

# Educational aspects of mobile impact, uptake and usage

By Mar Camacho

Societies and individuals around the world increasingly recognize that investment in education is an investment in future growth, particularly in economic, social and personal areas. With the growing availability and related infrastructure of low- cost mobile and wireless technologies, massive opportunities are emerging for learners, teachers and institutions in developing countries. In particular, mobile connectivity can facilitate new ways of teaching and learning that are cost-effective and better personalized to the individual's needs and context. Mobile technologies also offer potentiality for contextual learning, and have unbound learners from classroom walls while also enhancing collaborative processes in informal contexts. These features of mobile learning are particularly relevant to developing country contexts since mobile learning can only take place outside of school as there remains an in-school ban on mobile phone use by learners. Nevertheless, mobile learning still must overcome conceptual, practical, and organizational challenges before people can fully benefit from this learning medium.

This article will begin by exploring three broad areas: (i) mobile learning in the global knowledge economy, with its emerging topics (teaching and learning scenarios, the essential skills for a specific mobile literacy and culture...), (ii) the challenging dimensions of mobile learning in developing countries, and (iii) current uses of mobiles for teaching and learning, including a revision of tools for the construction of learning. The article includes some recommendations based on the need to develop overarching visions for mobile learning that move beyond implementations that cannot be replicated and advocates for the development of a best-practice framework to guide future action and thinking.

## Mobile learning in the global knowledge economy: Emerging topics and opportunities

According to the World Bank's report *Information and Communications for Development 2012: Maximizing Mobile*, in developing countries, citizens are gradually using mobile phones to create new livings and improve their lifestyles, while governments are using them to expand service delivery and promote citizen feedback mechanisms.

*"Mobile communications offer major opportunities to advance human and economic development – from providing basic access to health information to making cash payments, spurring job creation, and stimulating citizen involvement in democratic processes," (...) The challenge now is to enable people, businesses, and governments in developing countries to develop their own locally-relevant mobile applications so they can take full advantage of these opportunities."*

Mrs. Rachel Kyte  
World Bank Vice President for Sustainable Development, 2012<sup>1</sup>

Mobile phone use in developing countries has exceeded that of developed areas, according to the report. The developing world is using mobile apps to help build, educate, and even entertain.

A recent report by *We Are Social*<sup>2</sup> includes statistics that illustrate 3.79 billion unique mobile users, representing 51% global penetration. While still a long way to go before everyone in developing countries has access to mobile communications, the push to increase access in underserved regions of the world is being made by organizations such as the Alliance for Affordable Internet. Currently, there are as many mobile subscriptions as people in the world, and every

second, 20 new mobile broadband subscriptions are activated. In addition to the rise of subscribers, data consumption also continues to increase<sup>3</sup>. The number of mobile subscriptions is continuously growing across regions. Greater device affordability is encouraging new subscribers in developing regions, whereas an increase in mature markets is due to individuals adding more devices. According to Ericsson, local economic conditions also have a significant impact on the uptake of subscriptions in different regions. The growth is fueled by the strong uptake of mobile broadband subscriptions across most regions. Mobile broadband subscription growth is expected to be particularly strong in the Middle East and Africa due to a young and growing population, rising GDP and smartphone uptake. Several countries in the Asia Pacific region will also experience a strong mobile broadband subscription uptake over the next five years, while more mature regions like North America and Europe will have more moderate growth.

By harnessing the use of mobile devices people are enabled to participate in education, too.

### The new teaching and learning scenarios in developing countries

Mobility is understood as a great catalyst of change, and together with digital media, offers learners in developing countries previously inaccessible tools to develop knowledge, skills and social practices. The impact that mobile technologies can have on learners' lives can lead them to situations where educational undertakings are driven by both personal needs. Kukulska-Hulme introduces the concept of "context-aware learning," which alludes to the possibility of enabling learners to use personal and social technologies to draw on aspects of their environment, including people who can join in or help, approaching the environment as a dynamic learning resource<sup>4</sup>. While Kukulska-Hulme primarily works with examples from Global North educational settings, her description of context-aware learning is readily applicable to countries in the Global South as well.

With mobile learning, learners in developing countries can be immersed in their "environment-cum-classroom", and learning can occur at any time and at any place since the means by which

content can be made, received or exchanged is increasingly widespread and sophisticated. Similarly, Fitzgerald<sup>5</sup> states the following: "If we can embody an effective pedagogy within user-generated content, we can provide learning any time and at any place".



*Any time any place learning*

The fluid nature of mobility is a critical element of many mobile learning scenarios and possibilities for people in the Global South. Mobility enables a shift from one-to-one to many-to-many communication, individual to collaborative interaction, and centralized to decentralized systems. All of these shifts can occur when a learner is at home, when they are walking to school or a local market, or even when they are stuck in traffic on a form of public transport. Yet, a key question is how to utilize this fluid nature of mobility to design spaces where learners "on the move" are shifting between various communication and interaction modes in a seamless way that still enables informal learning to take place.

It could be said that there is a shift towards a diverse learning milieu in which learning adapts to each learner instead of each learner adapting to the prevailing learning model where they live – which in many developing countries still

remains a static, uni-directional experience whereby the teacher transmits knowledge to his or her students with no response from students expected. Mobile learning can help transition this learning model type into one where the following traits can be realized:

- The personalization of learning
- Schools will take on new forms
- Learning will no longer be defined by time or place
- A variety of digital network and content resources will help learners to connect and learn
- Geographic and virtual communities will take ownership of learning in new ways
- Social innovation will help address resource constraints and other challenges

### Mobiles for lifelong learning and skill development in developing countries

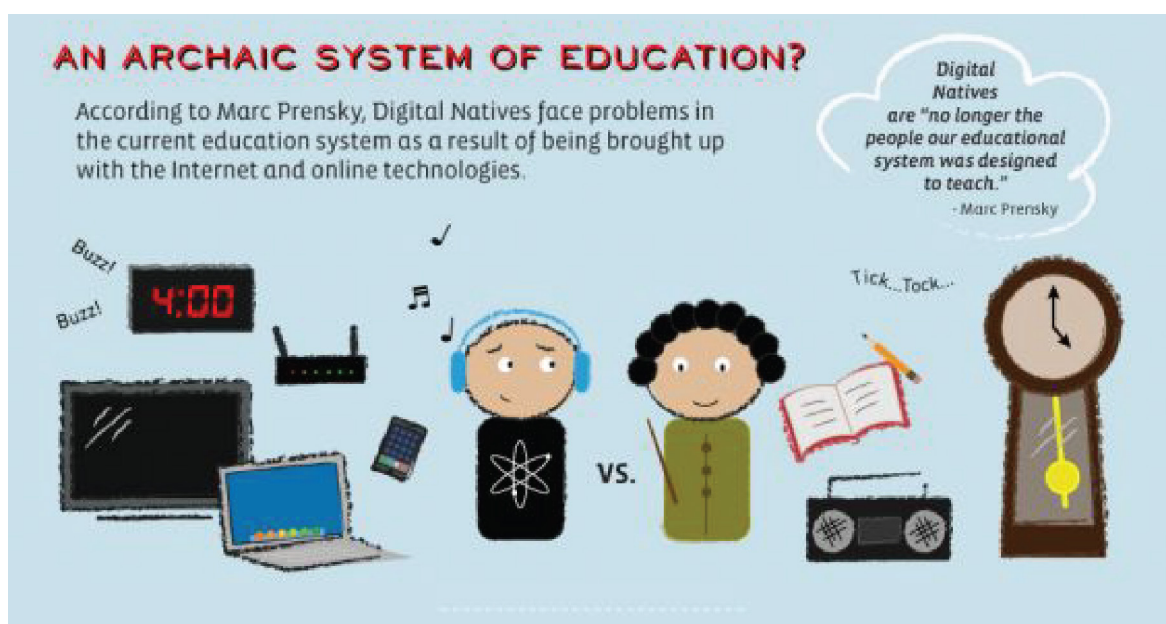
*“We are already at the moment in which the ability to use social media, and particularly social media*

*as amplified through the power of the mobile web, has become a key literacy.”<sup>6</sup>*

Successful practices, which allow the development of a distinctive mobile literacy, together with the power of mobile learning to blur formal and informal boundaries, could account for new teaching and learning scenarios as well as the reshaping of traditional education patterns in developing countries (Figure 7.1). For a nation to cultivate a skilled workforce, people require skills that prepare them not only to thrive but also to collaborate and innovate in such a way that they can benefit both themselves and potential employers. To be at the vanguard of this new world, educational systems need to enact policies that empower students in developing countries to take advantage of the affordances of technology so that learning can happen across contexts and with diverse subject matter. This, mobile literacy becomes of importance when considering a serious and significant implementation of technology in teaching and learning processes (Figure 7.2).

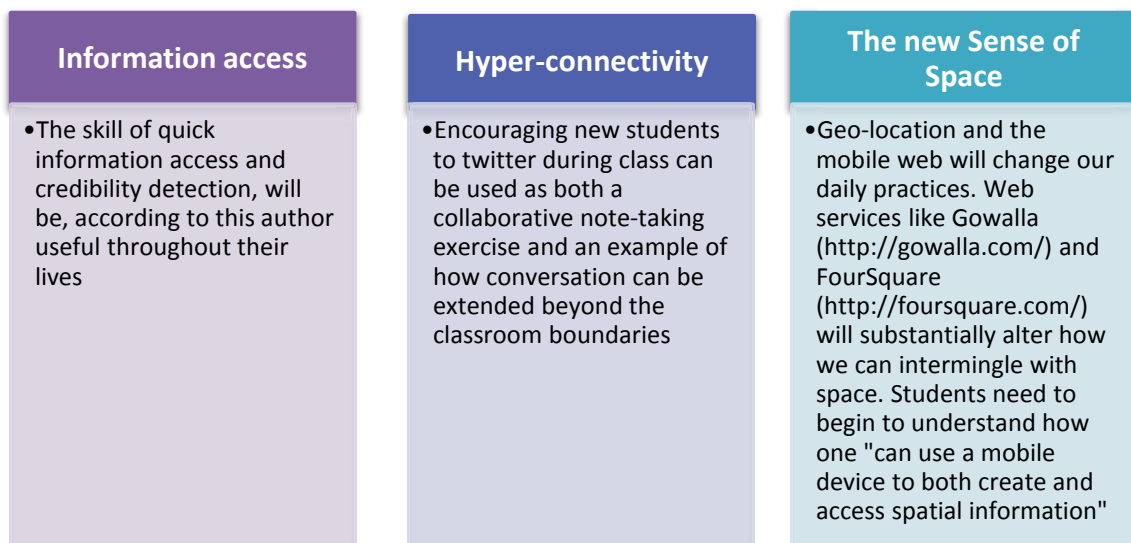
Given that the first experience that many people in the developing world have with the Internet is via the mobile web, the future that these students will inherit is likely one that will be mediated and stitched together by the mobile web. Learners will need to master effective usage

Figure 7.1: Are we wired for mobile learning?



Source: Mobile Learning Infographic. (2013). *How Digital Natives Are A Bit A Head*. [online] <http://elearninginfographics.com/mobile-learning-infographic-how-digital-natives-are-a-bit-a-head/> Accessed 12 May 2015.

Figure 7.2: Teaching mobile web literacy



Source: Parry, D. (2011). *Mobile Perspectives: On teaching Mobile Literacy*. [online] Available at: [www.educause.edu/ero/article/mobile-perspectives-teaching-mobile-literacy](http://www.educause.edu/ero/article/mobile-perspectives-teaching-mobile-literacy) Accessed 30 Sep. 2015.

of these technologies so that that the *digital divide* is erased. In places like Kenya, Peru, and the Philippines, teaching mobile web literacy seems to be as crucial as teaching basic literacy. Since the mobile web opens up a host of pedagogical possibilities, David Parry sketches out a few literacies that teachers need to understand and ought to be striving to teach students<sup>7</sup>.

Thus, as a distinct mobile learning culture arises, learners can take mobility and context-awareness as a departing point to become more visible and involved as innovators, creators and mediators of learning. Such meaningful and learner-centred participation will help learners develop new skills and literacies, facilitated by mobile technologies, in order to provide additional opportunities to extend their learning beyond the classroom and with formal learning as only one way of knowing (Figure 7.3). Teacher training will need to take place so that educators in developing country contexts can be included in the vision of using new technologies in ways that will enable 21<sup>st</sup> century competencies and skills such as critical thinking and problem solving, effective oral and written communication, initiative, curiosity and imagination, etc., to be reinforced or to develop in the first instance. Although there is a prevalent opinion that the school as a social institution plays a central role in the life of learners, and that in the future it will remain a key component to a person's educational experience, it will be

necessary for the nature of schooling to adapt and to work towards objectives that contribute to the development of people.

### Empowering teachers with mobile devices

The critical importance of teachers in the new teaching and learning scenarios must be underscored. According to UNESCO<sup>8</sup>, there are two important areas to consider regarding teachers and mobile learning in developing country contexts: "1) professional development that instructs teachers how to use mobile phones to improve teaching and learning; and 2) professional development that is delivered through mobile phones". Indeed, a major problem with regards to education in developing countries is the lack of qualified teachers. With the introduction of mobile phones in the developing world, areas that were once isolated are now more enabled to communicate both locally and globally. Additionally, mobile phones enhance teachers' professional development by supporting not only mentoring and observation, but content creation and the reshaping of teaching practices. Mobile learning allows teachers in rural areas to connect and collaborate with teachers outside their regions so that they may obtain advice and encouragement from experienced professionals. By involving teachers in such opportunities, it can



Figure 7.3: Skills and attributes of today's learner



Source: Northern Art Teacher. (2013). Skills & Attributes of Today's Learner. [online] Available at: <https://northernartteacher.wordpress.com/2013/07/25/a-thank-you-note-to-skype/skills-attributes-of-todays-learner/> Accessed 20 Nov. 2016.

serve as an illustration of what is possible to be enacted with their students (Box 7.1).

Compared to print materials, mobile content can provide a wider reach and can even be more affordable; for example, with the Worldreader (2014) mobile phone application, a learner in Kenya can read a book via mobile for about 3 Kenyan shillings, while purchasing a print book can cost at least 100 Kenyan shillings. Use of mobile content therefore can enable access to learning materials that promote new ways of knowing.

Many mobile learning initiatives have a teacher professional development component with built-in teacher training designed to enhance teachers' subject matter knowledge as well as their technological skills and to specifically train teachers in using mobile phones effectively in their instruction. Mobile learning is used for both training teachers in the technological aspects of mobile learning as well as providing teachers knowledge in the subject matter that they teach. Indeed, through mobile learning, teachers in developing countries have the hope of learning

from learning materials that are more up-to-date, which could lead to an increase in the quality of teaching and learning<sup>9</sup>.

### Current uses of mobiles for teaching and learning: Tools for the construction of learning

Texting, microblogging, video creation or mobile storytelling are instances of new educational possibilities that mobile technologies can offer to learners in developing countries. Successful integration of traditional teaching and learning processes with more learner-centred, experimental processes made possible with mobile technology will be key to realizing the full potential of what mobile learning can facilitate for people in the Global South. As previously stated, successful practices which allow the development of a distinctive mobile literacy, together with the power of mobile learning to blur formal and informal boundaries, account for a new teaching and learning scenarios that can serve to reshape traditional patterns of teaching and learning so

### Box 7.1: Empowering teachers with mobile devices: the UNESCO-NOKIA project



*Teacher training with mobile devices*

Photo credits: CC Marie-Lise Bourcier

Mobile learning offers promising opportunities to combat inequality and to provide teachers with empowering solutions and strategies for their day-to-day classes. In October 2010, UNESCO and Nokia signed a partnership to use mobile technologies to support education which concerned the implementation of four pilot projects to support teacher development through the use of mobile technologies in four different countries: Mexico, Nigeria, Pakistan and Senegal. Each project was designed based on the countries' respective educational needs, telecommunication infrastructure, and existing mobile learning tools. Results showed a significant increase in the teacher's motivation as well as the possibilities for scaling-up the initiative to other contexts.

that the learner has both more ownership and responsibility for their learning (Figure 7.4).

There are examples of best practices with mobile learning which could provide an overview on the potential of mobile technologies and what impact these might have on learning and teaching practices in developing country contexts. Some of these examples include the use of SMS-enabled treasure hunts designed to facilitate peer learning as students need to quickly interpret cues and exchange ideas to reach the prize (Box 7.2).

Other interesting experiences include the exploration of mobile devices to support social work students and mentors when students undertake their placements (REMORA), the use of pocket PCs to support portfolio development by teaching (WoLF), and the use of augmented reality to enhance teaching and learning (SCARLET) simultaneously allow students to experience the magic of original materials, whilst enhancing the learning experience. The FAVOR project Open Resources showcases the work of language teachers in universities, by engaging them in

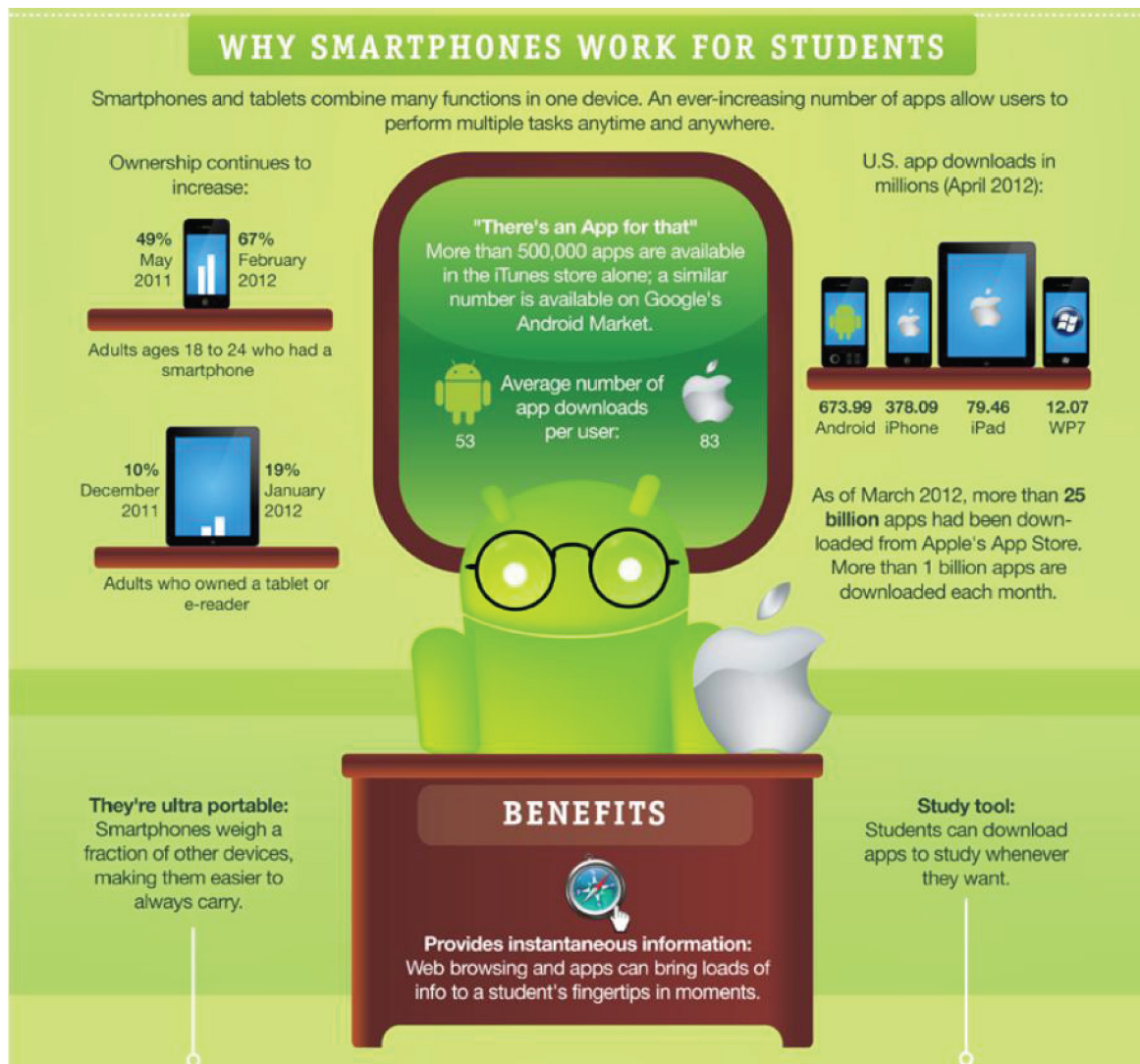
activities that will enhance the student experience and contribute to the academic life of their institutions.

Another example of international and multicultural collaboration, the iCollab project (Box 7.3), constituted by an international community of practice of students and lecturers started in 2011 which aims to explore and evaluate which mobile web tools, pedagogic strategies and learning scenarios can be effective to support international student collaboration, participation in decision-making as part of curriculum development and the development of 21<sup>st</sup> century skills.

## Conclusions and recommendations

Living in a world in which the number of connected mobile devices already exceeds the world's population, the inclusion of mobile technologies in education should be seen as a unique opportunity, rather than a threat, that will lead educational systems to promote change. The advantages of using mobile technologies for educational purposes are manifold: ubiquity, personalization

Figure 7.4: Why smartphones work for students



Source: Science's Alphabet Soup. (2013). APPS & B.Y.O.D. in Education. [online] Available at: <https://scottbgoldscher.wordpress.com/2012/08/08/apps-b-y-o-d-in-education-infographics/> Accessed 11 May 2015.

of learning, skill development... and they provide new insights with which to face education in the 21st century framework. As mobile technologies continue to grow, their usefulness as powerful educational instruments will continue to expand in the near future. The following considerations intend to summarise key aspects to be considered when facing mobile impact, uptake and usage.

1. A deep understanding of mobile culture and mobile literacy defined in terms of context-awareness, mobility and of learners' specific needs happens to be genuinely important for a successful implementation of mobile technologies and ground-breaking design for learning.

2. New competencies and skills that may develop through the use of mobile technologies demand a very specific mapping between what is expected of learners and how these technologies may be of help to achieve those objectives.
3. Educational institutions and related stakeholders need to take ownership of change and be able to reshape their landscape as it is being challenged by the mobile revolution.
4. Mobile and wireless technologies can provide flexible and timely access to learning resources, instantaneous communication, portability, active learning experiences and the



### Box 7.2: SMS to deliver course materials in Nepal

There are more than 6 million GSM mobile phone subscribers in Nepal and about 7 million mobile phone users. This is much higher than the number of households with access to the Internet (about 630 000, 2009 data). Nepal's mobile phone users are not concentrated in any one part of the country. The market has shown growth across the whole country, even in rural areas without proper roads and means of transportation, although compared to urban areas the rate of growth is slower. This presents an opportunity for mobile learning in Nepal. Education institutions<sup>a</sup> – profit seeking or non-profit – can develop course materials and send them via text messaging to subscribers. Incoming messages are provided free of charge.

The messages, which are 160 characters long, may not be suitable for subjects requiring analysis or calculations like economics, pure science or mathematics. Yet for basic courses in English, civics, history, and geography, the characters constraint is not as limiting in terms of what can be taught with a mobile device. With the mobile Internet, institutions can provide an option for students to take online courses, as a supplement to the text messages. Educational messaging can be a useful service, especially to students in rural areas who have little or no access to the Internet or a library. The messages can supplement their classroom instruction. They can also be a way to spread awareness about diseases, social issues and natural disasters in hard to reach areas.



*School kids at Ranighat, Nepal*

Photo credits: Argenberg, via Wikimedia Commons

<sup>a</sup> Future Challenges. (2011). *Nepal: Opportunities and Challenges For Mobile Education*. [online]. Available at: <https://futurechallenges.org/local/nepal-opportunities-and-challenges-facing-mobile-education/> Accessed 23 March 2014.

empowerment and engagement of learners, particularly those in dispersed communities. However, despite the almost ubiquitous ownership of mobile phones, there is a lack of research that informs its real impact upon educational practices in developing country contexts.

5. Due to their portability, low cost and flexible features, mobile technologies have the potential to provide teachers in developing countries with teaching and learning strategies that can empower them to transform educational practices.



### Box 7.3: The iCollab project: Building global learning communities via mobile social media

The iCollab project ([icollab.wordpress.com](http://icollab.wordpress.com)) is an international community of practice of students and lecturers started in 2011. The project aims to explore and evaluate which mobile web tools, pedagogic strategies and learning scenarios can be effective to support international student and lecturer collaboration, participation in decision-making as part of curriculum development and the development of 21<sup>st</sup> century skills. The partner universities in iCollab project are: AUT University (New Zealand), Beuth University (Germany), Salford University (UK), Universitat Rovira i Virgili (Spain), National University of Ireland, Galway (Ireland), Limerick Institute of Technology, Limerick (Ireland), University of Wollongong, Wollongong (Australia). iCollab educational affordances and research interests include:

- Exploring mobile tools for international collaboration of teams of students
- Engaging students in participatory curriculum development by means of social and mobile media
- Exploring the creation of digital identities in social and mobile media
- Using mobile media for situated co-creation of student-generated content
- Use of mobile web 2.0 as catalyst for pedagogical change/innovation
- Collaborative research in mobile social media integration in education

6. Mobile phones are already being used informally in many cases to support learning activities (e.g. communication with friends about homework assignments, recording of lectures, discussion of an education lecture via SMS, etc.). However, to date, these informal learning activities have not been to skills development needs in a manner that will help ensure that people are equipped for entering the workforce prepared to make meaningful contributions.
7. Texting, microblogging, video creation or mobile storytelling are instances of educational possibilities that mobile technologies offer to learners in the Global South. Evidence is growing to support the inclusion of such technologies into the teaching and learning processes.
8. It is important to take into account the increasing impact that informal learning will have upon skills development. Informal learning represents a special aspect of education and training nowadays and greater recognition should be given to it due to the skills with which it provides and the part it plays within the learning process.
9. The quality and diversity of non-formal and informal learning should be acknowledged so as to recognise its social and economic added value. In this sense, new educational approaches that could be attractive for different groups of learners should be further developed.

## Endnotes

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- <sup>8</sup> UNESCO. (2013). *Policy Guidelines for Mobile Learning* [online]. Available at: <http://unesdoc.unesco.org/images/0021/002196/219641e.pdf> Accessed 26 Nov. 2015.
- <sup>9</sup> UNESCO-NOKIA. Teacher Development. [online] Available at: [www.unesco.org/new/en/unesco/themes/icts/m4ed/teacher-development/](http://www.unesco.org/new/en/unesco/themes/icts/m4ed/teacher-development/)