

Mobile Technologies, Input Hypothesis and Second Language Acquisition in the Rwandan Context

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Abstract

The use of technologies in education started in the 1950s specifically with the use of audio-visual tools in language learning. Those tools which were made of big heavy hardware with limited software, accessible only from a specific location, have currently evolved into handy portable and mobile devices which are accessible at any place and time with unlimited variety of software, and this gave birth to mobile-assisted language learning as a young field of study. As the world rapidly changes, there is a need for studies which integrate these technologies with the available traditional theories that were primarily based on traditional ways of teaching and learning. This article is an attempt to integrate the use of modern mobile technologies with Input Hypothesis of second language acquisition in the context of Rwanda, one of the monolingual world countries in matters of national language, but which use foreign languages for various purposes.

Keywords: ICT in education; mobile assisted language learning; second language acquisition; mobile technologies in language learning (MTLL); emerging technologies; input hypothesis

Introduction

According to Barton and Lee (2013:65), “we are living in an increasingly mobile world, both physically and virtually. Flows of people, knowledge, ideas and objects are all speeding up, leading to... new forms of learning online and offline”. The use of computers and mobile devices has replaced the use of many traditional tools in all working areas ranging from manual activities such as farming and industrial activities, to intellectual activities such as learning and teaching. In learning and teaching, technological devices and online and distance learning programmes allow the teaching-and-learning process to take place without necessarily face-to-face contact of teachers and students.

As far as language learning is concerned, many researchers and linguists worked on the way in which a language can be acquired or learnt in different settings and by different individuals. One example regarding language-learning settings is Ellis (1994) who states that a language can be learnt or acquired in natural and educational contexts. The language learning natural context can be defined as where the target language is acquired through natural exposure and interaction with its speakers, whereas according to Ellis (1994:227), the educational context is “a setting where the target language is taught as subject only and is not commonly used as a medium of communication outside the classroom”. The latter being the context in which second languages are learnt in most African countries including Rwanda, in either context, there is one condition for a successful second language acquisition process to take place, and that is the availability of a “comprehensible input” (Krashen 1982). According to Ellis and Shintani (2014), there are two main ways in which input can be made comprehensible, and thus a

successful second language acquisition process can take place. In this regard, Ellis and Shintani (2014:177) state the following:

First, situational context can make the meaning of the input clear when learners can relate what is said to objects and actions they can see. Second, input becomes comprehensible when it is simplified, as occurs naturally in the simplified codes that learners are exposed to.

This article reports on a study which was conducted in Rwanda, a small developing country located in East Africa, of which 39.1% of the population is poor (NISR 2015). In matters of the use of modern technologies, the National Institute of Statistics of Rwanda (NISR) specifies that in 2011, the mobile connection signals were available on 72% of the total surface of the country (NISR 2012), and currently 2.5% of the population owns a computer, whereas 63.6% owns mobile phones (NISR 2015). According to NISR (2015), only 9.3% of the total Rwandan households have access to Internet connection “including through mobile phones”, and only 20% have access to electricity. The latter explains the reason why the use of modern technologies such as desktop computers that require the availability of electricity is still low, and why the use as well as the ownership of mobile technologies which do not require the availability of electricity is increasing.

In matters of language use, Rwanda is predominantly a monolingual country. According to its constitution, Rwanda uses only Kinyarwanda as the national language, and Kinyarwanda, French and English as official languages (Republic of Rwanda 2015). As a Rwandan legacy, Kinyarwanda is the dominant language, used and spoken by every citizen in everyday activities (Niyomugabo and Uwizeyimana 2018). In 2010, Kinyarwanda speakers in Rwanda were more than 99.4% of the total population, and among them, around 90% could not speak any other foreign or second language (Samuelson and Freedman 2010). At that time, foreign and second languages were spoken by only 3 to 5% of the Rwandan population (Samuelson and Freedman 2010). Of the two foreign official languages of Rwanda, the focus of this study is on English, which is the language of instruction at all levels of education in Rwanda (Kagwesage 2013 and REB 2014). English is taught at all levels of education in Rwanda, but it is not used outside the classroom setting; and this becomes a challenge to its successful acquisition as learners must rely on the formal language classrooms, where they get a little language comprehensible input from the language instructors without having enough opportunity to practice the language outside the classroom (Uwizeyimana 2015). In the framework of the traditional Input Hypothesis, this article is an attempt to integrate the use of most accessible modern technologies, i.e. mobile technologies into second language acquisition, with the purpose of enhancing the language input received by learners from their instructors as well as the conventional learning materials, creating the context in which the target language can be practiced outside the formal classroom, and thus contributing to the success of the second language acquisition process.

Literature Review

On its theoretical side, this article is based on Input Hypothesis, which is a key hypothesis in Krashen's model of second language acquisition (Shehadeh 2013; Krashen 1982; Ellis and Shintani 2014). It is important to note that this key hypothesis claims that a second language is acquired or learnt "by understanding messages, or by receiving comprehensible input" (Gass and Selinker 2008:309). The term 'input' was introduced in the field of linguistics in the 1950s (Rast 2008), and is defined by Crystal (2008:247) as "the external linguistic data available to speakers in the course of acquiring a language". This term is also defined by Hatch (1983) as any element that the language learner hears and attempts to process, and by Fang (2010:11) as "the linguistic forms, the streams of speech in the air directed at the [language] non-native speaker".

The notion of 'language comprehensible input', which is the focus of Input Hypothesis, is defined by Gass, Behney and Plonsky (2013:131) as "that bit of language that is heard / read and that is slightly ahead of a learner's current state of grammatical knowledge". Thus, according to Krashen (1982:21), Input Hypothesis claims that "a necessary but not sufficient condition to move from stage i to stage $i+1$ is that the acquirer understands input that contains $i+1$, where 'understand' means that the acquirer is focused on the meaning and not the form of the message". In the framework of Input Hypothesis, the second language learners, by using their linguistic competence, and with reference to the context as well as the knowledge and the extra-linguistic information language that they have about the world, they understand language that contains structure that is a little beyond their knowledge, and therefore, they can successfully acquire the language (Krashen 1982).

In the context of most African countries such as Rwanda, 'second languages' are equal to 'foreign languages', and they are learnt as subjects at schools and universities, but they are not spoken or practiced outside the classroom within the learners' communities. For a successful second language acquisition process in such contexts, the need for instructors who make the target language input comprehensible must be complemented by "creating opportunities for output... where the learner is stretched to express messages clearly and explicitly" (Ellis and Shintani 2014:25); but in most cases, due to the tight school and university curricula, the lack of enough teaching materials, as well as the class teaching timetable which expands from early morning to the late evening, providing a sufficient target language input to students, and creating a well-coordinated and monitored face-to-face setting for the target language output are not practically possible. This is the main challenge to the success of a second language acquisition process in Rwanda.

On its practical side, this article attempts to address this second language acquisition challenge by integrating the use of modern technologies, specifically mobile technologies within the second language learning process. The use of technologies in the language teaching-and-learning process was introduced in the 1960s (Heift and Chapelle 2012; Gitsaki 2013), and nowadays, it involves not the use of limited teaching software and audio materials in a language classroom, but unlimited use of web resources, social networking applications, blogs, wikis,

online corpora, audio and video communication applications. These technologies are no longer dependent on heavy desktop computers and other hardware systems which can be accessed only inside laboratories and classrooms, because of the modern mobile technologies that include smartphones, laptops, tablets and multimedia players, which can be easily used for language learning and teaching purposes, and which are accessible from any place at any time as a result of their portability and mobility features. According to Sarica and Cavus (2009:439), currently language students “learn faster and easier than before because of the use of technology in educational institutions”. This article is rooted in mobile-assisted language learning (MALL), the field that “since the mid-1990s... has focused on the exploitation of five mobile technologies, [namely] pocket electronic dictionaries, personal digital assistants (PDAs), mobile phones, MP3 players, and most recently ultra-portable tablet PCs” (Burston 2013:157). MALL was opted for this article, because scholars like Chen (2013:20) have found it to have the potential to “improve access to education and promotes learning that is learner-centred, personalized, collaborative, situated, and ubiquitous”.

According to Krashen’s Input Hypothesis, there are six requirements for optimal language input. Specifically, in order to have a successful second language acquisition process, Krashen (1982) states that the provided target language input must be a tool for conversational management, comprehensible, interesting and relevant, not grammatically sequenced, quantitatively enough, and must facilitate the high level of affective filter. The following table illustrates how the Krashen’s Input Hypothesis can be integrated with the use of mobile technological devices with the purpose of obtaining a sufficient comprehensible input and creating a favourable environment for the target language output, and thus addressing the current challenge of second language acquisition in countries similar to Rwanda:

<i>Optimal input</i>	<i>The use of mobile technologies</i>
i. Input comprehensibility	To help learners to acquire and understand the meaning of new words in the target language.
ii. Interesting and relevant input	To help the learners to acquire the new words that they need for the success in their everyday activities, and the new words that are relevant to the learners’ contexts.
iii. Input grammatical sequence	To avail the materials which help learners to understand implicitly the target language grammatical rules.
iv. Input quantity	To expose the learners to sufficient, rich and comprehensible target language learning resources.
v. Filter strength	To help learners to improve their communication skills in the target language.
vi. Conversational management	To help learners to interact with the target language speakers, and thus to improve their communication skills.

Table 1: MALL and optimal input

Methodology

On the research permit N° MINEDUC/S&T/256/2014 issued by the Rwandan Ministry of Education, this study was conducted at Kigali campus of the University of Rwanda – College of Education, and it focused on undergraduate students who were doing English language as one of their majors. The purposive sampling strategy (Lewin 2005; Cohen, Manion and Morrison 2011) was used, and 24 research participants were selected based on the academic programmes for which they were registered, i.e. English language related programmes, as well as their awareness and use of modern mobile technologies. More specifically, all 24 participants of whom 13 made up the experimental group and 11 made up the control group, were selected from English-Education combination, which is under the Department of Humanities and Language Education.

On one hand, the study's three-month experimental period involved to provide the training and guidance on the use of mobile technological devices, namely the smartphones and tablets, with the purpose of obtaining English as a second language input with reference to the guidelines provided in Table 1 above, to the experimental group. More specifically, in the framework of Input Hypothesis (see Table 1 above), the use of various mobile applications, which were found effective to second and foreign language teaching and learning, including instant messengers such as Skype (Kukulska-Hulme and Shield 2008) and 'WhatsApp' (Kukulska-Hulme, Norris and Donohue 2015; Hazaea and Alzubi 2016), social networks such as Facebook (Liu, Abe, Cao, Liu, Ok, Park, Parrish and Sardegna 2015), electronic dictionaries (Hazaea and Alzubi 2016), camera and different applications for recording and sharing multimedia files (Kukulska-Hulme, Norris and Donohue 2015), electronic translators and eBook readers, was the focus of the experiments. And on the other hand, it involved providing the additional conventional English language learning materials, namely the reading books, printed newspapers, and audio cassettes, to the control group. At the end of these experimental activities, the data were collected using an English test that was administered to both the experimental group made of participants who had received the training on the use of mobile technologies for language learning purposes, and the control group that did not receive the training, but who received the additional conventional language learning materials.

According to Krashen (1982:60), "we acquire by going for meaning first, and as a result, we acquire structure... We acquire spoken fluency not by practising talking but by understanding input, by listening and reading". The test for this study was made of two sections, one to evaluate the participants' listening skills, and the other to evaluate the reading skills. Each section was marked out of 10, and the participants were allowed the maximum of 15 minutes for listening section and 45 minutes for reading section. The participants' test marks were entered in STATISTICA data mining software for analysis and generation of the statistical results which are presented and discussed in the following section. With the purpose of comparing the performance of the research experimental group versus the control group in the test, all the participants' marks in each section were recorded and grouped per sample groups, and the mean, the standard deviation (Std.Dev) and p-value (p) were calculated.

Results and Discussion

According to Abdous, Camarena and Facer (2009:77), the use of audio clips as teaching, learning and assessment tools can “enable students... to expand their vocabulary, and to build oral and aural skills”. With reference to this, in the listening section of the test, all the participants were requested to listen to the open-access podcast entitled ‘Learning vocabulary’ provided online by the British Council’s Learn English Professionals (cf. website: <https://www.britishcouncil.org/learnenglish/>), in which a French university student talks about learning English and the difficulties he has in it; then to choose and circle the difficulties he mentions among the statements which were listed.

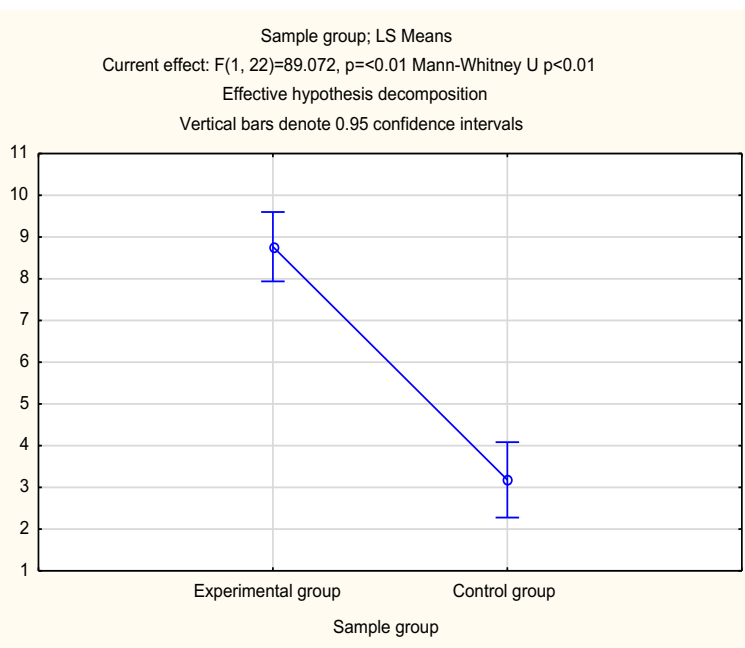


Figure 1: Participants’ performance in listening test

The participants’ score in this section ranged from 1 to 10. The score for the experimental group ranged from 7 to 10, whereas it ranged from 1 to 7 for the control group. The general mean for the listening section became 6.21, which indicated that the section was relevant to all research participants; and the overall Std.Dev became 3.17, and this indicated that the experiments, i.e. the training on and the use of mobile technologies for second language acquisition purposes, as well as the use of the conventional second language learning materials, had a positive effect on the participants’ performance in listening skills. But as it is illustrated in Figure 1, the experimental group remarkably outperformed the control group. The mean for the experimental group is 8.77, whereas it is 3.18 for the control group. The Std.Dev is 0.93 for the experimental group whereas it is 1.89 for the control group, i.e. the scores for the experimental group members are closer to the mean than the scores of the control group members.

In calculating the p-value, 0.95 was selected as the confidence intervals, i.e. the assumption that the integration of mobiles technologies with Krashen’s Input Hypothesis can address the challenges of second language

acquisition in Rwanda would be rejected if the p-value is greater or equal to 0.05, and adopted if the obtained p-value is less than 0.05. For the listening section of the test, as illustrated in Figure 1, $p < 0.01$, which completely supports that the assumption of this study is relevant to the acquisition of listening skills in English as a second language in Rwanda.

As it was mentioned above, the administered test was made of listening and reading sections. In the reading section, the research participants were requested to read the extract from an academic book by Yule (1996), which was one of their university prescribed books, and to answer the comprehension questions. Similarly to the listening section, the mean, Std.Dev and p-value were calculated for both control and experimental groups, and compared.

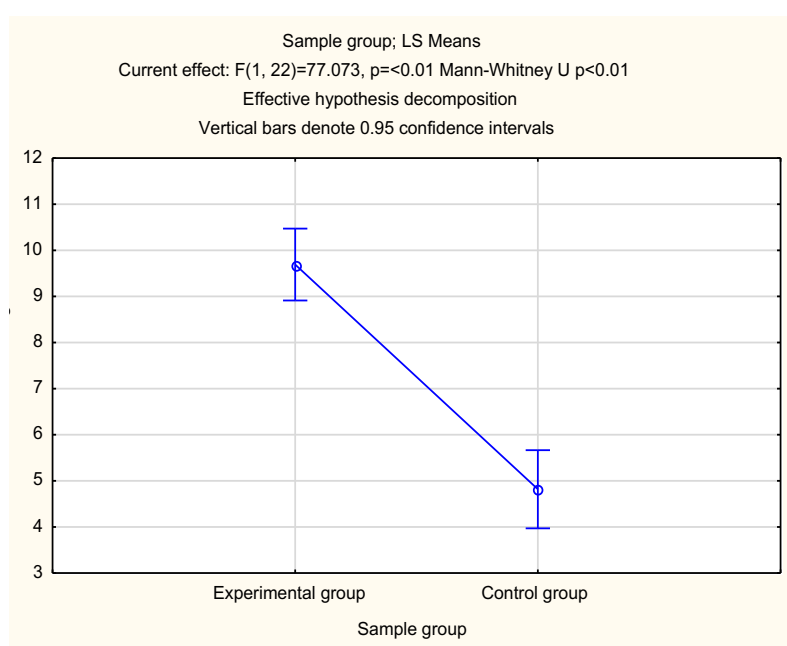


Figure 2: Participants' performance in reading test

In the reading section, the general score ranged from 2 to 10; the general mean became 7.46, and the overall Std.Dev became 2.81. As illustrated in Figure 2, the experimental group outperformed the control group in the reading section as well. For the experimental group, the minimum and maximum scores were relatively 9 and 10; while for the control group they were relatively 2 and 8. The mean for the experimental group became 9.69, which is considerably higher than the mean for the control group which was 4.82. The Std.Dev became 0.48 for the experimental group, and 1.94 for the control group.

Similarly to the listening section, 0.95 was adopted as the confidence intervals in calculating the p-value for the reading section. As it is indicated on Figure 2, for the reading section, the obtained $p < 0.01$ means that the integration of mobile-assisted language learning with Input Hypothesis has a positive effect on the acquisition of English reading skills in Rwanda.

Conclusion

According to Gass, Behney and Plonsky (2013:132), "if input is understood, and there is enough of it, the necessary grammar is automatically provided". In the context of Rwanda and other countries which fall under a similar situation in matters of second language acquisition, specifically where languages are taught as foreign languages, "the main function of the second language teacher is to help make input comprehensible, to do for the adult what the outside world cannot or will not do" (Krashen 1982:64). But the main challenge is that most of the language teachers are not the target language native speakers, often not fluent in the target language, and they are the ones who produce future language teachers. This implicates that there is a vicious circle of lack of proficiency in second language due to the lack of both sufficiently rich input and exposure to fluent native speakers of the target language. In such contexts, with the integration of technology, especially mobile technologies, in the language teaching and learning process, it is possible to get a richer language input than from language teachers and the conventional learning materials, and it is possible to be exposed to the target language native speakers and interact freely with them in the target language (Uwizeyimana 2018).

It is important to note that the successful learning or acquisition of any language does not require only getting comprehensible input, but also being given the opportunity to practice the language with native speakers in a physical or virtual setting. The contribution of language teachers is not sufficient enough to make a second language acquisition process successful; but the learners' involvement, an appropriate physical or virtual learning environment, as well as the use of learner-centred teaching methods can result in a successful second language acquisition process. The study that was reported in this article found that the availability of language teachers and traditional learning resources alone cannot help second language learners to meet these requirements if (i) they do not have access to modern technologies and (ii) and of course do not use them with the purposes of enhancing the target language input and creating a conducive environment in which the language learners can practice the target language. From the participants' score in the administered language test, it was deduced that for the improvement of the target language communication skills, especially listening and reading skills, the learners need to get optimal input, as well as the opportunity to practice the language at any time they want, at any place, as well as in any manner they want to; and all these requirements cannot be met without the use of mobile technological devices. It is in these regards that in the context of Rwanda and other countries where languages are taught as foreign languages, in addition to attending formal language classrooms, learners should have access to modern technologies and be trained in their use for language learning purposes (Uwizeyimana 2018). These technologies can not only give a favourable and rich learning platform, but also form the source of relevant, original, rich and updated language learning materials which are accessible at any time and place.

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