Identifying Mobile Phone Usability Issues in Informal Swedish Language Learning:

What users think about it?

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Abstract
This thesis studies the usability issues of the mobile phone in informal Swedish language learning. The concept of usability is defined by expanding the technical usability attributes of Jakob Nielsen with other recent attributes derived from considering the technical aspects of mobile learning (m-learning). Thus, the ultimate structure of the usability factors that are discussed in this study consists of: accessibility, easy-to-learn, technical design, efficiency and satisfaction. With the support of the relevant previous literature and interview, we research this topic by considering the mobile-assisted language learning (MALL), informal language-learning and usability elements, in order to explore and identify the usability of mobile phone. The goal of this study is to contribute to detailed understanding of mobile phone usage, further identify the usability issues of mobile phones by obtaining both critical and commendatory feedbacks and reflections from the users. For final results, through qualitative research approach, we offered several findings regarding the mobile phone usability with specified reasons.

Keywords: usability, mobile usability, mobile-assisted language learning (MALL), mobile learning (m-learning), informal learning.
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Abbreviations

MALL  Mobile Assisted Language Learning
M-learning  Mobile learning
CALL  Computer Assisted Language Learning
PDAs  Personal Digital Assistants
SMS  Short Message Service
SFI  Swedish for Immigrants
ISO  International Organization for Standardization
Chapter 1 Introduction

This chapter describes the background, problem description, the research question and the target audience of the thesis. At the end of this chapter, it shows the overall structure of this research paper, and what have been included in each chapter would be shortly mentioned.

1.1 Background

This research project comprises 3 big areas: mobile-assisted language learning (MALL), informal learning and usability evaluation. MALL is the suburb of a growing area of mobile learning (M-learning) and with time began to obtain more popularity among language learners, teachers, educational admirations and researchers. Nowadays, technological products have become more sophisticated, innovative and attractive due to their advanced capabilities. The merge of such technologies into educational context is a progressive process, as educators need to figure out how they can be effectively implemented to support various learning. Understanding the domain is helpful to develop more effective approaches to both teaching and learning, and practical materials for learners have become one of the major concerns of many scholars.

According to Kukulska, the successful development and improvement of M-learning depends on the human factors in the use of new mobile and wireless technologies (Agnes Kukulska-Hulme, 2007). But in order to achieve this, there is a need for further research on the user feedback, use of a certain product, product design, etc. Once the usability problems of a product are identified, it is possible to improve the usability of such product as well as promoting the effective use of it. The usability concept was rooted in 1980s when personal computers start to become part of people’s life (Mads Soegaard, 2012). It is agreed to be significantly important for user satisfaction and their acceptance of a certain product.

The other field related to this thesis is the informal learning. In terms of language learning scenarios, mobile technologies seem to be more helpful in informal learning situations, where the students learn language or carry out language learning activities without the guidance and help of a teacher or even classmates. Thus, exploring the user feedback in order to identify the usability issues of mobile phones (Only focusing on Smart phones) in the informal Swedish learning situations is our core goal in this project. More profound explanations about the research areas are introduced in Chapter 3.

1.2 Problem Description

‘In future, learners need not be tied to particular locations. They will be able to study at home, at work, or in a local library or shopping center, as well as in colleges and universities. People
will be able to study at a distance using broadcast media and online access. Our aim should be to help people to learn wherever they choose and support them in assessing how they are doing and where they want to go next’ states the British government’s Green Paper about lifelong learning (Secretary of State for Education and Employment, 1998).

After more than a decade, people have witnessed marvelous changes in terms of our learning environment, learning tools and learning approaches. Learning in the 21st century, or the digital age, is influenced by the rapid development of low-cost mobile devices, such as laptops, tablets, smartphones, etc (R. S. Cobcroft, et al., 2006). The dramatic developments in audio, video, and computer-mediated communication programs provided teachers with so many possibilities helping them to build activities, which involved listening to TV and radio news program, watching relevant videos and holding conversations in real-time (Taher Bahrani et al., 2012). And that started to be recognized and used by learners as well. Learners now are able to learn with the aid of computers, mobile phones, tablets and other personal digital assistants (PDAs). Therefore, several new concepts have come into existence regarding the guidance or assistance of technology in one’s learning: computer assisted language learning (CALL), mobile assisted language learning (MALL), mobile learning (M-learning) and online learning etc.

Most of those new mobile devices mentioned above, contributed to the development of a trendy, fast and unprecedented learning style, which is now known as mobile learning (M-learning). M-learning is an emerging concept due to the fact that the development and adoption rate of mobile technologies is increasing fast globally (Dr Tom H Brown, et al., 2003). However, according to the authors on Mobile Learning-system Usage (Saleh Alharbi, et, al., 2014), the concept of M-learning is not yet well defined in the literature, due to the various understandings of the term ‘mobility’. Generally, mobile learning is defined as the conducting of educational activities through using a mobile device and wireless service in which both the learner and the device are mobile (M. O. M. El- Hussein et al., 2010).

Speaking of m-learning, one new sub-terms of it has been developed, which is called mobile assisted language learning (MALL). According to Shield L et al. (2008) MALL is claimed to be an approach to language learning, which is enhanced or assisted through the support of modern mobile technological devices. Mobile technologies offer many advantages such as flexibility, small size, user-friendlessness, low cost etc. Researchers are also working on the usage, usability and how to apply mobile technologies to support and improve language learning in recent years (Huang et al., 2012). In early studies, Agnes Kukulska stated that the majority of mobile learning activities continue to take place on devices that were not initially designed or developed with the educational applications in mind (Agnes Kukulska- Hulme, 2007). But as technology became much more advanced and the expectations from both learners and educators increased, more and more mobile-designed apps and webs are
created, which is likely to motivate learners and enhance learner satisfactions. Yet, this does not imply that we are free from usability issues.

Some cases and research papers indicated the usability issues in m-learning devices in previous decade, such as having difficulty due to the screen brightness when the learner is outside (Corlett & Sharples, 2005), with wireless devices having weak signals and slow access to documents (JISC case study, 2005), having small screen size, low processing power, low memory capacity and high-costing data exchange rates (Amir Dirin et. al, 2013). These issues addressed the necessity to carry out usability testing, heuristic evaluation, usability evaluation, researching user experience and observation on from a huge system to an individual app. Therefore studying usability issues and user experience are of great importance for the development and design of mobile technical devices that are suitable for m-learning or MALL. In addition, the usability testing and other relevant studies would contribute to the understanding of user expectation and user attitude. All these, consequently promote the user satisfaction, product acceptance and efficiency of a certain activity, in which the specific product or method is used. However, when it comes to the usability in the educational context, researchers have to be extremely cautious because of the intimate relationship between usability and pedagogical design (Agnes Kukulska- Hulme, 2006). Pęcherzewska and Knot claimed that concerning m-learning in general, the majority of MALL activities are said to make use of mobile phones (2007). Mobile phones indeed empower m-learning and MALL by having all these characteristics such as flexible, mobile, instant, low-costing and accessible etc.

1.3 Research Purpose

This thesis investigates the usage of mobile phones to support informal Swedish language learning and address the identified usability problems. Thus, the purpose of this study is:

(1)Investigate the usability issues of mobile phone in mobile-assisted Swedish learning in informal learning situations.

This goal is achieved through face-to-face (semi-structured) interviews with a group of Swedish learners by asking topic-related questions. Our overall aim is to contribute to the mobile-assisted language learning theories and practices, as well as to improve the Swedish learning results by utilizing the potential benefit of mobile phone and suggesting improvements in current m-learning mobile tools with focus on Swedish language acquisition aspects.
1.4 Research Question

The goal of this project is to explore the mobile phone usability problems exist in informal Swedish-learning situation. In order to achieve this goal, we are expected to combine the concept of m-learning, MALL, informal (language) learning, and mobile usability. After binding all those concepts together, the following research questions are defined:

- Regarding the informal Swedish language learning, how mobile phones are being used?
- How is the Usability of Mobile phones in informal Swedish-learning? What the users/learners think about it?
- What are the advantages and disadvantages of mobile phones in Swedish mobile-assisted-language learning?

Directed by these research questions, qualitative data are gained through the interviews with 7 participants who have been learning Swedish at both University and SFI (Swedish for Immigrants) schools.

1.5 Target Audience

The expected audiences for this thesis are:

- Scholars/researchers working on the field of mobile usability; usability testing; M-learning and MALL.
- Educational organization and teachers who are trying to help and improve the students’ language acquisition/learning output;
- Non-Swedish speakers who aim to learn Swedish language could be another interested reader.
- Companies who develop learning-related online websites or apps. Through this study they are likely to create more mobile-friendly apps for Swedish learning.

1.6 Structure

There are 5 chapters altogether. **Chapter 2** describes the methodologies used to answer the research questions. We will explain the conceptual knowledge associated to the research area in **Chapter 3**. Then **Chapter 4** introduces both the findings and a detailed analyzes of the results. **Chapter 5** covers information about the future expectations and conclusions.
Chapter 2 Methodologies for this Study

After setting up the research questions and research goal, this chapter, describes the research plan and the structure of the research design. According to Toledo (2012), a research design should be clear, doable and reasonable to follow the logic. This chapter presents explicitly the design, the data collection, and data analyses methods adopted in this study.

2.1 The Research Design

This study is an empirical research supported by the participation of limited number of Swedish language learners. It is carried out based on the conceptual background of informal language learning, MALL and usability. As mentioned in the introduction part, the research aim is to specifically investigate the usability issues of mobile phone in mobile-assisted Swedish learning, under the condition of focusing on the informal learning scenarios. The overall research design includes 4 steps: 1. Research Planning 2. Methodology Validation 3. Data Collection 4. Data Analyzing 5. Summary shown in Figure 1.

1. Research Planning- It is the initial work required to support the subsequent phases of the research. During this phase, a thorough study is carried out in order to get familiar with the main existing practices within our field of study. The outcomes from this phase are used to devise the research goal and questions. This phase highlights the possible contribution of this study as well.

2. Methodology Validation – Whereas Research Planning is more concerned with the research direction, research questions, and research aim, the Methodology Validation
concerns the approaches used for carrying out the research. This phase aims to determine the most appropriate methods for answering our research goal by exploiting the available background knowledge which is called by us as theory base. Based on the nature of the research goal and research questions, a \textit{qualitative research method} was deemed as advisable for this thesis. Qualitative method is said to be of great value to exploring issues, getting to know phenomena by analyzing and making sense of unstructured data (\textit{online resource: www.qsrinternational.com}). For our study, it is used to identify the usability issues of mobile phones in terms of informal Swedish learning.

3. Data Collection - After forming the research plan and determining the methodology, data collection is the next step in this study. With the motivation of research questions, we gathered useful and research-related information through semi-structured interviews to enable us to find out the answers for our questions and reach research aim.

4. Data Analyzing - After we gathered related data; our next step is data analyzing. In this stage, we have re-checked and categorized the raw data, and excluded the research-irrelevant ones out, and ultimately saved the ‘clean’, data. Through this stage, we manage to collect explanatory statements and address the answer to our research questions.

5. Summary and conclusion - It plays the same role as conclusion section does. After going through all the earlier phases, this is the last section. We made the most use of our time and effort to acquire truly, and correctly interpreted research summary at the end. After stating a summary about the data we have analyzed, the final conclusion will be provided.

As displayed above, each stage involves different research activities, and promotes the continuity of the next stage.

2.2 The Interview

This is a qualitative study. Interviews in qualitative research have been considered as an important channel to the research result. According to \textit{McNamara (1999)}, interviews are particularly helpful for getting the story behind the interviewees’ experiences, and beneficial to investigate their responses further. However there is a downside of interviews as a research approach. Considering that the interviewer is the one who mainly designs and dominates the interview process, interviewers are said to have some bias: based on the study ‘Interview as a method for qualitative research’ (\textit{Dapzury V et al., 2008}):

- The interviewer has to know the multiple ways that inadvertently bias the results;
- The interviewers needs to understand why it is crucial that they do not bias the study;
- By reclining the result, they may disadvantage/ jeopardize the result or the aim of the study;
By bearing in mind these biases for an interviewee, with the most possible cautious manner, we carried out the interview by cooperating with the foreign (non-Swedish) people/students, who are currently learning Swedish in Swedish Universities or SFI (Swedish for Immigrants) schools. With the intention to achieve a successful and effective interview, we carefully considered those factors before the interview:

**How many participants should be interviewed?**
Originally we planned to interview 10 to 15 people. However, due to the saturation state in our raw data results, altogether 8 people were interviewed. Among that, one person’s data was removed during the data analyzing process for the fact that the interviewee was considered to misunderstand the questions and departing from the topic and answered to another irrelevant question. Hence, the ultimate number of the participants for the interview is 7.

**People with what kind of background should be interviewed?**
Since this study is concerned with the user perspectives, our target participants are the Swedish learners with different study background. Most of them are currently university students, with the background of science, information technology, social science and only two of them are newly graduates. We did not specifically differentiate the background of those interviewers, nor tried to interview the same ones. Instead we assumed that various people from different background might offer different practical and unprecedented ideas regarding the mobile usability in their Swedish language learning.

**How to make the contact and persuade the people to be part of our interviewee?**
We chose to contact the people through face-to-face form, by introducing the topic and research aim, further asking inform them if they would be willing to be the interviewee for this research. One more issue that needs to be pointed out is that, the interview was done almost immediately after getting their permission about being participant for the interview. In order not to lose the target interviewee, we’ve decided to begin the interview timely.

**Where should we carry out the interviews?**
In regard with this, we gave the right to the participants to decide where he/she wants it to be done. Thus, the school library, and also cafeteria were selected as the interview locations. Places that seemed to be quiet and have electricity connection (for the computer to record the conversation) were our main concerns regarding the locations.

**In which way the interview is carried out?**
Based on theory, there are mainly three different approaches for carrying out an interview (structured *interview*, semi-structured *interview* and *unstructured interview*). For our research, we applied a semi-structured interview. What is more, we complete the interview with the assistance of computer to record the audio/conversation between interviewees.
2.3 Data Collection

2.3.1 Background Knowledge
For the research process in information system (IS) field, the most common research methods are interviews, observation, questionnaires and documents. The selection of the method is decided by the researcher and the context of research questions and research aims, as well as the conceptual framework (Briony J Oates, 2009). After briefly describing the research methodology that was selected for our research (section 2.1), the data collection procedures will be shown in more details in this subsequent section.

In accordance with the research questions and research aim, the data were collected through a semi-structure interview (qualitative approach) by asking open ended questions:

1. **Semi-structured interview**- is usually conducted with a more causal order of the questions. In this type of interview, the tester participates in the interview by being more talkative and interacting with the interviewee as opposed to the structured interview, which is more formal due to pre-code answers. An unstructured interview describes an interview procedure in which the researcher has less control and gives most of the time to the participant to talk and develop his/her ideas (Briony J Oates, 2009). Semi-structured interviews are often preceded by observation, informal and unstructured interviewing to permit the researchers to develop a sharp understanding of the topic of interest necessary for developing relevant and meaningful semi-structured questions (Online resource, www.qualres.org). For our interviews, we used similar form of questions to understand and be more explorative. However, we did not strictly follow the same questioning order for different participants. And if necessary, we added some extra sentences or words to make sure the smooth ongoing for the interview. Meantime, we played a leading role to explain the concepts, background and definition of certain things and also made the interview less serious, and attempted to be free and open to talk more, and reflect more.

2. **Open-ended questions**- are questions that the interviewee is expected to think more, and offer more than a one-word answer. It is not like close-ended question, which requires the person to give ‘yes’ or ‘no’ answer, or a simple one-word response, for example, the multiple choice questions on some questionnaire. Open-ended questions are considered to be rather beneficial for finding out more about the situations, or about a certain object. The question format in open-ended questions would be like, ‘Tell me about...’, ‘What do you think...’ or ‘Why do you emphasized ...’ etc. (Open-ended Questions, Media college). In this research, during our interview, we adopted this type of question in order to let the interview participants be free, explorative to provide deep, thoughtful and meaningful answers. Information for experience, opinions, feeling and input etc., are involved in our questions (Appendix 2).
About the interview questions that we have put in appendix 2, we need to clarify that they are not the only questions that have been asked during the interview. We decided to put the questions in a more organized and summarized way so that the readers can get to know the content of the questions, rather than the manner we used to ask these questions. Moreover, since, we, as an interviewer, focused on the same research goal, thus, we made sure that there would not be a huge difference between all the questions, especially in terms of usability attributes. Based on what each participant answered to our pre-interview question (in section 2.3.2), we formulated our questions and continued the interview.

### 2.3.2 Data Collection Procedure

For our study, the data is mainly collected through a face-to-face interview. Here is the detailed data collection procedure displayed in the table (Table 1), explaining each step, and what kind of activities is involved in that particular step.

<table>
<thead>
<tr>
<th>Interview Guidelines (Franck Tétard, 2015)</th>
<th>What is going to be done or asked? (activities or elements that are involved)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Planning the interview</strong></td>
<td><strong>What:</strong> The kind of questions that is asked during the interview. It begins with questions in relation to the user background, the type of mobile phone, and the amount of time he /she spends on the phone, his /her first impression about his/ her own mobile phone in regards with informal Swedish learning. Further, the questions would be asked regarding the 5 components of usability theory. Then, more explanation is asked for individual evaluations for usability; <strong>Who:</strong> International/foreign people who study Swedish in Uppsala (both University and SFI schools), at the age of from 20 to 40, both female and male. <strong>How:</strong> Face-to-face semi-structured interview will be done for this study in different time, with the help of audio-recorder and note-taking. And with some material reward to the participants such as candies or cookies.</td>
</tr>
<tr>
<td><strong>2. Arranging the interview</strong></td>
<td><strong>Contacting:</strong> For this study, relevant contacts in advance are not really needed since the interview would be carried out spontaneously. And ultimately 8 (eight) Swedish learners participated in this interview. <strong>Informing/Notifying:</strong> The interview process is spontaneously. After a short introduction about the project /research goal, the permission will be asked if the person is willing to participate in it. Besides, they are told that they are free to ask for clarifications or further explanation of the questions asked or other aspects of this study. <strong>Arranging:</strong> In order to arrange an interview, the place and time will be decided based on the need of the participant, not the interviewer/us (if he is fine with my decision, then the other way around.). Additional devices needed for this interview have to be prepared as well: an audio recorder with enough memory, notebook and pen. <strong>Confirm:</strong> Let the participant know the conditions and privacy terms that we are going to make sure. What is more, asking his permission and tolerance for an unexpected situation, for example, the interview might take more than the original plan (13-18 minutes).</td>
</tr>
<tr>
<td><strong>3.Carrying out the interview</strong></td>
<td><strong>Introduction:</strong> The interview begins with the introduction about us (interviewer), study background, and the aim of this interview. Then another introduction to the project, the project background and contexts of the study is shortly mentioned. In next step, some questions about the user’ learning habits, what that person mostly uses mobile phone for (in terms of Swedish language learning activities, e.g., listening, reading, speaking, writing or vocabulary learning etc.) are asked.</td>
</tr>
</tbody>
</table>
The usability assessment: Most crucial and research-relevant questions would be asked in this part in the form of open-ended questions. As shown in appendix 2, 5 big questions are further mentioned by us, with the intention to let the participant be more explorative, talkative, and precise. However, the contexts of the questions are roughly similar but not completely the same with each other literally/textually. But the differentiation exists to a small degree.

The ending of the interview: A quick reflection would be given on the interviewee's performance and the data he/she has provided. And also ask if it is okay to contact the person for further, necessary question or information for this research.

| 4. Summarizing the interview | Fast and short summary about the interviewee, quick and short conclusion about the data gathered during that interview would be done, with the help of fresh memory and ‘keyword’ paper recording. |

Table 1. The Detailed Data Collection Procedures

The overall process took place in such an order: asking the permission for an interview (if the person agreed), then asking the pre-questions, which is shortly explained in the 3 step in this table (introduction), and then moving to the questions related to the usability components. After the concrete assessment, the core part of the research came: questioning the participant for offering such an evaluation or the reason behind it. By that, we managed to see how users perceive mobile phones, and the issues or advantages they carry in informal situations for Swedish language learning.

2.4 Data Analysis

After gathering the data during the data collection phase, the next step is to analyze the data. Qualitative data analysis is the range of processes and procedures whereby researcher moves from the qualitative data that have been obtained into certain form of explanation, understanding or interpretation of the people and situations we are investigating (Tilahun Nigatu, 2009). In order to achieve useful data analyzing results, the following procedures are followed:

1. Data preparation: During this phase of the research, data preparation is the first step. It is process where we aim to get the raw/original data into a form ready to be analyzed. Thus, for this process, we will get the raw data ready by rearranging the audio data and the transcribing them at the end.

2. Designing a framework and data coding: After reading the transcript and listening to the audio again and again, we begin the next step: identifying and designing a framework, which is helpful to structure, label and define the data useful for the research. For this study, a framework (explanatory framework, which is guided by the research question) will be developed. Then, under the lead of our framework, we will start coding, in the form of selective coding. For this, we will code our data based on coding keywords.
(Appendix 2) or key phrases and themes. We will begin by taking a small chunk of the text where the line is being coded, and to see if the text/ data include any of the keywords (or to observe the occurrence of new keyword that we haven’t formed). And this step will be repeated to mark the key phrase and further analysis it.

3. **Comparison**: After each coding, there will be a short summarization and the codes will be compared to see if there is any new term or new concepts occurred compared to the earlier code, so that an upper level of concepts would be developed. What is more, constant comparison is thought to be useful to ensure that coding is consistent (allows to observe if the selected piece of text one codes is helpful; If not, then one should consider choosing other piece of text/ words to code relevant to the study).

4. **Data analyzing**: It is a process of cleaning, transforming and modeling data with the aim of finding out useful information, conclusions and supporting decision-making. In terms of the data analyzing, the ‘Ground Theory’ is applied, and the inductive thinking is used during our data analyzing procedures.

![Figure 2. The Qualitative Data Analyzing Procedures](image-url)
Chapter 3 Key Concepts and State-of-the-Art

In the first part of background section, the essential research-related concepts are shortly explained. Their definition, characteristics, their interrelations with each other, and the subareas that they involve are also delivered in this section.

### 3.1 M-learning and Mobile Assisted Language Learning (MALL)

Before giving any explanatory about the concepts, we thought about the necessity of a diagram to show the simple relationship between MALL and M-learning.

![Figure 3. The Relationship of M-learning and MALL.](image)

When discussing mobile assisted language learning (MALL), it is common to talk about its features or any specialties by involving M-learning. M-learning, can cover almost any types of subjects, and can be applied into any style of learning. It can be applied in science, art, literature, or even the common knowledge about society, culture, religion, philosophy etc., while underlying the mobility of learning and learning device.

According to Vavoula, m-learning is defined as ‘any sort of learning that happens when the learning is not at a fixed predetermined location, or learning that happens when the learner takes advantage of learning opportunity offered by mobile technologies’ (Vavoula, G. 2005). In the past, the definition of m-learning has often been defined based on the use of mobile technologies, yet, more previous studies begun to prioritize the mobility of learner as well (Sharples, 2006). Often, the informal aspect of m-learning is also emphasized (e.g., Fallakhair, 2007). Even though m-learning can take place either in the classroom learning environment or outside the classroom, it is stated that m-learning technologies are more useful for doing learning activities while the user is outside the classroom (Tayebeh Mosavi Miangah et al., 2012). M-learning enables the learner to have mobility in both physical mobility and device-mobility. Through the aid of mobile technologies, the users are able to save time, save effort and be more effective. Learners can achieve a better learning result by means of cooperative, collaborative, interactive and independent learning. Based on what Valk et al., (2010) claimed in his study, m-learning has been proved to be effective in improving educational
outcomes, because it improves access to education and promotes learning that is learner-centered, personalized, collaborative, situated and ubiquitous.

In both m-learning and MALL terminology definitions, the ‘mobility’ has been always a crucial factor that needs to be understood correctly in terms of the identification of ‘mobility’. There have been various arguments about it. For example, in 2002, Sharples et al., claimed the concept of mobile learning was strongly linked to the device (2002). But later they (Sharples et al., 2005) claimed again that it is the learner that is mobile, rather than the technology. Mark Pegrum (2014) adopted the previous research results to state that mobility does not only primarily refer to the devices, but also the learner, and even the learning itself (Traxler, 2007). Different user or learner is likely to hold different opinion about mobility in m-learning. Some may regard m-learning as learning while one is outside, while he/she is travelling, running, cooking, or driving. For these types of users, mobility is something that entitles them to learn ‘eyes-free’ and ‘hand-free’. Others, nevertheless, possibly focus on the mobility of device. For them, m-learning is a learning that enables them to actually learn through the help of mobile devices.

However, MALL mainly focuses on the language learning, and language acquisition contexts. Even though technically, both are used within the educational area, MALL is rooted into a more specific field by emphasizing the assistance of mobile technological device in one’s language learning. MALL is the formal or informal learning of a foreign language with the assistance of mobile devices, claimed Xiao- Bin Chen (2013). It implies the on-going of language learning activities without being restricted in terms of space and time; any kind of language learning happens without being limited to a fixed or pre-arranged location or pre-determined time scenarios. It is a relatively new research area (Vavoula & Sharples, 2008), despite the fact that people have now been using personal portable devices for some time.

The main distinguishing feature that MALL has compared with the traditional language learning:

1) It is able to afford the mobility. Learners are totally able to carry their devices anywhere, and learn a language in ‘mobile’ way;

2) MALL holds possibilities for increased learning opportunities through spatial and time shifts (Kukulska - Hulme, 2009). The learners are not restricted to learning due to the change of the place and time;

3) Another additional characteristic of MALL is connectivity (Xiao- Bin Chen, 2013) which connects students with teachers, and also students with students. Therefore, through the 3G data availability and Wi-Fi network, current mobile devices provide the learners with huge opportunities to be engaged in useful real-context interactions and multi-way collaborative learning. All of the above mentioned advantages are almost impossible to achieve in the
traditional language learning environment, in particular out-of-school/classroom informal environment (Lan et al., 2007 & Chang & Hsu, 2011).

3.2 Informal (Language) Learning

Another essential field of this study is Informal Language Learning. Through the name, it can show the close correlation between informal language learning and informal learning. Just like the relationship between MALL and m-learning, informal language learning is part of informal learning. In other words, one is about learning language in informal approach, the other is the generalized context for all sorts of learning.

Informal learning was found as an essential social phenomenon as early as the 1970s (Tough M. Allen, 1979). There are various types of definition of informal learning. Coombs and Ahmed et al., (1974) have claimed that informal learning is “the lifelong process by which every individual acquires and gathers knowledge, skills, attitudes, and insights from exposure to the environment at home or at work through reading books and newspapers, or by watching films or televisions, or listening to radio”. In 2000, Livingston defined it as “any activities involving the pursuit of understanding, knowledge or skill which occurs outside the curricula of institutions providing educational programs, courses or workshops”. However, by 2006, Livingston (2006) improved the relevant research and redefined informal learning in this way: “all forms of intentional or tacit learning in which we engage either individually or collectively without direct reliance on a teacher or externally organized curriculum”.

Informal language learning was originally defined by Knowles in 1950 (Taher Bahrani et al., 2012). The definition carries certain similarities as informal learning. Rogers (2004) defined informal language learning as unstructured, unintentional but is the most expansive and most significant part of all the learning that all of us are engaged in every day in life. While setting the definition of informal language learning, some researchers linked their definition directly with informal learning concept. For example, the scholar Barbra Granegna applied the informal learning definition in the research paper named ‘Formal Language Teaching versus Informal Language Learning Supported by Mobile Devices’. The author only mentioned the definition of informal learning, without giving explanation for informal language learning in the research paper.

Modern mobile devices play a significant role in the informal language learning scenarios. They began to enable learners to move from traditional language learning manners such as interacting with native speakers, or reading newspapers to conducting an individual, independent and technology-assisted language learning forms. And that brought us to the formulation of computer assisted language learning (CALL) and Mobile assisted language learning (MALL) contexts. They provide the learners with strong connectivity with other
learners or learning resources. Many experienced users are said to adopt their mobile devices such as Tablets, smartphones, MP3 players etc., to assist their informal learning (learning activities). Similar to many informal language learning research studies, we will discuss our study by referring to the informal learning theories, and applying them into the informal language learning practices.

Informal learning is roughly classified as intentional informal learning and non-intentional informal learning, as shown in the figure below (Figure 2). Based on this typology, in the research, we decided to apply the informality into both scenarios. Put it in another way, during the interview every learner/interviewee would be asked certain questions to describe their individual learning habits, routines, learning methods and their main aims while using mobile phone. And both intentional and un-intentional informal learning activities would be applied in this study, without being strictly distinguished.

![Figure 4. Typology of Informal Learning (Reproduced from Vavoula et al. 2005).](image)

**3.3 Usability**

The term usability was first applied in the 1960s to define the ease, which user can use a program. Since then there have been several explanations introduced and even now it appears to lack a contextual agreement regarding what it is (ISO 2002, Nielsen 1993 and Quesenbery 2011). The simplest and consensual explanation is that it refers to the ‘ease’ with which people can use a human-made object. Usability is considered to be crucial to user satisfaction and their acceptance of certain object. According to ISO (International Organization for Standardization, Guidance for Usability), ‘usability is an approach to product development that incorporates direct user feedback throughout the development cycle, in order to reduce cost and create products and tools that meet user need ’. Meanwhile, Keinonen (1998) has argued that usability is a term related to these features 1) The product’s design process, 2) The product itself, 3) Use of product, 4) User experience of product or user expectations from this product. For our study, we mainly concentrated on
the feature 3 and 4. Moreover, usability context is discussed by combining the usability attributes from Jakob Nielson and other recent m-learning researches in this thesis.

Human-computer interaction researchers recognized that in order to develop a good system with good usability, it is essential to get to know the psychological, ergonomic, organizational and social factor that influences how people operate (Agnes Kukulska-Hulme, 2007). Agnes Kukulska has stated that mobile learning development has a huge dependency on human factors while using new mobile and wireless technologies. She also claims that by involving usability concepts in it, mobile usability can be seen as a raising specialism within the more general area of usability. Usability is explained by Jakob Nielsen (1993) as the overall acceptability of a system, including its social acceptability and all practical elements like cost, compatibility, usefulness and reliability. Early studies imply that in mobile learning the user-centered design and focus on contexts of use will contribute to better mobile learning usability (Agnes Kukulska-Hulme, 2007).

It is important to be aware that usability is not a single, one-dimensional property of a product, system, or user interface (Online recourse, www.usability.gov). It is about the effectiveness, efficiency and overall satisfaction of the user while using a certain product and it is the combination of several indicators including east of learning, efficiency of use, memorability satisfaction etc. Whereas, the most common existing models of usability defined by Jakob Nielsen, which is built up by these five factors: efficiency; satisfaction; learnability; memorability; errors. Through literature review from previous studies, we found out that most of the definitions of usability emphasize efficiency, learnability and user satisfaction particularly. From some of the previous research studies, we found out that there is a variance of the usability attributes, depending on the system features or the characteristics of research objects. Based on relevant earlier studies and also additional thinking about our research goal, we decided to overstep and investigate this study by involving some newborn usability attributes with Nielson’s usability component: accessibility, easy-to-learn, efficiency, technical design and satisfaction. In terms of this study, we did not observe all the usability attributes that Nielson has defined; neither did we follow all the usability factors that others have used for their studies. For us, our aim is to get to know and explore the mobile phone usability issues in informal Swedish language learning situations rather than conducting a usability testing (which is often conducted in a lab and also pre-deciding some scenarios or tasks for the participants). Thus, after taking the research aim, the research object/product, and also studying m-learning into our consideration, we set up those 5 factors finally:

1. **Accessibility** ([Sylvanen & Nokelainen](#)): It can be also understood as the ‘ability to access’ and benefit from some product or system. This concept underlines the access to something for the people with special needs, disabilities or even the enabling path through the appliance of a particular technology. Accessibility implies close correlations
between the universal designs of a certain product with the possible range of abilities or functionalities it can provide to the people. This is about making things more accessible to all people whether they have a disability or not (Online resource, www.en.wikipedia.org/wiki/Accessibility). After asking questions about the user’s learning habits and aspects that one uses mobile phone frequently for (like learning, listening or vocabulary practices?), we further asked his/ her subjective evaluation about accessibility, then we asked the participant to clarify/ explain for such an evaluation (more details in Chapter 4). Thereby, in this study, accessibility can be understood in this way: How is the accessibility of your mobile phone in your Swedish language learning activities in the informal situations (high or low)? Is it easy is to access and use mobile phone devices for Swedish language learning related activities (For example, when one need to listen to something, or read something or conduct a vocabulary practices, is it easily accessible or not? ).

2. **Easy-to-learn** *(Quesenbery)*: how well the product supports learning throughout its lifetime of use. It involves both initial orientation and continued learning to use a specific product. *Whitney Quesenbery* has used ease-to-learn concept to replace the original ‘learnability’ attribute in Jakob Nielson’s. Besides, learnability is more concerned with the initial use or the first time that the user interacted with a certain system or application, and it is easiness to learn the system. *Vishal Mehta (2011)* has also promoted this idea by claiming that an easy-to-learn product is the one that is supportive in one’s both initial and continued learning to use. He also pointed out that we need to exercise usability in the expectation of the future directions of a particular product to see that it is just easy to learn to use, but easy to master as well. Thereupon, combining both Mehtas and Quesenberys ideas, we decided to adopt this idea to see to what extent are mobile phones easy-to-learn for the Swedish learning purposes in informal language learning. In other words, in this study, it proposes if the mobile phones for Swedish leaning activities (informal situation) require a lot of instructions and help?

3. **Technical design** *(Yu-Hui Chen et al)*: A similar concept (interface/design) is involved in usability attributes in a research paper by *Yu-Hui Chen et al., (2009)*. Based on what has been identified in that study, interface/ design, defined as the technical design concerning the system or website interface, including its design elements (e.g., color, scrolling, and links), design consistency, and navigation (breadth and depth). Thus, in our study concerning the specialty of the object in this research and research goal, we’ve come up with a new index to assess the mobile phone usability and further explore the usability issues. We defined technical design as the design structures of a particular item and their functionalities or performance for a particular task. As a result, in this study, it implies the quality of design, screen size, sound effect, display, keyboard for entering to search for something relevant to the user purpose for his learning activities.
4. **Efficiency** *(Nielsen)*: Assuming that the users have learnt the design or a feature of a product, how quick and effort-saving is it to accomplish a particular task? In a general sense, efficiency can be seen as the ability to do a certain thing successfully and without the waste of time and extra effort. It is not uncommon that the concept of efficiency is very often misunderstood as something similar to effectiveness. Effectiveness is about doing the right things, and efficiency is doing things right *(online recourse, https://en.wikipedia.org/wiki/Efficiency)*. Generally speaking, efficiency is usually measured in quantitative manner, considering the ratio of useful result/ outcome to total input. Consequently, in this research, efficiency questions the time and effort to be spent to accomplish certain goal, or to satisfy one’s needed.

5. **Satisfaction** *(Nielsen)*: How pleasant is it to use the product/ system. In other words, it refers to how users feel about a particular product while using it. Satisfaction is said to be the subjective opinion that comes from users about the system (or about some parts of it). It is mostly an elusive usability attribute, and it is totally reliant on the subjective opinions of user *(S.A Adepoju et al., 2008)*. It can be connected with the emotional feelings like, frustration, anger, worry or annoyance of a certain item/system/ app etc., while using the phone for Swedish learning-related activities.

Usability needs to be understood differently when it is being evaluated in the pedagogical context (Appendix 1), claimed Agnes Kukulska et al., (2006). According to Agnes Kukulska (2007) usability is particularly measured from the viewpoints of problems or issues encountered by the ultimate users. When we first looked at Jakob Nielson’s usability attributes, we formulated our usability attributes by *exclusion method*: First, we excluded the ‘Error’ factor, since it is more related to a specific task (which is part of a usability testing), and the errors occurred during the accomplishment of such task. Due to the specialty and difference of our research goal, we realized that it is impossible and unreasonable for us to take this as our consideration for this study. Secondly, ‘memorability’ was removed from our usability attribute options. Based on what Nielson has justified for memorability, it refers to when the users return to the design after a period of not using it, how easily can they reestablish proficiency? But for our study, it is the mobile phones, which with a very high chance of being constantly used by the people, and we did not base our study on a particular app or web, which also made it impossible to evaluate the memorability and find out the relevant issues later. Then the ‘learnability’, we initially decided to apply this term in our study, but after looking through Whitney Quesenbery’s study, we found out the latter one is more sound and more suitable for our study. Last, we came up with the idea of treating mobile phone as an independent object, which also interested us to go through the overall technical design/ interface, to explore the issues in terms of the technical design (including the display, screen, portability, sound/ hearing effect etc.) of mobile phones while considering them as a learning assisting tool.
Often, usability is seen to be a technical topic by educators and trainers, but from the view of pedagogical point, it is concerned with providing good educational experience and helps the participants (e.g., students and teachers) to achieve a successful interactions (Agnes Kukulska et al., 2005). In our research, we tried to go beyond the pedagogical usability concepts (e.g., learner control, learner activity, goal orientation etc.), and focus mainly on the technical usability and also come up with other new usability attributes. Even if we did not observe the usability rules totally, we still believe that through those components we will be able to investigate the usability issues of mobile phones comprehensively.

3.4 Mobile phones in MALL

3.4.1 Learning Approaches in Language learning
The urgent need of combining mobile technologies with everyday life and school life has grown so fast in this era thanks to the incremental development in the mobile technologies. Speaking of the appliance of modern mobile devices in learning context, the usage scale started to expand to both formal and informal learning situations in terms of almost all the school subjects. And the use of technology in learning and teaching environments particularly began to achieve considerable attentions recently. Warschauer and Meskill (2000) have claimed that usually, any type of language learning activity involves the use of a particular type of technology. Two types of learning approaches have been introduced in order to show how technology (from the traditional ones like auto-tapes to modern devices such as mobile phones or tablets) has been used in accordance to particular learning approaches, in the paper named ‘The effect of Mobile Assisted Language Learning …’ (Sasan Baleghizaden et. al, 2010):

1. Cognitive approaches
It is prone to treat learning as a psychological process through which the learners try to make a mental model of language learning system through active interactions of cognitive structures and comprehensive input, according to Chastain (1988). Therefor in this approach, mistakes that students make are not viewed as the outcome of bad habits which should be avoided, but instead, treated as natural products of this construction process. Relevant technologies that resonate with this approach are the one that allow the learners to have the chance to have interactions with rich and useful contexts, which promotes the development of competence. For example, some of the technologies, such as are text-reconstruction, telecommunications and multi-media simulation software (Sasan Baleghizaden et. al, 2010).

2. Sociolinguistic approaches
These types of approaches view working with people and socialization as essential area
of any sort of language learning and teaching activities. Thus, in this manner, language learning is considered as a process of real socialization into a particular discourse communities (Schieffelin and Ochs, 1986). This can be reached with the aid of various collaborations between students on particular projects and tasks. In regards with this practice, the Internet support on mobile technologies is the main catalyst for a collaboration and communication in learning scenarios. Thus, the aid of technical products, especially the current modern devices contribute to a revolutionary learning: from the one-way individual learning to two- or multi- way collaborative learning (Lan et al., 2007; Chang & Hsu, 2011).

With the emergence of various methods, different forms of technical devices provide an effective and efficient support for language learning. For instance, for listening, except from the traditional and simply-designed MP3 players or similar devices, learners now are able to use mobile phone, tablets or handheld devices to listen to the course-related contents anytime anywhere. For speaking, except practicing it face-to-face manner, oral practices can take place through only with the learners are talking to each other from different parts of the world. With time passing by and fast innovation in mobile technologies, the learning strategies of the contemporary students changed largely from the traditional manner. Some of today’s mobile devices, such as mobile phones (particularly smartphones) and tablets, can play the same role (or even more) as MP3 or MP4 players, listening, recording, or watching videos.

After talking about the support and assistance of mobile technical devices, the terms of mobile assisted language learning (MALL) is established. MALL is defined as the formal and informal learning of a forging language with the aid of mobile devices. In MALL, the ubiquitous availability of portable devices with their other functionalities, make MALL to be distinguishing from the traditional language learning: mobility, availability at any time anywhere, and connectivity that portable devices offer.

3.4.2 Mobile phones in MALL
According to the Global Mobile Statistics, in Apple App store and Google Play over 800,000 apps are sold and 800 to 1000 apps out of all are introduced for language learning (online resource, mobilethinking.com). Since the first attempt to use mobile phone for language learning in around 2001 (Hourser, Thronton, Yokoi & Yasuda), mobile phones and their usage in language learning and teaching context became more common. Mobile phones seem to have more advantages in language learning field by having these properties:

1. Costs: Economically, mobile phones are relatively economical than modern mobile device. Due to this reason, it is even estimated that after 2011 the mobile phones use among the world is four times bigger than the use of personal computers (Brightside of
the News). Even though owning mobile phones does not necessarily indicate its usage in language learning, it shows the fact that mobile phones are what most people can afford when it comes to modern technical devices.

2. **Portability**: Mobile phones are relatively smaller than other devices, such as tablet, IPad, handheld computer, or desktop computers. With this characteristic, learners can have their phones in the pocket, bag or just on the hand. With a smartphone in their hand, students carry a device with the capabilities of a computer but the portability of mobile phones (Adrian L; Akihiko T et al, 2015). This feature entails mobile phones to be available without being restricted by the space and time.

3. **Data connection**: With this property, students are able to carry out many sorts of learning activities in individual and collaborative manner in the form of informal and formal learning environment. In addition to these accesses, learners are able to get access to learning materials and practice learning. Compared to this, tablets they don’t usually work for the collaborative learning, especially when there is no Wifi connection. Besides, mobile phones, even without internet connection, by the natural functionality-calling or SMS, students are still possibly able to reach collaborative and cooperative language learning.

4. **Functionality**: In contrast to other language learning assisting tools such as computers, tablets, IPods Touch etc., mobile phones build a direct bridge for human communication, even when there is no Internet access (through SMS, and calling functions). Even if cannot be used as efficiently as it has data connections, students are likely to contact with each other, with teachers to interact and exchange ideas in regards with language learning aspects. This cannot be immediately achieved by tablets and computers, especially without internet connection.

Concerning mobile phones in m-learning and MALL in general, Pęcherzewska & Knot have claimed that the majority of MALL activities seem to make use of mobile phones (2007). The increasing development of mobile phones and their big change in functionalities fulfill the need of teachers and students in pedagogical context. Klopf er (2002) with his co-workers have summarized the properties of mobile devices used in MALL as follow:

1) Portability: such devices can be taken to different places anytime due to small size and weight; 2) Social interactivity: exchanging data and collaboration with other learners is possible through mobile devices; 3) Context sensitivity: the data on the mobile devices can be gathered and responded uniquely to the current location and time; 4) Connectivity: mobile devices can be connected to other devices, data collection devices, or a common network by creating a shared network; 5) Individuality: activities platform can be customized for individual learner.

Over the decades, mobile phones have been used in so many different aspects. For example, some used traditional telephones to facilitate distant language learners with feedback and
assistance (Twarog et al., 1988); Some used mobile phones to send learning relevant contents, such as words, idioms etc., via SMS (Levy and Kennedy, 2005); Some others utilized mobile phones to recite words through apps and improve reading comprehension while they are on the train and bus.

Discussed as above, mobiles phones are gaining gradual preferences by learners and even teachers. Besides, more and more mobile-friendly apps and mobile form web-designs are developed by some organization in order to create a better and effective learning atmosphere. Learners obtain effective benefits from reading, listening or grammatical accuracy and spelling, but also improved their self-confidence and motivation for learning (Naveen K Mehta, 2012). However, even with some features that make them more stand-out, it does not necessarily mean that mobile phones are without defects. Mobile phones are seen as a distraction while studying by some students according to Leis (2014). Another problem exists in mobile phones is the small screen, which ultimately makes reading, and writing relatively difficult compared to computers and tablets. What’s more, the small screen size leads to more scrolling, which is considered to be time-consuming and result in frustration among users. Another issue exists in the mobile phone usage in language learning is that some learning activities such as watching some videos, using apps or downloading relevant materials without Wi-Fi connectivity are the huge ‘consumer’ for the 3G data. This led to the reluctant usage attitude of the users and eventually possibly makes the students less motivated and less effective.

This thesis aims to research mainly the usability issues of mobile phones (smartphones) in Swedish learning outside-classroom situations. Another additional criterion to be carefully considered is how mobile phones are utilized for language acquisition processes. In other words, rather than considering if students use mobile phones to accomplish a school-based task such as send or check e-mail, submit home assignments, in this study, we focus more whether mobile phones are used to improve the actual learning results, treated as a learning tool or the learning assisting tool to the actual learning.

3.4.3 Literature Review from Previous Researches

Literature review presents proofs to support the new knowledge that researchers try to investigate in their research (Oates, 2005). It is rather beneficial for us establishing the research questions and research goal. It also provides suitable methodologies and previous evidence from some other similar research, which can be applied into this study.

This part of review follows the rules established by Webster and Watson (2002): keyword searching and examining key journals for research and keyword related research papers. First of all, in this study, a series of keywords are used to search for literatures: m-learning and language learning; and the combination of some keywords such as mobile devices, hand
handheld devices, smartphone, mobile phones, and PDAs together with language learning or language learning practices. In order to save effort and time, as well as make sure the reliability, we modified our searching strategy after examining the ‘abstracts’ sections in the obtained articles. Apart from these, we focused further on the leading websites, key journals, for example, Computer Assisted Language Learning Journal, Computer and Education, Educational Technology & Society, Language Learning & Technology etc.

Technology is the only means to update oneself compared to traditional ways such as books, (Toher Bahrani et al., 2012). Being one of the major and most common modern technological devices in the field of education, with its near-ubiquitous market penetration and social acceptability, mobile phone and its rapid development and benefit in transforming learning process is easy to see. According to the relevant statistics on elearninginfographics.com, it is stated that the worldwide market for Mobile Learning products and services reached $5.3 billion in 2012. With a compound annual growth rate of 18.2% for the next five years, it is estimated that the worldwide mobile learning market in 2015 will reach $8.7 billion and it will even reach $12.2 billion by 2017 (online resource, elearninginfographics.com, 2015). Within these facts and statistics, the contribution and power of mobile phones in m-learning practices has not been specifically mentioned. But, based on the contemporary urgent necessity of mobile phone usage in society and also its enormous functionality, portability, and connectivity, we can still predict the future development and popular adaptation of mobile phones in language learning and other learning-centered situations.

Regarding the future development of mobile technology and m-learning, Agnes Kukulsk-Humle has proposed that the success of m-learning will depend on the human factors in the use of new mobile and wireless technologies (June, 2007). Learners in the past used to carry course materials and were unable to reach their learning facilities in short time with less effort. The current innovation in modern technical devices combining 3G and wireless data connection (WIFI) empowered students to benefit from all these modern development in tech world to improve their learning by saving time, money and effort. Finding out the problems and advantages of specific mobile technological devices in terms of m-learning is important for the further development and effective m-learning practices.

Even though MALL is a recent field, some 575 works relating to MALL have been published over the past two decades (Jack Burston et al., 2013). The topic is studied in terms of technical specifications, mobile device ownership, user attitude toward a specific device, pedagogical design, learning theory, user satisfaction, motivational effects, institutional infrastructure, and teacher training, among others. For example, Baleghizadeh & Oladrostman, (2010) focused their study on mobile phones and their effect on grammatical accuracy for English learners; In 2005, scholars have studied the effectiveness of video - capable mobile phones in English learning in Japan (Thornton, P., & Houser, C, 2005 );
Stockwell (2007) has investigated a study about the use of a prototype mobile-based intelligent vocabulary stem; A study on evaluating student preference and attitudes to MALL (Stockwell, 2007, 2010); And researches have been carried out to prove the effectiveness of PDAs in promoting the reading comprehension (Chang & Hsu, 2011) and creative learning of idioms (Wong & Looi, 2010; Kiernan and Aizawa, 2004), developed a study investigating whether or not mobile phones are useful tool in language learning and explored their benefit in task-based learning, name a few. Besides, Swedish language learning practices are not that broadly studied in the MALL research world. However, several studies that are concerned with other language learning practices like English, Spanish, Italian etc., are still easy to find. The first project using mobile phones in language learning was undertaken by Stanford University’s Learning Lab, by adopting vocabulary practice, quizzes, word and phrase translation and access to live talking tutors through mobile phone (Brown, 2001). Eventually, this project found out that students showed that automated voice vocabulary lessons and quizzes had significant potential for their Spanish learning. A program was created for Italian language learners in Australia by Levy & Kennedy (2005), about using SMS in a scheduled form to send idioms, words, definitions and example sentences via mobile phone.

In the coming chapter, we are going to demonstrate what has been found out through the interview. Further, we will provide our qualitative analysis in relation to our findings and also try to provide detailed explanations to our research aim.
Chapter 4 Findings and Analysis

This chapter presents the research-related findings and describes the analytical results and discussions regarding the results. For the discussion, we will involve related literature to conduct supportive and critical comparison for the research results. The last part of this chapter will cover the facts related to the research process and limitation of the study.

4.1 Findings from the Interview

4.1.1 Information Related to the User and User Activities

After taking the relevant measures for data analyzing, in this part of the thesis we show the corresponding results concerning the mobile usability in informal Swedish language learning. All the statements belonging to one topic were analyzed together and compiled into a few meaningful words or sentences, describing the identified issues. During the data analyzing process, we considered the frequency of mobile phone usage and the type of device used for their informal Swedish learning as useful pieces of information to understand the target group and their characteristics. Facts about whether the respondents had a better smartphone, what features the users use, their age, and occupational status were needed to help classify the participants and identify usage trends.

In the topic-related pre-questions, some participants have answered that they use their phone in some formal learning activities, including full and part-time campus-based education. However, all of them are asked to offer qualitative details (orally) about their Swedish learning with their mobile phone. Qualitative details show how participants use their mobile devices to support their informal learning. These qualitative data helped to broaden our understanding about the potential of mobile devices as aids to learning, and provided learning case studies which could be compared with previous mobile formal learning scenarios.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>Type of the learner</th>
<th>Type of the mobile phone</th>
<th>Major learning activities through phone</th>
<th>The device that the user uses for the Swedish learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34</td>
<td>Passive learner</td>
<td>IPhone 5 Dimensions (mm) : 123.8<em>58.6</em>7.6</td>
<td>Translation</td>
<td>Laptop (primary choice, at home or school) and the phone (outside)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td>-----------------------------------------------------------------</td>
<td>----------------------------------------------------------------</td>
</tr>
<tr>
<td>2</td>
<td>32</td>
<td>Active</td>
<td>Sony (Xperia Z)</td>
<td>Watching <strong>cartoon</strong> (with Swedish subtitle); Listening to CD</td>
<td>Mobile phone (mostly on the way to work and home; at the kitchen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>learner</td>
<td>Dimensions (mm):</td>
<td>records (from books) and Swedish radio; Reading; Translating</td>
<td>and riding)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>139<em>71</em>7.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>Passive</td>
<td>OnePlus One</td>
<td>Taking screenshots and put it into the Google translation app</td>
<td>Mobile phone (mostly at supermarket, on the road, or some other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>learner</td>
<td>Dimensions (mm):</td>
<td>; Memorizing words; Pronunciation;</td>
<td>public places. The interviewee is not active learner and only</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>152.9<em>75.9</em>8.9</td>
<td></td>
<td>uses the phone when necessary to know the word).</td>
</tr>
<tr>
<td>4</td>
<td>26</td>
<td>Active</td>
<td>Samsung S3 Mini</td>
<td>Translating; <strong>New reading</strong> (on apps); Memorizing words;</td>
<td>Laptop and mobile phone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>learner</td>
<td>Dimensions (mm):</td>
<td>Writing;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>121.55<em>63</em>9.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>28</td>
<td>Passive</td>
<td>IPhone 5S</td>
<td>Translating; Word memorization; <strong>Watching Swedish movies</strong> on</td>
<td>Laptop (at home); Mobile phone (outside; Mainly use the apps).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>learner</td>
<td>Dimensions (mm):</td>
<td>(with Wi-Fi);</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>123.8<em>58.6</em>7.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>25</td>
<td>Active</td>
<td>Samsung mini</td>
<td>Listening; Typing/ Spelling; Translating; <strong>Audio-recoding</strong> (to</td>
<td>Laptop-most of the time (if possible). Phone is mostly for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>learner</td>
<td>Dimensions (mm):</td>
<td>practice back after listening to the audio)</td>
<td>translating (instant)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>110.4*60.6 *12.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>29</td>
<td>Passive</td>
<td>Samsung S3</td>
<td>Translation; <strong>Speaking</strong> and <strong>pronunciation</strong></td>
<td>Phone (Only when there is nobody around him). Otherwise, the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>learner</td>
<td>Dimensions (mm):</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
In the table above, the type of the learner was categorized into two different categories: Active and passive learner. We decided to categorize the learners into such types after having the interview, thinking it may be helpful to see the correlation between their usability exploration, and the types of the learner.

**Active learner** is someone who actively uses the mobile devices or any resources for the ‘actual’ learning. In this study, based on participants’ learning habits and learning processes, part of them were identified as active learners, who use any chances to improve his/ her Swedish language skills, concerned with the method, learning materials, learning devices or even learning environments. The active learners usually apply the skills to practice and also try to develop more their skills (*Norman Herr, PH.D., Passive vs. Active Learning*).

**Passive learner** is someone who has certain passive attitude to learning something, or just focusing on whatever the school or teacher told him/ her to do, instead of putting more effort and time to improve his knowledge or etc. Passive learner is learning something or engaged in certain activities, not because he is eager to learn something and become better at that, but more likely is being rather passive to do something only because there is a necessity he /she to do accordingly without having more options.

### 4.1.2 Key Findings through Data Analyzing

1. Regarding informal mobile-assisted Swedish learning (MASL), in which aspects mobile phone can be used for?

Through the interviews, we got to know that some users use their phone basically for translation, reading, and vocabulary practices/ recitation through translation or apps. Others use it for listening, watching Swedish videos, pronunciation practice and Speaking. Moreover, other learning-related activities such as audio recording, taking pictures or screenshots, typing (with the potential aid of improving the spelling) are also mentioned by the participants. Additionally, another rarely-mentioned activity that people use their phone during their Swedish learning process is also explored: *applying the voice command on their Google Translate App*, which was described as a time-saving approach during one’s Swedish learning.
language learning. All those activities are said to be helpful for listening, reading or their vocabulary learning.

2. How are the evaluation results of mobile usability in informal mobile-assisted Swedish learning?

Table 3 shows how each usability part has been evaluated. During the data collection process, besides the casual questions in relation to their Swedish-learning activities in non-teacher-led environment, the users are also asked to give some concrete evaluation about each of the usability components, with a rating scale from 1 to 5, the users are asked to evaluate each of the usability attributes. Thus, the corresponding questions of each usability components were asked based on the following sample questions (Given two examples, the rest is in appendix 2):

1. How bad/hard (1) or good/easy (5) the accessibility of mobile phone for your Swedish learning (activities) outside the classroom? (1= very bad; 5= very good).

2. How would you rate your satisfaction after using your mobile phone for your Swedish learning activities? From 1 (very low) to 5 (very high)?

<table>
<thead>
<tr>
<th>Attributes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>and scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessibility</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>P1, P4, P3*</td>
<td>P2, P3*, P5, P6</td>
</tr>
<tr>
<td>Easy-to-learn</td>
<td>-</td>
<td>-</td>
<td>P2, P5</td>
<td>P1, P4, P7</td>
<td>P3, P6</td>
</tr>
<tr>
<td>Technical Design</td>
<td>-</td>
<td>-</td>
<td>P1, P5, P6, P7</td>
<td>P2, P4</td>
<td>P3</td>
</tr>
<tr>
<td>Efficiency</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>P1, P3, P4; P6</td>
<td>P2, P5, P7</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>-</td>
<td>-</td>
<td>P1, P6</td>
<td>P2, P3, P4, P7</td>
<td>P5</td>
</tr>
</tbody>
</table>

Table 3. Users’ specific Assessments for the Usability Attributes

Based on what each interviewee has offered as an evaluation result, we further questioned why he/she decided to give such an assessment, to be more explorative specific. And that is how we reached to obtain answers regarding the usability issues and users’ likes about

\[1\] In table 3, the sign ‘*’ implies that there are different scores for the same usability attribute with the consideration of different learning activities or different conditions: Thus, P3* means that interviewee (participant 3) has offered two different evaluation scores (5 and 4) for the accessibility components assuming the circumstances with data/internet-connection and non-data/internet connection.
mobile phones as a learning (assisting) tool in the informal Swedish language learning situations.

3. What users like and dislike about the mobile phone in terms of the usability components?

These two aspects are shown in Table 4. They are strongly and directly related with the previous interviewees’ answers about usability evaluation. The aim is to understand better why each interviewee gave certain evaluations for each usability attribute (With the reference to Table2 and Table3). Based on the data in table 4, we are able to display the answer to the research question 2, which is used to identify the usability issues of mobile phone in Swedish learning procedures.

<table>
<thead>
<tr>
<th>Usability Attributes</th>
<th>Likes</th>
<th>Dislikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>Data Connection; P1,P3,P4,P5,P6,P7 Conveniet to carry; P2</td>
<td>Low-lasting battery; P7</td>
</tr>
<tr>
<td>Easy-to-learn</td>
<td>Easy procedures; P1,P2,P5,P5 Instant photo-taking; P3</td>
<td>Hard to type/ write: the users have to press the letter ‘o’ and ‘a’ longer for writing certain special letters; P4,P7 Copy and pasting is hard and time consuming; P1 Too much scrolling; P2</td>
</tr>
<tr>
<td>Technical Design</td>
<td>Zooming function; P3 Small designed /portable ; P1,P2 Good sound, Voice effect; P3,P7 The voice command (Screenshot 1**3 ); P7</td>
<td>The keyboard (part of the users don’t have the standard Swedish keyboard to type ‘Ä’, ‘Ö’); P1 No auto-correction for words or sentences; P1,P7 Small screen; P2,p4</td>
</tr>
</tbody>
</table>

In Table 4: (1) Px (X=1, 2, 3, 4, 5, 6, 7) in the table represents the participant, for example P3 means the third (3rd) participant. And the order of the participants is majorly decided by the date (time) that they are interviewed. (2) The Screenshots (notified with **) are attached in the appendix section. (3) These results are gained after the usability evaluation. In other words, after assessing the usability attributes, the interviewees are asked to clarify and explain their answers for giving such an evaluation. For example, if someone has given ‘4’ to the accessibility, then we asked him why ‘4’ not ‘3’ or ‘5’, motivating the user argue for their assessment.
<table>
<thead>
<tr>
<th>Efficiency</th>
<th>Able to do an instant translation by putting the fingers on top of the word; P7</th>
<th>The lack of mobile-friendly websites; P5</th>
<th>Offers bad translation and limited answers (Screenshot 2); P5</th>
<th>Small display; small memory; P6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>Easy to use, thus saves time and effort; P1,P2,P4,P7</td>
<td>Typing takes time (due to the small screen and keyboard); P4</td>
<td>Offers instant help; P2</td>
<td>Extra operating/ task is needed, like scrolling and zooming; P3</td>
</tr>
<tr>
<td></td>
<td>Immediate help; P1,P3,P5</td>
<td></td>
<td>Fast app downloading; P5</td>
<td>Sometimes seems a bit slower to reach the aim compared to computer; P4</td>
</tr>
<tr>
<td></td>
<td>Offers instant help; P2</td>
<td></td>
<td>Enables the user to reach his goal in short amount of time; P1</td>
<td>Typing is frustrating (because of the small screen and non-standard Swedish keyboard); P4</td>
</tr>
<tr>
<td></td>
<td>The information is as correct as computers; P2</td>
<td></td>
<td></td>
<td>Small screen; P2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The meaning of the word or sentence is not fully offered; P7</td>
</tr>
</tbody>
</table>

| Table 4. Specification ‘Likes’ and ‘Dislikes’ of the Users |

When it comes to the ‘like’ and ‘dislike’ lists, some segments or words, which imply the same aspect, or contextually mean the same thing, are put into the same row. Besides, under each segment of ‘likes’ and ‘dislikes’, the interviewee who has mentioned a certain problem or advantage is also pointed out. We thought this to be useful to reveal the usage trend, usability evaluation and also show the correlation between the participant’s background with his explanation and argument regarding ‘likes’ and ‘dislikes’.

4.2 Data Analyzing Results and Discussion

This section analyzes the results of research and conduct appropriate discussions by combining our research with other previous theories and similar research findings.
4.2.1 Research Results

Analyzing Result 1 Mobile phones are used in the following aspects in informal Swedish learning contexts: translation, vocabulary learning, reading, listening, and writing (table 5). All these aspects are devised on what the participants have told during the interview, and the ‘most frequent used’ aspects are listed first.

<table>
<thead>
<tr>
<th>What mobile phones are used for</th>
<th>How mobile phones are used</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Translation</strong></td>
<td>Translation is the major activities that smartphones are used for in phone-based informal Swedish-learning scenarios. It is mostly processed by Google Translation (basically the mobile app form). Translation takes place through directly entering (writing) a word or sentence, copy-pasting, or by taking a picture or scanning a specific word on another item, or even by voice command to search the translation.</td>
</tr>
<tr>
<td><strong>Vocabulary learning</strong></td>
<td>In Swedish learning practices, the other usage of smartphone is in vocabulary learning/acquisition. It is achieved majorly through some mobile apps like ‘Duolingo’, ‘Learn Swedish’ and ‘Bubble’. Learners apply those apps to learn the words based on the relevant topic by listening to the pronunciations, and seeing the concrete spelling. They also acquire vocabulary through online recourses, such as reading news, article or friends’ updates on social media. One more approach to the vocabulary learning is the translation (both mobile app form and web form). By translating, the learners are entitled to save the ‘history’, which can work as good as a notebook that they’ve taken during the class.</td>
</tr>
<tr>
<td><strong>Reading</strong></td>
<td>Learners use smartphones for reading to a moderate extent. Through mobile phones, they managed to read some online news, school-based lessons or other Swedish materials via their phone by using both app form (for some news) and online (web-based) form.</td>
</tr>
<tr>
<td><strong>Listening</strong></td>
<td>Smartphones are used to listen to radio programs, pre-downloaded audio records, and also Swedish songs to enhance their listening comprehension. Students take advantages of these functions while they are walking, cooking, training, lying, or riding. The radio function is considered to be particularly helpful for their listening compression and pronunciation.</td>
</tr>
<tr>
<td><strong>Writing</strong></td>
<td>Mobile phones are not directly and constantly used for writing, but it can indirectly contribute to a better, more accurate and logically correct writing skills through the learner’s reading and listening activities on their smartphones. It is more about how to write a sentence, grammatically, lexically, and logically correct rather than just the spelling. Some learners believe that their phones are beneficial to improve their writing skills.</td>
</tr>
</tbody>
</table>
Speaking

It is almost denied that smartphones assists speaking. Even though via mobile phones they can talk and express ideas in an online Swedish-learner community, with the functionalities of sending voice message in mobile social media apps, none of the participant has applied this function into their speaking practices. Thus, it implies that mobile phones are hardly used for speaking practice. Whereas, some learners indicated the indirect benefit of mobile phones to speaking, by reading aloud some texts and gradually develop the ability to speak.

| Table 5. Where Mobile Phones (Smartphones) are Applied Mostly? |

**Analyzing Result 2** After all the ‘findings’ in the former section, we now show our analytical result, mainly concerning the mobile phone usability issues through its general usability evaluation.

Among all the usability attributes, **Accessibility** is assessed in a rather good way. Mostly due to the data connection it has, portability and also small design, so that the users can have them with them all the time. However, one issue has been brought up in this aspect is the low-lasting battery, which is said to potentially result in the mobile phone its functionalities less accessible sometimes.

According to most of the learners, mobile phones are not complicated/hard to use for their learning intentions. Thus, when it comes to **Easy-to-learn**, users think that it is easy to learn how to use their phones for Swedish learning, without a specific teaching or guideline. Whereas, they also indicated that even if taught how to use mobile phones for Swedish language learning, the problems still exist in mobile phone while assisting their language learning (e.g., Participant 5: *It is easy to use the phone, probably because we/ users don’t know too much apps or webs to learn Swedish, now we are just using everyday web or simple apps like google translation, for our Swedish learning. If we knew, perhaps it would have been a difficult one to use, and perhaps we would need more guidance or help to use the app or webs*). Thus, in terms of Easy-to-learn, they have mentioned the trouble that they have encountered while using the phone, and they related this to the continued using rather than the initial interaction with their mobile phones (table 4).

Compared with the previous usability elements, the **Technical Design** and satisfaction were given a bit lower scores relatively. As demonstrated in table 4 and table 3, many ‘dislikes’ are largely associated with technical design, such as they keyboard is not supportive sometimes; small display, small screen etc., (table 4). Since each participant is asked to provide his/her individual opinion based on personal experience, some people particularly mentioned lots of usability problems, especially in the technical design sector. People with small-screened mobile phones tend to have trouble in terms of the display, screen size (which eventually
possibly leads to the difficulties with typing, copying and pasting or even reading, e.g., P6). Participant 6 explained that he is giving such an evaluation and also mentioning these problems because of the small size and simple-designed of mobile phone (table2) he has, if he has a better phone with bigger screen and better keyboard, perhaps he would not have mentioned some of the problems (e.g., it could be better, sort of better battery, probably with bigger display and faster memory. But this is an old phone, so... (He paused)—said participant 6). Or some people they initially chosen their phone depending on their personal presences of the brand or the model, rather than utilizing it as a learning tool or learning assisting tool, this suggests another reason for them to give such an evaluation or the explanation. For example, our participant 2 has mentioned this: I don’t think they have in mind learning Swedish when they designed this phone or for certain language. I chose this model, because it is smaller, although I am complaining about it when it comes to learning Swedish.

Next to it, in terms of Efficiency, mobile phones are thought to be very efficient (time and effort saving) in their Swedish learning, by being simple (to use), and having data connectivity very often. Issues have been identified in the ‘efficiency’ attribute are: typing. Typing is mentioned as problem as it takes longer time and effort to enter some words compared to computers, besides, especially without a standard Swedish keyboard, typing is considered to be a time and effort-taking issue in one’s Swedish language learning activities in informal situations, besides, some of the participants tend to think about the issues by . For example, the screen is very small, when you want to type. Maybe not the easiest thing to do ever! It takes longer and also sometimes it can be super annoying to type, copy etc., (participant 6).

In the Satisfaction component evaluation, even if expressed some frustration while using their phones, learners tend to be tolerant and understanding. Some people based their answers regarding satisfaction, on their feelings during the time they use mobile phones for certain aims. For example: according to participant 4 and participant 6’s opinion: Obviously, there are things like I don’t have to spell mostly in Swedish, because, I don’t use the regular key boards. So for negative, if I don’t find an answer on Google translation or dictionary, then I can ask someone through social media, which is what I do. So... it doesn’t get the point that I get really frustrated because usually the dictionary has it, if it doesn’t have it, then Google has it, if Google doesn’t have it, someone on my Facebook will be out to tell me in a few seconds (P4); The 4th interviewee declared this: Well, it has some limitations, but they are not extreme. It just sometimes gets annoying, but if you are patient enough. And other combined the result that they gained/achieved after using the phone, such as participant 7: 80% of the time, the information we search or we use for our learning intentions is correct as computers do. But sometimes, even if some results or answers are offered for our learning, it does not seem like providing enough. Especially google translation, not enough meanings of a certain word would be shown on the mobile app pf Google.

Analyzing Result 3 Another result achieved in this research is problems that exist in mobile phones in phone-based Swedish learning informal scenarios (table 4). Corresponding to this,
we found out most of the dissatisfactions and dislikes have emerged because of those factors:

Firstly, due to the poor technical design of mobile phones, and secondly, because of the specialty of Swedish characters/letters. Smartphones carry shortcomings, such as having small screens, bad auto-correction, low-lasting battery, bad performance with regular websites (designed initially for computers, without any mobile-friendly form) inadequate translation results, typing issues with the keyboards, and slow processing. Besides, without Wi-Fi connection, it is said to be very costly for the users to use it for learning purposes.

One more additional fact that has to be mentioned is that, our assumption that categorizing the learner may also have impact on the usability evaluation and user feedback turned out to be wrong, not as we expected. Due to the limited number of the interviewees and also differentiation of the evaluation and answers between the same learners (belonging to either passive or active learners) made it difficult to tell if the type of learner matters when it comes to the evaluation and further identifying the issues. Some active learners tend to be really tolerant and optimistic while some passive learners behaving the same. Thus, for this matter, we cannot imply any direct and close relationship between the type of learner and usability evaluation in this research study.

4.2.2 Research Discussion and Comparison

In this study, users viewed the usability of mobile phones in relatively positive way. Whereas, some problems have been pointed out as problematic during their informal Swedish-learning activities. Learners have claimed the problems, such as the difficulty with typing/writing, the limited translation results offered by mobile-form platforms compared to the online form, high internet consumption, and the trouble with reading due to the screen size, (Table 5) etc., in our study. These are consistent with other previous researches in terms of English learning. In one of the experiments, Stockwell claimed that many learners have shown small complain while using mobile phones for their learning activities (2008). Learns found that it always takes too long for a task to be accomplished on mobile phones, and due to the huge internet consumption, small screen, and keypad, they still prefer to use PCs. Furthermore, Stockwell (2007b) demonstrated the facts that (English) learners generally require more time to complete vocabulary activities and achieved slightly lower scores on mobile phones when compared to completing the same activities on desktop computers (Stockwell, 2010). The tiny screens of mobile phones were thought to be improper for learning new context but effective for review and practice (Thornton & Houser, 2002).

In terms of the positive feedback and usability assessments of the mobile phone, the participants in our interview have mentioned their favorites about mobile phones for the Swedish learning outside the classroom. Take some examples: the internet connection, portability, and immediate assistance to their Swedish studies, multi-functions that enable
them to effectively reach their aim, and through connect, to ask for help etc. Participants also claimed that they truly believe that mobile phones can be rather helpful for their Swedish learning in both formal and informal scenarios. Even if have been taken place in relation to other language learning practices, in many research studies, those features of mobile phones have been described as an advantage of mobile phones in their language learning processes. Canny has claimed that mobile phones offer an ideal platform for learning since they are ubiquitous, affordable, and compact and wireless (Microsoft Research Program, 2010). It may be true that compute a computer is capable of conducting more activities in terms of visual, sound, textual information, but the mobile phone is still superior to a computer in portability, said Yamaguchi, T., (2005). In an investigation on the benefit of mobile phone to help grammar and vocabulary in French language learning, the authors have illustrated the positive attitude of the participated students toward the help of iPhones for their French learning (Ally et al., 2011). In a Turkish research paper, the learners/ mobile phone users said that (English) vocabulary learning is more entertaining and effective through mobile phone rather than books, and flashcards (Başoğlu et al., 2010), etc.

Most of the advantages are very common in almost all the language learning practices. But when it comes to the shortcomings, some issues maybe relatively annoying in other languages except English, like typing. Due to the alphabets/ letters in Swedish (especially the letters with Å/å, Ä/ä, Ö/ö), one of the obvious and common difficulties is typing, especially when someone bought the phone in other countries. Even if most phones have keyboard settings, for some really old or earlier designed smartphones, having the Swedish keyboard is a problem. In addition to this, Swedish is not a broad international language like English or Spanish. Thus, not so many mobile-friendly resources are available today. As Ring (2001) promoted, Web-based course materials should be decomposed into small pages that can be easily read on small mobile screens, we can still expect this issue can be solved in near future. In terms of other problems, in particular the screen size, we doubt if this can be solved totally even in future. Since mobile phones are originally designed as a communication tool, it has to make sure the portability as well as the actual functionality. It can be improved a little more, but cannot be reached to an idealistic design.

4.3 Facts about Data Collection and Data Analyzing

The data is collected in the form of semi-structured interview and we played a role of leading the interviewees into the topic in order to inspire the interviewee to think about precisely and be more explorative. All the interviews begun with pre-interview with questions such as ‘Can you tell me...’, ‘Is there any situations that ...’ or ‘what kind of ...’ etc., instructed by some scholars (Tony Cornford et al., 2006) etc. Besides, 8 people were interviewed originally, but since one of the participates seem not to be understanding the right topic and correctly understanding the major questions even about 30 minutes, we
decided to discard this interview data from my final data. Another issue about the data collection process is that not all of the interviewees are native English-speakers (Only 4 out of 7 are native English speakers). Thus, it cannot be avoided that there might be some misunderstanding or misleading from both sides: the interviewer and the interviewees. Considering this fact, while transcribing the audio recording, in order to make sure that we heard the right thing that the user initially indented to express, an email was sent to one interviewee to ask if ‘this’ is what he has meant. This study field is considered to be an incredibly broad field, which potentially makes it harder for us to explain and motivate the interviewee to talk freely and give feedbacks. This also makes it problematic for the user to answer our question without being out of the ‘track’/topic. When it comes to language learning or language acquisition, people always tend to associate it with the formal and traditional learning situations like sitting in the classroom, holding the textbook. One more additional fact regarding the assessment results is that, some interview participants seem to be subjective. In other words, even if they have offered lots of ‘likes’, they tended to be rather strict to their ‘grading’; or the other way around, there were high scaling/grading, even if relatively many ‘dislikes’ have been mentioned.

Jakob Nielsen has mentioned in his book ‘Mobile usability’ that: Usability questions seldom have a single answer. Rather, they are qualitative issues that specify the direction and nature of inevitable design trade-offs (Jakob Nielsen et al., 2012). Regarding the usability-relevant answers, people are likely to have different understandings about same components. Something bad that a certain learner considers can be treated as something good, for example, zooming. Someone (e.g., p2) said: ‘zooming is very time-consuming and effort-taking. Plus, sometimes if I want to read an article or news, I have to scroll a lot, which is pretty annoying’. However, for other, it is thought as an advantage (e.g., p3): ‘Even if the screen is not big enough as computers, I can still zoom it and eventually manage to read...’

Another crucial factor about the data collection process is that all these 8 interviewees are from different backgrounds. Some studies Biology, some does research on Cancer and some has background from Information System. Thus, it is not inevitable that the answers given by some of them were perhaps related to their background. What is more, we found that some of them are being shy, or avoid talking too much, and only blaming themselves. For example, some said ‘I don’t know too much about this technical stuff’ or immediately denying their answers after saying something by saying: ‘Or perhaps it is not the case for me’.

Chapter 5 Conclusion

The information that this chapter is charge to present is the short and conclusive answers to the research question, and future research expectations.

5.1 Answers to Research Questions

Q1: Regarding informal Swedish language-learning, how mobile phones are being used?
Mobile phones are mostly and largely used for translation, followed by vocabulary learning/reciting. Further, we found out that learners used their phones for reading (involves reading normal news or essays on web in Swedish, and reading course-centered materials). Using the phone for reading when one is outside or on a train etc., students believe that this is another approach to gain vocabulary. Mobile phones are less used for speaking among all, and used for listening occasionally. How mobile phones used are dependent on the personal need, the learner’s learning attitude (active or passive learner) and the type of mobile phones.

Q2: What is the Usability of Mobile phones in informal Swedish-learning? What the learners think about it?
Overall the usability evaluation is positive. The users viewed Accessibility rather positively, scoring Efficiency in second position. Apart from them, the usability component Easy-to-learn ranked in third, considering the average assessment scores. In contrast to these 3 usability attributes, users lower down their scores in terms of satisfaction, and Technical Design is ended up with the lowest assessment among all.

Q3: What are the advantages and disadvantages of mobile phones in Swedish mobile-assisted-language learning?
In informal mobile-based Swedish learning, mobile phones includes such advantages as: small design (also connected to the mobility and portability), 3G/ data connection, Voice command, camera and audio recorders, (almost) available anytime anywhere, zooming and copy, paste functions, easy to use, time and effort-saving, and offers immediate help. The advantages are either related to the functionalities or characteristic of mobile phones that contribute to a positive view about it (e.g., time and effort-saving, portable).

Disadvantages of the mobile phone are, to huge degree, related to the technical design, which ultimately leads to dis-satisfaction and negative evaluation, and due to the lack of mobile-friendly apps and websites. What’s more, the unique and different letters in Swedish is likely to be a contributor to the existence of some shortcomings. These involve: small screen size (make it hard to read and type), slow procedure, low-lasting battery, typing difficulties (due to the special letters/ alphabets in Swedish), (sometimes) lack of spelling auto-correction, as well as the limited translation results on the mobile phones compared to computers.
Learners tend to be tolerant when it comes to the usability evaluation. Many times during the interview, they also emphasized that ‘we should not require mobile phones to be a qualified learning tool. They are more like an additional assistant than a learning-oriented tool (e.g., P5, P2, P3, and P6). Some of them also mentioned they may have evaluated it differently if it is considered in formal (teacher-led, classroom) situations, but for informal ones, they admitted that the availability is what makes mobile phones powerful and prior.

5.2 Future Expectation and conclusions

In future, there is a huge need for schools and teachers to promote the benefit of mobile phone in language learning situations. Simply having mobile device is unlikely to result in an effective usage and efficiency. Some people are likely to lack of the basic knowledge and experience to deal with the problems or overcome the difficulties in process of applying and utilizing a new technology (Xiao Bin Chen, 2013). Besides, for the web designers from both educational and technical contexts, there is the necessity of explore the user/ student attitude or preference of a specific site and develop more mobile-friendly web pages in a possible way.

Despite its relevant contributions to MALL field, we cannot be completely free from limitation. One of the obvious limitations of our research is lack of scale. Although the research results shows useful results and practical value to MALL, Swedish language learning, and mobile usability, the data samples are not really quantitatively representative just by 7 people. We completed this study with limited number of participants and consequently, it possibly would not create a powerful, vigorous generalization. Thus, One more future expectation would be further studies (in both qualitative or quantitative) concerned with the Swedish language learning areas, focusing on the specific effectiveness of mobile device(s) by gathering representative data from as more people as possible. The other fact about this study is that we did not follow the original usability attributes, but developed our usability components. Thus, if time and effort is enough, anyone interested in MALL areas can also conduct a research of mobile usability in educational contexts by setting up a particular task in a certain scenario. Another expectation from future researchers would be a deeper investigation to explore to what extent mobile phones can be effective in one’s language learning, by mostly likely doing a comparative research (e.g., comparing the effectiveness of tablet and mobile phones in informal scenarios; or traditional learning and mobile assisted learning situation).

There is a need for some experimental study how a certain mobile technology can affect one’s learning behaviors, leaning methods or learning attitudes.
In conclusion, learners have relatively positive views regarding the usability of mobile phones in their informal Swedish language-learning situations. They also have indicated that they truly believe that mobile phones can help their learning and improve the result. The degree that mobile phones benefit them to has not been studies in this study though. Even though several problems have been pointed out, the users are highly aware of that mobile phones should be treated as a mean of communication, rather than a learning (assisting) tool. Besides, with their potential properties, mobile phones are likely to get even bigger popularity in future. However, if tablets or other handheld devices are improved in regards with functionalities, they may be replacing mobile phones and gain a bigger preference in near future.
Appendix

Appendix 1

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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Learner control</td>
<td>1. Clear goals and objectives</td>
<td>1. Specific learning tasks</td>
<td>1. Establishment of context</td>
<td>1. Appropriate levels of learner control</td>
<td>1. Learnability</td>
</tr>
<tr>
<td>5. Experiential value (Authenticity)</td>
<td>5. Elicit learner understandings</td>
<td>5. Presentation of video resources</td>
<td>5. Understandable and meaningful symbolic representation</td>
<td>5. Suitability for different learners and different situations</td>
<td>5. Suitability</td>
</tr>
</tbody>
</table>

\[ a = \text{Theoretical model.} \hspace{1em} b = \text{Theoretical model and heuristic checklist.} \hspace{1em} c = \text{Theoretical model and subjective end-user inventory.} \]

Figure 6 Summary of Pedagogical Usability Criteria (Petri Nokelainen, 2006)

Appendix 2

2. Interview questions

2.1 Topic-related pre interview questions
What type of mobile phone do you have?
Can you tell me how do you associate mobile phone with your Swedish learning?
What kind of expectations do you have on your mobile phone in your informal way of
learning Swedish? What reasons motivates you to use your mobile phone in the language learning?
Do you agree that it helps your Swedish, combining speaking, reading, listening, vocabulary, pronunciation or writing? How / in which way it helps? Did you understand my question?
Do you think, this (answer to the question above) is caused by the design or functionality of your phone or caused by your personal habit, outside distraction or attraction of the stuff like games, social media or other needs? Can you explain it more precisely?

2.2 Usability-related Interview questions
(There is a slight difference in the questions between different interviews. Besides, for each individual question, we also asked many different small questions in different time period, they are not asked continuously)

1) **Accessibility**: How is the accessibility of your mobile phone in your Swedish language learning activities in the informal situations (high or low)? Is it easy to access and use mobile phone devices for Swedish language learning related activities (For example, when one need to listen to something, or read something or conduct a vocabulary practices, is it easily accessible or not? ). Given an evaluation score from 1 to 5 that represent: It has Very easy, easy, just fine, hard, very hard accessibility, which would be your answer?

2) **Easy-to-learn**: Do you think it is easy to ‘learn to use mobile phone’ for your Swedish learning purpose? In other word, do you think you needed guidance and instructions when you used your phone for your Swedish learning activities? (Thinking about the skills required using it, complicated or simple)? Please answer to it from 1 to 5 that represents: Very easy, easy, just fine, hard, very hard, which would be your answer? Why?

3) **Technical design**: What do you think of the technical design of the mobile phone, when considering it as learning-assisted tool? Take the elements such as screen size, sound, display, keyboard, signal and access to internet/data. From 1 to 5, here it implies the technical design of your mobile phone, very bad, bad, fine, good, very good, which score would it be given in terms of the technical design? And can you explain why?

4) **Efficiency**: Do you think your phone is being efficient support for your Swedish learning intentions? Considering time and effort you put while using it. From 1 to 5, which score would it be given? And can you tell me the reason for giving such an evaluation?

5) **Satisfaction**: How pleasant is mobile phone to be used as a language learning (assisting) tool? Did you find it fun to use your phone for your learning intention? How satisfied are you when you use your phone as your Swedish learning assisting tool, especially considering your feelings mentally, anger, frustration, disappointment or relaxation, pleasure while processing/ using your phone? Given a scale from 1 to 5, how much would you want to give regarding mobile phone in your informal Swedish learning activities?

2.3 The end of the interview
- Do you have any related questions for me?
- Are you okay if I call you or email your for further information or other relevant necessity for this study?

3. Coding Key words

3.1 Categories of ‘likes’ and ‘dislikes’:

<table>
<thead>
<tr>
<th>Likes</th>
<th>Dislikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(my) favorite</td>
<td>(I) hate</td>
</tr>
<tr>
<td>(I) Love</td>
<td>(It is ) problematic/ tricky</td>
</tr>
<tr>
<td>(I) Like</td>
<td>(I) don’t like</td>
</tr>
<tr>
<td>(It is )good /great /cool (to xx)</td>
<td>(It is) bad (to xx)</td>
</tr>
</tbody>
</table>

3.2 Liking Scales:  
1, 2, 3, 4, 5

- Very bad
- Bad
- Okay /Fine
- Good
- Very Good
- Easy
- Very easy
- Not bad*
- Hard/ difficult
- Very hard/ very difficult
- Pleasant/ fun
- Very Pleasant/ fun
- Frustrating
- Very frustrating
- Not at all *
- Efficient
- Very efficient
- Not efficient
- Not efficient at all
- Good design /Good designed
- Badly designed
- Satisfied
- Very Satisfied

*Not bad is considered to be ‘Good’.
* Not at all is considered as two extreme situations: either very good or very bad.

3.3 Usability Components (words to code):

Accessibility
Easy-to-learn
Technical design
Effectiveness
Satisfaction

Accessible
Simple / not complicated
Learnable
Easy
Time-saving /time-consuming
Effort-saving
Pleasant
Frustrating

Instant
Immediate
4. Screenshots

- The Swedish economy gets worse and worse recently.
**Screenshot 1.** The voice command translation on the app form of Google translation

```
Detta är uppe sent och rolligt i tonåren, men kan göra att du ser äldre ut än du är.
```

```
Staying up late is fun in their teens, but can make you look older than you are.
```

**Screenshot 2.** The translation results of Google translation online form.

*(If the same sentence is searched on the mobile form or app form, there would be limited translation shown at the end—Screenshot 3)*
Screenshot 3. The translation results of Google translation mobile app form.

**SWEDISH**

Att vara uppe sent är roligt i tonåren, men kan

**ENGLISH**

Staying up late is fun in adolescence, but can
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