeting, thus providing the opportunity to answer some basic questions regarding what do we know about the NML and what is the evidence supporting this knowledge; and what are the most relevant issues that should be addressed.

2. To refine the methodological approach, by way of asking the experts to suggest alternative methodological approaches to assembly evidence regarding the emergence of NML in OECD countries.

3. To contribute to networking opportunities for experts in the OECD area

4. To prepare the first OECD publication on the definition of the NML.

Exploring the NML

Initially, the project is intended to look at the NML from the demand side, thus looking at the main areas of concern resulting from the impact of a continuous use of digital devices and services. In a later stage, the project will deal with the supply side, looking at what educational institutions have done to accommodate or to struggle with NML characteristics, expectations and needs.

This expert meeting was therefore focused on four main areas:

1. The definition of NML: which characteristics conform the profile of NML.

2. The impact of digital technologies on cognitive skills development.

3. The evolution of social values and lifestyles.

4. The overall impact of ICT on learning expectations and educational performance.

Defining NML

The starting point for the meeting was the topic of how to define NML considering the following questions: Are all teenagers NML? Do they, because of their daily out-of-school use of a wide range of ICT, have different views about communication, knowledge management and learning than the ones traditionally supported by teachers? What about adult people? Are these views equivalent among NML throughout OECD countries? What factors explain the differences? Are they mostly dependent on the amount of ICT exposure? To what extent are these views shared by NML irrespective of their socio-economic status? Has gender any influence on becoming NML? Are there different and even competing NML profiles as regards the range of technological devices and services used, the frequency of use, and its purpose? All these questions were discussed by Prof. Win Veen (Delft Technological University, NL), Prof. Luca Toschi (University of Florence, IT), and Prof. Eszther Hargittai (Northwestern University, US).

Not surprisingly, all experts agreed on the importance of NML as an emerging phenomenon all over OECD countries and its relevance for educational policy making and practice. But as a matter of fact, there is little evidence supporting some commonly agreed beliefs, as for instance that this is exclusively a generational phenomenon and that all teenagers are equally NML. As a result, irrespective of how attractive and fancy the concept of NML may seem to be, there is a need to better define it, exploring not only the most salient elements that are more appealing but drawing on what evidence is telling us.

To begin with, there seem to be some already well-established conceptions regarding the characteristics of the digital natives, but these are more based on theoretical assumptions than on empirical evidence. For example, although concepts like multitasking or non-linear approach to information are taken for granted in the case of digital natives, there is little known about their practical implications. Same applies to the spread of videogames and the nature of implicit learning that players can eventually acquire. If little is known about this, discussing the actual implications for education can be really inappropriate. Instead of this, more work should be done to validate the theoretical hypothesis about the crucial characteristics than could be said to shape NML.

This is even aggravated by the fact that, besides to eventual changes in the younger generations because of technologies, society as a whole seems to be in the beginning of a cycle of social change that could lead to a true networked society. Again, the practical implications of this evolution are easy to depict in theory, but more analytical work is required to really apprehend the relevance of this change in social and political terms, but also in education.

In all, empirical research although still limited points out that far from being a generation-wide phenomenon, NML has to be further investigated to uncover very different profiles. As some results underline, even in the same generation there are indications of the emergence of a second digital divide, which instead of being related to the access to technologies (first digital divide) is linked with

the uses given to digital technologies and services. Since differences in use seem to be extremely correlated with socio-economic status and, at the same time, those differences can be expected to have an impact on such status, there is ground for political and educational concern: the lack of political action in this domain, using education as a change agent, can contribute to amplify not only the second digital divide but, what is even worse, the socio-economic differences which such a divide is already reflecting.

Besides to socio-economic status, gender and age seem to have important implications in terms of generating different approaches to digital technologies and services, different levels of mastery of the required skills and, in the end, alternative uses. To sum up, the concept of NML may be useful just to refer to a generational phenomenon, but it does not carry *per se* enough analytical weight. The problem is far from being generational only: on the one hand, the effects of being surrounded by digital technologies and services also affect growing numbers of the adult population and, on the other, the effects are likely to be different according to age, but also according to socio-economic status and gender.

Cognitive skills development

Generally, the discussion about the effects of digital technologies focuses on the impact on cognitive skills. Accordingly, this session was devoted to try to respond to the following questions: Does a continuous use of ICT have an impact on the development of cognitive skills? Do NML learn differently? Have NML developed alternative strategies to retrieve, manage, create and share knowledge to those supported by school education. If so, what evidence do we have? The main discussants were Prof. Paolo Ferri (University of Milano Bicocca, IT), Prof. Josie Taylor (Open University, UK), and Prof. Ros Sutherland (University of Bristol, UK).

Most attention was devoted to the analysis of how young people learn to use and use technologies, particularly outside schools and also with mobile devices. However, once again, little seems to be known about the effects of technologies on cognitive skills development. And this issue deserves far more attention.

Studies carried out with children age 3 to 10 seem to demonstrate that what really matters in the development of skills related to technologies are two factors: first, the impulse to experiment and discover, and the consequent lack of fear, that characterises the exploratory behaviour of children at a very young age; and second, the effects of their predisposition to emulate adults' behaviour as well. The latter shows, once again, the importance of the gender issue and the relevance that the differences of use according to gender can have in education, both at home and in schools.

Not surprisingly, a number of experts raised the issue of the contrast between these somewhat natural behaviours and the ones imposed during formal schooling, where technologies seem to play a very marginal role at teachers' discretion. Although there was no clear evidence for this, it was suggested that such a contrast could contribute to explain, at later ages, the increasing feeling of disaffection towards schools.

School disaffection and pupils' increasing lack of interest in school-based learning was also related to the need of new teacher profiles, in the line of the New Millennium Teachers. In the light of this discussion the issue of initial teacher training rapidly emerged as one of the most salient issues. Although some studies show that teachers are amongst the most skilled technology users, the fact is that they are unable to take benefit of this competence and to apply it to the way they teach. It was argued that this was partly the default of the current configuration of education systems, but also the

lack of a clear vision of what teaching in the new millennium should look like and, accordingly, the absence of initial teacher training programs where such a vision is embodied.

Social values and lifestyles

An ample range of perspectives were intended to throw light on the impact of digital technologies on social values and lifestyles, in an attempt to respond to some of the following questions: Does a continuous use of ICT affect cultural patterns and values as to challenge those prevalent in education? Is there a global convergence of lifestyles because of the influence of digital content? Does physical isolation tend to be reinforced or civic engagement avoided? Does digital-related activity is extended longer and tends to cover time spans previously devoted to rest? Are immediate responses and quick reaction speeds seen as the norm in personal communication? Is multimedia content considered to be, by its very nature, of higher value than mere text? The speakers for this session were Prof. Andy Gordon (University of Washington, US), Prof. Dominique Pasquier (CNRS - École des Hautes Études en Sciences Sociales, FR), Prof. Manuela Pietrass (University of Munich, DE) and Prof. Lance Bennet (University of Washington, US).

Research carried so far supports the idea that there is a growing gap between school culture, and the values and lifestyles traditionally associated to it, and young people's cultures. A number of factors can explain this gap, ranging from the evolution of family patterns to the emergence of specific cultural products for young people, increasingly associated with digital media, as well as the democratisation of schooling which contributes to the extension of young dependency on parents. The effects of this growing gap are the crisis of the vertical transmission of culture, as operated historically in schools, and the increase of horizontal socialization among young people.

Both of these result in the isolation of teachers who can hardly find their way in bridging the gap between school and home cultures and making them at least compatible. Moreover, teachers seem to be subjected to pressure to adopt always the latest technologies, which easily become intrusively, instead of being invited to ask for the kind of technologies they really need to facilitate learning. At least in some subject areas, like in civic education for instance, there is also the need to redefine teaching and learning in order to cope with new societal demands –and in this case, for instance, as a result of a reconsideration of the concept of citizenship in the networked society. So, it is not only about teaching methods, but even more about the goals of education.

It would be a mistake to consider that technologies bring with them a specific set of values or suggest a particular lifestyle. Once again one must keep in mind that technologies are just tools which can be used in a variety of ways, and the issue is that the appropriation of these new media is different according not only to socio-economic status but also to gender. There is enough evidence to support that different socio-economic status result in different uses of technologies and in different, so to say, architectures of knowledge, where, for instance, reading books may or may not be seen as an important source of knowledge and culture. Interestingly enough, girls are very much linked to old, traditional media such as books, and at the same time the uses they make of technologies are very focused on communication; so, in many respects, boys, as NML, pay a price.

Learning expectations and educational performance

The final session of presentations was entirely devoted to the analysis of the relationships between ICT and learning expectations and educational performance, according to the following questions: Is there sustained evidence regarding the effects of technology on educational achievement? Is there a contradiction between how NML manage knowledge outside and inside schools? How do NML see the school education they are getting in regards to the use of ICT? Are they supportive of

ICT-based educational innovations or, rather, would they prefer to keep teaching as traditional as it can be? Do they mostly welcome more flexible ways of ICT-enhanced learning such as e-learning? The discussants were Dr. Giovanni Biondi (INDIRE, IT), Prof. Andrew Richards (University of York, UK) Prof. Eric Bruillard (INRP, FR), Prof. Josep Maria Mominó (Universitat Oberta de Catalunya, ES), and Prof. Morten Søby (ITU, NO).

There was a consensus among the experts regarding a number of points. The issue of the implications of digital technologies on learning expectations and educational performance was extremely important but very difficult to approach. The importance lies particularly on the eventual implications that evidence on the positive links between technologies and education can have both at a political and a practical level. The difficulties arise from two different areas. On the one hand, it is a domain where simple causal models are not helpful at all, given the number of variables and contextual factors that intervene. On the other hand, the research done so far seems to be extremely influenced by the agenda of the researcher or of the agency funding the research. On this basis, it is not surprising that the results, as shown by a number of research reviews if not contradictory, are at least inconclusive. This clearly points out that the need for new models and research strategies, which clearly consider that the impact of technologies on learning, may need at least 4 or 5 years to become measurable.

A second point was the transformation of digital technologies and applications both in society and in education. Social applications, which truly embody the concept of the network society, become increasingly important and gain users among young people. Educational institutions should therefore realize that most pupils already have the competence to deal with sophisticated learning environments where digital resources are an important asset. It is important for these institutions to figure out ways in which they can promote the convergence of all educational resources, traditional and digital.

The third and probably the most important point was, once again, the discussion about the emergence of the new digital divide on the basis of what consistent evidence is showing: even if the issue of access seems to be solved in most, if not all, OECD countries, there is an unequal appropriation of the technological benefits, and the actual uses being made tend to reinforce the impact of socio-economic status on learning. The Matthew effect was evoked to recall that children who already have a good starting point in terms of socio-economic status and level of parental education get more positive effects from digital technologies and services than the ones who lack these conditions. The problem lies in the fact that, in the long run, those technologies and services contribute to an increase of the social divide.

New public policies must be designed to cope with the perverse effects of only providing access to these technologies in educational settings. There is also room for improvement also from the practitioners' perspective. The need for a new kind of New Millennium Teachers was also suggested, but the reference was meant to suggest that one of the most outstanding problems related to the use of digital technologies in educational contexts is the fact that they are hardly put to use in teacher training institutions. Because of this, teachers lack a clear vision and the role models necessary for an effective use of technologies in teaching. Add to this the lack of incentives to actually use them, including also inconclusive evidence on their effects, and the result cannot be other than scattered experiences and innovations. Certainly, economic research can be extremely helpful in providing powerful reasons to reconsider the role and use of digital technologies in educational settings, particularly if it addresses the issue of value and real significance of technological skills in promoting economic growth, and what the actual demands of labour markets are in this area.

The last point was the claim that the assessment of learning, especially in schools, should reflect the competences that seem to be linked to digital technologies. Accordingly, instead of focusing

exclusively on what pupils and students learn in terms of contents or subject-based skills, assessment should also consider what the knowledge society identifies as critical competences, particularly those related to communication and knowledge management. Otherwise, the risk of widening the gap between educational institutions and life in the world outside could be inevitable.

Methodological suggestions

A final session was devoted to the discussion of the methodological strategies of the New Millennium Learners Project and how to strengthen the added value of the unique CERI comparative and evidence-based approach. Experts worked in teams for this session.

The main suggestions arising from this session were as follows:

1. The emergence of new issues for analysis throughout the development of the project:
   - Diverse profiles of NML
   - Gender
   - Teacher training
   - Games
   - Research on the educational effectiveness of technologies
   - New forms of digital divide connected to alternative uses of technologies
2. To facilitate the exchanges among experts by means of the setting up of a knowledge network on NML.
3. To make an effort to bring in the voices, the perspectives and the suggestions of NML themselves into the conversation, making them an integral part of the project.
4. To increase the dissemination efforts of this project addressed to teachers, on the one hand, and policy makers, on the other, bringing as many evidences documenting the changes occurring as possible, as well as creating opportunities for dialogue among them. Consider also their participation in assessing the design of the research component of this project

Next steps

Having settled the scene for the NML project thanks to this kick-off meeting, the project will now be entering a stage of full development in the area of the analysis of the demand-side, including activities in the areas of desk research, expert consultation, and empirical research. Some initiatives for dissemination are also being considered. All of these activities will be carried out until March 2008. Starting in late 2007 a parallel cycle of activities will address the issue of NML from the supply-side, both from the institutions' and policy-makers' perspectives.

Desk research

Three main tasks are envisaged:

1. *A statistical overview of the emergence of NML in OECD countries*. This overview should provide insights on the impact of factors like age, gender and socio-economic status in appearance of different NML profiles. This task has already begun but some experts may be asked to provide national accounts in this area.

2. *A series of research reviews* on the issues of the impact of technologies on cognitive skills development, social values and lifestyles, and learning expectations and educational performance, paying particular attention again to the incidence of factors such as age, gender and socio-economic status. The reviews will be commissioned next April to external experts, trying to cover as many OECD regions as possible.

3. *The drafting of a first report* intended to define the phenomenon of NML and provide evidence of their emergence and implications for educational policy-making and practice.

Expert consultation

A full cycle of experts meetings is expected to develop during this year. As a result of this first meeting, the most salient issues to be addressed are the following:

1. Is there a gender divide regarding technologies? What implications could this have for education?

2. The second digital divide: NML and socio-economic status.

3. Do videogames have any effect on learners' minds? Are serious videogames worth the effort?

4. Teacher students as NML: What are their expectations regarding the uses of digital technologies in education? What is the role of these technologies in their training as teachers?

5. Research on the educational effectiveness of digital technologies: What do we know? What should be investigated? How?

Possible venues and times for these expert meetings are currently under discussion with governments and institutions that have expressed interest in hosting them.

Empirical research

As initially foreseen, the project will have two main empirical components: a questionnaire and a qualitative research module.

- The *questionnaire* will be run in conjunction with the next PISA round in 2009. A new series of items have been already developed to modify the ICT familiarity questionnaire, but more work is needed to improve the pupil's background questionnaire.

- The components of the *qualitative research module* have yet to be designed. The concept of this module is to confront samples of learners (accounting for age, gender and socio-economic status differences) with a number of tasks to solve involving both communication and knowledge management. Some of these tasks will be related to education or training,

others to daily life. Participants will be asked to explain why they select different strategies and the role they assign to digital technologies in each case.

Dissemination

At this initial stage the main dissemination channels are going to be digital, until a first OECD publication/report is finished by late 2007. In April 2007 both a project site (www.oecd.org/edu/nml) and a blog will be launched (http://www.ceri-forums.org). There are also plans to use forums to enhance participation from relevant actors such as NML, teachers, parents, researchers and policy makers. These forums will not start until the autumn of 2007.

For more information on this project

Francesc Pedró
Senior analyst
Centre for Educational Research and Innovation (CERI)
Directorate for Education, OECD
2 rue André Pascal
75775 Paris Cedex 16, France
Tel: +33 (0) 1 45 24 80 83; Fax +33 (0) 1 44 30 63 94
www.oecd.org/edu/ceri
Francesc.Pedro@oecd.org