



Using Wireless Technologies for Context Sensitive Education and Training

WP7– Use of context
sensitive technologies in
language learning.

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Summary

The main focus of this document is to outline the work conducted in Work Package 7 which is use of context sensitive technologies in language learning via Mobile learning materials enhanced by context sensitive and location technologies, in a range of language learning contexts at Ericsson Education Ireland. A description of the training package produced is outlined, followed by the evaluation of this package with users and the conclusions that can be drawn from it.

Introduction

The meaning of M-Learning can be interpreted in variety of ways, in the article called *the current state of mobile learning* by John Traxler which states:

“The use of wireless, mobile, portable, and handheld devices are gradually increasing and diversifying across every sector of education, and across both the developed and developing worlds. It is gradually moving from small-scale, short-term trials to larger more sustained and blended deployment.

The gradual move towards m-learning is coherent with the maturity of mobile devices. The profile of the typical mobile device, and also user, has changed dramatically since 3G was first introduced commercially 10 years ago. Wideband Code Division Multiple Access (WCDMA) was the first 3G standard introduced commercially and was envisaged as the first step towards commercially available mobile broadband networks. This allowed network operators to offer data rich services to their customers, similar to what they were used to on a home or office PC.

The next phase step for 3G networks was the addition of High Speed Packet Access (HSPA), along the first evolution of WCDMA in terms of capacity and user speeds. The introduction of HSPA has caused “mobile broadband” to explode over recent years and opened up a whole new world of opportunities where consumers can now experience mobile broadband at data rates and prices comparable with fixed broadband.

At present there are over 400 Million WCDMA subscribers globally, which includes over 140 Million HSPA subscribers. At the time of writing, there are 290 commercial WCDMA networks in 120 countries and 274 HSPA networks in 115 countries, over 94.4% of networks are mobile broadband capable. (Source: <http://www.gsacom.com>)

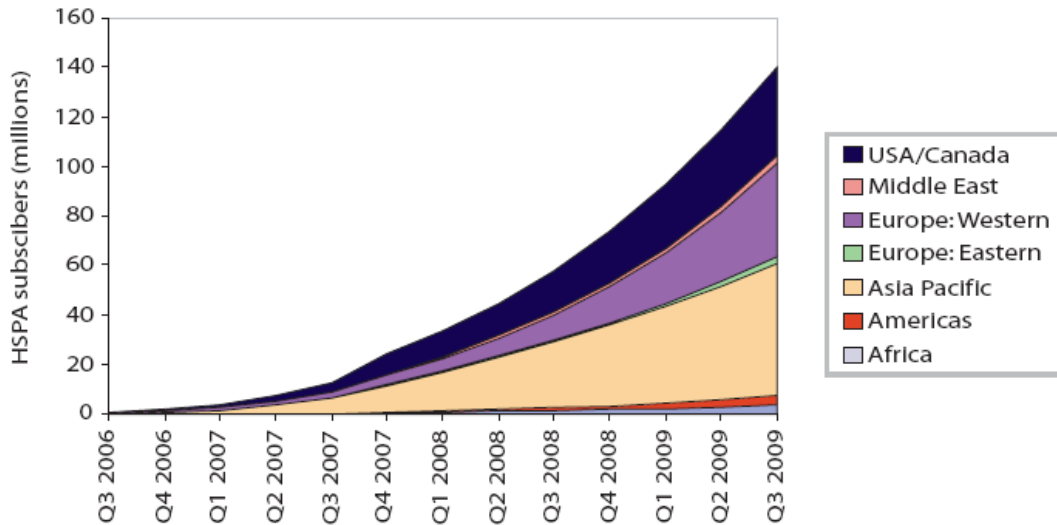


Figure 1: HSPA subscriber numbers July 2009

Mobile broadband access is being made on all types of mobile devices. Originally devices were pure mobile phones or pure PDA (mobile computers). Today, there exists a wide range of devices within this continuum, that mix traditional telephony with computing services, such as mail, calendar, but also with FM radio, MP3 players etc. PC and cell phone vendors are crossing into each others territory as phone and computer functionality converges, which can be clearly seen with the recent introduction of 3G wireless-enabled laptops. As well as Device Convergence, two types of convergence which should be considered are as follows:

- **User service convergence;** implies that there are common user service delivery capabilities with access and device awareness. This means that a multitude of services (person to person, person to content and content to person) can be provided to the same user over different access networks and to different devices.
- **Network convergence;** implies the consolidation of the network to provide different user services, with telecom-grade quality of service to several access types with an emphasis on operator cost efficiency.

All this means that it is now possible to envisage an audience for mobile learning content which is media rich, collaborative and always available to the user. Using established location detection technologies, training content can be developed for both context sensitive and location based delivery. Context sensitive education and training refers to training material which is directly relevant to the training situation that the learner finds themselves in. Location based education and training refers to material which is directly relevant to the location in which the students find themselves. Seeing as mobile devices can be used almost anywhere, they are perfect platforms for situated learning activities where real life is used to provide stimuli and activity for learning.

As the convergence of networks, media and end-users continues at great speed it will encourage the development of learning based around existing and emerging technologies.

This should lead to huge advances and greater opportunities for a lifelong learner to choose how, when and where they learn, based on their personal preference. Already there are 31 network operators committed to the next step in the mobile technology roadmap, namely Long Term Evolution in Radio Access Networks (LTE), which will be introduced commercially in 2010 and allow users to avail of much higher mobile broadband speeds; matching fixed line broadband networks. The introduction of LTE and the move towards all IP mobile networks will further strengthen the ongoing convergence and lead to the development of a lifelong learning environment based on mobile technologies. Also as the number of broadband-capable mobile subscribers begins to grow rapidly (Figure 2 below), the demand for such learning environments is bound to increase.

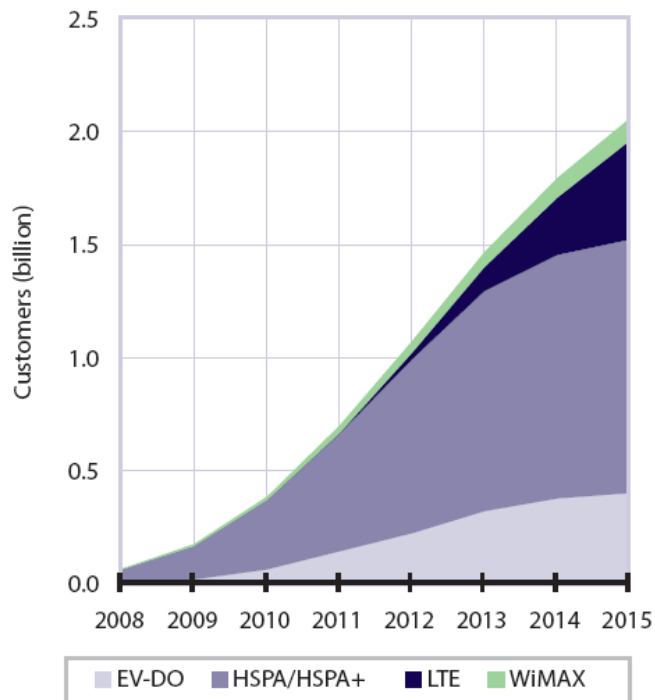


Figure 2: Wireless broadband customer forecasts worldwide, by technology.

Training Requirements of Vocational professionals

The training package developed is a context sensitive-based mobile learning of day-to-day scenarios that a vocational professional may encounter as part of their experience of living in Ireland.

The package utilizes location firstly to identify what type of context the professional is currently in, and context sensitive technologies to supply the learner with a list of common scenarios based on living in Ireland. The advantage of using such technologies is that the learner does not have to be familiar with all the local terminology before for e.g. Making

a haircut appointment, it may reduce the amount of time/money spent on researching such topics and assist in language learning of the various contexts.

Development of Training Material

The material was developed based on three language learning scenarios provided to the user to help them adapt to living in Ireland within a language context sensitive environment. The requirements for developing these scenarios are described below.

In the bank scenario

This course will give the student vocabulary and English grammar structures related to choosing a bank and opening a bank account. The course also aims to improve pronunciation skills.

The course presents the vocabulary and grammar on its own and in context in sample dialogues. The student is able to measure their understanding of the presented material by answering questions based on it – the student user is given automatic feedback on selecting the answers to the questions.

As a functional learning task, students are required to find local banks on their mobile device, visit them and obtain specific information related to their bank account products.

On completion of this course the participants will be able to:

1. Choose a bank suitable to their needs and open a personal bank account.
2. Use modal verbs such as should, must, have to, ought to for giving advice and instructions
3. Identify the different pronunciations of the letter sequence “ough” in English

The target audience for this course is: English language learners based at the Ericsson offices Dun Laoghaire aiming for English language level of Upper-Intermediate and above (European Common Framework level B2)

The prerequisite to this course is that student should have at least Intermediate level of English (European Common Framework level B1)

The course is self-paced on the student users mobile device and should take approximately 35 minutes to complete the content. Functional task will require additional time.

Learning situation provides that the course is self-paced and presented audio-textually via student-user's mobile device.

Having your Haircut

This course will give the student vocabulary and grammar related to having a haircut. The course also aims to review some pronunciation skills.

The course presents the vocabulary, grammar and pronunciation items on their own and in context in sample text, audio and dialogues. The students are able to measure their understanding of the presented material by completing textual and audio tasks based on it the student user is given automatic feedback on selecting the answers to the questions.

As a functional learning task, students are asked to visit a local hairdressers/barbers and obtain specific items of information.

On completion of this course the participants will be able to:

1. Go to a barbers/hairdressers for a haircut
2. Use correctly the grammar construction "have something done"
3. Have correct pronunciation of final "-ed" in past-participles / past regular verbs

The target audience for this course is: English language learners based at the Ericsson offices Dun Laoghaire aiming for English language level of Upper-Intermediate and higher (European Common Framework level B2)

Prerequisite is that student should have at least Intermediate level of English (European Common Framework level B1)

The course is self-paced on the student users mobile device and should take approximately 35 minutes to complete the content. Functional task will require additional time.

Learning situation of the course is self-paced and presented audio-textually via student-user's mobile device.

At The Pub

This course will give the student vocabulary and language structures related to socialising in an Irish pub context. The course also aims to improve pronunciation skills and review some basic grammar.

The course presents the vocabulary, grammar and pronunciation items on their own and in context in sample text, audio and dialogues. The students are able to measure their understanding of the presented material by completing textual and audio tasks based on it – the student user is given automatic feedback on selecting the answers to the questions.

On completion of this course the participants will be able to:

1. Understand vocabulary used in Irish pubs
2. Use correctly the grammatical items ‘some’ and ‘any’
3. Identify and use the correct pronunciation of the ‘r’ sound in Irish-English.

The target audience for this course is: English language learners based at the Ericsson offices Dun Laoghaire aiming for English language level of Upper-Intermediate and higher (European Common Framework level B2)

Prerequisite is that student student should have at least Intermediate level of English (European Common Framework level B1)

The course is self-paced on the student users mobile device and should take approximately 35 minutes to complete the content. Functional task will require additional time.

Learning situation of the course is self-paced and presented audio-textually via student-user’s mobile device.

Testing of Location and Context Sensitive Package

The testing phase took place in Dublin during November 2009. The participants were a mix of vocational professionals in Telecoms from a range of countries worldwide representing up to 15 nationalities. Some of these participants were living in Ireland and found the language learning element of the courses very relevant and helpful. While others were only staying temporarily for training courses in Ireland therefore not all of the content was relevant in this case however most found the scenario of in the pub situation for this particular context interesting and helpful for learning pronunciation of certain words.

All participants that completed the evaluations had completed the prerequisites of the courses which specifies that students should have at least Intermediate level of English (European Common Framework level B1). The participants were a range of international students attending training courses in the Ericsson Education Centre in Ireland and all these courses are delivered in English. Participants were telecom engineers working in a variety of different job roles in the industry, such as support engineers, system administrators and system integrators.

As mentioned above, training is not always available at the right time for the reasons outlined. Using the functionality, computing power and mobility of mobile devices three learning scenarios was developed to test context sensitive and location based training to enable vocational professionals in a language learning context to receive training at any time and place of their preference.

The test phase took with total of 20 participants All participants installed the appropriate material for the task at hand to their mobile phone using Bluetooth technology.

Evaluation and Analysis

Evaluation Methodology

In total, a group of 20 participants in total completed the context sensitive language learning course and the audience ranged across a number of nationalities including: Lithuanian, Hungarian, French, Spanish, Czech, Romanian, South African, Jamaican, Dominican, Macedonian, Egyptian, Turkish, Filipino, Haitian and Qatari. Each individual was given a short introduction regarding the purposes of the project and the reasoning for developing such a mobile based application for individual learning. A single mobile phone was used for testing purposes, namely the Sony Ericsson 750i. Each student completed the learning language application in approximately 10-20 minutes. The aim of the testing was to evaluate the “look and feel” of the application.

Questionnaires were completed by each student has been gathered from the testing phase:

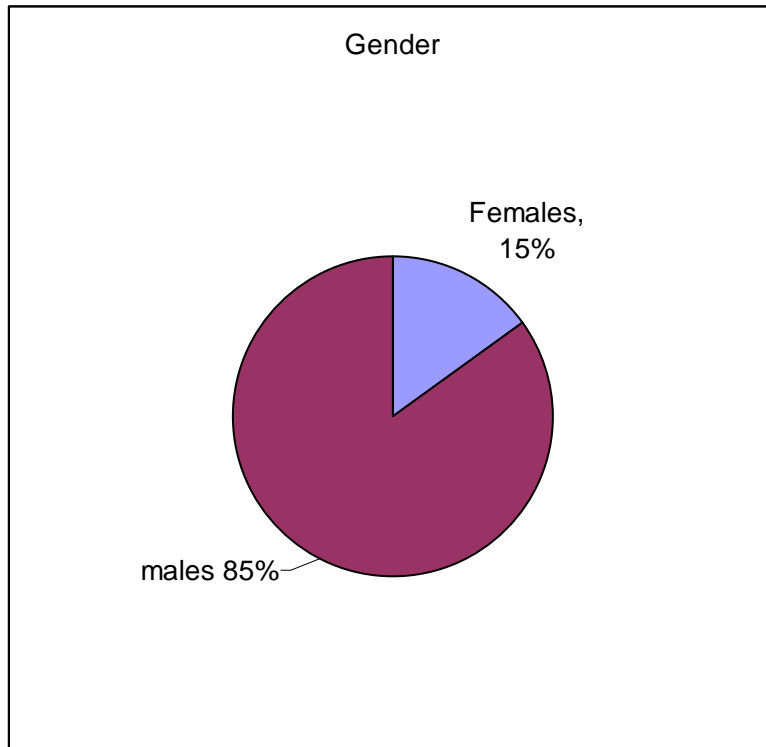
Evaluation results

Student questionnaire results

20 questionnaires were completed using the questionnaire in Appendix 1. The questionnaire aims to gauge the user experience of a variety of users of different age, gender and technical experience.

Gender

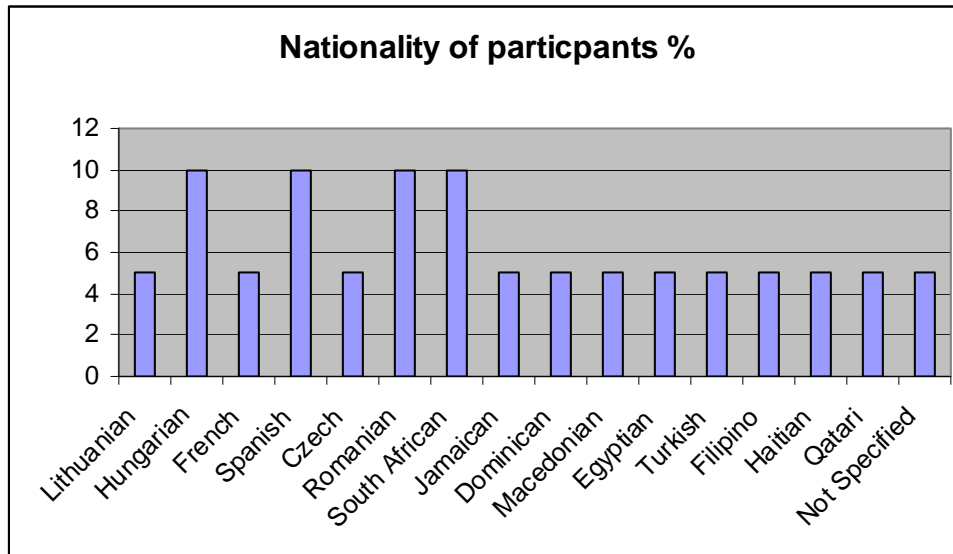
	Frequency	Percent (%)
F	3	15
M	17	85
Total	20	100%



The sample comprised 15% females and 85% males.

Nationality

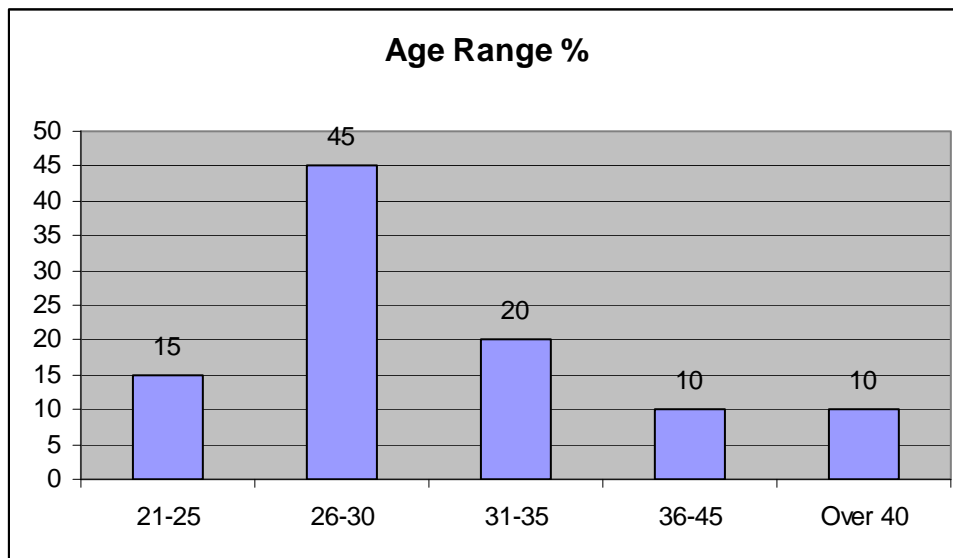
The evaluation participants ranged across a number of nationalities to total of 15 including: Lithuanian, Hungarian, French, Spanish, Czech, Romanian, South African, Jamaican, Dominican, Macedonian, Egyptian, Turkish, Filipino, Haitian and Qatari.



Nationality	Frequency	Percent (%)
Lithuanian	1	5
Hungarian	2	10
French	1	5
Spanish	2	10
Czech	1	5
Romanian	2	10
South African	2	10
Jamaican	1	5
Dominican	1	5
Macedonian	1	5
Egyptian	1	5
Turkish	1	5
Filipino	1	5
Haitian	1	5
Qatari	1	5
Not Specified	1	5
Total	20	100

Age

Age	Frequency	Percent (%)
18-20	0	0
21-25	3	15
26-30	9	45
31-35	4	20
36-45	2	10
Over 40	2	10
Total	38	100



The age range of the students spans from 21 to over 40. 60% (12) are aged 26-30 and 40% (8) are over 30.

1 Which mobile phone do you own?

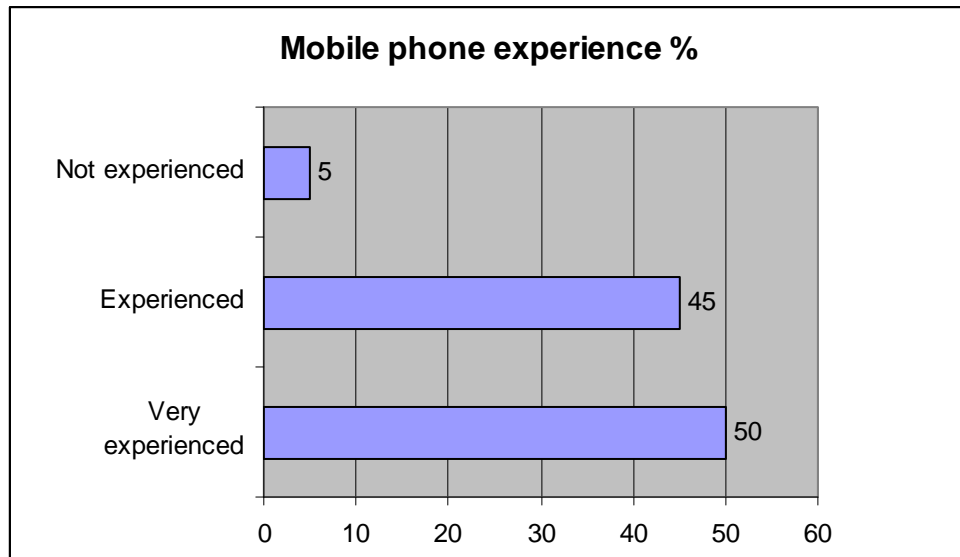
All the students used the Sony Ericsson 750i.

2 Does your phone have GPS?

Not enabled on Sony Ericsson 750i.

3 How would you rate your experience in using mobile phones?

	Frequency	Percent (%)
Valid Very experienced	10	50
Experienced	9	45
Not experienced	1	5
Total	20	100



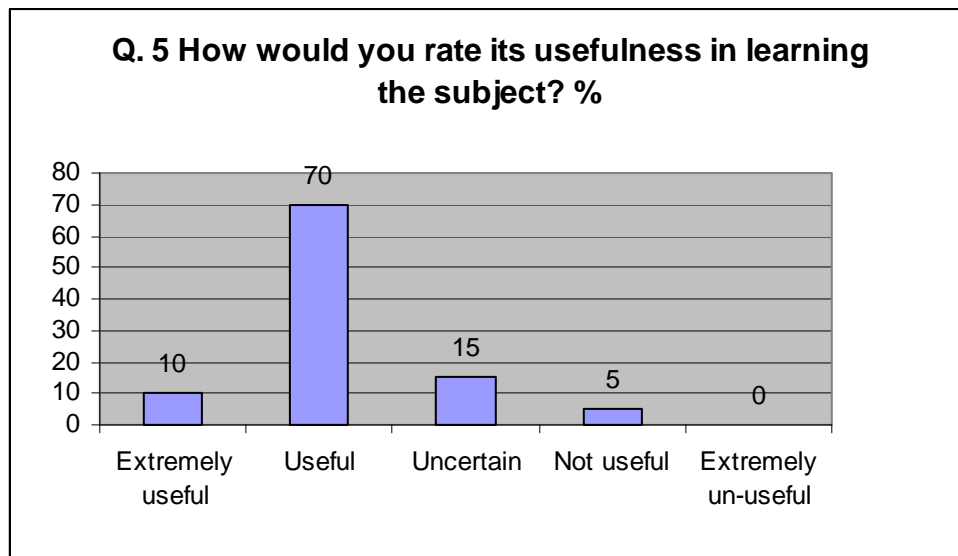
4 What did you think of the mobile learning course you have just experienced?

1. Its good introduction for beginners if you just arrived to the country and need vocabulary to the country for one of the offered situations.
2. Very clear & explanatory
3. Good experience
4. Quite good
5. Very good
6. It has potential to become a now way of learning worldwide.
7. Its interesting and fun
8. Quite advanced
9. It's a little slow
10. Needs to be faster
11. Fairly easy to use and good support to learn.
12. Short courses maybe useful. I can imagine listening to them for e.g. when going to work.
13. Interesting
14. Good idea but still a lot to improve
15. Excellent, very nice, helpful, simple & easy to use.
16. Good
17. It is complex
18. It was fairly informative.
19. Its ok, it meets the objective/target of each set. I learned from the set about Ireland.
20. It is a good guide for people who are already a mobile user as well as a level of English other than "beginners" otherwise the user level should be lowered.

5 How would you rate its usefulness in learning the subject?

	Frequency	Percent (%)
Valid Extremely useful	2	10
Useful	14	70
Uncertain	3	15
Not useful	1	5
Extremely un-useful	0	0
Total	20	100

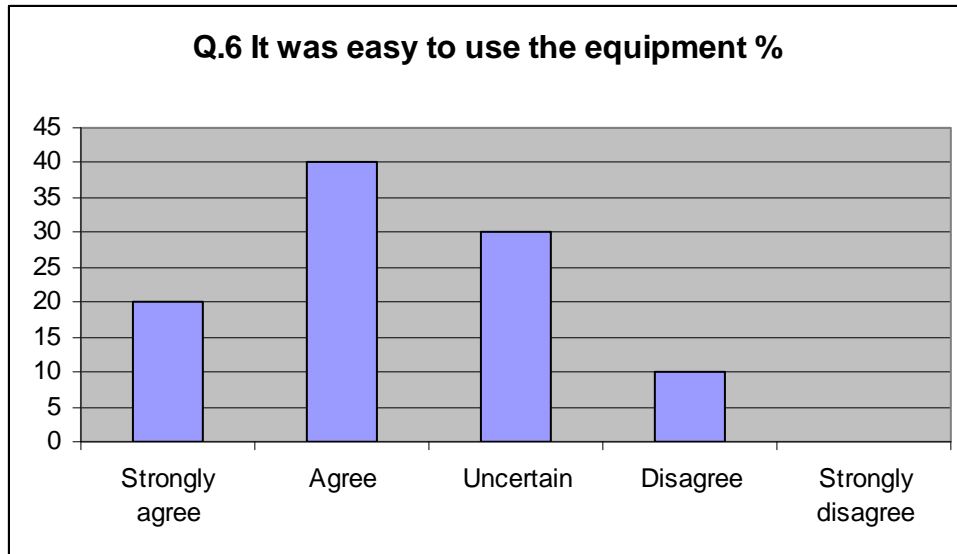
Overall majority of users found the learning experience useful 80% (16) and only 15% of users were uncertain (3) and 5% (1) found that it was not useful.



6 It was easy to use the equipment.

	Frequency	Percent (%)
Valid Strongly agree	4	20
Agree	8	40
Uncertain	6	30
Disagree	2	10
Strongly disagree	0	0
Total	20	100

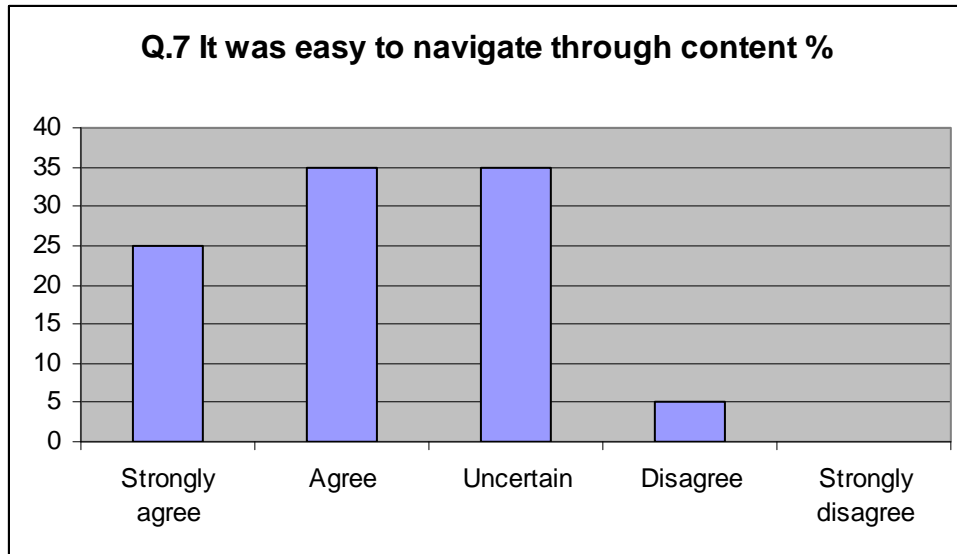
The majority said it was easy to use the equipment, 60% answered “agreed” or strongly “agreed” 30 % were uncertain and only 2 people disagreed that they found the equipment difficult to use.



7 It was easy to navigate through content.

		Frequency	Percent (%)
Valid	Strongly agree	5	25
	Agree	7	35
	Uncertain	7	35
	Disagree	1	5
	Strongly disagree	0	0
	Total	20	100

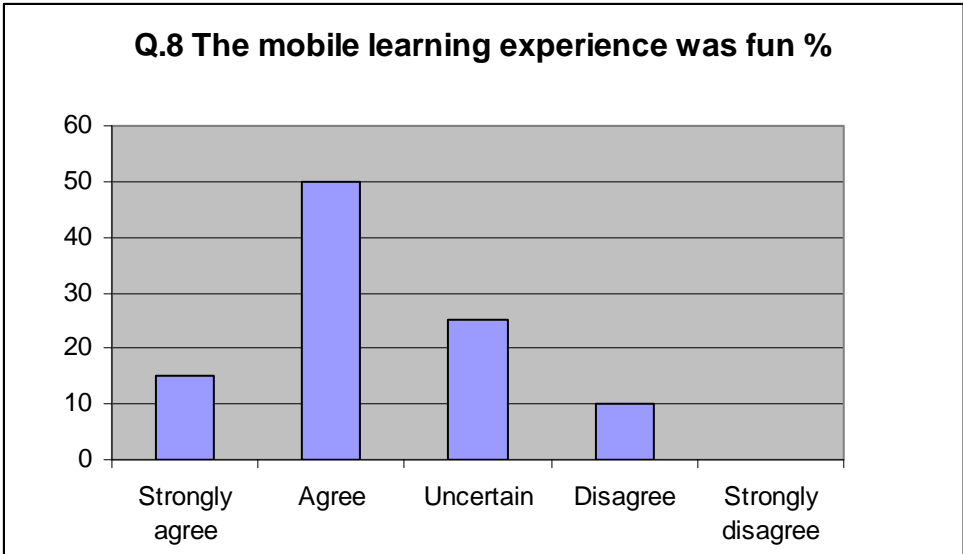
The majority also found it easy to navigate through the content, with 60% rating they agreed or strongly agreed. Some were uncertain 35% just one person disagreed as they felt the menus should show completed and the screens should have a title on them.



8 The mobile learning experience was fun

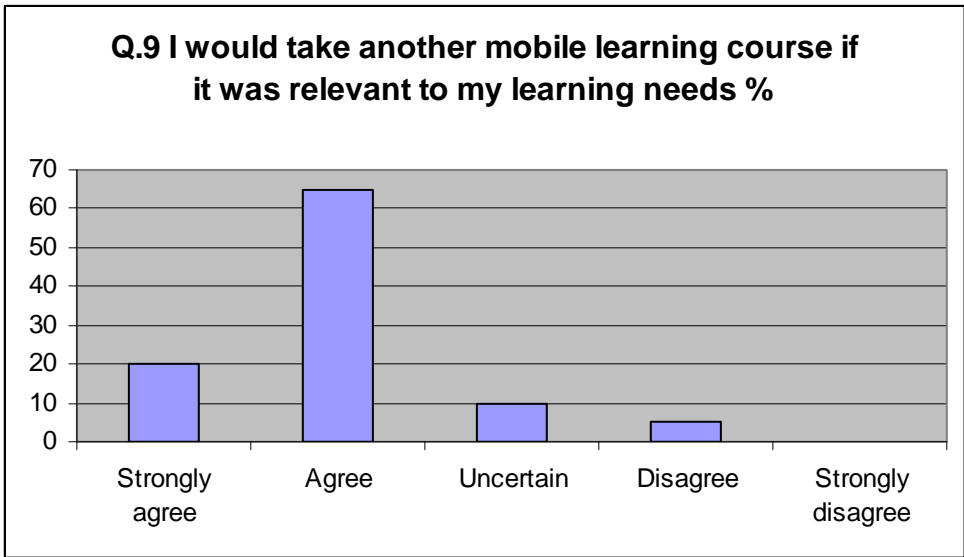
		Frequency	Percent (%)
Valid	Strongly agree	3	15
	Agree	10	50
	Uncertain	5	25
	Disagree	2	10
	Strongly disagree	0	0
	Total	20	100

65% of the students agreed that the mobile learning experience was fun, either agreeing or strongly agreeing. Some were uncertain this 25% could be those that were not living in Ireland at the time of completion and perhaps found the information not relevant in their case.



9 I would take another mobile learning course if it was relevant to my learning needs.

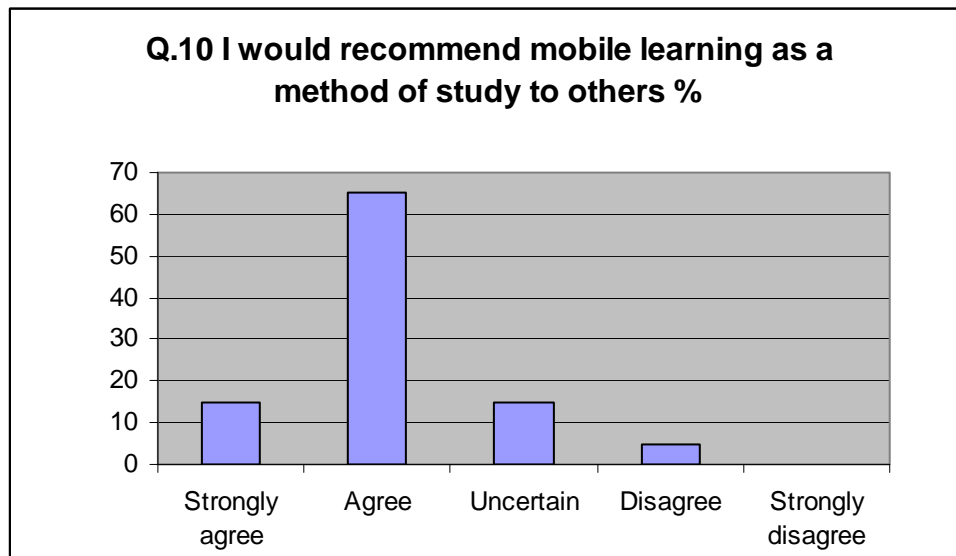
		Frequency	Percent (%)
Valid	Strongly agree	4	20
	Agree	13	65
	Uncertain	2	10
	Disagree	1	5
	Strongly disagree	0	0
	Total	20	100



A good indication that the students had a positive experience is that majority of correspondents 85% agreed with taking another mobile course. Only one person disagreed.

10 I would recommend mobile learning as a method of study to others.

		Frequency	Percent
Valid	Strongly agree	3	15
	Agree	13	65
	Uncertain	3	15
	Disagree	1	5
	Strongly disagree	0	0
	Total	20	100



Almost all of the participants 80% would recommend mobile learning as a method of study to others, while 3 participants were uncertain, only 1 disagreed.

11 The mobile device enhanced the learning experience.

		Frequency	Percent (%)
Valid	Strongly agree	4	20
	Agree	10	50
	Uncertain	5	25
	Disagree	1	5
	Strongly disagree	0	0
	Total	0	

70% thought that the mobile device enhanced the learning experience: 20% 'strongly agree', 50% 'agree' 25% were uncertain and only 1 person disagreed.

12 In what ways did it (or did not) enhance the learning experience?

1. We use mobile phone everyday in life.
2. It is easier to learn from visual device than actual hard copy on paper.
3. Its helping a lot and give you many good info with voice too which is cool
4. It allowed me to repeat steps in the lesson for emphasis and is something I can easily do in my own time.
5. Confusing & dull
6. It can be easy
7. It is easy to use as you can do it while you are away from your desk, home. It is possible to use it in the car or while stuck in traffic.
8. Good use of audio & visual. Relevant
9. The voice/audio quality made it difficult to understand what the software was questioning, this leads to spending more time to complete the lesson.
10. No idea
11. –
12. Good idea to use everyday life conversation and using voice assistant for pronunciation it helps improving both pronunciation and audition.
13. GUI
14. Ability to access content at any time anywhere

13 Which functions of the device did you use most?

1. Arrow keys
2. Bank
3. Instructions are not very clear
4. The joystick
5. The pointer, to move into the lesson and button to confirm answers.
6. Voice, movie
7. Home
8. Browsing through content

14 What did you think about the look and visual design of the course?

1. Very clear, explanatory, good quality
2. Nice, more than enough for business.
3. Simple, effective but not very attractive
4. Very limited due to the size of the screen.
5. I like it
6. Simple
7. Very good
8. It's simple but effective, not so visually appealing but gets you the objective.

9. Ok
10. I think better if users will see colours and the cursors what to click next is more visible.
11. Good visual, look and feel.
12. Good
13. Ok
14. I liked it
15. Simple & easy to read
16. Maybe it should be more "fancy"

15 The course used location-based technologies to provide relevant learning materials to your phone. How did you find this?

1. The content of the course was relevant and helpful
2. Excellent
3. Quite innovative. The course material was relevant.
4. Relevant
5. Information was relevant, its hard for foreigners to know the vocabulary used in these situations so it depends on the basic English language while using it.
6. Very good
7. It is great that its location based as long as the user can modify the default behaviour, should the system make an incorrect decision regarding the location.
8. Yes
9. Yes its good its location based
10. Good
11. Good
12. Worked well

16 Did you encounter any technical problems? If so, what problems did you have?

1. No
2. No
3. A few issues with navigation at first, perhaps a better phone would have made the experience better.
4. No
5. No
6. The software doesn't advice about sound so my volume was completely off but I was supposed to use audio for some parts.
7. Slow
8. There were parts I should choose between two options, I cannot click on one and check if its correct.

9. No
10. No
11. No
12. I haven't had any technical problems.
13. Issues with test questions, not able to answer some of the questions before getting an answer.
14. Sometimes I saw a block sign/rectangle in the text. Also I was not able to scroll to bottom once.

17 What did you like most about the mobile learning course?

1. The visual design
2. Real life case with voice
3. The amount of information I was able to get in such short time.
4. Accessible anywhere, doesn't need extra device only mobile phone.
5. Audio
6. You can take knowledge in small device and use it simple situations like plane trips.
7. You can learn something new in your mobile phone.
8. The idea
9. Mobility
10. The idea
11. Its useful cause my mobile phone is always on me.
12. Mobility
13. You can learn " on way"

18 What did you like least about the mobile learning course?

1. Only the interface/navigation
2. Lacks an introduction. There's no replay option, neither highlighting the words as they are pronounced. No design change from chapter to chapter. The sound was not normalized.
3. No navigate feedback as I'm using this method while learning French through an iphone.
4. Audio quality not so good
5. No indications of scenarios that have audio, no visual clue. After confirming an answer the screen does not automatically move onto the next.
6. Navigation.
7. The cursors/navigation.
8. Lack on interactivity/practice
9. After chapter finish does not jump automatically to next chapter but the menu.
10. Not enough information
11. Using a handsfree set is recommended to use this course.

19 Do you have any suggestions for how we could improve the mobile learning course?

1. Put in mind not all people will have new latest phone models which will be difficult to use this app. Also make sure it can work with any brand phone and should be for free. Also to have it preinstalled on SIM when you buy new SIM.
2. Scroll one line by line and controls can be more intuitive.
3. I believe the more feedback you will get from students who are new to the country and who can use it in practice. The more relevant courses can be created and updated.
4. Maybe some pictures
5. Make the multiple choice questions that have a single answer be answered with numeric keypad so no need to use the pointer and then select.
6. Try to make it faster.
7. Maybe on the graphics and the cursors.
8. Ameliorate the user level (navigation) so that people with least knowledge in mobile can use it. I think it will be best to have a translator in some important commercial languages.
9. More information
10. Including interactivity, include links to learn more.
11. Fix the problems mentioned above & adjust the volume.

Synthesis of the evaluation results

20 students completed the training course. Each student completed a paper-based questionnaire after complete the course

The responses to questions in the student questionnaire are synthesized below.

Learners

15% of the participants were female and 85% were male, reflecting the employee gender ratio in telecom engineering industry. The age range of the students spans from 21 to over 40. 60% (12) are aged 26-30 and 40% (8) are over 30. All participants owned a mobile phone and the vast majority (95 %) considered themselves to be experienced users.

Student feedback

Q4 What did you think of the mobile learning course you have just experienced?

Of the 20 learners who responded to this question, those who felt it was excellent stated *“Its good introduction for beginners if you just arrived to the country and need vocabulary to the country for one of the offered situations”* and another mentioned *“Excellent, very nice, helpful, simple & easy to use”*.

Some of the learners remarked that navigation needing improvement as it can be slow to navigate around the course and that the layout could be more graphical and colorful. This would reflect the experience of the course developers among the participants.

As an overall majority of the group viewed the experience as good or better, it can be stated that the concept is acceptable to the learners albeit with few reservations which will be discussed in more detail below.

Q5 How would you rate its usefulness in learning the subject?

Majority found it useful in learning the subject with 80% stating it was 'extremely useful' or 'useful'.

Q6 It was easy to use the equipment.

The majority said it was easy to use the equipment, 60% answered "agreed" or strongly "agreed" 30 % were uncertain and only 2 people disagreed that they found the equipment difficult to use. Think there was limitations for navigation with handset provided for testing (Sony Ericsson k750i) as its very limited in features for m-learning applications. Users were relying solely on the joystick for navigation through the courses as there was no touch screen or pen enabled touch screens

Q7 It was easy to navigate through content.

The majority also found it easy to navigate through the content 65 % agreed or strongly agreed, however some found it difficult to navigate and commented that they system is "too slow". One who disagreed felt the menus should indicate when a section was completed and the screens should all have titles. Also there was comment "*There's no replay option, neither highlighting the words as they are pronounced*".

Q8 The mobile learning experience was fun

Almost two thirds (65%) of learners agreed that the mobile learning experience was fun, agreeing or 'strongly agreeing. 35% were either uncertain or disagreed which would reflect that there is restricting navigation for interaction on the basic handset provided for testing. Also one person mentioned there should be "*more graphics and color used for different learning scenarios*".

Q9 I would take another mobile learning course if it was relevant to my learning needs.

A good indication that the students had a positive experience and felt that they learned from the experience is that very few were uncertain about taking another mobile learning course: 85% answered 'strongly agree' or 'agree'. It's clear it was relevant to the context of language learning when a learner mentioned "*Information was relevant, its hard for*

foreigners to know the vocabulary used in these situations so it depends on the basic English language while using it”.

Q10 I would recommend mobile learning as a method of study to others.

Majority of learners (85%) would recommend mobile learning as a method of study to others answering either “strongly agree” or “agree”, only 2 were ‘uncertain’ and 1 “disagreed”.

Q11 The mobile device enhanced the learning experience.

70% thought that the mobile device enhanced the learning experience: answering “agree” or strongly agree”. 30% of the group being uncertain or disagreed with the mobile device enhancing the learning experience is not reflected in the preceding questions but will be answered through the responses to question 12.

Q12 In what ways did it (or did not) enhance the learning experience?

On the positive side convenience, mobility, accessibility, working at own pace, learning anywhere at anytime and immediacy were cited as enhancements of the learning experience by a lot of learners. The mobility aspect is evidently providing benefit as one person comments “*It is easy to use as you can do it while you are away from your desk, home. It is possible to use it in the car or while stuck in traffic*”.

On the negative side screen size, lack of indication of audio when is being played , no page numbers, problems with navigation, more diagrams, Display of the handset used for testing is small and more tiring were mentioned as aspects which did not enhance the experience for third of the participants. This explains the reaction to question 11 above. The majority of the negatives could be addressed through course design and testing on numerous handsets.

Q13 Which functions of the device did you use most?

This question elicited a mixture of responses, some liked the arrow keys, up down buttons, the course menu and the use of joystick for navigation. Some of the aspects which were mentioned are:

- *simple layout*
- *easy to use.*
- *GUI*

Q14 What did you think about the look and visual design of the course?

As might be expected from an audience which contains technical engineers, the reaction to the look and visual design was constructively critical. However some comments were positive pointing to aspects such as:

- *“Good use of audio”*
- *“Very clear and explanatory”.*

Areas that could be improved more colour in text, graphics, more up to date menu layout and GUI, mentioning layout was too simple. There was also important mention that when audio is played this is not clearly indicated and therefore user may miss some content.

Q15 The course used location-based technologies to provide relevant learning materials to your phone. How did you find this?

Majority who answered this question, were positive towards the material being relevant to their location *“The content of the course was relevant and helpful”* and *“Quite innovative. The course material was relevant”.*

One person importantly mentioned *“ It is great that its location based as long as the user can modify the default behaviour, should the system make an incorrect decision regarding the location”.*

Q16 Did you encounter any technical problems? If so, what problems did you have?

Overall 75 % participants did not experience any technical problems the main issues that were listed was in regards to navigation limitations, responsiveness is slow comments such as *“A few issues with navigation at first, perhaps a better phone would have made the experience better”.*

Importantly in relation to the usage of audio *“The software doesn’t advise about sound so my volume was completely off although I was supposed to use audio for some parts”.*

Also in relation to interaction one person commented *“ There were parts I should choose between two options, I cannot click on one and check if its correct”.*

The negative commented stated above can be addressed in the release of future courses for example simply providing audio symbol each time audio content is provided and using better phones for testing will improve the navigation issues.

Q17 What did you like most about the mobile learning course?

Most enjoyed the mobility aspect with comments such as *“You can take knowledge in small device and use it simple situations like plane trips”* and *“The amount of information I was able to get in such short time”.*

Also the relevancy to the language learning context was clearly present with one person mentioning *“Real life case with voice”.*

Q18 What did you like least about the mobile learning course?

Again the main feature which was least liked is navigation and lack of interactivity or practice the concepts learnt. An important comment was made in relation to highlighting the words has the audio pronounces them at same time one person states that course *“Lacks an introduction. There’s no replay option, neither highlighting the words as they are pronounced. No design change from chapter to chapter. The sound was not normalized”*.

Mostly the elements least liked by the participants could be addressed by designing the courseware differently for clearer navigation and providing better phones for testing. Also implementing audio symbol when contents played enables users to be clearly aware when to activate sound settings. Navigation may be proved by for e.g. *“After chapter finish does not jump automatically to next chapter but the menu”*.

Q19 Do you have any suggestions for how we could improve the mobile learning course?

The majority of suggestions received concentrated on the design of the course and how it could be enhanced. The comment which encapsulates the feedback best is *“Put in mind not all people will have new latest phone models which will be difficult to use this app.”* Also navigation is repeated *“Scroll one line by line and controls can be more intuitive”*.

Interactivity should also be addressed for example the suggestion *“Make the multiple choice questions that have a single answer be answered with numeric keypad so no need to use the pointer and then select”*. References to additional content could be provided to enable user guidance and support to learning.

The benefits of context aware content:

All the courses were aimed at general language learning scenarios in the context of a vocational professional newly living in Ireland and speaking a different language. The participants welcomed the benefit of the context aware content to help them adapt to different situations and learn relevant vocabulary to assist them with general living scenarios.

There is evidence in regards to context sensitivity clearly by one participant whom states *“Information was relevant, its hard for foreigners to know the vocabulary used in these situations so it depends on the basic English language while using it.*

The use of location aware technology:

Although the course had to be downloaded outdoors due to the constraints imposed by GPS, people seemed to appreciate the advantages of the location aware aspect of the

course. Unfortunately location determination via IMS was not yet available and as expected people foresaw limitations with using GPS.

Conclusions

The participants of this survey were a mix of vocational professionals in Telecoms from a range of countries worldwide representing up to 15 nationalities to provide reliable evaluations in relation to context sensitive learning for different languages.

It dealt with a mix of genders and age groups which have been ideally suited to trial this course. In addition, the skill and knowledge of the group dealing with handsets was high with most users being experienced in mobile devices, implying that user training was not required and the course developed was intuitive to the needs of the learner.

The ability to download the appropriate material in relation to the location was not required for testing in this phase as this has been achieved in previous evaluations. However the context sensitive aspect of the trial was highly emphasized during the evaluation process complying with the requirement that every participant is from a non-English speaking nationality. This helped provide the relevance of the context that is language learning to different nationalities living in Ireland.

Many of the learners tested were new to the concept and enjoyed the mobility aspect to learning and the immediateness of available material for assisting different language learning scenarios. The Flexibility for learning in users own time is evident when one student mentions *“It is easy to use as you can do it while you are away from your desk, home. It is possible to use it in the car or while stuck in traffic.”*

This is also evident in the article called *the current state of mobile learning* by John Traxler which states:

“Mobile learning is uniquely suited to support context-specific and immediate learning, and this is a major opportunity for distance learning since mobile technologies can situate learners and connect learners”.

The majority of people found the experience to be fun with of participants expressing they would do a similar course again. The fun aspect of learning will encourage people to engage in lifelong learning as they will be more engaged and active in the learning experience, and will feel they have a greater control in their own development.

However there were comments that the interface was not very interactive and the lack of color/graphics provided. Also more user support could be enabled for example by providing list of additional links related to the learning subject such as to online translators for retrieval of the meaning of words in different languages. User guidance could be provided via highlighting the words in the learning material as they are pronounced. It's mentioned that it not always clear in parts where audio is required, this should always be stated very clearly to user to increase their learning potential.

In general, the context and location sensitive course was well received by all participants and the vast majority can see the benefits that such technologies will have for end users, this is evident by comments such as “Simple to use” and “innovative”

Overall the benefit of m-learning provided for a range of language learning contexts using context sensitive and location technologies is clearly evident in the evaluation results listed. Users mentioned many advantages to the mobile learning courses tested such as the availability of audio tools for pronunciation of words in the English language, one learner states “*Good idea to use everyday life conversation and using voice assistant for pronunciation it helps improving both pronunciation and audition*”.

The advantage of context sensitive learning in different language scenarios is commented again when a learner mentions “*Information was relevant, its hard for foreigners to know the vocabulary used in these situations so it depends on the basic English language while using it.*”

Many participants were highly impressed by the learning courses tested, stating “*it has potential to become a now way of learning worldwide*”, this indicates they were highly impressed by their experience.

The overall positive responses indicate the key trend for m-learning to grow substantially in the future. Almost all users agreeing they would recommend m-learning as method of learning to others and also agreeing themselves they would participate again in another m-learning course matching their needs. The context sensitive delivery to the courses is evident by majority of users 80% indicating the content was useful to the learning subject.

Issues such as the course design and technical aspects of the mobile device highlighted will need to be addressed in future course developments These relate in particular to areas of navigation, phone functionality and are common across most research in this area. Overall the main negative aspects were largely related to limitations with the mobile device used in testing but these did not detract from the learning experience and the overall satisfaction of those who participated in the context of language learning.

Reference:

Current State of Mobile Learning, JOHN TRAXLER, UNIVERSITY OF WOLVERHAMPTON UNITED KINGDOM Available at:

http://wlv.academia.edu/documents/0015/8468/01_Mohamed_Ally_2009-Article1.pdf
accessed on 20-11-09.

Appendix 1: The Questionnaire

CONTSENS Mobile Learning Evaluation Questionnaire

Please complete this questionnaire. Your views are very important to us, so please do give your honest opinion. All your answers are confidential, and you will not be identified in any resulting work.

Name: Male: Female:

Course or module:

Nationality:

Age: 18-20 21-25 26-30 31-35 36-45 Over 40

1. Which mobile phone do you own?

2. Does your mobile have GPS (Global Positioning System)? Yes No Don't know

3. How would you rate your experience in using mobile phones?

Very experienced Experienced Not experienced

4. What did you think of the mobile learning course you have just experienced?

5. How would you rate its usefulness in learning the subject?

Extremely useful Useful Uncertain Not useful Extremely un-useful

6. It was easy to use the equipment.

Strongly agree Agree Uncertain Disagree Strongly disagree

7. It was easy to navigate through the content.

Strongly agree Agree Uncertain Disagree Strongly disagree

8. The mobile learning experience was fun.

Strongly agree Agree Uncertain Disagree Strongly disagree

9. I would take another mobile learning course if it was relevant to my learning needs.

Strongly agree Agree Uncertain Disagree Strongly disagree

10. I would recommend mobile learning as a method of study to others.

Strongly agree Agree Uncertain Disagree Strongly disagree

11. Using the mobile device enhanced the learning experience.

Strongly agree Agree Uncertain Disagree Strongly disagree

12. In what ways did it (or did not) enhance the learning experience?

13. Which functions of the device did you use most?

14. What did you think about the look and visual design of the course?

15. The course used location-based technologies to provide relevant learning material to your phone. How did you find this (e.g. was the course material always relevant, did this work well, etc.)?

16. Did you encounter any technical problems, e.g. in using the device and/or location-based technologies? If so, what problems did you have?

17. What did you like most about the mobile learning course?

18. What did you like least about the mobile learning course?

19. Do you have any suggestions for how we could improve the mobile learning course?

If you would be interested in being involved in further research with us into using mobile phones for learning, please give your details below:

Name:

Email address:

Thank you for your help