The *LanCook* Project: When technology supports language… and cooking skills!

An interview with Paul Seedhouse

Le projet *LanCook*, «*Learning languages, cultures and cuisines in digital interactive kitchens*», a été mené par Paul Seedhouse et Patrick Olivier de l'Université de Newcastle entre 2011 et 2014. Ce projet, financé par la Commission européenne, a permis de développer une cuisine digitale interactive pour l'enseignement de 7 langues secondes européennes (anglais, allemand, espagnol, catalan, italien et finnois). Le défi a été d'une part technique, avec la réalisation de la cuisine digitale mobile, qui fonctionne notamment grâce à des senseurs et des accessoires permettant aux apprenants d'«interagir» avec le matériel de cuisine via une interface didactique sur tablette – le projet a d'ailleurs été nominé aux «E-learning Awards 2013». D'autre part, il s'est également agi de développer un support digital qui puisse servir les principes de l'apprentissage par tâches (*Task-Based Learning*): par une tâche linguistique et manuelle précise, soit la réalisation d'une recette de cuisine, l'interaction et l'apprentissage sont situés et «*embodied*», mais guidés par une interface didactique digitale qui peut différer notablement des interactions enseignants-apprenants. La question de la relation entre apprentissage des langues, cultures et cuisine est également au coeur d'un tel projet, puisqu'il réunit 5 universités européennes (Newcastle University, Università degli Studi di Modena e Reggio Emilia, Helsingin yliopisto, Universität Paderborn et Universitat Autònoma de Barcelona) qui ont chacune eu la liberté de proposer les recettes les plus «représentatives» culturellement parlant. La création d'un recueil européen de matériel didactique pour l'enseignement des langues secondes basé sur la cuisine ainsi que d'un guide culturel pour toutes les recettes présentées – et dont les activités sont en lien avec les objectifs des différents niveaux du CECR – est d'ailleurs un des résultats les plus significatifs du projet.

Après une présentation de la cuisine digitale et de son fonctionnement, l'interview de Paul Seedhouse approfondira les origines, les motivations et le futur du projet *LanCook,* et se focalisera également sur les rapports entre cuisine, technologie et apprentissage des langues. Pour clore cette contribution, des témoignages d'apprenants-utilisateurs de la cuisine digitale seront présentés.

Pour toute information sur le projet *LanCook* ou pour prendre contact avec ses concepteurs en vue d'essayer la cuisine digitale, vous pouvez visiter son site, extrêmement complet!

http://europeandigitalkitchen.com/

How does the European Digital Kitchen work?

Constructing the European Digital Kitchen involved drawing on an existing technologically-enhanced kitchen (the Ambient Kitchen) which was originally developed at Newcastle University to support older people and those with dementia in their everyday kitchen activities. The term "ambient" refers to the nature of the technology used in the kitchen, which is absorbed or hidden in that environment and, similarly to a car satellite navigation system, is designed to guide and support the user in an everyday setting.
In the European Digital Kitchen, this technology was developed so that the kitchen speaks to the learners in a range of languages, providing step-by-step cooking instructions in relation to learners' completion of the cooking steps. It can also detect what the learners are (or are not) doing and this information is used by the kitchen programme to provide feedback, such as a reminder that help is available, or to provide more details about a certain cooking action as a "tip". Embedded or hidden digital sensors were developed and inserted in or attached to all the equipment (for example, a peeler, a mixing bowl, a whisk or even the oven door) and ingredients (for example, a bag of flour, sugar or a tub of butter) as in Figure 1.

Figure 1: Digital sensors attached to cooking equipment

The sensors use a technology similar to the Nintendo Wii™. Learners are also able to communicate with the kitchen, using an interactive screen or Graphical User-Interface (GUI), where they can request audio and visual help along the way and the ability to move back and forward between the cooking instructions if needed, as in Figure 2.

Figure 2: Communication with the kitchen via the Graphical User Interface

To sense and recognize activities relevant to the cooking process, we instrumented the objects used for cooking with small, inexpensive acceleration sensors (see Figure 3).

Figure 3: Acceleration sensors detect movement

These wireless sensors are integrated into the handles of cooking utensils, incorporated into containers that hold ingredients, and directly attached to kitchen appliances (e.g., oven door, weighing scales). When a sensor detects movement it starts transmitting the raw acceleration data to a nearby receiver, which is connected to a host computer. To recognize activities from the accelerometer data, we employ a technique that reports motion if certain thresholds in the signal's energy and the magnitude of its power spectrum are exceeded. Motion events are generated if kitchen objects, e.g., food containers or the oven door, are moved.

We have produced a "portable digital kitchen" for the project, made up of tablet PC with touch screen and a set of utensils with embedded sensors and additional sensors for other kitchen equipment. This portable digital kitchen can function in any existing kitchen setup, ideally where there is access to kitchen equipment such as a counter, sink and an oven etc.

Figure 4: The portable digital Kitchen with a selection of the utensils

Following standard practice in Task-Based Language Teaching (TBLT), kitchen users work in pairs; we normally paired users with skills in a European language together with users with skills in cookery so that they were able to exchange skills.

The interview with Paul Seedhouse

Babylonia: While researching for the present issue of Babylonia, we came across the project "*LanCook: Promoting European language learning, mobility and collaboration through cooking and technology*" and were surprised by the chosen approach: since cooking is a highly social, embodied and almost intimate activity, most didactic approaches to language learning involving food/cooking choose to topicalize a cultural or personal point of view and combine language training with the acquisition of cultural knowledge. In contrast, *LanCook* chose technology to support language learning. How and why did you choose this approach?

Paul Seedhouse: My colleague in Computing Science, Patrick Olivier, had built an Ambient Kitchen[1] which is designed to speak to people with dementia and talk them through cooking a meal, thus enabling them to stay in their own homes and look after themselves. The Ambient Kitchen was designed to provide situated support in the form of written or audio prompting during a kitchen-based activity such as making a cup of tea. It does this by detecting actions and linking these to the possible intentions of the user. When I saw this, I thought this would be perfect for language learning and so we worked together on first the French Digital Kitchen project[2] and then the European project.

Babylonia: We can assume that cooking as the main support-task for language learning was not a random choice. Why did you choose cooking as the base of your digital language learning project?

Paul Seedhouse: Because I love food! As Ayeomoni (2011) writes, "the relationship among language, food and culture in a society is an inextricable one." The pedagogical design of the kitchen means that

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Babylonia: The Digital Kitchen is available in 7 European languages and learners can cook one or more typical recipes given in the target language. This project, involving 5 Universities throughout Europe, has probably had to deal with cultural issues. How did you integrate cultural aspects into your project? How did you choose the recipes? Were they chosen for the opportunities they offer to work on specific linguistic and/or cultural aspects?

Paul Seedhouse: Each partner had the freedom to decide which recipes to choose and how they would relate to culture. Our Italian partners produced a great video about the regional nature of Italian cuisine, which you can find on the Italian website. In England we chose an Indian curry recipe as the basis for a discussion on the multicultural nature of English society. We created a culture guide and downloadable recipes with culture notes[3]. Each recipe is suitable for use by language teachers or learners in any kitchen, not just a digital one, so this should be a useful resource for your readers.

Babylonia: As regards language learning processes, the approach chosen for the *LanCook* project is Task-Based-Learning (TBL), with the development of materials that are "designed to promote a genuinely situated language learning experience of a real-world activity". Since the main interactive "participant" or "feedback provider" is the Digital Programme, one could be surprised by the choice of the words "situated learning" and "real-world activity". How is this kind of interaction different than teacher-learner interaction? How can you evaluate the efficiency of the linguistic and task-oriented feedback?

Paul Seedhouse: The participants work in pairs, so much of the interaction is between participants as they work out together how to navigate the task, which is what is intended in TBLT. By "situated learning" we mean in a kitchen rather than in a classroom and by "real-world activity" we mean that participants are actually cooking and they really eat what they produce, as they do at home in their own kitchen. It's rather similar to sat-nav on your car. The system gives you instructions and feedback, but you actually concentrate on the task at hand with your partner, equipment and ingredients – if you don't, you will crash!
We evaluated the efficiency of vocabulary learning using pre-test and post-tests and by post-interviews with learners. To see what actually happens, watch *Lancook* TV[4].

Babylonia: Is the project specifically aimed at cooking or hotel schools or is it open to non-vocational training? How can schools acquire the programme?

Paul Seedhouse: We have trialled the materials with 250 people of all kinds and all ages in 5 countries. The vast majority have been foreign language learners, not catering students. If we receive further EU funding, we intend to produce free downloadable smartphone and tablet apps, so anyone will be able to use the materials in a couple of years time.

Babylonia: How does the *LanCook* experience, for a language learner, differ from traditional learning? What does it add to the classroom programme?

Paul Seedhouse: As I have visited the 5 centres and cooked the recipes in 7 languages myself, I can say it is totally different from classroom learning. You are immersed in an environment and a task (as with sat-nav on your car) and you are trying to cook a dish using multiple resources: the system gives you instructions and you work out with your partner what to do by using each other as a resource; by getting help from the system in terms of photos and videos; by looking at the ingredients and implements. One time in Germany I was so immersed in the

Family Style. © Martin Zeller / *Foodscape* 2008.

task that I didn't notice a sensor was touching the hotplate and starting to burn! Another difference with the classroom is that you get to eat the result of your learning!

Babylonia: What are the future developments for the *LanCook* Programme? How will it develop in the field of cooking? Or can it/will it apply the same processes to other "everyday activities" to support language learning in other fields?

Paul Seedhouse: We have applied for EU funding for a project called *Linguacuisine*. We will create for the new project free downloadable smartphone and tablet apps (android and Apple). These will enable users to be guided through cooking a range of recipes in 6 different European languages. The phone or tablet will speak to the users in the foreign language and offer multimedia help to users in terms of photos and videos. Users will be able to access different levels of help to support their language learning depending on their levels of competence. As no sensors are involved, users will let the phone or tablet know when they are ready to move to the next step.
The main aim is to create a sustainable model for the production and use of multimedia materials for learning languages, cuisines and cultures based on user-generated content in support of a community of practice in those areas. We will take 30 digitally marginalized project participants with little or no digital experience. We firstly provide them with digital and transferable skills. We will co-design the app and authoring tool with them, thus ensuring that the apps will be usable by most social groups in the EU. Then we enable them to use the authoring tool to author a multimedia social recipe for language learning. "Authoring" here means a) writing an existing cooking recipe onto the system in short, simple stages using the authoring tool, b) creating audio files for spoken instructions, and c) creating photos and videos together with subtitles as help facilities.

The "authoring tool" is a software system that allows both technical and non-technical people to programme content for use in the app. We will disseminate the social recipes through the development of online communities of practice in 6 EU languages which bring people together in sharing and cooking the recipes. Dissemination activities will ensure that people across the EU will share and author social recipes themselves.

Notes

[1] See: http://www.ncl.ac.uk/ihs/research/project/2756

[2] See: http://digitalinstitute.ncl.ac.uk/ilablearnkitchen/

[3] http://europeandigitalkitchen.com/?page_id=2940

[4] http://europeandigitalkitchen.com/?page_id=2233

Reference

Ayeomoni, M.O. (2011). Language, Food and Culture: Implications for Language Development and Expansion in Nigeria. *International Journal of Educational Reasearch and Technology*, Volume 2, Issue 2, 50-55.

Paul Seedhouse

Paul Seedhouse is Professor of Educational and Applied Linguistics at Newcastle University, UK. His research areas are spoken interaction and digital technology.

Young *LanCook* users' feedback