Global perspectives on Computer-Assisted Language Learning

Glasgow, 10-13 July 2013

A pervasive language learning environment: The European Digital Kitchen

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Abstract

This paper reports on the research activities of an on-going European Union-funded project, 'Learning languages, cultures and cuisines in digital interactive kitchens' (LanCook) which develops the application of digital sensor technology together with a Task Based Language Teaching (TBLT) approach to create a pervasive language learning environment. The principle objective of the project is the creation and use of multilingual task-based Language language learning materials for learners to cook dishes linked to 7 European cultures and countries: Catalan, English, Finnish, French, German, Italian and Spanish. The materials use digital sensor technology to promote a genuinely situated language learning experience of a real-world activity. The pedagogical design of the materials means that learners are able to learn aspects of European languages whilst performing a meaningful real-world task and simultaneously experience the cultural aspect of learning to cook a European dish.

This focus of this paper is on outlining the different processes involved in the creation of technologically enhanced language learning materials using sensor technology from pedagogical and technological design to initial findings from data collected so far as part of a year-long trialling phase.

Keywords: Task Based Language Teaching; situated language learning; materials design; European languages

1. Introduction

Learning foreign languages offers rich rewards including improved cultural understandings, communication abilities and job prospects. However, in recent years, the European Union has acknowledged that Europe faces specific challenges regarding increasing foreign language proficiency, an area which impacts the EU economy (European Commission, 2008).

LanCook is a European-wide collaboration (5 countries) which engages with some of the major challenges concerning how to increase foreign language proficiency, language skills in the EU as well as how recent developments in digital technology can enhance approaches in CALL (http://europeandigitalkitchen.com). The project does this by drawing on Task-Based Language Teaching (Skehan 1998; 2003) and through an innovative combination of cooking and digital technology.

Beginning in December 2011, LanCook involves the creation and use of multilingual task-based language language learning materials for learners to cook dishes linked to 7 European cultures and countries: Catalan, English, Finnish, French, German, Italian and Spanish.

The materials are designed to be used with a 'portable kitchen' which uses sensor technology (similar to the Nintendo Wii™) to lead learners step by step through the cooking of a dish. Embedded digital sensors are inserted in or attached to all the equipment and ingredients allowing the kitchen to detect and evaluate activity as learners progress through their cooking tasks (Hooper *et al*, 2012). As the kitchen is able to detect what users are doing, it can provide help along the way through a range of audio messages, pictures and video. There is also the option to gain more details about a certain cooking action. As an interactive activity, learners are also able to communicate with the kitchen. The pedagogical materials are stored as a software programme in a portable tablet PC and comprise of an integrated suite of materials for cooking preparation.

Figure 1: The touchscreen, interaction tools and some utensils with sensors which make up the portable kitchen

2. Method

The project is organised into a number of phases moving from materials design, creation, trialing and implementation to modification. As research and development-oriented activities, each of these phases addresses specific practice-based research questions:

Design phase: Which components of Task-Based Language Learning are relevant to the pedagogical design of language learning and cooking in a situated learning environment of a kitchen? What are the technological affordances and constraints of using digital sensor technology for use with language learning and cooking in a situated learning environment of a kitchen?

Creation phase: How does the pedagogical and technological design of the kitchen impact on the selection, building and programming of recipes to be used in the digital kitchens?

Trial phase: What aspects of European Languages are acquired in the digital kitchens by individual learners? What is the impact of the design and creation decisions on how learners perform the task of cooking in the digital kitchen? What is the relationship between individual learning outcomes as a product and the how learners performed the task in the digital kitchen as a process?

Modification phase: Based on the findings of the trialing phase, what elements of the pedagogical and technological design of the materials mostly supported learners in the completion of the cooking task, and which ones didn't?

3. Discussion

A series of participatory design workshops took place in June 2012 in Newcastle, UK, where the project members, made up of language teachers and applied linguistics experts worked closely together with computer technologists to finalise a merged pedagogical and technological framework for the design.

A smaller team of project members made up of a computing technologist, programmer and a language learning researcher worked together to create an authoring tool which reflected the collaboratively produced design decisions. The tool was successfully piloted with other project members and the first versions of the materials were created in each of the 5 countries.

Following a period of piloting where learners were observed using the materials and some changes were made to the recipe programming, the trials began. The project is currently running at least 125 trials involving a minimum of 250 learners across 5 countries. Learners are invited from adult, higher and vocational education learning contexts as well as immigrants and overseas students. Data collected during the trials include audio-video recordings, pre-post and delayed vocabulary test data, self-reports on using the digital kitchens and learner biographical information.

The trailing phase will lead to findings that will be incorporated into a modified design ready for dissemination and exploitation.

At this interim point in the research, we are able to point to a number of initial ways in which key design decisions impact on how the materials are approached and used by learners. Two overriding features linked to the use of the digital sensors are coming to light: First, the notion of *accompaniment*, how the digital kitchen and the users come to work in tandem as a partnership to complete the cooking task and second, how the digital kitchen is able to encourage active participation with the task *and* between the users.

4. Conclusions

Our initial findings contribute to on-going debates over the role of technology in language education more generally and CALL more specifically. As technologies in these areas offer increased learning opportunities: should they support traditional CALL paradigms, or can and does the innovative use of novel technologies such as the European Digital Kitchen require a new pedagogy?

5. Acknowledgements

This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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