

# TRANSFORMATIONS: MOBILE INTERACTION & LANGUAGE LEARNING

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## ABSTRACT

Mobile devices and the interactions that these technologies afford have the potential to change the face and nature of education in our schools. Indeed, mobile technological advances are seen to offer better access to educational material and new interactive ways to learn. However, the question arises, as to whether these new technologies are being used to their full 'interactive' potential? In Wales, the Welsh language strategy (2012-2017) is pushing to ensure that the Welsh language can embrace new technologies and use them to support and facilitate it's use by Welsh language learners and speakers. As more and more Welsh schools invest in ipads and handheld devices, it is important that the way these schools use these technologies evolves too. These new technologies (and the new interactions that they provide) need to be closely stitched with the desired learning objectives to ensure value, new meaning and learner engagement is achieved. This paper reports on an initial empirical study into the design of a Welsh Learning application, particularly the alignment of the interaction facilities of the technology and learning material in an attempt to harness the desired learning experience.

## KEYWORDS

Elearning, mobile technologies, Welsh language, engagement, interaction, mobile learning

## 1. INTRODUCTION

As more and more schools are investing in mobile technology for learning (i.e. iPads, iPods and other handheld devices etc.), the question arises as to what these devices and the new modes of interactivity that they bring to the classroom will actually mean for education. This paper is focused on the education of the Welsh language, as Wales is currently losing around 2,000-3,000 Welsh speakers every single year (Welsh Language Commissioner, 2012). In fact, 'there are many shortcomings in the teaching and learning of Welsh as a second language' (Lewis, 2012). In terms of technology, there are an ever increasing range of exciting and engaging educational websites and applications out there; however, it seems that there are very few that support the education of the Welsh language (Welsh Government, 2013). Even though many Welsh language schools are moving toward the use of mobile devices, they might not be using the full potential of these devices to fully nurture a deep learning of the language. The aim of this research is to explore how the iPad device can be harnessed to create an interactive, fun, yet meaningful way of learning the Welsh language. Of particular interest is the relationship between *interaction* and *learning* and how these need to be closely aligned and nurtured in the mobile environment to ensure an 'engaging' learning experience is achieved.

## 2. TRANSFORMATION – AN 'ENGAGED' LEARNING EXPERIENCE

Tablets, mobiles and handheld computers such as the iPad / iPhone are fast becoming the epi-centre of people's lives; they are transforming the ways in which we interact with technology. Most of these smart devices are currently embedded with powerful interaction facilities and programmable sensors such as GPS, gyroscope, microphone, haptic sensors, cameras, accelerometers and so on. In fact, these sensor-enabled devices are influencing all aspects of our social ecosystem, particularly holding huge pedagogical potential

for our educational system (Serrano-Santoyo & Organista-Sandoval, 2010). With sensors and new modes of interactions, these devices are changing the way we interact with the physical world around us; they afford interactions which play an intrinsic role in the learning experience. Indeed, interaction has the potential to draw out the essential quality of a learning object; it can initiate an absorbed interplay of cognitive and non cognitive faculties that in turn can cause what Dewey (1934) describes as a transformation – an ‘engaged’ learning experience. As Elkind (2009) highlights ‘[learning] experience is not always independent of our behaviour but rather created by it’. With mobile technologies, learners and educators of today, do not only have the opportunity to explore and reinvent the learning object in new and refreshing ways, but they also have the ability to expand learning through the amplification of social conversations and learning networks.

In an attempt to understand these new opportunities for interactivity and the opportunity for learning, it is equally important to be aware of the concepts inconclusively linked to these new technologies and interactions. Usability, being one of these, can be seen as being a quality attribute that assesses how easy user interfaces are to be used (Nielsen, 2003). From the beginning, the study of how people use technology has played a central role in the development of Human Computer Interactions (HCI), so much so, that the HCI discipline has often been portrayed ‘as the study and the practice of usability. It is about understanding and creating software and other technology that people will want to use, will be able to use and will find effective when used’ (Carroll, 2001, p. xxvii). However, in terms of interaction and particularly the varied interactions of today, it is now evident that we need to understand the bigger picture and acknowledge that usability is actually made up of several components. Indeed, usability is a collective term for all aspects of an activity’s performance. As Löwgren & Stolterman (2004, p.5) describe, the design of computer interactions is more ‘the process that is arranged within existing resource constraints to create, shape, and decide all use-oriented qualities (structural, functional, ethical, and aesthetic) of a digital artefact for one or many clients’. It is the shaping of digital artefacts for better user experiences, in terms of both appearance and function; the interaction point is what brings everything together and where new connections of knowledge emerge that hold the potential for greater understanding and learning.

How might we shape new interactions for Welsh language learning? A number of researchers in the field of Learning Technology have chosen to use a Design-Based Research approach (Kelly, 2004; Bannan-Ritland, 2003; Barab & Squire, 2004) to examine and analyze in a systematic way every aspect of a new learning design innovation. The transformation, we discuss, depends on balancing the interaction afforded by the technology (function and appearance) with the learning cues and connections to guide the learner into a sense of flow and engagement in the learning environment. Interactions, particularly those afforded by new mobile technologies (touch screen, sensors etc), have the potential to expose the learner to a number of opportunities for the creation and recreation of new, exciting and ‘engaging’ learning experiences. The key lies with the learning designer and how well the ‘transformation’ is designed; how well the interactions, function as well as appearance, are aligned with the learning material.

### 3. INITIAL STUDY OF THE APPLICATION

This research was undertaken at the University of South Wales to explore how the iPad device and the interactions it affords can enhance the ‘Welsh language’ learning experience. In Wales, there is a ‘need to ensure that the [Welsh] language can embrace new technologies and use them to support and facilitate its use by Welsh speakers of all ages’ (Welsh Government, 2011). To build the *Welsh language learning* application, a design-based research approach has been used to ensure that each stage of the development has been considered and addressed as described (Carroll and Kop, 2011). From the start, it was important to think about the appearance and function of the interaction and how this integrates with the learning objectives – to create ideas of what the main features of the application might look like and also how these would function (i.e. what interactions they would afford). Based on the national curriculum of Wales, we decided to focus the *Welsh language learning* application on the area of ‘Knowledge and Understanding of the World’ and within this to concentrate on three main topics: ‘Knowledge of the Home’ ‘Animals’ and ‘Weather Observation’. For example, on paper, the *home environment* section of the application aimed to encourage the child’s Welsh literacy skills and to reinforce their vocabulary and knowledge of items around the house. This core idea was then expanded through interaction to incorporate more playful experiences. In detail, the learner is presented with the cutaway profile of a house showing four separate rooms full of everyday

household objects. Each room contains objects that have been embedded with touch gesture interactivity and it is the learner's task to visually explore the rooms, touch the objects and in doing so build up his or her Welsh language skills. The key lies in the interaction – driven by the curious exploration – in that each learner needs to be enticed to visually engage with an object and then to physically touch it to trigger a response. For example, on touching the television set, the television switches on and the Welsh pronunciation of the word 'television' is audibly played as well as textually presented. In doing so, the learner is able to familiarize him or herself with the sound, spelling and visual representation of each object in Welsh.

Five local Welsh medium nursery/ primary schools (1-5) were approached in order to test the application. Both children (approximately ten learners per class/ school) and teaching staff (approximately one teacher and two teaching assistants per class/ school) were asked to take part in the study; the study was conducted through the medium of Welsh. Observational methods and focus groups were used to evaluate the children's impressions of the *Welsh Language Learning* application. The teaching staff from each school were asked to complete a questionnaire after using and observing the use of the *Welsh Language Learning* application to evaluate its interactivity and potential for learning.

The overall perception from the study was that all children enjoyed using the application, they were all interested and it proved a suitable tool to engage and keep them involved. Generally, all children participated in the activities and enjoyed discussing the application with their peers. The playfulness of the *drag and drop weather* activity and the novelty of the *dressing up an avatar* seemed to be most popular with schools (1)(2)(3) whilst children in schools (4)(5) engaged more in the exploration of the *home environment* section as they found identifying all the items around the house as well as the quiz the more challenging. Some children did slightly struggle with the learning content and children from school (3) were recorded to occasionally use the 'English Help' button for help. Overall, as the focus group discussion highlighted, all children enjoyed and were interested in using the application; in fact, they wanted to use it more. From the questionnaire data, we concluded that teachers from all five schools felt that the children enjoyed, were interested in and had the potential to benefit educationally from using the application. Three out of five teachers thought that the 'weather' section seemed most successful with the children whereas school (2) thought that the home environment section was the more engaging. All teachers agreed that the majority of children were participating as they usually do and were all paying attention (i.e. not easily getting distracted etc). In terms of learning the Welsh language, four out of five of the teachers found that the application was slightly too easy for the target audience (i.e. very few children seemed to need extra guidance). However, when asked to rate what they thought the probability of learning for each child after using this application would be (on a scale of 1-5, 1 being lowest – 5 being highest), teachers from four schools rated the application as a '4' for its potential for learning. The results also indicate that 'learning through play', particularly the playful elements incorporated into the interactions, proved to be an effective way to engage children of such a young age in the 'Welsh language' learning process. In terms of interactivity, all teachers felt that the children enjoyed interacting with the application; in fact, they all felt the need for more interactions to further enhance the child's learning experience.

#### 4. CONCLUSION

This short study has allowed us to identify the learning activities and interactions that the children were most engaged in whilst using the *Welsh Language Learning* application. More importantly, it has given us some insight into why the children were engaged with them (i.e. novel activities, playful interactions and challenging tasks). It is this power to 'engage' learners that emphasizes the importance of interaction to the learning process. In fact, it is this very 'power' that exposes the need to rethink the potential of the interactions that new technologies afford to the learning experience. Indeed, it is the attention to both the visual appearance and function of the interaction that can keep participants in the flow of their activities and consequently enhances their experiences. It is this detailed focus on the interaction that then plays an important role in determining the 'transformation'. As we have seen from this initial study, it was a combination of challenging learning tasks (i.e. appropriately set learning objectives) framed in novel activities that were brought to life through visually and functionally 'playful' interactions that harnessed the learners' engagement and the enhancement of the learning process. Looking ahead, the aim is to explore further iterations of this application with a deeper focus on the visual and functional aspects of the mobile

interaction and its role in the learning experience. Engagement is the key and it is the harnessing of engagement which takes interaction beyond usability and more towards the experiential, introducing many possibilities for new and exciting learning experiences.

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