What do teachers in Higher Education expect from OER?

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Abstract
On December 14, 2009, the Minister of Education of the Netherlands, Ronald Plasterk, launched the first version of Wikiwijs. A little more than one year before, on December 4, 2008, he had first launched the idea of Wikiwijs. Wikiwijs has to be the place where all teachers of the Netherlands, ranging from primary education to higher education, can (co)develop, share, rework and use digital learning materials, published under an open license.

To learn about the requirements for Wikiwijs, research has been conducted to find out about the expectations among teachers in all educational sectors. The principles of User Centered Design (UCD) were followed by this research. This approach leads to a set of personas, each representing thousands of future users of the system. The paper will give insight into these principles and will present the results for teachers in the field of Higher Education.

Keywords: OER, User Centered Design, Wikiwijs, Qualitative research, Teachers

1. Introduction

On December 4, 2008, by the Minister of Education at that time, Ronald Plasterk, launched the idea of Wikiwijs (Schuwer and Mulder, 2010). The **basic idea** is to create a digital, internet-based platform to bring together, share and develop digital learning materials for all educational sectors, ranging from primary education to higher education. Digital learning materials are more than digital textbooks only. It will also comprise tests and practice materials.

The first version of Wikiwijs was launched ultimo 2009. For this version the focus was on several subjects (language, arithmetic and math) and only primary, secondary and intermediate vocational training were supported. One of the activities in the period before the launch was an investigation into the demands of the target group. This investigation was carried out using the principles of **User Centered Design** (UCD). This choice was based on positive experiences with these principles in earlier projects.

During the first half of 2010, the scope of Wikiwijs was broadened. One of the activities was to find out what the best way was for Wikiwijs to support Higher Education. Again, the investigation used the principles of UCD.

In chapter 2 the background of UCD is described. Chapter 3 describes the way the investigation was set up. In chapter 4 the results of the investigation for Higher Education are presented. The paper ends with some conclusions on both UCD and the results.

2. User Centered Design, the principles

In many development projects in one or the other way users play a role. In meetings design decisions are based upon an idea that the user is going to be happy with these decisions. And if there is any doubt you can always do an usability test. In how far the design decisions are really based on users expectations and needs and not on say, technical possibilities or the design teams preferences, is not really an issue. If there is an usability test before the publishing of the website, due to time pressure often only quick wins are implemented. In the next releases hopefully all the other findings from the test will be implemented.

This summary of a standard development process leaves two questions open: 1. How do you know that what the development team has in mind about their users has any real connection to the users? and 2. How do you know you have chosen the right concept/design? In an usability test you only test that particular concept, with the risk of improving the wrong concept.

The frustration of many designers who listen carefully to the requirements of the development team is bad results from the usability tests. They did meet all the requirements in the concept they designed and the development team was probably cheering when the designer presented the design.

Wouldn't it be nice and logic to have user data ready before the development starts? Making sure you chose the best concept for the user needs? And the usability test would improve this best design to even higher standards.

If you look at **user centered design** which in short means, putting the focus on the needs, wishes and capabilities of end users or customers during every part of the design process, wouldn't a lot of development teams think that is what they are doing? They talk about the users and they (sometimes fight to) have an usability test done. What is wrong with that? The thing that is really missing here is the user himself. User centered design means **talking to actual users about their work in the work place**. This will take about one hour per user and even talking to only one user is better than none at all. You talk about their work, because that is what you are going to support. Or you talk about the decision process in their daily or professional live, because that is what you are going to support. Talking to users about content and/or functionalities won't get you the user data you really want and can support your design decisions. It is hard for users to pinpoint how their work can be supported by what functionality. Besides that is not their job, it is the development teams job. As a development team you want an overview that covers all your users, not one or two 'super' users who have knowledge about ICT development. Interviews and observations of users during the execution of activities in the offline world will identify common patterns and mental similarities. This gives a clear picture of all the users, in an early stage.

Summarizing, UCD focuses on three important things about designing with the focus on ease of use:
• Your users: what roles they play regarding the system.
• Their work: what tasks they are trying to achieve in their roles.
• Their needs: what instruments/tools and materials are needed for the tasks.

UCD as a process will lead to discovering new targets. The method is goal directed but not static. It contains a set of principles which can support any form of development process. Using UCD will support and promote innovation and the results are desired by real users. It creates the ability to radically transform by having user data available at the beginning of the development process.

2.1 Characteristics of User Centered Design

The **roots** of the UCD process lie in the Grounded Theory (2010), a method of qualitative research. In (Boeije, 2006) the following list of the characteristics of qualitative research are mentioned:

- Experience of those investigated, interpretative.
- Research in the everyday environment, naturalistic.
- Open investigation procedure.
- Researcher as an instrument.
- Working with texts (transcript), which include extensive and detailed descriptions.
- Statements by stakeholders and from a theoretical and / or social backgrounds.
- Experience of those investigated, interpretative.
- Research in the everyday environment, naturalistic.
- Open investigation procedure.
- Researcher as an instrument.

Both end users and domain experts are needed to provide input. Users live with the product, closely linked to their daily work, but are relatively unaware of important issues outside their scope. Domain experts hover above the product, they know the whole landscape, but see less of the practical details. Easy access to users and domain experts promotes fast switching between design and development.

Designing for users is to connect to their expectations and creating a positive acceptance. The interaction with an interface is part of every computer and determines how people use and manage that system. If the interaction is well designed, it is understandable, predictable and manageable. As a result, users feel happy and involved with their tasks.

Within the UCD process the design is tested early in the design process. In this way the solution is checked whether it fits the logic of the user. Several iterations are possible. Both, parts or the whole product, can be tested. Participants can be the same as the interviewed users or a new selection is made based on personas.

The greater the pressure to develop systems, the greater the need for thoughtful and comprehensive use of models. That is easier said than done. There is a need for making shortcuts, but creating shortcuts will ultimately cost money because reverse development always takes longer. But still it is better to interview one user or customer than none at all (Beyer and Holtzblatt, 1998).

Summarizing, UCD has the following advantages:

- Everybody in the organization will have access to user data.
- Putting the focus on the needs, wishes and capabilities of end users or customers during every part of the design process.
- Seeing the 'big picture'.
- Preventing behavioural preference of one or two (super) users.
- Less need for (expensive) usability testing.
- Preventing the pitfall to build what the user asks instead what people actually will use.
- Saving time because the discussions within a development team are focused on the big picture and real user data.

2.2 User Centered Design techniques

The method of UCD consists of a few techniques which you can use in a way that fits the development team and deadline for the project. One thing is critical though, you have to collect user data and talk to the actual users in their work place. You are free to chose the amount of users you interview, which work models you create, whether you want to use **personas**, even if you want to design a product or instead use the data for communication, brainstorm sessions or other organizational processes.

These primary and basic stages will lead to a complete design that will connect to users expectations and create a positive acceptance:

- Collecting and analysing user data
- Create work models
- Write personas
- Create information analyses schemes
- Designing wireframes with navigation panels
- Early usability testing using paper prototypes and improving the design

Some of these activities will be described in the remainder of this chapter.

Collecting and analyzing user data

Interviewing users is the main activity for collecting user data. The intention of the interviews is to visualize the work of the user. The interviews are semi-structured and master-apprentice in approach. Semi-structured means that a set of questions are pre-prepared that need answering and keeps the focus on the research question(s). The master-apprentice approach means that the interviewer leads the interview process but not the information that is given.

During the interviews artefacts are collected. Artefacts are tools used during the work- or decision process by users and tell how people work and what they might lack in support. An example of this are e-mails that people send to themselves to remember certain things.

The difference in questioning when using qualitative or quantitative methods is best shown with these example questions about the use of a digital board by a teacher. In UCD the main focus is on answering 'why' and 'how a problem gets solved' questions. (In Boeije, 2006)

- Question in quantitative method: How often do teachers use a digital board and in what frequency?
  Explain the answers by checking these numbers in relation to school type, age, background, gender, region.

- Question in qualitative method: What variations are there in meaning and methods of using a digital board?
  Explain the answers by looking at patterns in use:
  - Do teachers have existing digital course material available?
  - Does different usage of a digital board depend on certain topics?
  - Does different usage of a digital board depend on the level of students?
  - Do teachers develop digital materials themselves?
  - Are teachers dependent on the available classrooms that have a digital board?
  - Do teachers use the digital board all the time during a lesson or partially?
  - Has the usage of a digital board increased or decreased the work load?

All questions are followed by the 'And why?' question.

Create work models

After interviewing the users, transcripts are made for analyses of the interviews. To be able to work with the data and spread the knowledge into an organization work models are created. There are several models to chose from, all models representing the user. For example a flow model that shows the relationship between the different roles of users and a mental model or affinity diagram which shows the relationship between the tasks of users. Without work models critical functions are discovered late in the development process, which leads to high costs because of redesign.

There are few other advantages creating and using work models. Because they are simplified forms they focus on the big pictures, details are kept for later when they do matter. This will accelerate realization. Work models are real data and accessible throughout the whole

organization, they allow reliable design decisions. It promotes research and innovation based on real user intentions and needs, not gadgets, desires and fantasies functions (Beyer and Holtzblatt, 1998).

Mental model, a clear picture of the 'market'.
The mental model describes the work from the standpoint of the users in their own words. It tells how people think and cope with their tasks and goals. A representation of the way users do things, such as how to solve a problem or complete a process. In addition, common issues and themes within large groups of people become clear and whether they deal with things in the same way as another person. This overview inspires to find new solutions, bottom-up. For Wikiwijs it means to finding out how Wikiwijs can support teachers, not only by automation but also by the things like training. The role of the solutions is always to unburden peoples workload.

Create a mental model
In a mental model a large amount of concrete user information is organized. The structure of a mental model has the form of a narrative, the story of the work processes. Information is arranged bottom-up, this means without pre-defined categories. The structure of a mental model can directly matched onto the structure of software. One of the big advantages is that the structure of a online service will not be sorted by keywords but is supported by the natural work flow.
User activities are divided in so-called **mental spaces**. A mental space is a group of task towers (a set of related tasks; the yellow parts in figure 1) that share the same user goal. For example working on a letter and decide to go and check e-mail messages is a switch of attention and therefore are different mental spaces. The relation between tasks is based up on steps a participant describes and similarity in tasks. Visually every task box shows how many people mentioned this activity.
Mental models can grow in response to a new group of users or new activities or roles.

In the example Movie mental model from Indy Young (2008), the mental spaces are:
- Decide to watch a film
- Encounter a film I haven't heard of
- Choose film
- Learn more about a film
- Choose a theatre
- Choose a time
- Go to the movies
- Watch a film at home
- Eat dinner
- Attend a film event
- Watch the film
- Identify with a film
- Interact with people about film
- Follow the industry.

The mental spaces of the university teachers were:
- Using digital learning materials
- Develop learning materials
- Share self developed learning materials
- Teaching masters students
- Adjust existing learning materials
- Using online learning materials
- How students learn
- Communicating with students using digital tools

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- Teaching
- Get inspiration

To put it simple, when a mental model matches the structure of a tool or content this software will be easy to use. People recognize their own workflow in the system, minimizing the learning curve and they can predict what and where everything is placed.

If there is an existing system making a content analysis happens by placing the model of the users on top and beneath it the model of the system. Checking the mental model with the content and functionalities of the system gives insight in whether all task towers are supported by content or functionalities. Any gaps show possibilities for automation, any overload on the systems side will tell what to delete.

When a new system is developed every mental space or task tower shows if this activity is important enough to support because a lot of users talked about it or when it is an important part in the whole user work process. Under the model of the user all possible content and functionalities (or trainings) are placed, following the exact flow mentioned by users (Young, 2008).

Figure 1 shows a part of the mental model of Teachers in HE: Activities surrounding the handling of information in relation to the development, use and choice of materials.

As an example, figure 2 shows a mental model of a movie goer, adapted from (Young, 2004).
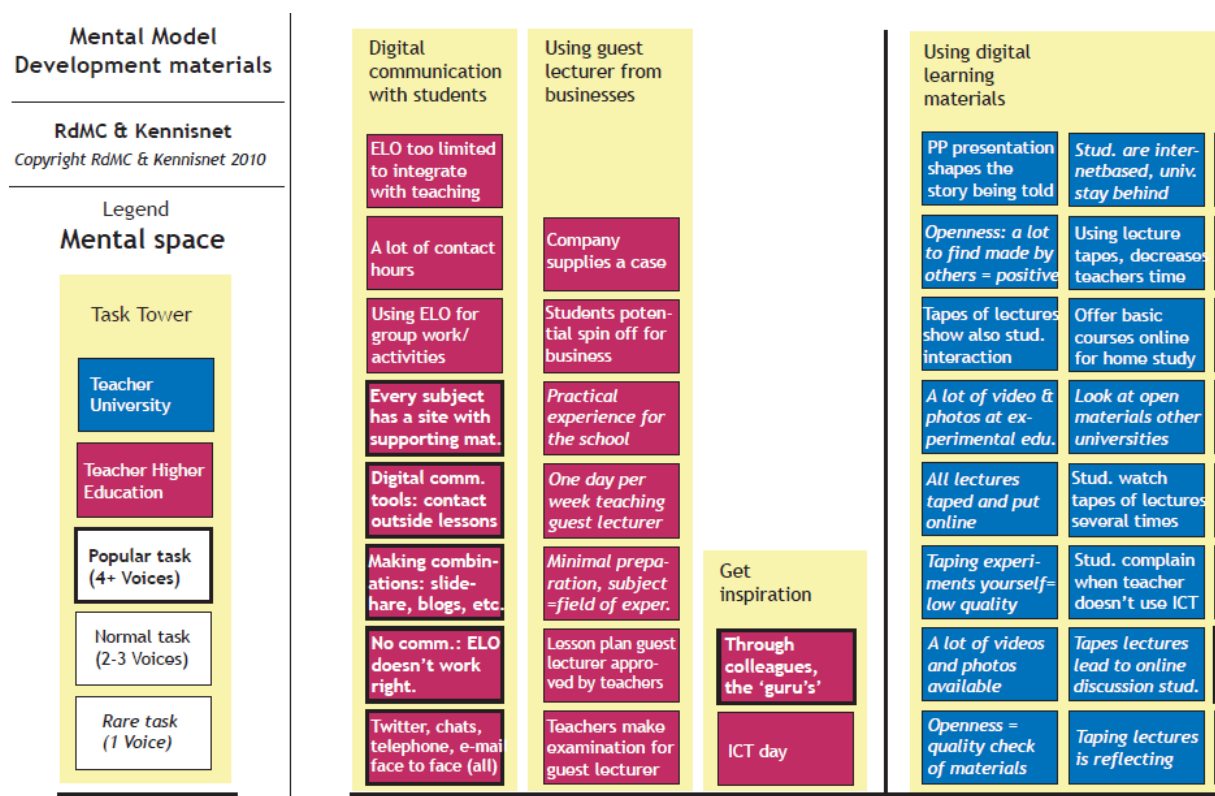

Fig.1 Mental model of Teachers in HE: Activities surrounding the handling of information in relation to the development, use and choice of materials.

Movie Goer Alignment Diagram

Research Conducted by Indi Young
June 2004

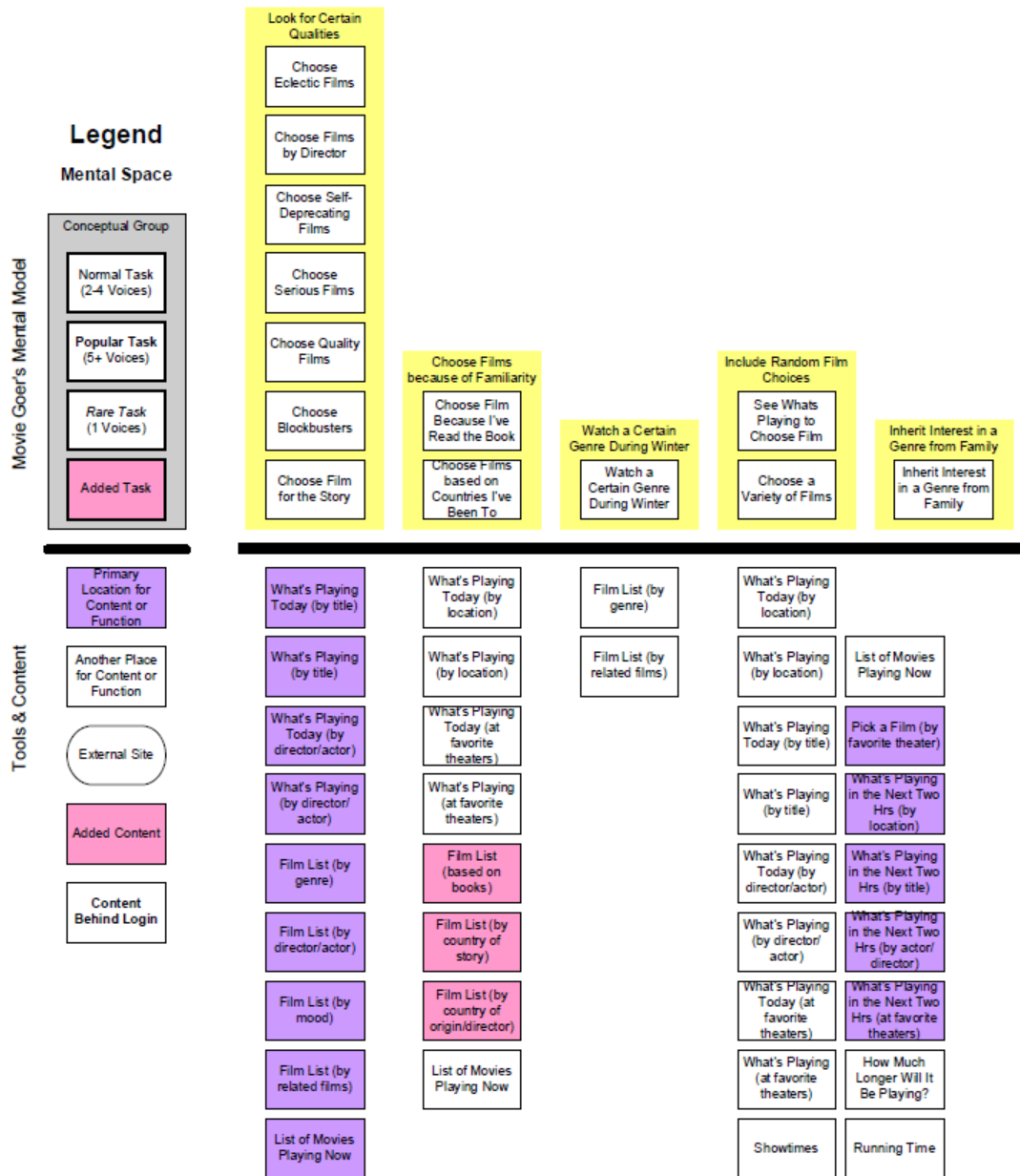**Choose Film**

Legend

Mental Space

Fig.2 Mental Model: Movie goer

Write personas

A good way of telling what personas are is quoting the design company Adaptive Path (2010): "Personas are fictitious people who represent the archetypal qualities of your audience. They provide targets for design and are generally very effective for communicating design and research activities throughout an organization."

Personas are a tool that help communicate the results of the interviews to the development team or through all levels of an organization. From the interviews archetypes are created for the major groups of users. Using these fictitious persons, the focus during the development process stays on the target groups. Personas give concrete direction by asking questions like:

- How can we best support persona X during his/her work?
- Do we help persona X in providing this functionality?
- Persona X wants this, how can we design it?

It helps the development team to make choices and decisions. Because there are often large groups of users, making multiple personas who represent these groups the patterns (similarities and differences) can be seen throughout the large amount of users. Any misconceptions about the user can be tackled at an early stage. And ultimately this leads to improving the quality of a product or service. It also saves time because the discussions within a development team are focused on real users.

In summary a persona is based on realistic behaviour, motivation, attitude, skills and needs. The behavioural patterns, belonging to a persona group, are described as concretely as possible from the various interviews. The typical characteristics of users are presented as a lively, narrative description. Aim of the personas is that they are challenging and will tell new things. One persona represents thousands of users.

One of the ways to use personas is a scenario where the personas 'walk' through and use the product. It gives an overview of tasks and functions and helps to design a logical and user oriented flow of all activities in a process. This provides an easy way to check the design decisions before testing the whole product.

The personas and the different models that are created have a life span of about five years. That means that during this time the models and the personas can serve as a starting point for development and extension of the system. After that period they need revision (Cooper, 1995).

Figure 3 shows a persona of a teacher in HE in the Netherlands.

Casper Wilson
Senior lecturer at Technical University

Background
- 42 year old man.
- Just married and father of a newborn son.
- He is involved in teaching and research in the field of sanitary engineering.
- Has recently implemented a new educational curriculum.
- Travels a lot because of lectures he gives and conferences he visits.
- Considers web conferences a major outcome in terms of saving time and money.

Personal Profile

At the university where Casper works all lectures are recorded and are digitally available online. Just like all the lecture notes, PowerPoint presentations, examinations and special assignments. At his university they want to use the digital possibilities. Initially, there was an enormous shudder amongst colleagues: "Should we do that, way too modern." But Casper and a group of colleagues want their students to have the best material. This can also be used for recruiting activities, which for Casper is clearly an afterthought. "You can never develop something for the future, you do not know whether it will attract the students. It obviously costs a lot of money to develop education." The consequence of open publishing means all materials automatically undergo a quality check, according to Casper. "Because once we had everything in Blackboard here. And Blackboard is a 'wonderful' closed environment".

The technical department is applied education and is great for making movies of experiments.

The course is internationally established. Therefore there is a very diverse group of students having different backgrounds. "And that makes a nice interaction between students, as a foreign student may say: 'Yes, but in my country we do it very differently.' This way you get a very nice discussion."

Foreign students speak English very well, in theory, but in practice they do not. "I know that some students view the lectures up to eight times." Diversity also arises because the master students have worked already a number of years in practice. They really have very specific questions about issues they encounter in the daily activities of their job.

More and more students ask for digital educational applications. The more you can digitize, the more pleasant it is for them. "And it is really crazy that we get money from the government and that education happens in small rooms at universities where nobody can see it. Make it open! We get paid anyway by the government? So show what you do and if the teacher is afraid to lose his face, then he should not teach. That is part of the game. Anyway, that's my opinion and I know that is not shared by everybody. "

> "The basic lessons I'll tape on video, I'll teach them well once and they stand for the next five years. That's also the way I see Wikiwijs, a basic will arise and you pick up from there on."

Casper Wilson
Senior lecturer at Technical University

Goals and motivation

Casper comes to Wikiwijs to ...
- Find core courses, for example about a small part of chemistry. The basic components plus a way to link applications to each other. "That would be a nice form of connecting materials."
- Digital didactics for support. To see what's going on in the field of digital learning resources, especially internationally.
- See how educational trends are applied.

Casper expects from Wikiwijs...
- That it focuses on practice. "Publish only theoretically materials and no one will visit Wikiwijs."
- A kind of base for colleagues to be able to build upon. "Fundamental knowledge that you do not want to explain yourself anymore."
- An international set up.
- English language.

Casper will return to Wikiwijs for...
- The core lectures.
- Making referrals to publications and books he writes.
- To see what other experts from leading institutes are talking about.
- Movies of technical experiments, preferably in 3D.

Philosophy of Casper
- Arrange education so that in addition to digital communications your personal contact hours will be maintained. "Extra things you offer to students to make them feel: I'm unique."
- Besides lectures add many practical elements.

Work motivation
- The diversity of students and discussions.
- Develop the best materials together with colleagues .
- Give inspirational lectures that will affect you.
- The personal relationship with the master students.

Internet usage
- Experience: High
- Primary uses: Sites of other (foreign) universities.
- Favorite sites: My department site for the students.
- Hours online per week: Continuous online.
- Computer: My laptop.

Fig.3 Persona Casper, Teacher HE

Number of interviews

When selecting the number of participants for interviews keep in mind the goal of these interviews: knowing how people organize their work process and whether they deal with things in the same way as another person's do. How tasks are divided into activities, goals, strategies and several individual steps.

One way to select participants is to define **roles**. We all have different roles and these roles tell what we do and where our responsibilities lie. During the interviews finding out how someone performs this role, what their approach is and where this approach has similarities with other approaches is the main focus. We are all unique, but only in details. Looking at the structure of any approach shows that three different ways of doing things are the maximum. (Beyer and Holtzblatt, 1998). This was confirmed during the Wikiwijs user research.

If you ensure that the roles defined are at least three times discussed then you have enough participants. The matrix in figure 4 shows that role E and F occur only twice within the set of six participants. This means a seventh interview is necessary or one or two participants should be replaced. Eventually expand the number of participants after the analyses of the data.

Role / Participant	A	B	C	D	E	F
1	X	X	X			
2	X	X	X	X	X	
3	X	X	X			
4		X		X		X
5	X		X		X	
6	X	X	X	X		X

Fig.4 Participant matrix

Karen Holtzblatt (2001 and 2004) states about the relatively small number of interviews:

'…years ago, while testing for usability, people in the industry were not comfortable with test results from small numbers of users. However, after 15 years of collecting data, the industry has found through experience that small numbers add up to a detailed picture of work practice that supports design. And we're not just looking at usability anymore; we're engaged in market characterization at the level of work practice.'

'A small, quick-iteration project only needs a small amount of planning. We have completed field studies of 5-8 users, quickly consolidated and brainstormed solutions, all within a week or two.'

3. UCD research in Wikiwijs, the approach

In 2006, the Open Universiteit used UCD to find out about motives and desired support for teachers in primary and secondary education. This investigation was commissioned by the Ruud de Moor Centre, a department of the Open Universiteit with the assignment to develop tools and support for teachers to help them professionalize. As part of this earlier work, personas were developed and several models were created that guided the development of a supporting website from the Ruud de Moor Centre. End of 2008 and 2009 this research we extended with a focus on the use of some knowledge bases that were developed by the Ruud de Moor Centre and that needed a redesign.

In June 2009 the research started among teachers in primary, secondary and vocational education for the Wikiwijs program. The research question was to find out about activities surrounding the handling of information in relation to the development, use and choice of materials. Because this question had overlap with the earlier research of the Ruud de Moor Centre, part of the personas developed could be reused for this research. In September 2010, Wikiwijs was extended for use by teachers in Higher Education (HE).

To conduct the research, interviews of approximately one hour were taken from ten teachers in their work place, spread over a range of schools for higher education and universities. Dimensions (combinations of requirements) were formulated to create a maximum of diversity in selecting schools and teachers:

- Sector: Schools for Higher Technical and Vocational Education and Universities.
- Subject areas: Language, beta sciences and the rest.
- Level: Teaching or Developer of study methods.
- Roles: Developer, Orchestrator, User.
- Experience: A lot of experience in development, none or a little experience in development, none or a little experience using digital teaching materials.

For the interviews, a list of questions was prepared to ask during the interviews. During interviews, some of them were skipped, depending on the roles of the teacher has.
- What do you do before, during and after the lesson?
- What are the triggers for the different activities?
- Which information is hard to find?
- What do you do when you can't find the necessary materials?
- When are more (supporting) material developed, why and how?
- Do you share materials, do you receive materials and how?
- How long does it take to prepare and develop different kinds of materials?
- Do you have a clear idea before you start developing?
- Do you develop learning materials together with others or alone? Why, how and when?
- Do you use a digital board, is there an internet connection in the classroom?
- Which educational method do you use now and which ones have been used in the past?
- How do you find out you have to add material? Approach, time and planning? Do you keep these materials for yourself or do you share them?
- Development of learning materials during a school year and over the last years?
- What is the influence of switching schools or classes on your activities?
- Did you have any training in development of learning materials?
- Where do you find/look for learning materials?
- On which characteristics do you select certain materials?
- How do you get confirmation that the materials are effective?
- Is there any difference in development for certain classes, schools, fast or slow students?
- Do they concult colleagues or experts?
- What support are you lacking in their work?

Each interview was conducted in the work place of the interviewee. From each interview, a transcript was made. These transcripts were the starting point for the mental model and the personas. These results will be handled in the next chapter.

4. Results of the research for Higher Education

After conducting the ten interviews, the personas were written. To determine how many personas were needed, the interviews were divided into persona groups. Persona groups are

determined by looking for patterns in differences or similarities. The groups were based on the way they collected and developed learning materials.

We named the persona groups thinking about how these groups worked. The groups were based on the way they collected and developed learning materials:

The Collector

Supporting lessons

- Approach: Simple, little demands, adhoc and short term.
- Goals:
  - Clarifying existing lessons.
  - Connect to the reality/world of the students.
  - Variations in lessons.
  - To be sure of your teaching skills.
  - Prove the existing learning materials.
  - Connect to different levels in a group.
  - Didactics, keep order.

The Hunter

Structuring lessons or sets of lessons

- Approach: Extensive, many demands, growth, long term.
- Goals:
  - Take on new issues and subjects.
  - Make lesson schemes.
  - Guarantee educational quality.
  - The existing method is not up to standards.
  - Connect to different levels in a group.
  - Doing it better than the existing method.
  - Connect to the reality/world of the students.
  - No existing learning materials available.

From the interviews the most representing user was chosen for every persona group. Based on this interview the persona was written. Elements from other interviews completed the story of the persona. The interviews representing a persona group will provide multiple quotes and the one that gives the persona real credibility is added.

This resulted in the following persona groups and characteristic quotes (keep in mind that the names are purely fictitious and that the pictures are not pictures of the interviewees):

Sven Pateel: Higher Education (Hunter)
"For part-time education I combine the background of students and the learning materials in order to achieve new insights. That to me is very instructive and fun. But that requires other methods than standing in front of the classroom and speak."

Maarit Kotting: Higher Education (Hunter, developer of a digital education system)
"A digital board can be useful but it's not about me making notes but that my students can make notes. I use an ordinary projector and my laptop and you can go online anywhere here in this school."

Minke Ulrich: Higher Education (Collector)
"I really never find materials which I can use without editing. But what I do find online are separated materials and nice ideas, but ultimately I develop it all myself."

Elsbeth Weeda: University Master and Bachelor (Collector)
"Frankly, I think you have to ask yourself at any stage: Will a piece of chalk do the job, a whiteboard now, or must you create a complex digital rumpus."

Casper Wilson: University masters (Hunter)
"The basic lessons I'll tape on video, I'll teach them well once and they stand for the next five years. That's also the way I see Wikiwijs, a basic will arise and you pick up from there on."

Besides the personas, also a mental model was created. This model gave insight into the main activities about creating and using digital learning materials and the expectations of a system that will support these activities. Activities and support (both already existing and demanded) that were named by the majority of the interviewees are highlighted in this model, providing a starting point for system development. This led to the following list of activities and experiences.

Category (mental space): finding and using digital learning materials
- Let students perform experiments
- Share bookmarks
- Online contact outside class
- Efficiency is important
- Students assist in solving IT problems
- Search on tags or keywords
- All learning materials found need adaptation
- Refer students to specific sites
- Looking for different ways to perform educational activities
- Author and institution are important determinants for using specific learning materials

Category: creating or adapting digital learning materials
- Determination of the goal is the first activity
- Develop modules as a team
- Demands by students are the trigger

Category: sharing digital learning materials
- Use Slideshare for slide presentations meant for students
- Use intranet sites; only accessible for your own students
- Publish under an open license: the learning materials is created using tax money
- Use students work to share also

Category: communicating with students
- Combine Slideshare, blogs, twitter, e-mail
- Do not use the Electronic Learning Environment for communication (not suited)

During the interviews it was discovered that there is a big difference between teachers working with Master students and other teachers. Teaching masters students is on a much more personal level, having most of the time one to one conversations about a subject. Every student has its own subject he or she has chosen. The student works on experiments/does research and asks questions about the process and results. These questions are the bases for the lessons, or better the conversations between student and

teacher. A large part of the master students come from outside the Netherlands and therefore the communication is in English. All the university teachers that were interviewed preferred teaching to master students because of the personal contact and complex and innovative subjects. No standard materials but finding out yourself. There was not enough time left to extend the number of interviews. Instead, a brainstorm session was organised with several stake holders from HE. This brainstorm more or less confirmed the results from the UCD research, but generated also a lot of other ideas which were not known before (e.g. that the main competitor for Wikiwijs in HE are the "closed" intranet repositories each institution has).

All Wikiwijs personas and mental model (both in Dutch only) can be downloaded from the Filterdesign blog (2010).

5. Conclusions

The UCD activities gave a good view on the activities teachers in HE perform around using and developing digital learning materials. It resulted in a first version of support for HE implemented in Wikiwijs. Among this support was connecting to repositories in other countries. Due to differences in standards for metadata, it was not yet able to support teachers in HE in sharing their own digital learning materials in Wikiwijs. It is expected that these differences will be solved in the next coming months.

There are still activities remaining to perform. Among these are conducting more interviews to refine the results for the teachers in University masters. Furthermore, the first version of Wikiwijs will be monitored to learn more about the use and the appreciation of the support by the teachers involved.

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