# DEVELOPING CONTEXT AND WORK BASED MOBILE LEARNING IN THE CONSTRUCTION SECTOR

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## Introduction

This paper describes ongoing empirical research and development activity to develop a mobile work based learning application in the construction sector. The work is part of the EU FP7 Learning Layers project and is being piloted in north Germany.

Although apprenticeships in Germany are normally organised through the Dual System, combining learning at work with more formal vocational education through the vocational schools, in construction there is a tripartite system, with apprentices additionally attending training in industry funded training centres. BauABC, a partner in the Learning Layers project, in one of the largest industrial training centres in Germany, with some 2150 apprentices in 22 different occupational areas. Whilst attending the training centre, trainees carry out a series of practical projects, documented through the so-called White Folder. The aim of the mobile application, called Sharing Turbine, is to provide enhanced flexibility and to allow the increased use of multi media materials for learning. It is also intended to bring together both formal and informal learning and to bridge learning at different venues including the workplace and the training centre.

The early development has been led by the Welsh research and development SME, Pontydysgu, and undertaken in close consultation with both BauABC and the Institut Technik und Bildung at Bremen University.

This paper describes the research questions and major design issues raised through the consultation process with Meisters (trainers) from BauABC and the outcomes of a questionnaire on the use of mobile devices for learning, completed by over 2150 apprentices. It also incudes the first two iterations of Sharing Turbine and explains how the design has evolved through these iterations.

## Research questions

he research focus for the development is based on a number of practical issues. In particular, how can the uses of mobile technologies, tools and apps and services help to bring the real working life closer to the learning situations in the training centre? Other questions include how can wider access to information and learning resources be linked to better understanding of the uses and quality of information and how can use of internet and new media help the users to assess their own learning and

professional growth? How can improved access to information and communication resources and media from different locations be utilised to make communication and knowledge sharing across the organisation more effective?

**Emergent Issues**

Over 700 apprentices have completed a questionnaire on the use of mobile devices for learning. The results reveal the vast majority own a smart phone (mainly using the Android operating system) and over 50 per cent use their phone for accessing information related to their learning and work. However, most employers do not allow them to use their mobile in working time and there is very little use of purpose built construction Apps. The main uses are unsurprisingly for communication and for taking photographs. The majority would like more uses of mobiles for learning.

Three major issues have emerged from the questionnaire and from workshops with the trainers. These can be seen as being related to the increased use of mobiles as a working tool in the construction industry.

The first is how to move from using mobiles for seeking information to using them as an active learning tool. The second and related issue is how to encompass the many tools and physical objects used in construction within the mobile ecosphere. The third is how to design an application which both serves as a learning environment within the training centre but in the different context of the enterprise or construction site can serve as an information and shared knowledge base.

**Iterations in the design process**

Rapid Turbine has been developed as a mobile work based learning demonstrator for Sharing Turbine.

The objective was to research the theory and practice of developing mobile applications for work based and informal learning and to practically explore the pedagogic processes which can be supported through mobile learning.

The pilot was based on a task from the White folder called Rohrleitungsbau (pipe and sewer laying).

Paper based wireframes were created and a front end developed using the Twitter Bootstrap Framework in consultation with Meisters from BauABC, involving lengthy discussions around pedagogic approaches. The initial findings were that although the discussion proved rich and useful, the White Folder tasks per se do not easily transfer into a mobile digital format. Even if this approach was to be successful it would be extremely time consuming to digitalise all tasks in their existing form.

However training sessions with the Meisters have proved much potential for producing digital materials using existing apps and programmes and there is a positive attitude towards being able to document learning activities in other formats than text.

A second iteration of the Sharing Turbine demonstrator is presently being undertaken. Rather than focusing on white folder tasks per se, the front end will be based on commonly undertaken activities using mobile devices. The aim is to develop a White Folder Toolbox or a Digitally enhanced White

folder. One big advantage of this approach is that it is more flexible to incorporating digital materials for different tasks over a period of time, rather than being pressured to compete all the materials for any given task. Furthermore this approach should offer more flexibility in terms of linking informal and formal learning and learning in the training centres, in the vocational schools and in the workplace.