Chapter 8
Mobile Phones, Developing Countries and Learning

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ABSTRACT
The Internet and computers are accessible to only half of the population in the world. For the other half, computers and the Internet are almost alien concepts. This half has no medium for gathering information, and they are computer illiterate. In addition, it is well-known, that the use of computers and the Internet, directly and indirectly, enhance the learning process. Therefore, students from under privileged areas of developing regions of the world are, clearly, at a disadvantage compared to their peers in developed countries. However, mobile phones could change this situation. In developing countries, mobile phones are far more accessible than computers or Internet access. This high accessibility together with the multiple functionalities of mobile phones, allow for the potential to build feasible educational applications that enhance the learning experiences of students in developing countries. Such opportunities enable the students’ experiences to be made proportionate to the other half of the world, with a real mechanism for gathering information.

INTRODUCTION
Even though, there has been an increasing usage and access to Information Communication Technology (ICT) worldwide during the last few decades, the digital divide between developed and developing regions still remains (ITU, 2009).

In developed countries a well established ICT infrastructure exists in industrial, business, governmental and home environments. The infrastructure is available in big cities as well as in small villages. In contrast to developed countries, with a few exceptions, developing countries have little access to ICT infrastructure. The access and availability of ICT among developing countries...
is unequal, even within the same country. While some developing regions face a lack of global ICT infrastructure in their territories; other developing countries have a relatively satisfactory ICT infrastructure in urban areas (and/or for the wealthier populations), and a poor or non-existent ICT infrastructure in rural areas (and/or for the poorer populations). Sub-Saharan Africa and Latin America are representative examples of the former and latter situation respectively.

Although the earlier personal computer dates back to the end of the 80s and the Internet has been publicly available since the 90s, access to computers and the Internet in developing regions remains behind compared to developed regions. According to the data from ITU (2009) and the UN (2008) the proportion of household with computers in developed economies is over 75% in comparison to roughly 24% in developing countries. The proportion of households with Internet access in developed countries average 63% and only 16% in developing regions. Therefore, the majority of the population in developing regions has no access to computers or to the Internet, and it is very probably that many of them have never used or even seen a computer in their lives. Table 1 shows a summary of ICT access in households in developed and developing regions.

However, there has been a substantial advance in access to computer technology with significant relevance to developing countries through mobile phones. In contrast to developed regions, for many citizens of developing countries (specially the rural and poor areas) mobile phones represent the only way of remote communication, the only way of gathering information and the first and sole means of interaction with computer technology and digital information (ITU, 2009; Valderrama, Döring & Schmidt 2008). According to ITU (2009) “the penetration of mobile phones worldwide in 2007 was around 40%. Moreover, around 64% of the mobile phone subscriptions worldwide during 2007 came from non-developed countries” (pp. 3-4).

As shown in Table 1, in developing countries the proportion of households with mobile phones is almost twice that with computers, and around three times that with Internet access. Even though Table 1 does not include all the countries in the world, hence some data is incomplete and it is not representative of all the developing countries (ITU, 2009), it still gives a representative overview of ICT access in developing regions of the world. The lack of infrastructure for dedicated phone lines in rural villages in developing countries has given rise to the growing use of mobile phones where the signal coverage of cell phones covers vast areas. So mobile phones are making the difference for telecommunication in developing countries.

Additionally, in developing countries the rate of increase of the penetration of mobile phones is high. For example, from 2006 to 2007, Africa presented the highest mobile growth rate of 32% (ITU, 2009). The current high use of mobile phones in developing regions and their trend for increased use of mobile phones could represent a realistic alternative for introducing computer technology to people in underprivileged areas in developing countries. Mobile phones have the potential to overcome the shortage of access to computer technology there and hence the access to information and knowledge.

As well as the high penetration rate of mobile phones, mobile phones also introduce three main

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<tr>
<th>ICT Access</th>
<th>Developed Countries</th>
<th>Developing Countries</th>
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<tbody>
<tr>
<td>Proportion of households with computers</td>
<td>75,50%</td>
<td>23,65%</td>
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<tr>
<td>Proportion of households with Internet access</td>
<td>63,00%</td>
<td>15,83%</td>
</tr>
<tr>
<td>Proportion of households with mobile phones</td>
<td>84,37%</td>
<td>45,72%</td>
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<tr>
<td>Proportion of households with dedicated phone lines</td>
<td>88,67%</td>
<td>36,25%</td>
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