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Viability of SMS Technologies for Non-Formal Distance Education

Angelo Juan O. Ramos, Jerome Trinona & David Lambert

Introduction

One and a half billion people around the world, are walking around with powerful computers in their pockets and purses. Today’s high-end cell-phones have the computing power of a mid-1990s personal computer, while consuming only one one-hundredth of the energy. Most users, however, do not seem to realise the vast potential of the cell-phone for education, or for the communication function for which it was originally designed. Most educators, on the other hand, still see the computer and the cell-phone as very different devices, with the tiny cell-phone being a much more personal and ubiquitous accessory, especially among young people. But with dropping prices and increasing functionality, it is virtually certain that not too far into the future, all students will have a cell-phone. This is enough reason and motivation for educators to explore the possibility of making the cell-phone as an important tool in the educational systems of developed and even developing countries.

Mobile Learning and the Cell-phone

Whereas e-learning delivers educational content via the Personal Computer (PC) and the Internet, m-learning takes this further by making online learning content available anywhere in the world through portable, mobile devices such as laptop PCs, Personal Digital Assistants (PDA), the cell-phone, and the Smartphone (PDA and cell-phone hybrid). Most of these efforts, however, focus on content that caters to the formal education sector, and tends to use more advanced functions such as multimedia messaging services (MMS), Java applications, GPRS (General Packet Radio Service) for fast mobile Internet connections, and Bluetooth technology for establishing remote connections. In Japan, telecoms companies such as NTT-DoCoMo’s Pocket Eijiro, an English language dictionary site, receives more than 100,000 hits per day. Costing $1.53 per month plus tax and service charges, it is the 4th most popular online site accessed by Japanese users through the cell-phone. In the United States, companies such as the Princeton Review are already offering cell-phone-delivered test questions for scholastic achievement tests. In the Philippines, Short Messaging Services (SMS) remain the most utilised service for most cell-phone users, despite the introduction of more advanced cell-phone technologies.

Cell-phone operators constantly come up with innovative breakthrough services, such as multimedia and Java applications, online games, lotteries and downloads. Such operators fall short of delivering educational content to their millions of subscribers, however. Currently, there are limited efforts to use and integrate the cell-phone and SMS into education. So far, the UP Open University offers SMS-based mobile courses in English, math and sciences (see Chapter 6). This initiative, however, is still directed towards the formal education sector. The Text-2-Teach program supported by the Philippines’ Department of Education utilises SMS, but only goes as far as to provide a way for educators to request educational content to be delivered to them, not by SMS but by satellite television.

The Molave Development Foundation (MDFI) is spear-heading a research study to determine the feasibility of using SMS techniques in non-formal education. This research, among others, is examining the socioeconomic and gender-based factors that motivate or hinder cell-phone subscribers to use SMS for non-formal education.
The project, called *Viability of Mobile SMS Technologies for Non-formal Distance Learning in Asia* is a component of the mega-project dubbed PAN-DORA, or Pan Asia Networking Distance and Open Resource Access.

The MDFI is the lead agency for this research project, in a partnership with two organisations in Mongolia; the English for Special Purposes Foundation (ESPF) and the Health Sciences University of Mongolia (HSUM), both based in Ulaanbaatar, as well as the Alternative Learning Services, in the Department of Education of the Government of the Philippines.

**Project Activities and Updates**

Launched just one year ago, in 2005, the Philippines section of the project has already completed major activities.

1) **Preparation and formative evaluation**

- Inventory of equipment and personnel: because of MDFI’s experience in running various development and research projects, its staff has been trained and has developed the capacity and knowledge to run the research.

- Training and capacity-building: activities handled by the team have involved developing the capabilities and knowledge of stakeholders through activities such as seminars and training-of-trainers workshops.

- Research methods: MDFI has experience in social development research, having successfully conducted a previous IDRC-funded project on “ICT and Distance Learning for Water and Sanitation”.

- ICT-enabled learning materials development: MDFI has developed previous interactive and multimedia-rich learning modules for health education and hygiene promotion.

MDFI also has a pool of consultants and experts who can assist in the conduct of the research as needed for:

- research design;
- database systems development and management;
- technical writers; and
- instructional design experts.

**Selection of Equipment**

The team explored various technical options in order to come up with a viable and cost-effective system for delivering educational content via SMS.

**Cell-phone Operators.** Philippine cell-phone service operators have various services and technologies that can be used by the project. These services, however, are primarily designed for profit and commercial purposes. A typical SMS costs one peso. The existing telco business model would require the users (in this case, the students) to pay more than twice the usual SMS rates: 2.50 pesos, or US 5 cents. It might become a burden to the students if the project were to proceed under this arrangement.

**Locally-installed Cell-phone Systems.** The project has considered developing its own system whereby cell-phone would be interfaced with the personal computer, along with open-source or proprietary GSM software to facilitate the exchange of data and learning between the server and student. This possibility is being explored. The project is also looking at a more automated and user-friendly approach, both for the students and the projects’ administrators.

**GSM Data Terminal.** The MDFI team has met with representatives of the Applied Science Technology Institute of the Department of Science & Technology (ASTI-DOST), and has examined a hardware and software solution they have developed called the GSM Data Terminal. This is a viable and efficient option for the project. The GSM Data Terminal is a PC card unit that is installed in a computer’s card slot to send and receive SMS messages. The software can be customised according to the user’s needs, as in setting up algorithms for a learning management system (LMS). The Mongolian research partners are also considering using this system.
Surveys, Focus Group Discussions, and Interviews

Situational and Stakeholder Analysis

Baseline Study. A total of 123 ALS students from the six districts of Manila (aged from 12 - 48) participated in the survey through questionnaires administered through the Teacher Community Coordinators (TCCs) of ALS. The baseline survey was conducted to get an initial assessment of the student’s learning preferences, as well as their “texting” and cell-phone usage. The survey data were collated and analysed using Epi Info 6.0 and Microsoft Excel.

Age and Gender Distribution

- 52% of the sample are male and 48% female;
- the predominant ages for men and women are 12 - 48 and 14 - 36 respectively;
- the oldest respondent was 48, and the youngest 12;
- the majority of males were aged from 15 to 23, and the majority of females from 15 - 19; and
- the men’s mean age is 19 and the women’s is 19.3.

Weekly Income of Breadwinners

- 49% earn at least 550 pesos per week;
- 7% earn 250 - 549 pesos per week;
- 6% earn less than 250 pesos per week; and
- 38% are unaware of their household’s weekly income.

Family’s source of income

- 45% are employed with private firms or government;
- 18 % are self-employed with their own business;
- 10% are vendors;
- 7% are drivers; and
- 2% are unemployed.

Educational Level

- 82% of total respondents have reached secondary level;
- 31% have reached 1st year high school;
- 25% have reached 3rd year high school; and
- 24% have reached 2nd year high school.

Reasons for dropping out of formal education

- 36% of respondents dropped out of school for financial reasons;
- 16% had to work;
- 4% stated that they have no time to study; and
- 44% have other reasons; the majority of this group (31 responses) said that they stopped going to school because they want to spend more time with friends.

Cell-phone Usage and SMS Preferences

- 36% have 2 cell-phones per household;
- 24% have 3 cell-phones per household;
- 24% have at least 4 cell-phones per household; and
- 16% have 1 cell-phone per household.

Percentage of Cell-phone load (credits) allocated to SMS

The majority of respondents (81%) allocates at least half of their prepaid cell-phone credits to SMS usage.

- 41% of respondents allocate 51-70% of their load credits to SMS use;
- 28% allocate at least 71% of their load credits to SMS;
- 12% allocate 50% of their load credits to SMS;
- 12% allocate 20% of their load credits or lower to SMS; and
- 7% allocate 21-49% of their load credits to SMS.

Do students want to learn through SMS?

Eighty per cent of the sample is open to the idea of learning through SMS. Twenty per cent state that they are not.

Does the sample want to allocate part of their SMS load to learning?

The majority of respondents (81%) said that they would set aside a portion of their load credits to learn through SMS. Sixteen per cent said they would not. Three per cent was unsure.
What subjects do they prefer to learn via SMS?

- Math is the most preferred subject for the SMS format (34%), followed by English (30%) and Science (20%);
- Male respondents prefer Math (20%) over English (14%) and Science (13%);
- Female respondents prefer English (16%) over Math (15%) and Science (7%);
- 12-19 year olds prefer Math (24%) over English (20%) and Science (20%); and
- 20-27 year olds prefer Math (19%) over English (11%).

Consultative Meeting with Key Experts

MDFI has organised a consultative meeting with teachers and instructional designers from the Alternative Learning Services (ALS), and with research experts. This is the second part of a series of meetings in the preparation and development of learning contents for the SMS project. During the meeting, the following issues were brought up by the participants, considered important in the preparation of SMS-based learning content.

Information and Content:

- How using SMS in DE might affect or further contribute to the deterioration of English writing and reading skills;
- the educational levels of Learners who will use SMS; and
- limitations regarding the information that can be communicated through text messaging

Technology issues: signal problems and message errors:

- objectives and values;
- suitability of SMS for disabled clients;
- limitations in social interaction;
- alignment of SMS content to student learning competencies; and
- proper use of the SMS load for the purpose of the study.

Processes:

- If a client does not answer the question correctly, how can he or she receive clarification? and
- what steps are taken when a client backs out of the research (attrition)?

Staffing and Skills:

- the SMS model to be incorporated in the training of ALS implementers/ facilitators; and
- training to advance knowledge on instructional design.

Management & Structures:

- Content and design of materials will be collated and handled by ALS; and
- MDFI will design and handle the technology and the research aspect.

The Focus Group Discussions

A focus group discussion (FGD) on learning needs and SMS usage was conducted with a group of 5 women and 3 men aged from 19 to 30, all currently enrolled in the Functional Literacy Program of the Alternative Learning Services (ALS). The FGD was conducted in March 2006, at the ALS office in P. Gomez Elementary School, Manila. A facilitator from MDFI led the discussion, gathering responses from the participants using a set of prepared questions. The FGD found that:

- all of the participants have cell-phones;
- all of the participants are SMS users;
- everyone agrees that SMS is a cheaper way to communicate with friends and loved ones, and an important communication tool for work and business;
- all of the participants agree with the idea of learning through SMS;
- learning ALS through SMS would be very convenient if it allow learners to be with their family or at work while learning;
• the costs of transportation saved by using SMS can be
reallocated to the SMS load used for learning;
• people want to learn subjects such as Math and English
because this will allow them to get a high-school degree
and find better jobs; and
• there was no observed difference between the men and
women in their opinions regarding these preferences.

As an additional activity, each participant was asked to select five
modules of interest to them, from the 292 existing secondary level
modules used by ALS. These choices indicated the following
learning preferences:

• communication skills: modules on English speaking and
grammar; and
• critical thinking and problem-solving: modules on
Business Math, and practical applications of Math.

Further focus groups have been conducted with people who meet
with foreigners in the course of their work and need to be able to
speak and understand some English. A preliminary list of such
people included taxi drivers, shop assistants, teachers, bank tellers,
waiters, and hotel staff. The team decided to target bank tellers and
waiters. A list of questions was generated for the focus groups on
two topics: 1) the participants’ use of cell-phones and familiarity
with SMS Text Messaging; 2) their need for English in their work,
command of the language, and problems faced in learning English.
Meanwhile, the Mongolian partner in the project (HSUM), used the
same set of questions for two focus groups with 10 doctors and
nurses in Ulaanbaatar, and 10 doctors and nurses in Bayankhongor,
a remote area of western Mongolia. The overall participation in this
round of focus groups included 21 bank tellers, 20 waiters, and 20
doctors/nurses. It was found that:

• all the participants have cell-phones;
• SMS messaging is very popular as it is cheaper than
making regular ‘phone calls;
• there is some resistance to sending SMS message as people
find it difficult to use the keypad;
• the use of cell-phones for personal reasons during work is
banned for bank tellers and waiters;

• the majority of the participants feels their English is poor;
• they all agree that knowledge of English would help them
in their work, and that a good command of English would
improve their job prospects;
• learning English is difficult for many of them because of
the cost of courses, and conflict with their work schedules;
• bank tellers need English to communicate with foreigners
and with the Bank directors who are mostly foreigners;
• there is a strong desire and motivation in almost all of the
participants to learn English;
• the waiters and bank tellers need appropriate professional
vocabulary and style, and social English; and
• the majority feels that it would be possible to learn English
with SMS messaging as a key component of a course, and
were attracted by the idea.

Preparation of Learning Content

Based on the above findings, the MDFI and ALS are now in the
process of designing learning materials for pilot testing. The ESPF
team has decided that SMS messaging will be a key element in an
English course that will also include a workbook, dictionary and
audio-cassette. The relationship between the SMS messages and the
workbook is seen as important. The program has been designed so
that the workbook materials need the SMS material for full
comprehension messages, and for it to be possible to complete the
required exercises. In general, the course is designed to simulate
the process of learning English through SMS messaging, as follows:

• the participants are assembled in a classroom with a
teacher/ facilitator (T/F);
• the participants work separately but can discuss the
exercises together if they wish;
• the T/F gives each participant their first “message” on a
card. The “message” gives information that is essential for
them to be able to do a particular workbook task, and
directs them to the relevant page;
• the participants do the task and take their workbook to the
T/F to be checked. The T/F indicates which parts of the
task are right/ wrong. If the exercise is all correct the
participant is given the next “message”. If there are
• mistakes in the first task, the participant returns to their desk to try to correct them;
• the dictionary gives vocabulary for each task; and
• each student has a cassette on which they can hear the words/sentences spoken;
• they are given instructions on how to interact with the tape in practising the words and sentences. This they do in their own time outside the classroom.

Conclusions

The rapid expansion of mobile ‘phone technologies, and the particular popularity of text-messaging (SMS), offers major opportunities for non-formal education. The current project has examined the appeal of SMS-based learning for a broad range of working individuals in the Philippines and Mongolia, and has found a common enthusiasm for this novel method. The team is now developing a wide range of SMS-based materials to improve the social development potential of this ubiquitous new tool.