



**ECQA Certified
mLearning Manager
Skill Set Design**

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ECQA Certified mLearning Manager (mLeMan)

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Skill Set Design

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1 Acronyms

Acronym	Description
NVQ	National Vocational Qualification standard of England, Wales and N. Ireland
EQF	European Qualifications Framework
ECQA	European Certification and Qualification Association, www.ecqa.org

2 Introduction

MLearning Manager

There never was a technology as widely available to citizens as mobile telephony. This technology connects people working at different places and different education and learning paths with opportunities for expert and peer feedback and co-learning. Mobile technology offers unprecedented possibilities for combining the strengths of formal and non-formal education and professional internship. For the first time in the history of the use of technology in education and training, is a technology that will cost the learners nothing, because they own the technology to be used.

The mLearning is emerging as a new sector in education and training provision, side by side with face-to-face education, distance education and e-learning. Just as distance education was recognized and accepted as a field in the 1970s when the great European Open Universities were founded and e-learning was accepted as a field in 1995 when the World Wide Web first became available to educators. We can say that we have been in the process of acceptance of mLearning from the beginning of the 21st century, along with 3G/UMTS and Smartphone

The new mobile learning arena imposes significant new design requirements of training programs - the ways they are structured and maintained. The effective mLearning imposes specific usability requirement. The assessment of the mobile learning in terms of learning outcomes is similar in all VET systems but techniques in mLearning are specific. The validation of the assessed formal and non-formal mLearning should be done in accordance with the common European principles. The quality assurance should be an integral part of the management of mLearning providing institutions.

Our study shows that managerial level in the field will acts as premise and stimulus to development of job-roles in the design and development levels. mLearning Manager is a manager but should know about the specific of mLearning pedagogy, mLearning technology and mLearning application development. He or she is not a developer, or teacher – he or she has to organize and manage mLearning design, development, evaluation and implementation into his, or her, organization. In this light he or she needs to get a picture of development and teaching processes of mLearning. mLearning Manager should be aware of the benefits and potential of mLearning, staff needed for mLearning development, resources and organization.

Mobile learning differs from electronic learning (usually referred to as e-learning) because it uses smartphones, mobile phones, PDAs (Personal Digital Assistants), palmtops and similar devices instead of the desk top and lap top computers of e-learning. This means that mobile learning, unlike e-learning, uses devices which citizens are used to carrying everywhere with them, devices which a man can carry in a pocket or a woman can carry in a handbag and uses devices which citizens regard as personal, friendly, cheap and easy to use. A further difference is the mobility of the learner in mobile learning. The mobility of the learner is seen with commuters on buses, trains and metros, with learners on the job for instance on a crane or at a base station and with learners

at art galleries, museums or tourism locations. A major difference is in the type of technology used which means that there are types of learning that mobile learning can do that the other sectors of education and training (face-to-face, distance education and e-learning) cannot do or cannot do as well as mobile learning: context sensitive and location sensitive learning materials and augmented reality.

A development which has the potential to transform the way we use mobile devices to interact with the world is Augmented Reality or AR. This specifically generates composite views using the real scene viewed by the user and a virtual scene generated by the device. The key aspect of AR is that the virtual elements enhance the person's performance and perception of the world by supplying relevant information that is not contained in the real world. MAR (Mobile Augmented Reality) systems are intelligence amplifying systems to enhance human cognitive activities, such as attention, planning, and decision making. AR (Augmented Reality) crucially provides both the direct primary experience (the real world scene) and the mediated representation (the digital augmentation). As a result AR provides significant support and opportunity for real time situated learning.

ECQA – European Certification and Qualification Association

People will be able to apply for a European certificate for the aforementioned levels. The exam portal is managed by ECQA - European Certification and Qualification Association [1]. The ECQA is a not-for-profit association which was created as a result of a number of EU-supported initiatives over the last ten years, where, as part of the European Union's Lifelong Learning Program, different educational establishments decided to follow a joint process for the certification of people working within industry.

- ECQA provides worldwide unified certification schemes for various professions.
- ECQA works alongside experts from the market and supports the definition and development of the knowledge (skills sets) required for professions.
- ECQA defines and verifies quality criteria for Training organizations and Trainers to ensure the same level of training all over the world.
- ECQA centrally promotes all certified professionals.

The European work force is highly flexible and needs to work for industries across Europe (Germany, France, etc.). Through the ECQA it is possible to attend courses for a specific profession, in Slovenia for example, and take a standard European test at the end of the course. The certificate will then be recognized by European training organizations and institutions in 14 Member States. This will automatically lead to a wider recognition of the qualification and better chances of working for customers in an open European market.

ECQA currently supports 15 professions in Europe and, with support from the European Commission continuing until 2012, the pool will grow to 21 certified professions. In addition to the qualifications available for the mLearning Manager, ECQA offers certification for roles such as IT Security Manager, Innovation Manager, EU project manager, E-security Manager, E-Business Manager, E-Strategy Manager, SW Architect, SW Project Manager, IT Consultant for COTS selection, Internal Financial Control Assessor (COSO/COBIT based), Interpersonal Skills, Scope Manager (Estimation Processes), Configuration Manager, SW Process Improvement Manager, Integrated Mechatronics Designer, E-Learning Manager and Terminology Manager.

The ECQA guide can be downloaded at http://www.ecqa.org/fileadmin/documents/4_chapter2-part2-certification-new-job-role-v3.pdf

3 Skill Definition Model

Skill Set Strategy

A skill set is a group of specific learning elements that a person should be able to apply within a certain job role. A standard group of skill sets within Europe is necessary due to the free mobility of workers. European countries such as the UK, The Netherlands, and France already have well-established open learning courses which support APL (Accreditation of Prior Learning). In APL the skills of students are assessed, existing skills are recognized, and a learning plan is developed to cover any skill gaps. The skill assessment is based on defined skill units and a skill profile which shows how much of the skill units have been covered.

Definitions

The skill sets are based on the skills definition proposed by the DTI (Department of Trade and Industry) in the UK for NVQ (National Vocational Qualification) standards [2] and revised skill cards from other countries. It contains the following items:

- **Domain:** An occupational category. E.g. Domain = Process Improvement.
- **Job Role:** A certain profession that covers part of the domain knowledge. E.g. Job role = Yellow Belt, Orange Belt, Green Belt or Black Belt.
- **Unit:** A list of certain activities that have to be carried out in the workplace. It is the top-level skill in the qualification standard hierarchy. Each unit consists of a number of elements.
- **Learning Element:** Description of one distinct aspect of the work performed by a worker, either a specific task that the worker has to do or a specific way of working. Each element consists of a number of performance criteria.

- **Performance criteria:** Description of the minimum level of performance a participant must demonstrate in order to be assessed as competent.
- **Level of cognition:** For each performance criteria there is an intended level of cognition. At the same time this describes the complexity level of the test questions for each performance criteria, according Bloom's Taxonomy – Rev. 2001 [3].

Skill Set Structure

Using the terminology outlined in the skills definition model and including the skills identified during the demand analysis at the beginning of the project, a skills hierarchy for the job role MLearning Manager has been designed.

4 MLearning Manager Skill Set

U1. Pedagogical Aspects of mLearning

The pedagogy of mobile learning straddles two quite different pedagogical systems: the pedagogy of traditional face-to-face education and the pedagogy of distance education. The aim of this unit is to recognise the role of mobile learning in conventional, face-to-face education and in distance education. The objectives: Develop skills in the didactical structuring of mobile learning materials; Develop skills in the pedagogy of the use of media in mobile education systems; Develop skills in the pedagogy of the development of student support services for students studying by mobile learning. Decide which elements of the achievements of the Open University can be of value for the mobile learning programme of your institution. Decide which elements of the pedagogy of e-learning can be of value for the mobile learning programme of your institution. Develop skills in the management of the course development process for mobile learning in Textual materials, audio, video and TV materials, location and context sensitive course materials and augmented reality so that the qualified mLeMan manager can manage the production of mobile learning materials in his or her institution.

U1.E1 Mobile learning characteristics and design principles

Mobile devices can be used to provide a wide range of different types of short, support forms of learning intervention. This Unit presents:

- the mobile learning characteristics (ubiquitous, bite sized, on demand, just-in-time access to resources, blended, collaborative)
- the design approaches largely adopted in mLearning: performance support through instant information, assessments/ quizzes/ skills checks, collaborative learning, audio learning, video learning

U1.E1.PC1	Knowing the meaning of ubiquitous, bite sized, on demand, just-in-time access to resources, blended learning and collaborative learning
U1.E1.PC2	Knowing the principles to be kept in mind while designing mobile learning solutions
U1.E1.PC3	Knowing the design principles for creating quizzes that can be downloaded onto mobile phones
...	

U1.E2 Devices and Content

The Unit explains which devices should be considered for mobile learning and describes the key characteristics of each category.

The Unit also analyzes which types of content are best suited to mobile learning.

U1.E2.PC1	Knowing which devices should be considered for mobile learning (PDAs/smart phones, digital phones and non-telephony devices including MP3 players, tablets) and their main specifications
U1.E2.PC2	Knowing the type of media elements (text, audio, video, etc.) used in mLearning content according to the characteristics of the mobile devices
...	

U1.E3 Learning theories & approaches in mLearning

The Unit focuses on the most common e-learning theories and pedagogical strategies that could support mLearning

U1.E3.PC1	Knowing when, according to a specific context, within a particular social and physical environment, the "situated learning" applies to mLearning
U1.E3.PC2	Awareing that Mobile devices can support Collaborative Learning by providing another means of coordination among users
U1.E3.PC3	Awareing that the mobile devices can support the individuals to acquire attitudes, values, skills and knowledge from daily activities and the educational influences and resources in his or her environment (informal and non-formal learning)
U1.E3.PC4	Knowing the basics of augmented learning (localization, adaption and personalization of the mobile contents)
...	

U2. Mobile Learning Tools and Technologies

Once a mobile learning course should be developed and deployed, content developers often have the problem of not knowing their target groups. These target groups do not use computers anymore, where high-level of interactivity and content display can be used, but prefer working on mobile devices. These lack a lot of the normal computer features (from hardware and software point of view) and contents developed for computers do not suit them anymore. Therefore mLearning Managers must know the basics of mobile technologies, how they limit them and how they can turn these limits in opportunities and powerful learning tools. The large variety of devices allows these tools to be then deployed in large scale of working/learning scenarios and thus allow for better acceptance and usage of the learning content.

U2.E1 mLearning Content Development – main concepts

Nowadays, there are many different mobile platforms. Each of them has its different standards and methodologies for content display. Often additional tools are needed for the development of educational content. Due to the smaller screen sizes, different way for working and lack of “typical” for computers features, using standard ways for content delivery is not suitable. Therefore new architectures and systems for content development, which are mobile-ready, must be used. In cases, where standard methods like web and/or file downloading cannot be used (like when sensors like camera/gyroscope/GPS must be used), native application development must be done.

U2.E1.PC1	Knowing the the different mobile operating systems (Symbian, Windows Mobile, Web OS, Google Android, Apple iOS) and their characteristics.
U2.E1.PC2	Knowing the advantages of mLearning applications (use of a camera to read barcodes or for augmented reality, GPS for location based information ...)
U2.E1.PC3	Knowing the different frameworks for developing mobile applications (Java, Objective-C, Java ME, BREW, Flash Lite, Windows Mobile, Mobile Web etc.)
U2.E1.PC4	Knowing how to prepare materials for mLearning. (Tools for converting and formatting file formats, Media-Convert Tools for creating resources (Diagrams, Images, Audiovisual, Audio, Documents, Interactions))
U2.E1.PC5	Awareing of mobile learning and LAMS – Learning Activity Management System (Collaborative learning system for empowering synchronous and asynchronous learning)
U2.E1.PC5	Knowing the concept of Web 2.0 and how to integrate/use it for mLearning
U2.E1.PC6	Awareing of different browser implementations and APIs in mobile devices (Android, Firefox mobile, IE Mobile, Opera Mobile, Safari, BI.Berry etc.)

U2.E2 Technological Layers in MLearning

Mobile devices are so popular device, exactly because of their mobility and possibility to have connection anywhere with anyone. This is established via mobile networks of different kinds, which have their positive sides, but also their drawbacks. The rich variety of form-factors in mobile devices, gives the opportunity to buy the one, which suits the needs of the user the most. Every mobile device has some kind of interfaces between real and virtual world, called “sensors”. These sensors help to enrich the raw online learning materials with real-life experience. Content can be delivered to the

user via many different methods. Choosing the fastest one, doesn't always guarantee best results. A compromise must be taken between speed and price.

U2.E2.PC1	Knowing the basics of mobile networks (GSM, UMTS, CDMA) and how these can influence the learning
U2.E2.PC2	Knowing the typical characteristics (display size, weight, touch/non-touch, etc.) of mobile devices of different kinds/types – e.g. mobile phones, tablets, PDAs, etc.)
U2.E2.PC3	Knowing typical sensors in modern mobile devices (GPS, A-GPS, Camera,...) and how to use them in mobile learning
U2.E2.PC4	Knowing the hardware mobile standards for content delivery (Bluetooth, Wi-Fi/WLAN, GPRS/EDGE, 3G and 4G, WiMAX and HSDPA etc.)
U2.E2.PC5	Knowing the software mobile standards for content delivery (W3C Mobile Web Default Delivery, Mobile Web, E-Mail, SMS-ing, In-Application downloading)

U3. mLearning Management

The aim of the unit is to give a clear vision about the methods of mLearning target group identification, analysis of their needs and constraints such as the operational environment.

As well to be aware of the innovation aspects of mLearning management.

U3.E1 Needs analysis

Before preparing a mLearning course or a mLearning application the target group and constraints such as the operational environment (mobile operating system, web browser implementation, ...), interfaces to other systems, technical capacities of the devices (screen size, camera, GPS...) must be in detail analyzed.

Especially in mLearning where mobile devices can be used by children or senior citizen, a regular communication and exchange with the target group must be ensured

U3.E1.PC1	Knowing the importance of identifying the target group (stakeholders, customers)
U3.E1.PC2	Knowing how to elicit needs and expectations from the target group.
U3.E1.PC3	Analyzing technology and device requirements and learning content requirements.
U3.E1.PC4	Understanding the needs for an effective and regular communication (feedback) with the customers/target group

U3.E2 Innovation and Business Management

The goal of this element is student to be aware of the innovation aspects of mLearning management and the role of mLearning for improving business – critical factors and benefits

U2.E2.PC1	Maintaining awareness of new mobile technologies, platforms and concepts
U2.E2.PC2	Understanding the business approaches and goals of different application stores and providers
U2.E2.PC3	Understanding the differences to e-learning
U2.E2.PC4	Knowing how to incorporate knowledge management in mLearning
U2.E3.PC5	Managing the innovation of mobile learning services and products to improve either business or [...] goals
U2.E3.PC6	Awareing of the critical success factors in mLearning
U2.E3.PC7	Knowing how to measure the benefits of mLearning

5 Appendix A - Mapping to Learning levels

National Vocational Qualification (NVQ) levels for Job role

Qualification/training levels: Five levels of qualification/training are defined by European legislation and this structure can be used for comparability of vocational qualifications from the different European countries.

- Level 1: semi-skilled assistant performing simple work
- Level 2: basic employee performing complex routines and standard procedures
- Level 3: skilled professional with responsibility for others and performing independent implementation of procedures
- Level 4: middle management & specialist performing tactical and strategic thinking
- Level 5: professional/university level

In most cases the same job role can be offered on different levels. e.g. IT Security Manager Basic Level (NVQ level 2), IT Security Manager Advanced level (NVQ Level 3), and IT Security Manager Expert Level (NVQ Levels 4 and 5).

European Qualifications Framework (EQF) for Job role

The European Qualifications Framework (EQF) acts as a translation device to make national qualifications more readable across Europe, promoting workers' and learners' mobility between countries and facilitating their lifelong learning.

The core of the EQF are eight reference levels describing what a learner knows, understands and is able to do – 'learning outcomes'.

Level	Knowledge	Belt level
Level 1	Basic general knowledge	-
Level 2	Basic factual knowledge of a field of work or study	-
Level 3	Knowledge of facts, principles, processes and general concepts, in a field of work or study	
Level 4	Factual and theoretical knowledge in broad contexts within a field of work or study	
Level 5	Comprehensive, specialized, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	
Level 6	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	
Level 7	<ul style="list-style-type: none"> Highly specialized knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research Critical awareness of knowledge issues in a field and at the interface between different fields 	
Level 8	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	-

Bloom's Taxonomy for Performance Criteria

In addition to content specifics, for each performance criteria in this skill set, also indicates the intended complexity level of the test questions for that topic. These levels are from “Levels of Cognition” (from Bloom’s Taxonomy – Revised, 2001) [3], and can be used to create learning outcomes for students.

The Taxonomy of Educational Objectives, often called Bloom's Taxonomy, is a classification of the different objectives that educators set for students (learning objectives). The taxonomy was proposed in 1956 by Benjamin Bloom [4], an educational psychologist at the University of Chicago. During the nineties, Lorin Anderson a former student of Bloom revisited the cognitive domain in the learning taxonomy [5]. Bloom's Taxonomy divides educational objectives into three "domains:" Affective, Psychomotor and Cognitive. This Skill only notices the Cognitive domain.

The ‘Levels of Cognition’ are in rank order - from least complex to most complex.

Remember

Recall or recognize terms, definitions, facts, ideas, materials, patterns, sequences, methods, principles, etc.

Understand

Read and understand descriptions, communications, reports, tables, diagrams, directions, regulations, etc.

Apply

Know when and how to use ideas, procedures, methods, formulas, principles, theories, etc.

Analyze

Break down information into its constituent parts and recognize their relationship to one another and how they are organized; identify sublevel factors or salient data from a complex scenario.

Evaluate

Make judgments about the value of proposed ideas, solutions, etc., by comparing the proposal to specific criteria or standards.

Create

Put parts or elements together in such a way as to reveal a pattern or structure not clearly there before; identify which data or information from a complex set is appropriate to examine further or from which supported conclusions can be drawn

6 References

- [1] European Certification and Qualification Association, www.ecqa.org,
- [2] DTI - Department of Trade and Industry UK, British Standards for Occupational Qualification, *National Vocational Qualification Standards and Levels*
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