

# Contsens evaluation report

## *Corvinno Pilot trial*

November 2009

### **Introduction**

During the lifetime of the Contsens project Corvinno has developed a Flash Light application for delivering learning content for VET courses. Besides the flash application four different courses has also been built up in order to test the concept of using location and context sensitive content delivery. This report summarizes the results of the application and course content testing.

### *Mobile Learning environment*

To exploit the advances of mobile technology it is indispensable to transform the traditional learning environments into mobilized learning spaces otherwise users can't benefit from mobility. Challenges of limited resources of mobile devices have to be tackled and fitted to the long-established campus-workstation based services. Corvinno was working together with Corvinus University of Budapest and in this test, the mobilized infrastructure provides an access point to selected services using a mobile phone. All mobilized content is uploaded to the CooSpace, which is reachable via the following URL: <http://coo.uni-corvinus.hu> Within the CooSpace a Mobile Learning Space has been created for the students, where all the mobile phone compatible teaching materials are being collected. The rest of the material was assigned to the additional lecture notes section. Students, who were logging in the system from a mobile phone, using the mobile interface of the LMS, can access and read the content, which is in the Mobile Learning space. The format of the material there is readable for mobile devices as well. They can also download documents, which are not assigned to the Mobile Learning space, but probably they can't open and read the documents, however this might be possible with some of the latest handheld devices.

All the materials are also reachable via the normal internet interface as well. PDAs, smartphones with Wireless LAN function are capable to enter the LMS via the normal interface.

## Context and location sensitivity

The Corvinno's system together with Coospace LMS is capable to handle various location and context aware educational situations. Figure 1 shows the general contextual learning scenario:

1. The user has to log on to the Corvinus' mLMS using wireless infrastructure (mobile networks, Campus (or any available) wireless network, GPS, QR tags, etc...) with a handheld device, using the previously installed application or (depending on the learning situation) a mobile web browser.
2. After the logging in, the application attempts to localize the user. At the moment this is only possible if the student possesses the appropriate (GPS enabled) device.
3. Based on the location of the user, selected learning content and/or learning services will be provided to utilize the learning.
4. The system follows the movement of the student. In case the location changes, different learning units will be available for the user.
5. The user always has the freedom of changing the content or denying the location related content and study something else according to her needs.

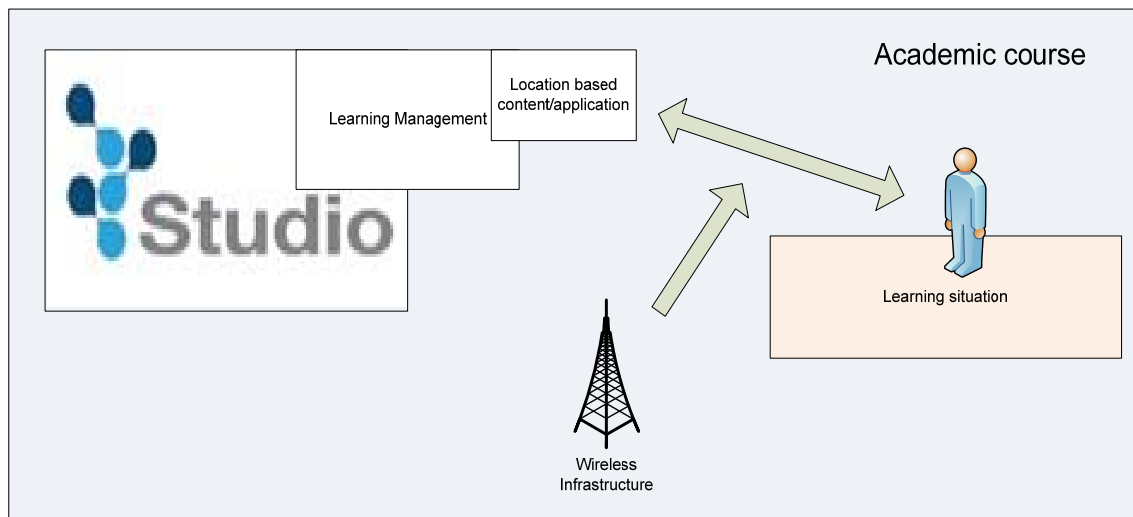


Figure 1. Context aware content distribution

It is important to emphasize that the Studio is an Ontology based system, which enables the content creators to consider various location and context sensitive issues when putting together the learning content. Basically, as it is also visible on the figure above, with little effort from the user, broad amount of services from different layers of the Studio system will be available automatically.

Therefore the final version of the application during the lifetime of the Contsens project is location and context sensitive. This version is capable to determine the user location and combine this information with the user's learning profile, stored in our Coospace learning management system. The content is pushed to the students based on both of these inputs. Figure 1 below describes the procedure.

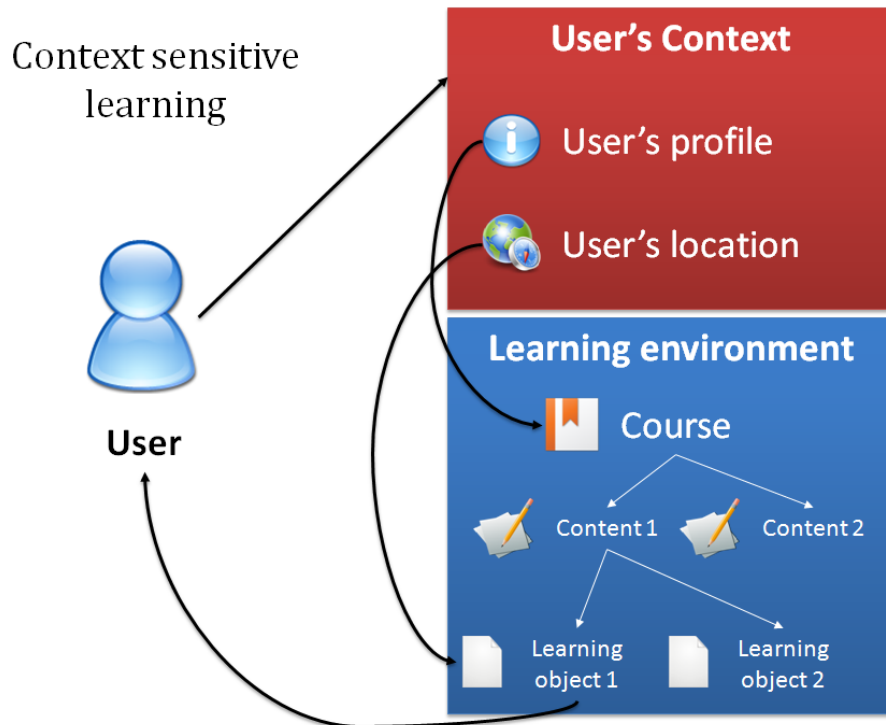


Figure 2. Context sensitive mobile learning scenario for the Contsens project.

## Alfa test

During the Alfa test the Developers of the flash application trialed their product with instructors. The test took place in Budapest, on the 19<sup>th</sup> of May, 2009.

Two different versions have been tested:

1. Contsens basic m-learning application showcase, that contains four context sensitive learning materials (learning material from Coospace), and a language learning game
2. Contsens location sensitive m-learning application, that is aware also the location of the user

In the following sections the test findings are detailed.

### 1<sup>st</sup> Case: Basic m-learning application showcase

#### Platform compatibility

- Compatible with wide range of mobile phones thanks to the Flash platform
  - Nokia Symbian phones (up to 3<sup>rd</sup> Edition)
  - Windows mobile
  - Android
  - More platforms will be supported in the near future 2010 (Iphone, Blackberry)

#### Installation

- Easy to install packages like .sis and .cab



- Android phones requires no further installation, they can reach the application via browser

#### Platform

- Flash lite platform has some speed issues, sometimes the application can slow down  
**Development suggestion: Easy weight application structure**

#### Functions

- Access data via Internet, that's why constant Internet connection required
  - Pictures and other multimedia data can cause strong data traffic
- Easy to reach learning content with structured categorization, offering "browse and learn" experience
- The e-learning framework (CooSpace) supplies an on demand learning infrastructure

#### Usability

- The navigation inside the application is keyboard based  
**Development suggestion: Navigation via touch interface, as there are a lot of touch based UIs in the market now**
- Restricted usability due to the lack of GPS availability

### **2<sup>nd</sup> Case: Location sensitive m-learning application**

#### Platform compatibility

- Compatible with only a few device
  - Nokia Symbian phones (up to 3<sup>rd</sup>Edition) with inbuilt GPS or bluetooth GPS
  - Not available on other devices, because of the restriction of Kunerilite framework  
**Development suggestion: Use more location library for Windows mobile, however GPS, camera and other core device services are restricted, there are no easy way to integrate these into 3rd party applications**

#### Installation

- Easy to install packages like .sis, the Kunerilite library needs other packaging way
- Portable Bluetooth GPS devices are not easy to connect to the phones, and provide less reliable locations compared to the built in GPS locators

#### Functions

- Access content via Internet: it is necessary to have 3G Internet access, because urban Wifi connections can't provide constant map availability, which is a must, since the application uses Google maps to show locations
- Phone's GPS hardware is not very reliable, doesn't provide exact location coordinates, that's why applications can't suggest one-to-one learning materials to the users, it is more like a "what's near" way to access the content

#### Usability

- Sometimes it is hard to follow Map based functions

Development suggestion: Auto navigation on the map, no user interaction, **more automatic suggestions**

- If there are too many learning materials nearby, it is **easy to track and use them**, however due to the unreliability of the GPS, sometimes it is **hard to find** an actual learning object's location.

## Pilot testing

The Pilot test took place on the 11th of November, 2009. 23 students were participating in this proof of concept and filled out the evaluation questionnaire provided by LondonMet (see Annex 2.). Students administered the questionnaires online, after the testing.

Two different versions have been tested:

1. Contsens basic m-learning application showcase, that contains four context sensitive learning materials (learning material from Coospace), and a language learning game
2. Contsens location sensitive m-learning application, that is aware also the location of the user

During the test the following learning materials have been used:

WP4 - Urban architecture  
WP5 – Historical Fountains  
WP6 - Artificial Intelligence in Urban environments  
WP7 – Language Game connected to WP6 content, in English

For further details about the courses, please consult the respective Technical Working Papers (wp4 – wp7)

### VET appliance

As it was mentioned before, this test was a proof of concept that location and context aware technologies can be used in mobile technology supported vocational education. There are several vocational education programs have been identified, where this approach may enhance the learning experience. Hereby we provide a list of programs, where the tested application and content fits to the accredited curricula (all these programs are officially accredited in Hungary, the national registration number is also provided):

- Idegenvezető (Tourist Guide) OKJ 54 812 01
- Közművelődési szakember I. (Cultural Manager I.) 61 345 01
- Közművelődési szakember II. (Cultural Manager II.) 52 345 02
- Műemlékfenntartó technikus (Monument Maintenance) 54 581 02
- Multimédia-alkalmazás fejlesztő (Multi-media content developer) 54 213 04
- Kőfaragó, műköves és épületszobrász (Building – sculptor) 31 582 14
- Vendéglátó és idegenforgalmi szakmenedzser (Tourism Manager) 55 812 01
- Protokoll és utazásügyintéző (Protocol and Travel assistant) 54 812 02

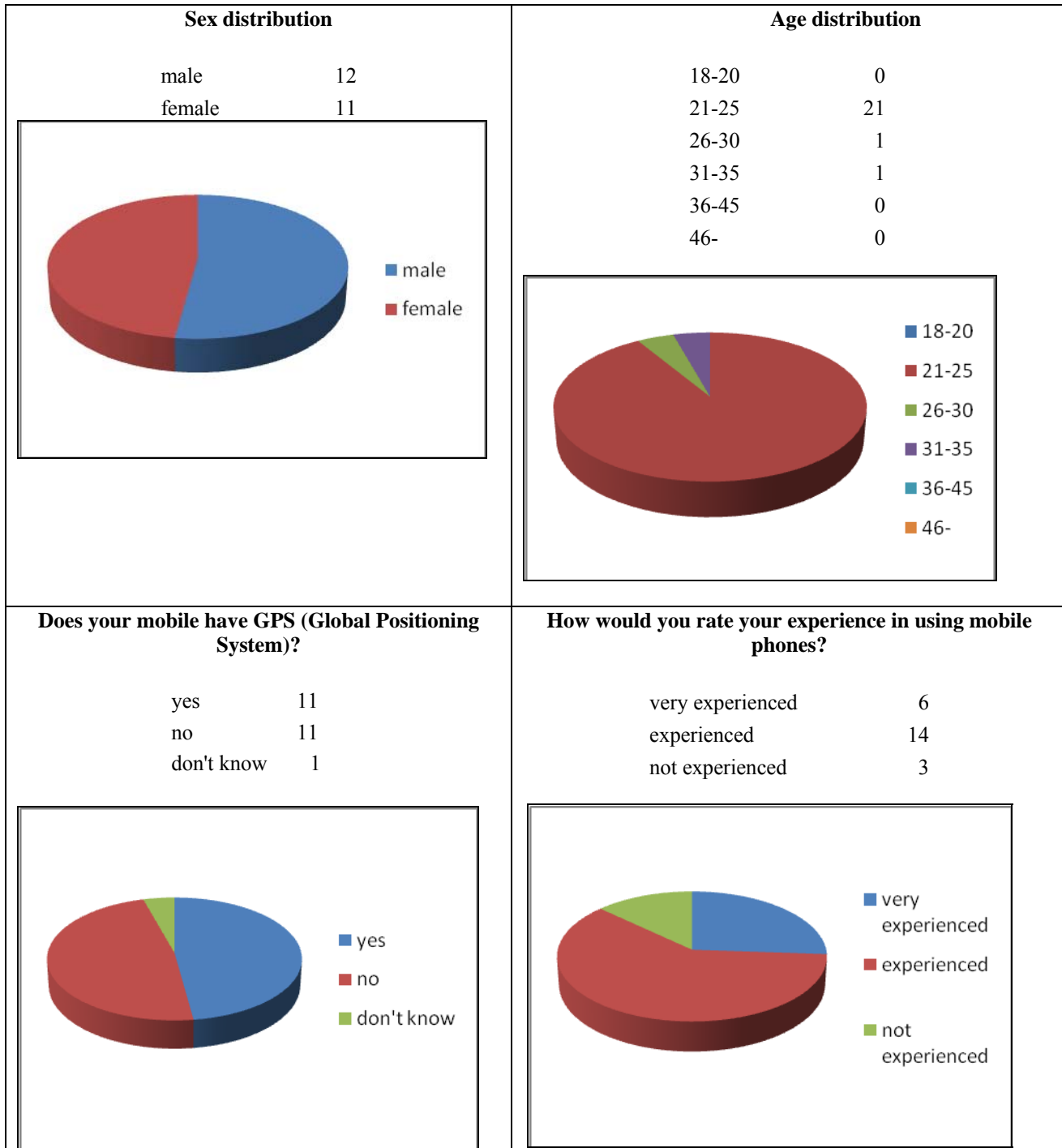
### Descriptive statistics

Altogether 23 people filled out the questionnaire. On the sample descriptive statistical methods have been applied. Frequencies have been established and taking sex, age, GPS and mobile technology experience items as independent variables cross tabulation has been processed. The complete statistical analysis is presented in Annex 1. Unfortunately the dataset

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is not designed and also too small for applying more complex statistical methods. Here we present only the most important and relevant findings.

The general descriptors of the population show that this group of learners equally consisted of males and females, their respective age group was 21-25, half of them has GPS device in their mobile phone (which is a surprisingly big number). They indicated themselves as very experienced or experienced mobile phone user.



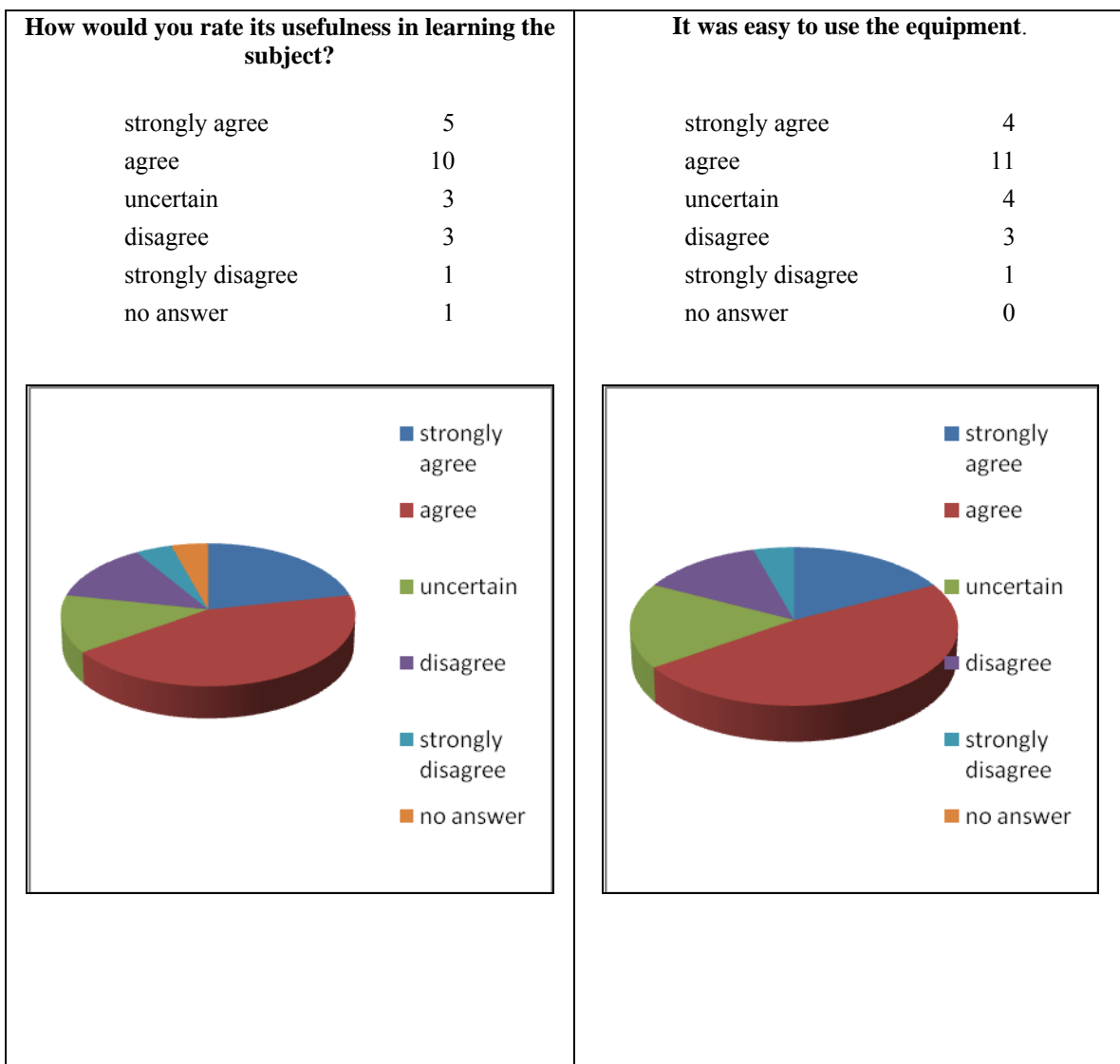
For the question “What did you think of the mobile learning course you have just experienced?” a positive general attitude can be described. Weak critics were articulated towards the quality of GPS signals, but besides that the testing crowd was satisfied. Some typical comments from students:

„I think it is an extremely good idea.”

„It seems very useful, and interesting.”

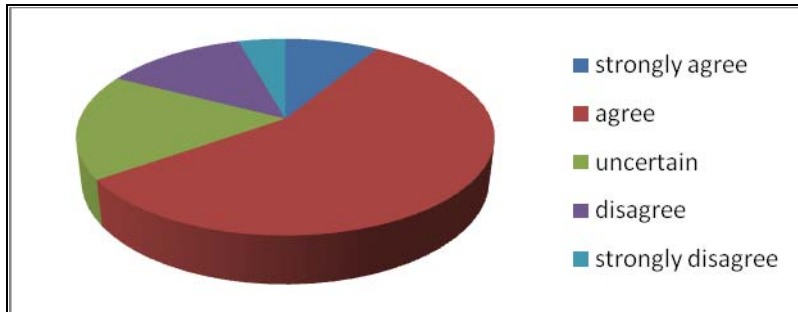
„It is very useful, more interactive, and gives a better impression of the things we are learning about.”

Learners had no real difficulties when using this flash application on their phones. According to the questions related to usefulness 15 of them treated our concept as useful (5 of them completely agreed with the statement). Using the equipment was also not a problem, only 4 people reported difficulties.



**It was easy to navigate through the content.**

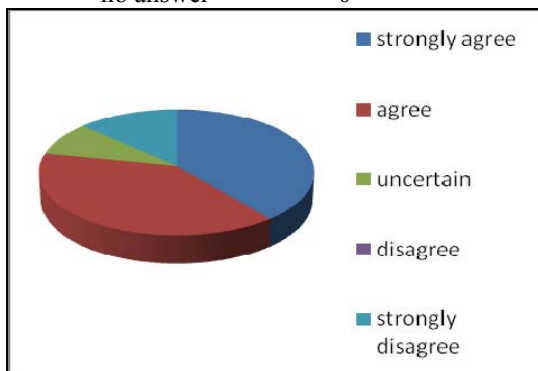
strongly agree	2
agree	13
uncertain	4
disagree	3
strongly disagree	1
no answer	0



When it comes to the quality of mobile learning experience the answers remained positive, but there is a remarkable amount of uncertainty emerging among the responders. The uncertainty rate by both important items “*I would recommend mobile learning as a method of study to others*” and “*Using the mobile device enhanced the learning experience*” were at 26,1%, meaning the despite the general positive approach there is a significant number of students, who are at least not convinced about this form of location and context sensitive learning.

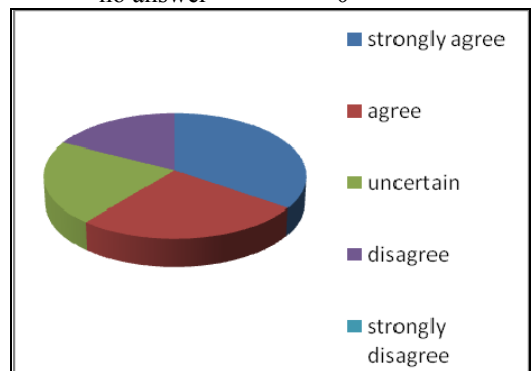
**The mobile learning experience was fun.**

strongly agree	9
agree	9
uncertain	2
disagree	0
strongly disagree	3
no answer	0



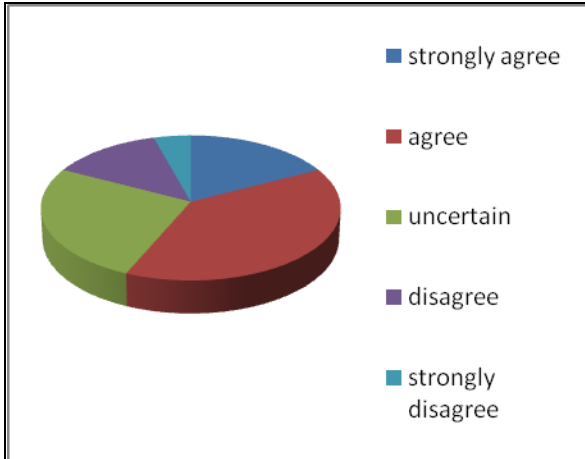
**I would take another mobile learning course if it was relevant to my learning needs.**

strongly agree	8
agree	6
uncertain	5
disagree	4
strongly disagree	0
no answer	0



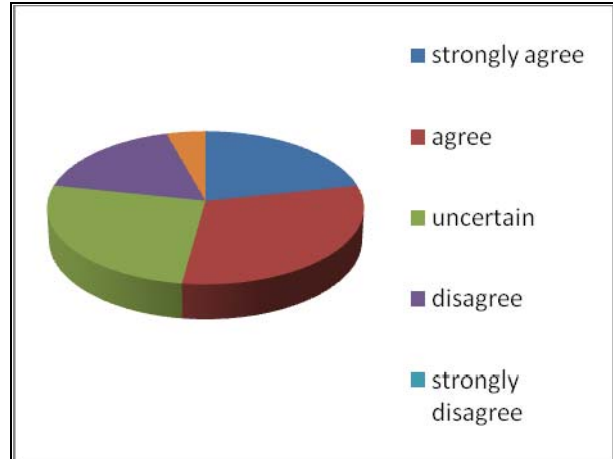
**I would recommend mobile learning as a method of study to others.**

strongly agree	4
agree	9
uncertain	6
disagree	3
strongly disagree	1
no answer	0



**Using the mobile device enhanced the learning experience.**

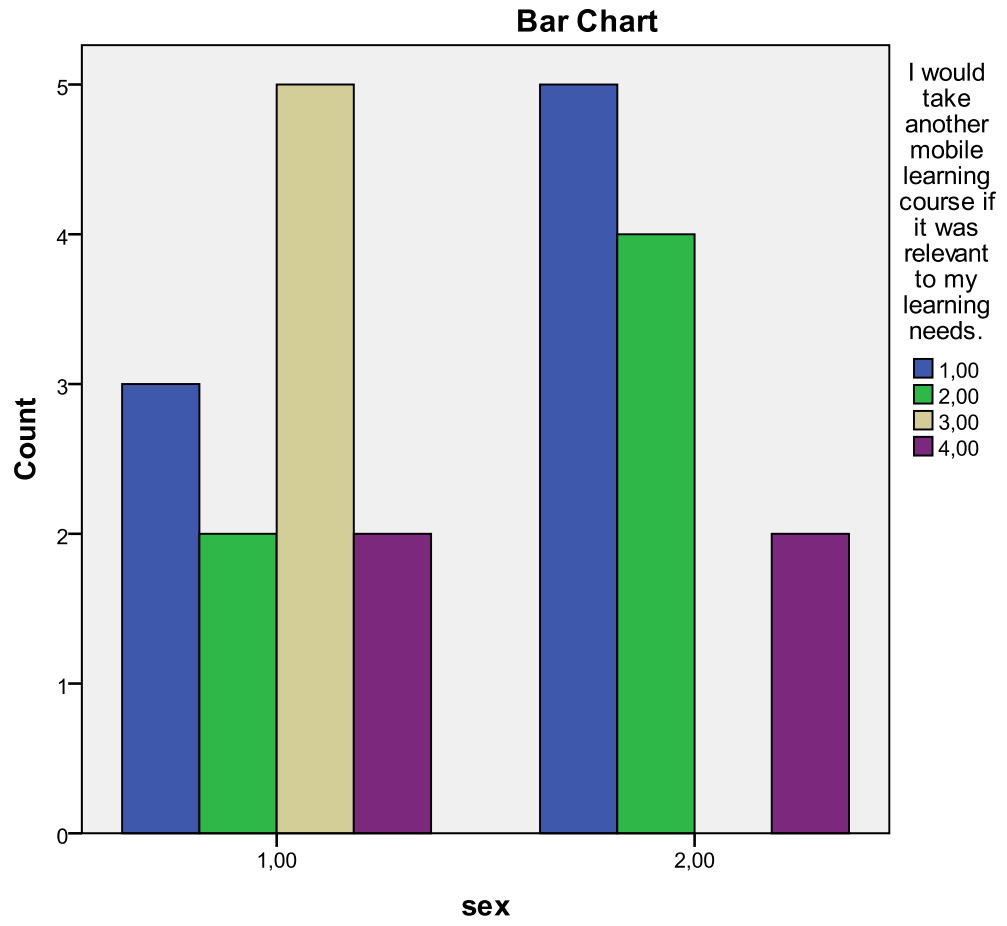
strongly agree	5
agree	7
uncertain	6
disagree	4
strongly disagree	0
no answer	1

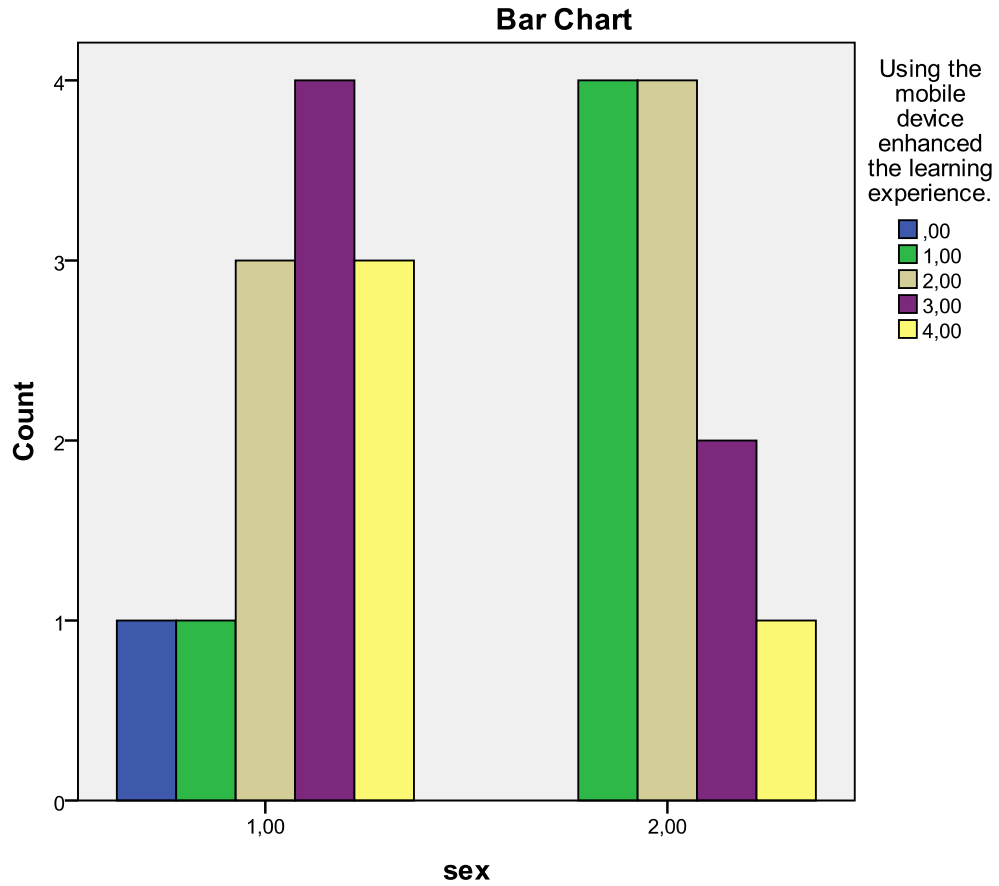


**Cross tabulation**

The results of cross tabulation also brought up some interesting and remarkable aspects of this pilot test. Despite the small sample size, what reduces the validity of this dataset, there are some interesting phenomenon in this cohort, which worth mentioning. In this population female (2,00) respondents were slightly more positive than males (1,00). Females also gave less uncertain answers.

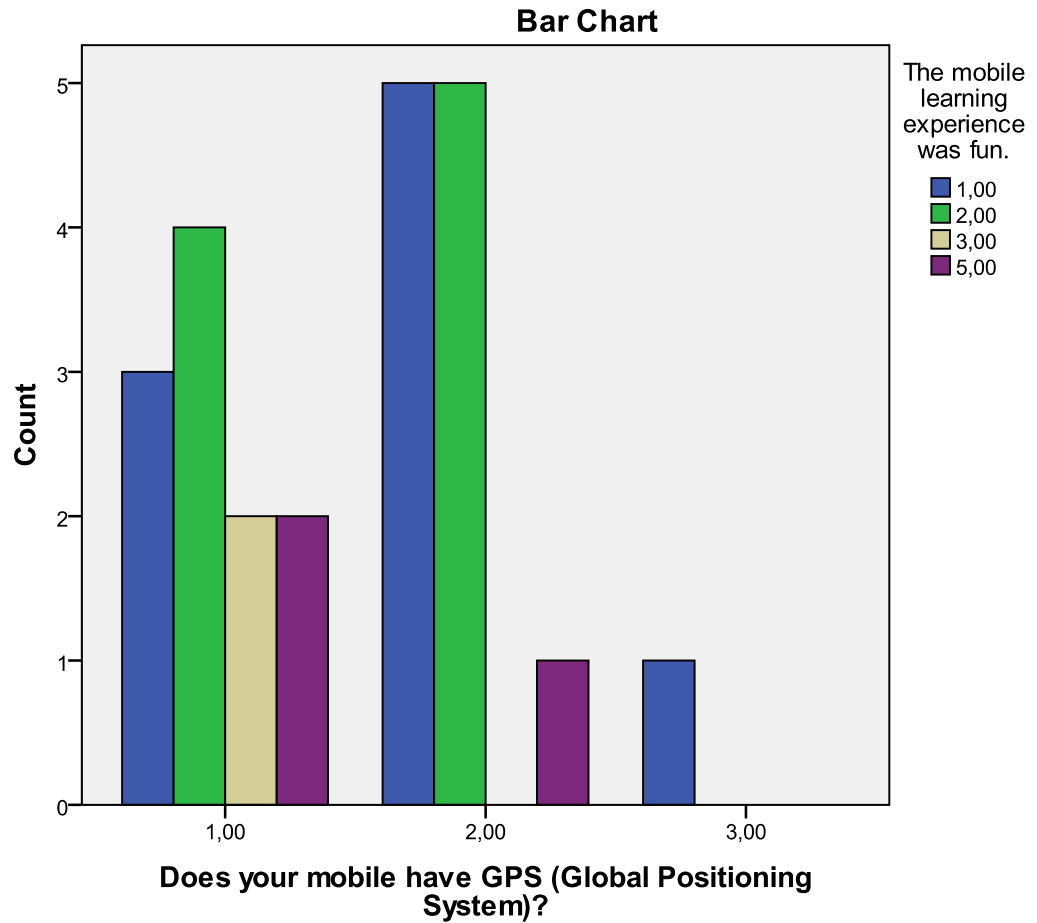
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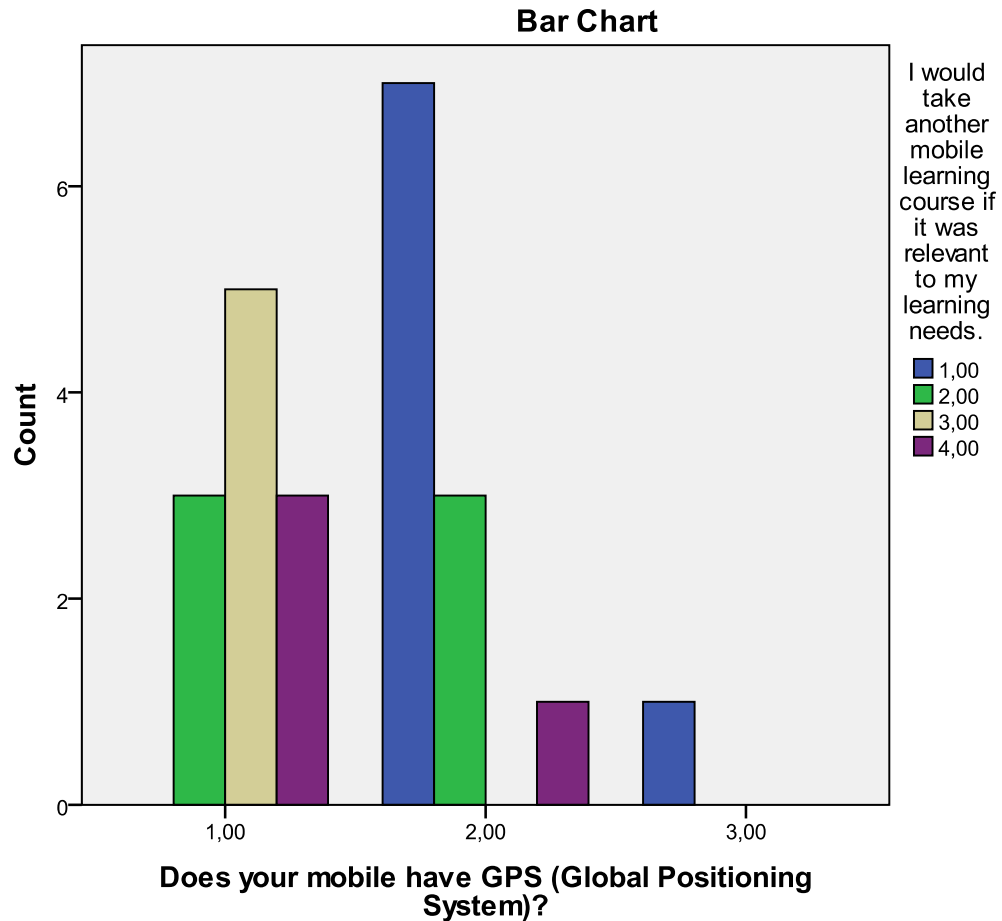


As it was visible before, regarding to the previous GPS usage, two groups were visible, with 11 students each. This gave us a good opportunity to check, the role of possessing GPS technology previously, when it comes to learning experience. The results were interesting. People using GPS enabled mobile phones (1,00) in their everyday life, showed more skepticism towards mobile learning. There was more uncertainty and disagreement in their answers than in the other group (2,00). They also experienced less fun during the test then people not having an everyday connection to GPS devices.

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The most remarkable difference between the two groups can be found by the item of measuring the willingness of taking another mobile learning course. Those people, who took location aware technology as novelty, were much more motivated to try out a mobilized course again than people in the other group. This suggests that technology showed here its pulling power. Learners like to trial new, novel tools in their educational processes, but as this experience shows as well, this motivation significantly lower once users know and use that particular technology on a daily basis.



### General comments

The answers for the item “In what ways did it (or did not) enhance the learning experience?” emphasized mostly the fun factor mobile learning. Students enjoyed not being in the classroom, but being confronted with a learning activity, where the task was to explore their neighborhood. Respondents also mentioned the simplicity as an advantage, but also the automatic location and context based learning content delivery got positive feedback. Some of the most typical feedbacks were:

*“It was fun like a game”*

*“Speed and simplicity”*

*“I don't have to find and download materials, it just gave it to me.”*

*“It is quite good that you can see the things around you that you can learn about, it makes learning more effective.”*

For the question “Which functions of the device did you use most?” The most common answer was: The map. This GPS based service was seriously in the middle of the attention. Therefore it is not surprising that this function received most of the positive but also most of the negative remarks. It was treated as an essential part of the application, but due to the unreliable GPS signal students failed to identify their location on the map quite a few times. A few answers from this set follows:

*“Finding learning material on map”*

