Mobile learning for the integration of groups that risk being marginalized

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Abstract

Social inclusion and cohesion are two of the objectives that the European Union has very often proclaimed in its documents, in the past ten years. At the same time, community policies have emphasized the role that ICTs can play to encourage and support participation and integration opportunities of disadvantaged citizens.

Within this context, the ENSEMBLE project, presented here, aims at developing a strategy of use of ICTs to promote socio-cultural integration of immigrant citizens by using technologies such as MP3 players and mobile phones, and by experimenting instructional methods and communication models suitable for the adopted instruments. The present paper focuses particularly on the educational communication design of MMS messages[1].

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1 Introduction

The massive proliferation of new devices is developing an unparalleled phenomenon. We speak of a 'connected and mobile society' to refer to the variety of information sources and communication devices available everywhere today, at home, at work, at school, and so on. Rheingold (2003), actually, describes this transformation as the beginning of the next social revolution.

Such innovations are also reaching the world of education. Educational projects and initiatives based on the use of mobile technologies are proliferating all over the world. Notwithstanding that, we are still at the very beginning, and even though we can perceive great potential, till now, there have been few successful experiences and several unsolved problems. How are mobile learning programmes organized? Which educational and communication patterns are more effective? Which type of technologies can encourage broad participation by users?

In this paper, we will deal with a specific case, the ENSEMBLE initiative[1], a m-learning programme funded by the European Union within the Lifelong Learning Programme (2008-10). The interesting part of this project lies in the attempt to combine the development of an innovative educational methodology with the urgency of involving citizens risking exclusion, in the perspective of containing the multiple (technological, cultural, cognitive, social) barriers that characterize our contemporary societies and which technologies, particularly the most modern ones, risk amplifying. After illustrating the project's background elements, its aims and its structure, we will focus on the educational and communication issues that emerged at the design and implementation stages of the multimedia content delivered through mobile telephone.

2 Background

2.1 Citizenship and digital inclusion

Social inclusion and cohesion are two objectives, which the European Union has very often proclaimed in its documents, in the past ten years, while referring, among other things, to the role ICTs can play. In fact, if ICTs are used within projects that take into account the ethical and social implications of technologies, they can increase participation and integration opportunities for disadvantaged citizens. This theme, which in European institutional lexicon is referred to as e-inclusion (electronic inclusion), was the subject of the 2006 Riga Ministerial Declaration on "ICTs for an inclusive information society"[2] and of the "i2010" initiative – Participation in the Information So-

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[1] Project web site: http://www.ensembleproject.org

[2] Cfr. in the Internet: http://www.pubbliaccesso.it/notizie/2006/riga.htm.

ciety" (European Commission, 2007). Generally speaking, these declarations solicit to support everybody's participation in the information society, even in situations of social or personal disadvantage. Digital inclusion is considered as a necessary condition for guaranteeing equity and social justice, because, today, impossibility to access digital information resources constitutes a strong discriminatory factor.

The various initiatives promoted on an international level regarding the digital divide (Warschauer, 2003), also fall within the e-inclusion perspective. They derive from the idea that improving technical and social access to ICTs is a necessary condition for guaranteeing a cognitive citizenship essential today to live in a knowledge society. Such aspects have been also emphasized on several occasions by UNESCO, particularly during the first World Summit on the Information Society (Geneva 2003 and Tunis 2005).

2.2 Learning and mobility

Mobile learning is the new term that is gaining ground in the educational technology vocabulary. What does this expression mean? Which are the main research approaches on m-learning? Given the novelty of the phenomenon, it is not easy to outline an exhaustive picture of the current trends. We can, however, distinguish four main perspectives (Winters2007):
- Techno-centric: this is still the dominant view that interprets m-learning as learning based on the use of mobile technology. Here the focus is on technologies and the adjective 'mobile' refers to the mobility of the learning device.
- E-learning-oriented: in this approach, m-learning is considered as an extension of e-learning, that is, as a form of e-learning based on the use of mobile technologies and wireless transmission (see for example Milrad, 2003). Such a comparison, however, does not help to understand what e-learning is specifically nor does it help to grasp its singular/unique characteristics.
- Complementary to formal education: in this case m-learning is considered as a kind of informal learning, because it can take place anywhere at any time (Cavus and Ibrahim, 2009). However, this is not enough to differentiate m-learning from other forms of distance education, which, by definition, are based on the possibility of placing a learning relationship in a setting free from space-time constraints.
- Student-centered: another line of research has gradually shifted its focus from the mobility of the devices to the student's mobility (Sharples, 2005), leading to more elaborate considerations on the concept of mobile learning. The emphasis, here, is not so much on the possibility of

consulting resources, but on the fact that this can be done within a life "context" potentially interwoven with the learning subject itself, and by using the potentialities of interpersonal communication. This approach is based on theories such as the Activity Theory by Engeström (2001) and the Conversational Framework by Laurillard (2002).

The debate on the potentialities and unique characteristics of m-learning is growing rapidly, and research and experiments are increasing, but there is still a long way to go.

2.3 Mobile learning and disadvantaged groups

What benefits can m-learning offer for the training of subjects at risk of exclusion? Are there any? Or are we faced with another utopia in the world of technology applied to education?

It is certainly still early to come to conclusions about the matter. It is, however, true that the proliferation of devices, such as mobile phones and MP3 players, has reached very high percentages in a few years exceeding the proliferation of the Internet. For example the ISTAT (National Institute of Statistics)[3] annual research on the life conditions of Italians shows that in Italy, in 2007, only 47.8% of families had a computer at home. Home Internet connection is even less widespread (38.8%), while the percentage of the population owning mobile phones is very high (85.5%). This data is in line with the tendencies generally found on a European level[4].

The steadily increasing availability of these devices, their versatility and mobility are heightening interest towards the use of such instruments in disadvantaged contexts (Kim, 2009), where there is no Internet, but there are mobile phones. Today low-cost mobile devices can hold and send great quantities of information, thus offering promising opportunities for reducing inequalities on a global level. Moreover, m-learning can also reach isolated populations.

3 The ENSEMBLE project: context, objectives, structure

ENSEMBLE, which in French means "together", stands for European citizeNShip lifElong MoBile Learning. The project is organized by the Department of Education, University of Florence. The partnership is made up of two public bodies – the French District of Yvelines and the Town Council of Prato – and of the English section of the Technology Company GiuntiLabs.

The initiative developed from past experiences still existing today, that is,

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[3] See the Internet at the following URL: http://www.istat.it/dati/catalogo/20081002_00.

[4] Refer to the International Telecommunication Union (ITU) data, on the Internet: http://www.itu.int/ITU-D/ict/statistics/ict/index.html.

the experimentation of podcasts in school education in the Yvelines District, and the use of text-messages by the Town Council of Prato to inform citizens. In the ENSEMBLE project, the partners agreed to develop these experiences, in the perspective of developing models and systems appropriate for ubiquitous and inclusive forms of learning. The project aims at:

1) experimenting an innovative educational method, based on the use of mobile technologies, to develop training programs addressed to citizens potentially risking social exclusion; 2) determining whether, and under what conditions, the use of mobile technologies can effectively offer opportunities to encourage socio-cultural integration.

The participants are lower middle school students and their parents, primarily, but not exclusively, first and second generation migrants. This target presents some special characteristics which have influenced some choices at the designing stage. In particular, there is an inhomogeneous level of linguistic competence among the foreign students and the majority are certified at lower intermediate levels. Even more so this applies to the parents. Moreover, the latter do not usually participate in their children's school life, teachers have difficulty contacting them and they do not go to parents day. Lastly, the participants' personal technological devices, particularly those owned by the immigrant citizens, are mainly, not "latest generation" mobile phones.

The experiment will take place in two different European cities: in the area of the town of Prato, where we can find one of the largest Chinese communities in Italy, and at the same time in Versailles, in the Yvelines district, which is characterized by a large presence of African immigrants.

On the technological level, we opted for devices that are quite common among the two types of participants in the project. Most adults today have a mobile phone, while MP3 players[5] are very common among young people. These devices can deliver two different asynchronous communication formats used in education: MMS messages[6] for mobile phones and podcasts for MP3 players.

The delivery MMS messages, which will concern the adult population, will take place through a communication delivery system that can send a series of multimedia messages, via web, daily. To interact with a course tutor, students can send text messages, while periodical face-to-face meetings will give rise to debate opportunities. The delivery of podcasts for students, on the other hand, will take place through the Moodle platform which will also allow us to offer students other educational opportunities (eg. multimedia educational resources and discussion environments).

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[5] See the 2008 CENSIS report on the Internet: http://www.censis.it/files/Ricerche/2008/Sintesi_7_rapcom.pdf.

[6] The Multimedia Messaging Service (MMS) is an asynchronous telephone messaging service that can deliver messages containing multimedia objects (images, audio, video, rich text).

The educational program revolves round four themes, which were chosen by giving preference to subjects related to citizenship education in an intercultural and European perspective, and to pre-adolescent life and problems, within and outside school, observed from both the students' and the parents' point of view. The intention is to enhance the participants' awareness of the rights and duties implicit in social life within multicultural societies, and, at the same time, to encourage school-teacher-student communication.

The educational content was structured in four didactic modules. Each module has two versions, one for the parents, with a series of 160 MMS messages, and one for the students, based on the delivery of 64 podcasts and also on the Moodle environment with learning objects and other educational resources. .

We will now continue by analyzing, above all, the educational and communication issues that emerged at the MMS message design and development stage.

4 Elements of educational-communication design for MMS messages

4.1 Mobile devices: affordances and limits

If we consider the pedagogical dimension, research is questioning the benefits of mobile devices as opposed to other technologies.

For example, Laurillard (2009) emphasizes the fact that on this issue there is still a lot to be done and she proposes her own understanding of the pedagogical added value of mobile devices. According to this researcher, the innovative character of m-learning is not to be found so much in aspects like the spatio-temporal flexibility or the constructivist nature of the learning experiences, but rather in the fact that mobile technologies render digitally-facilitated site-specific learning activities possible, that is, they can teach about the world while you experience it in a completely contextual manner. Another aspect, which Laurillard (2007) points out, is the positive impact that m-learning can have on motivation. This allows a higher degree of control on learning, it is based on the possession of a device, it allows learning experiences within a context and it facilitates continuity between contexts.

This potential should, however, be considered together with some criticalities. Mobile devices like mobile phones have small screens. This affects the amount of content that can be viewed as well as the time spent viewing (e.g. viewing an object on a very small screen can be tiring, thus reducing willingness to watch for a long time). The content must, therefore, be short and direct.

These attributes, in turn, condition choices related to the type of content that can be dealt with, which, typically, is information, facts, essential concepts,

concrete examples, rather than theories, explanations and so on.

Another critical situation that can have an impact on the methodology choices are the costs. Sending messages involves costs, which, if paid by the participants, particularly the ones in a disadvantaged position, can became an obstacle to intense interactions.

4.2 The 3IQA model

Taking into account the above-mentioned factors, we developed an educatio-nal -communication architecture, whose essential features are to be recursive, open and contextualized, i.e.:

- recursive: the information flow follows a cyclical path, that is, the same content is progressively integrated with adaptations and additional in-formation focusing on a concept or a fact from different perspectives. "Repetition" and "variation" are alternatively used as levers in the same cycle of MMS messages;
- openness/interaction: at the end of the cycle, the "last word" is left to the participant who interacts with a tutor, giving feedback on the viewed contents, thus allowing a certain degree of interaction and regarding the content itself as susceptible of being discussed and reconsidered;
- context/control: the information flow falls into context insofar as the par-ticipant can choose, among the range of available resources, the ones he considers interesting and useful for the specific life situation he is in.

The result is a conceptual model which we have defined 3IQA (3I stands for Introduction, Information, Integration, Q for Question, A for Answer) and which can be depicted as follows:
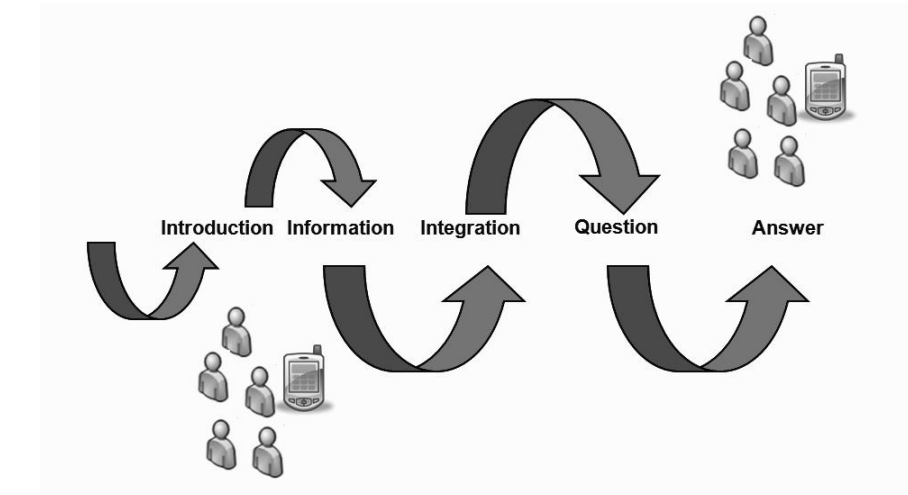
Fig. 1 – 3IQA Model

More precisely, for every content unit two cycles of 5 MMS messages follow each other, each of which consists of the message types described in the table below:

TABLE 1
A typical sequence of 5 MMS messages

Order	Type of MMS message	Pedagogical-communicative function
MMS 1 message 1	Introduction	Introduction, stimulating interest and involvement, activation of preexisting knowledge
MMS 2 message 2	Information	Presentation of the theme, definition of the general concepts that will be revised and integrated later
MMS messages 3 e 4	Integration	Additional information which provides more specific information or which illustrates particular aspects or which gives concrete examples through short stories
MMS message 5	Question	Creating interest in further study, interaction with people and context.

As can be observed in the above table, two MMS messages (MMS messages 3 and 4) have the same function, that is, giving additional information on the same subject/concept. While, after the fifth MMS message (Question), an

answering text-message from the participant is expected (Answer).

4.3 Multimedia and mobile communication

When designing and developing the multimedia content delivered through MMS messages, both visual design rules (Clark e Lyons, 2004) and multimedia learning principles, as defined by Mayer (2001) were kept in mind. According to Mayer, learners learn better when: 1) they can associate different sources in a coherent manner, because these provide more elements for the memory (multimedia); 2) different stimuli (e.g. words and pictures) are close to each other or are presented at the same time to encourage a more immediate integration (spatio-temporal proximity); 3) irrelevant words and figures are eliminated, given that working memory has a limited processing capacity (material coherence); 4) oral explanations are associated to illustrations rather than text to pictures, thus avoiding the overload of the visual information channel (multi-modality); 5) unnecessary different formats are not used; illustrations and oral presentations, rather than written texts, audio and pictures, are preferred (redundancy); 6) an informal, conversational style is used (personalization).

Generally speaking, we have followed/ the above principles with some adaptations due to the nature of the device. Mobile phones have small screens (e.g. 128x128 pixels) which are not standardized. One of the main problems, when designing MMS messages, is the existence of several types of screens and the fact that vector graphics formats cannot be used to produce/ messages. Thus, the choice of the point matrix for the message design is a tricky issue. In this sense, we are certainly not dealing with a facilitating device. So, when designing the content, the written text on each page has to be reduced to the minimum to be also able to use a big enough font which can be read even on the smallest screens. Moreover we have avoided pop-ups and particular transition effects between the screens to ensure compatibility with less recent devices.

To summarize, we have considered the following elements: the use of very short sentences (about 150 characters on each page) with highlight key terms; essential graphics, able to give/prompt an immediate idea of the page content; very limited use of scrolling; elimination of redundant information; attention to maximum coherence between delivered information and unit content; absence of redundant background noise; use of an informal/conversational style.

Nel 2007 una giovane cuoca di Bordeaux	riceve i **finanziamenti** del programma **Leonardo**	per lavorare tre mesi in un'**azienda agrituristica** del Chianti

Fig. 2 – Three example pages of an MMS message [Screenshot 1: In 2007 a young cook from Bordeaux, Screenshot 2: received Leonardo programme funding; Screenshot 3: to work for three months in an agritourism company in the Chianti region]

Conclusion

M-learning has started to attract the attention not only of technologists, but also of educational researchers. They question the benefits which such educational experiences can offer as opposed to other technologies, the affordances and limits of mobile devices on an pedagogical and communication level and the potential of such devices as regards socio-cultural inclusion and integration.

In this paper, we have only pointed out some of the problems and research prospects that are currently being discussed, while focusing on a specific case, the ENSEMBLE project, which is still in its first year. In this initial phase, our research has focused on the design of the technological structure, on the careful analysis of the most adequate educational models and on the development of the most suitable and potentially effective communication formats.

The next steps will aim at defining assessment tools necessary to evaluate the impact and setbacks of the decisions reached during the designing stage, and at testing the created educational learning units. Essential feedback and experiences, useful for theoretical considerations, will be provided mainly through experimentation in the second year, with the involvement of teachers, students and parents.

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