

Supporting Geolearners: Location-based Informal Language Learning with Mobile Phone

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ABSTRACT

Supporting collaborative learning in relation to geographical location is becoming more prevalent for learners who are geographically connected (Geolearners). The advancement of mobile and ubiquitous computing enables to determine geographical location, supporting geolearners to collaborate and participate through Web 2.0 technologies. In this paper we describe the design and development of a system that facilitates location-based, situated and collaborative language learning incorporating the potential of Internet-based television and mobile phone. We present TAMALLE+ (Television and Mobile phone Assisted Language Learning Environment), based on the requirements that were captured from multiple sources. Finally, we discuss results of multi-method evaluation studies together with further direction to our research.

KEYWORDS

Geolearners, Location-based Learning, Mobile Language Learning, Cross Platform Development, Ubiquitous Learning

1. INTRODUCTION

Language learning is complex, it involves acquiring different skills, as the separate functions of speaking, listening, reading and writing have to be addressed, each at many levels, from phonetics to discourse and pragmatics. Adult self-directed learners often undertake different approach to language learning. One important characteristic that has arisen from Knowles' theory is the notion of "self-concepts" or self-directedness of learning, which distinguishes adult learning (andragogy) from children's learning (pedagogy). Adults can "become self-directed, taking responsibility for their own learning and the direction it takes" (Fidishun, 2000, p.2).

Adult learning, from one standpoint, is seen as a continuing aspect of everyday life. This was initially articulated in the theory of lifelong learning. In practice, adults adopt numerous strategies for their learning, which may take place in many different situations and settings. Informal and non-formal learning are as important as formal learning, with some studies indicating that most adult learning takes place outside formal education (Tough, 1971; Livingstone, 2001, O'Malley et al., 2003). Learning is often linked with other activities as a part of everyday life and may also happen in various settings and places; at home, work, on the move, abroad, or in places of leisure (Vavoula, 2004). This is particularly true for language learning where theory can only deal with some aspects of language skills; therefore different strategies and approaches need to be adopted (Mitchell and Myles, 1998).

The possibility of using “non-desktop” technologies for supporting adult learning opens up a wide variety of activities and interactions for learners. The potential for technologies such as mobile devices (m-learning) and interactive television (t-learning) for learning has provided a new direction for research in the field of educational technology. In particular, designing for these new technologies has thrown up a number of design challenges associated not only with the physical and functional limitations of these devices, but also with the effective implementation of new learning paradigms - situated, collaborative, life-long, personalized and contextual (Naismith et al., 2005, Fallahkhair et al., 2007; Pemberton et al., 2010; Clough, 2010).

In this paper we concentrate on the design and development of a location-based system to support informal language learning. The system aims to capitalise on the strengths of two specialised technologies, iTV and mobile phones, which tend to be used in different settings and at different times. We first briefly overview the TAMALLE+ system. We then discuss briefly the first stage of the project, learner-centred negotiation of requirements, for developing ubiquitous language learning, which led us to the design and development of the system. The interfaces for the two devices are then described. Finally, we discuss a multi-method evaluation technique to gauge usability, perceived usefulness and desirability of TAMALLE+ system.

2. TELEVISION AND MOBILE PHONE ENHANCED LANGUAGE LEARNING ENVIRONMENT

Television and Mobile Assisted Language Learning Environment (TAMALLE) system was originally prototyped in 2005 (Fallahkhair et al, 2005), which has been further developed to support extended functionalities required for location-based language learning. In its latest version, TAMALLE+ is developed as the Android app to support situated and collaborative language learning. In this section we discuss a number of requirements that were gathered to inform the design of TAMALLE+ system.

2.1 Requirements Elicitation

To inform the design of a system to support adults learning a second language, we gathered requirements from multiple sources: learners’ study, language learning theories and affordances of technologies, in this case iTV and mobile phones. To study learners we conducted focus groups to investigate the approaches that independent adult language learners have adopted towards their language learning and their attitudes towards a range of technologies including iTV and mobile phones. The result of the focus group study and an overview of language learning theories were integrated into a discussion of the learning affordances of iTV and mobile phone technologies and shaped a framework for our design (Pemberton et al, 2004). This framework suggests adults self-directed learners can learn from an authentic materials broadcast on TV by receiving comprehensible input, constructing a personal learning space, communicating with other and engaging in performing enjoyable activities. On the basis of this framework a number of scenarios were developed (Fallahkhair et al, 2004), including the scenario to learn incidental vocabulary from an authentic television programme and scenarios for location-based language learning on mobile devices. The former scenario was developed and evaluated (Fallahkhair et al, 2007), the later scenario that supports situated and location-based language learning is described in this paper. Some of the general requirements elicited from the results of our focus group are as follows:

- To support situated and location-based language learning.
- To support learning from authentic materials, i.e. television programme.
- To support learning on anytime and anywhere basis, i.e. ubiquitous and mobile technologies.
- To support collaboration and communications amongst community of learners through web 2.0 functionalities.

Input from how adults go about their language learning and language learning theories also confirm learning opportunities through situated, location based and collaborative learning (Pemberton et. al, 2004). Jonassen et al.'s rubric for constructivist learning (2003) that outlines important attributes, including intentional, active, authentic, and cooperative learning opportunities that will be supported through the development of scenarios envisioned in this project.

The following section provides a general overview of the TAMALLE+ system describing its main functionalities to support location-based informal language learning using mobile and Internet-based TV technologies.

2.2 Description of the TAMALLE+ SYSTEM

The prototype of a cross platform language learning support system via iTV and mobile phone (TAMALLE+) was designed based on the requirements outlined in Section 2. The aim of the system is to support advanced learners of English as a second language in their television viewing, as just one element in their language learning activities. As the focus of the learners will be on media consumption rather than on conscious language learning, this support is designed to be as discreet and non-intrusive as possible. The system provides support to view television programme on Android based mobile devices and extra support will be available in the form of captions and other onscreen displays, for comprehension of specific language (or sometimes cultural) items for viewers as they watch English language programmes. These items can be incorporated by learners into their personal "learning sphere", a private data storage area (My TAMALLE). The system also provides support location-based language learning in the form of overlays for comprehension of specific language (or sometimes cultural) items for users. The system also enables communication and collaboration amongst learners incorporating existing social networks: twitter. Language learners will also be enabled to meet other language learners and communicate with each others through voice over IP at "Meeting Point" feature. Figure 1 and 2 illustrates TAMALLE+ system.

Figure 1: TAMALLE+: Main Menu and TAMALLE TV



The TAMALLE+ system depicted in Figure 1 and 2 shows the system's main menu including main features: Watching TV, My TAMALLE (personal learning sphere), Featured words (words that the system recommends based on the ranking that the learners provide), Twitte TV (links twitter application from the TAMELLE+, users can access twitter feed and their social networks), TAMALLE Places (Links new language or cultural items to location, enable learners to populate them as an overlay or to view other users' created location-based overlays), Photos Videos (enables adding new photos or video to selected language items to support situational learning), Dictionary/Translations (provides link to Google define search as well as Google translation API, users can use these services from the TAMALLE+ mobile app), Search (enables advanced search for language items as well as searching for personas), Meeting Point (enables learner to enter the social gathering sphere to either communicate with each other over voice over IP or to interact via video conferencing using their Android devices).

Figure 2: TAMALLE+: Twitte4TV and TAMALLE Places



3. EVALUATION

An evaluation of the TAMALLE+ was carried out using a combination of observations, interview, questionnaire and card sorting. Data were gathered in different dimensions to test the usability of the software itself, the usefulness of the features provided, the desirability of system use and overall acceptance. The main aim was to explore how useful and desirable an application, such as TAMALLE would be and how further improvements can be made in the future.

3.1 Method

Participants carried out a set of tasks using the TAMALLE+ system. This took about one hour and was followed by a further hour to fill out the usability questionnaire, give comments on the usefulness of TAMALLE features, carrying out the desirability evaluation.

For the usability evaluations we adapted the ISO Metrics questionnaire (Gediga et al., 2000). Six categories out of seven of ISOMetrics were selected: suitability for learning, self-descriptiveness, controllability, conformity with user expectations, error tolerance and learnability. For usefulness of its features we used feature-rating methods. This part of the questionnaire aimed to ask how useful users found TAMALLE+ features and what features were liked and disliked. The participants were required to rate 9 features of TAMALLE+ prototype on the scale from 1 to 5 (1= useless and 5=useful). They identified three or more features that they liked/disliked the most with their comments.

To measure desirability we used the product reaction cards described by (Benedek & Miner, 2002). This method provides an effective way for evaluating those aspects of user's experiences that are more intangible and difficult to measure in the lab setting. A total number of 118 words including 40% negative/neutral and 60% positive statements were presented to users. The participants were required to pick those that best described the software. They then narrowed down their selection down to five cards that best express their opinion and to write down their detailed comments for these five cards.

3.2 Participants

Our study included eleven paid volunteered of varied age and nationalities. They composed of six females and five males. Four were 21 to 29 years old and seven were 30 to 39. Participants were recruited amongst the staff, postgraduate and doctoral student who speaks English as a second language. Participants had reached a high level of English language competence from advance to proficiency level. This was also mentioned in call for help message as a prerequisite for participation. Eleven different nationalities were included: Brazilian, Hong Kong, Egyptian, Japanese, Spanish, Iranian, Mexican, German, Romanian , Burundese, and Dutch.

3.2 Results

TAMALLE+ scored an overall 3.8 indicating positive attitudes and statements towards TAMALLE+ ubiquitous interface. Suitability for learning (3.8), self-descriptiveness (4.1),

controllability (4), conformity with user expectation (3.8), error tolerance (3.6) and learnability (4.4).

Desirability evaluation revealed interesting results. The negative/neutral cards most mentioned were: “busy”, “distracting” and “slow”. Participants, however, found the TAMALLE+ interfaces very easy to use and learn. This confirmed results of the usability questionnaire. The audio visual and textual materials all together in one screen made the interface look a bit busy. The positive cards that were selected by more than half our participants are: “Useful”, “Helpful”, “Motivating”, “Easy to use”, “Personal”, “Consistent”, “Engaging” and “Familiar”. The result suggest that our participants have chosen 82% positive and 18% negatives out of total number of choices they had made from the first and second round.

4. FURTHER WORK

The TAMALLE+ design responds to the requirements we derived from multiple sources. Learning from engaging, up-to-date and authentic materials that are of intrinsic interest to language learners is enabled. Learning in context is made possible, with rich multimedia content providing a comprehensible setting for the new language. Learning on the move is supported while enhancing the experience through location-based for situated learning. Communications are enabled to facilitate collaborative learning amongst the community of geolearners.

However, the design of TAMALLE+ raised a number of questions to be addressed in further research. A first question regards the adaptation of such language leaning system. If learners are relied on collaborative and location-based learning, they need to be actively involved in social development of language learning content. Further research into community-based and location-based monitoring and regulating of crowd source generation of content need to be conducted.

A second set of issue is concerned with the development of algorithms for selection and segmentation of learning materials from the authentic television programme mainly by utilising the result of our previous experiments (Fallahkhair and Pemberton, 2007). At the moment we are considering the use of close captioned text to implement automated rules for the provision of these learning materials tailored in accordance to an individual learner’s language competence, motivation and preferences. These issues will be addressed in our future research. In addition we are evaluation TAMALLE+ system across different languages to capture more data regarding its effectiveness as a tool to support informal language learning.

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