

**Identifying Competences at the Heart of
Understanding a Profession
Guidelines for a Competence Profile**

Meea Heinonen and Riki Harri

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Abstract <p>Identifying and articulating professional competences has become a common topic of discussion in Finnish higher education. Particularly in occupational therapy, the ability to confidently express what occupational therapists do and why they do it is an essential skill for showing the value of the profession and enhancing its recognition – especially in multidisciplinary working environments. The thesis client is JAMK University of Applied Sciences' WORKPEDA-project. Based on an idea inspired by occupational therapy students' and teachers' experiences, JAMK became interested in participating in the development of a new digital solution that would enable them to identify and better understand their professional competences.</p> <p>The thesis was implemented as design research, and the objective was to make interface design guidelines for a digital Competence Profile. A rapid literature review was used to find good e-learning interface design features that would support learning. Nine articles were chosen for a thematic analysis. The results showed that consistent, simple and intuitive aesthetic appeal and relevant, simple and well-organized information structure in a user interface support learning in online environments. The development work focused on making guidelines on how to design a digital competence tracking tool which would in turn help occupational therapy students to learn and document competences. These guidelines are based on researched interface features, background theory, student experience and meetings with teachers and parties involved in the development project.</p> <p>With the use of a Competence Profile, which follows the guidelines for a learner-friendly interface, JAMK's occupational therapy students will be better equipped to identify, understand, articulate and defend their competences and skills and therefore, have more confidence in their professional identity.</p>		
Keywords occupational therapy, professional competence, competence, professional identity, design research, e-learning interface, user interface design, visual design, aesthetic appeal, information structure		

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<p> Tiivistelmä Opiskelijoiden taito tunnistaa ja sanoittaa osaamistaan on noussut yleiseksi keskustelun aiheeksi suomalaisissa korkeakouluissa. Eryteisesti toimintaterapeutin ammatissa kyky luontevasti ilmaista, mitä ja miksi toimintaterapeutti työssään tekee, on oleellinen taito ammatin arvon osoittamiseksi sekä ammatin tunnetuksi tekemiseksi – varsinkin moniammatillisissa työympäristöissä. Toimeksiantajana oli Jyväskylän ammattikorkeakoulu (JAMK) yhdessä Työelämäpedagogiikka korkeakoulutuksessa –hankkeen kanssa, jotka kiinnostuivat opiskelijakokemuksen innoittamasta ideasta kehittää toimintaterapeuttiopiskelijoille uusi digitaalinen työkalu ammatillisen osaamisen tunnistamiseen ja ymmärtämiseen. </p> <p> Tutkimuksellisen kehittämistoiminnan tavoitteena oli tehdä suositukset digitaalisen Osaamisprofiilin käyttöliittymän rakenteesta. Nopeaa kirjallisuuskatsausta käytettiin hyvien, verkko-oppimista tukevien, käyttöliittymän ominaisuuksien löytämiseen. Yhdeksän artikkelia valittiin teema-analyysiin. Tulokset osoittivat johdonmukaisen, yksinkertaisen ja intuitiivisen esteettisen käyttöliittymän sekä hyvin organisoidun, yksinkertaisen ja tarkoituksenmukaisen informaation rakenteen olevan tärkeimpiä käyttöliittymän ominaisuuksia oppimisen tukemiseksi verkkoympäristöissä. Kehittämistyössä tehtiin suositukset digitaalisen Osaamisprofiilin suunnitteluun toimintaterapeuttiopiskelijoiden oppimisen näkökulmasta. Nämä suositukset perustuivat kirjallisuuskatsauksen tuloksiin, taustateoriaan, opiskelijakokemukseen ja tapaamisiin opettajien ja kehittämistyössä mukana olleiden osapuolien kanssa. </p> <p> Kun uusi suositusten mukainen Osaamisprofiili otetaan käyttöön, arvioidaan sen auttavan toimintaterapeuttiopiskelijoita paremmin tunnistamaan, ymmärtämään, sanoittamaan ja puolustamaan omaa osaamistaan ja sitä kautta vahvistamaan ammatillista identiteettiä. </p>		
Avainsanat toimintaterapia, ammatillinen osaaminen, ammatillinen identiteetti, tutkimuksellinen kehittäminen, e-oppiminen, käyttöliittymä, esteettinen käyttöliittymä, informaation rakenne		

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1 Introduction

Learning to identify and articulate competences has become a hot topic of conversation in Finnish higher education (Brauer 2018; Mäki n.d.; TOTEEMI: Oppiminen yli rajojen n.d.). The articulation of competences has been considered as an important future investing point in higher education communities, seen as a key to combining knowledge from professional studies and working life experiences. According to Mäki (n.d.) articulation will become essential when a student is learning and preparing to indicate/address competence, and of course when it is time to actually demonstrate learned competences in practice. (Mäki n.d.)

For students to achieve the skill of good competence articulation, Mäki (n.d.) sees the importance of thoroughly opening up how professional competences can be accomplished and verified, not only at the beginning of the study program but at the beginning of every course. Mäki (n.d.) also believes that universities of applied sciences should invest more in teaching and guidance, in order to help students to achieve the skill of articulation.

JAMK University of applied sciences in Jyväskylä (later JAMK), uses principles of Competency Based Education in their curriculums of healthcare fields (Creating Competence n.d.). The occupational therapy curriculum is based on professional competences created by the European Network of Occupational Therapy in Higher Education (later ENOTHE) and the Council of Occupational Therapists for the European Countries (later COTEC) (What is ENOTHE n.d.). Leggett (2015, 455) states that a competency-based curriculum is an effective way for students to learn a knowledge base within a profession. Successful competency-based curriculum should include valid competences, personal scheduling, reliable assessment methods, effective learning resources and a competency “map” connected with learning outcomes and curriculum. (Leggett 2015, 447.)

An occupational therapist is a rehabilitation specialist who helps people to re-engage in meaningful daily activities by focusing on functional training, education and daily

activities that give meaning. Occupational therapy (OT) is unique to other healthcare professions in that it implements a top-down client-centered care while using the science of occupation (doing) when interacting with clients. In other words, occupational therapists use a mind-body approach with interventions that are wholistic, evidence based and specific to each client. (Lyon 2019.) Thus, being confident in core professional competences can be an important asset for an OT student to competently synthesise and act on the complexities of constantly changing information.

Despite the integration of a competency-based educational program and European-wide regulations of professional competences, occupational therapy students at JAMK have expressed uncertainty in their understanding of professional competences and what they mean in the context of the demands of future work as professionals. The occupational therapy program at JAMK is lacking a clear competency “map” that connects to the curriculum and learning outcomes. Legget (2015, 447) emphasizes this as being an important part of any competency based curriculum. This then begs the question, “Are occupational therapy students building enough confidence in their professional identity during their studies?”. Based on the current usage of competence documentation and self-evaluation tools used at JAMK, student and teacher experiences confirm the need for a new tool to better identify, understand and document professional competences during studies.

To meet this need and to address the difficulties understanding professional competences, the idea for a new digital competence tracking tool was formed. According to Mäki (n.d.) a competence-based curriculum vitae would help students to create perspective on how to gain skills in articulating competences.

The thesis client is JAMK’s WORKPEDA project, in which the solution/product to solve the problem was made. The Work-integrated Pedagogy in Higher Education (WORKPEDA) project develops operational models for higher educational institutions together with working life institutions to create learning environments where both theory and practice are available for student to master. (WORKPEDA is transforming

learning n.d.) The thesis was implemented as design research - which allows the researcher to combine the use of research methods and development work in order to solve a problem.

2 Aim of the thesis

The object of the thesis was to make interface design guidelines for a digital Competence Profile for JAMK occupational therapy students. The aim is to help occupational therapy students better learn and document professional competences. The vision is to see occupational therapy students using a learner-friendly Competence Profile tool to track their learning of competences and enhancing their ability to identify, understand, articulate and defend professional competences, thereby giving more confidence in their professional identity. Creating good guidelines to build a new competence tracking tool, needed the following research question:

What kind of structure in an e-learning interface will best support learning of competences for occupational therapy students in higher education?

The answer to this question is the creation of a new digital Competence Profile tool, named by the thesis authors. The Competence Profile would be a portfolio-like intuitive digital competence tracking tool which would enable occupational therapy students at JAMK to better document, identify, understand, articulate and defend competences. In the future, this digital Competence Profile could serve as a base for practicing these skills and tracking learned competences throughout the degree programme.

The thesis process and vision are described in Figure 1. The first four boxes in a darker blue background visualize the thesis process and the boxes in lighter blue visualize the outcomes after successful implementation of the thesis vision.

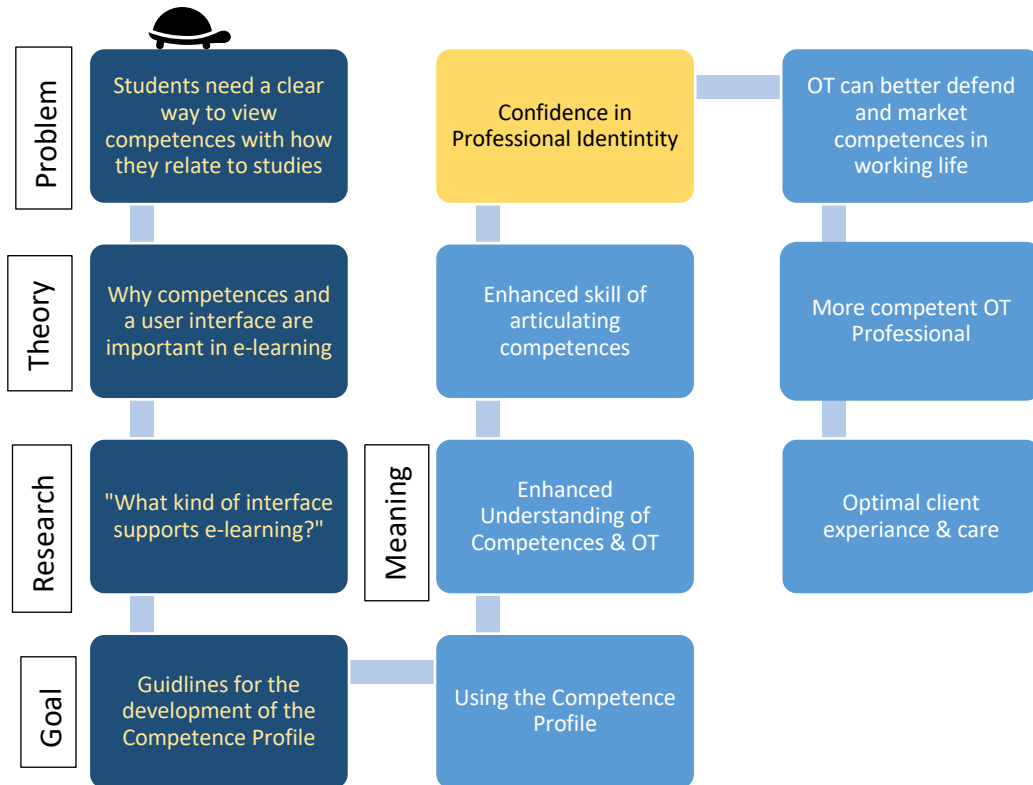


Figure 1. The thesis process and vision

3 Why a learning-friendly user interface for learning competences is important for occupational therapy students?

In its simplest form, the term “competency” simply means the combination of learning, practicing and applying. Competency is a combination of three separate parts: learning, practicing and applying. For example, when one does a driving test, they first have to read the rules (gain knowledge), practice how to handle the car (gain skills) and then finally drive in traffic (display the gained ability to use the knowledge and skills). (Sanghi 2016, 11.)

The concept of *competence* is used frequently in this thesis and for clarification sake, it is important to note that there is a difference between the word *competence* and *competency*. According to Jacobs, MacRae and Sladyk (2010, 476), McConnell (2001)

defines competence as having an ability to carry out professional responsibilities and competency is more about how a professional is performing in a situation at hand. So, competence refers to what people can do while competency refers to how people do it. Competence is a skill and standard of performance while competency describes behaviour - how a standard is achieved. (Sanghi 2016, 10.)

There are five characteristics of the term competency: skill (ability to do certain mental or physical tasks), knowledge (specific stored information), self-concept (self-image, attitudes & values), traits (dependable responses to situations) & motives (reason for doing something). (Sanghi 2016, 12.)

3.1 Occupational therapy and competence

Being a professional is more than choosing a career to make a living with. A professional has certain requirements in how they practice their profession and adhere to the knowledge and ethics base. (Jacobs et al. 2010, 451.)

According to Jacobs and others (2010, 475), Fraser and Greenhalgh (2001) describe the importance of profoundly knowing one's own competences in order to use them diversely: "In today's complex world, we must educate not merely for competence, but for capability (the ability to adapt to change, generate new knowledge, and continuously improve performance)". If the world has been complex in 2001 it is even more complex in 2020. This also applies to the profession of occupational therapy. According to Jacobs and others (2010, 475), Moyers and Hinojosa (2003) state that the risen demand of using evidence-based practice in the occupational therapy workfield is having an impact in increasing the need for occupational therapist to be competent.

In a complex world, having a complex profession with demands to practise evidence-based and accountable practice, means that occupational therapists need to know and use their own competences and capability well. Jacobs and others (2010, 475-

477) report how competence, competency and professional development should be enhanced after graduation in working life through self-assessments, reflection and learning plans. If professional development is considered important after graduation, why is this kind of learning strategy not taken seriously during professional studies?

The best way to become more involved in a profession is through reflection. Reflection is an ongoing process and “the bridge between ideas and facts”. This deepens engagement and emphasizes the undergone experience. (Jacobs et al. 2010, 462.)

3.2 Current situation - Tools for viewing competences

There are currently two platforms used at JAMK that help occupational therapy students to view and evaluate competences. The first is a PDF document called “Occupational Therapy Student’s Evaluation Record (Toimintaterapeuttipiskelijän arviointipassi)” and the second is a web-based platform called Kyvyt.fi.

The Occupational Therapy Student’s Evaluation Record is a tool for self-evaluating competences. At the top of the page there is a competence description and evaluation table. The instructions are to complete this evaluation every semester using a scale of 1-5. Feedback from teachers, working life coaches and friends is added under the competence description and evaluation table. After the feedback section, there is a blank page for reflection about personal strengths and further development under the context of a certain competence. (Toimintaterapeuttipiskelijän arviointipassi 2014.)

JAMK’s occupational therapy curriculum’s professional competences by ENOTHE and COTEC are used in Evaluation Record PDF. The table of Occupational Therapy Competencies can be seen in Appendix 1. ENOTHE is a non-profit organization with interest in standards and quality of professional occupational therapy education in Europe and it is in close collaboration with COTEC (What is ENOTHE n.d.). In particular, the

ENOTHE original competence descriptions - used in the description section - are not reader-friendly, with descriptions displayed as a bulk paragraph. Practically speaking, this means that when a student self-evaluates their competences, they need to first understand the text before reflecting with terminology that is not familiar or natural.

From a student perspective, learned skills can be often be very specific. The lack of a clear structure combined with a vague description of expectations can cause students to be unsure of whether they have actually learned the competences described. Trying then to write and reflect on specific learned skills in a course can be problematic.

Evaluation only every semester is a long time to recall any learned skills. What needs to change for OT students in JAMK to better learn competences? First of all, competences should be linked with courses. This, along with clear course descriptions would establish a clearer context for students to easily make self-reflections and help with recalling skills because everything learned is fresh in the mind. Secondly, detailed skills and competences from evaluation methods, theory models, intervention types/tools or client groups should be easier to articulate. These would make self-reflection/evaluation current every time professional competences are mentioned in the course description and learning outcomes.

Reponen and Ruodemäki (2018) conducted a thematic interview in relation to the formation of professional identity among JAMK occupational therapy students during their studies in their bachelor thesis. One interview theme of Reponen and Ruodemäki's (2018, 18) thesis was self-evaluation of competences. Some of the participants experienced difficulty in filling out the OT Student's Evaluation Record with it being hard and frustrating because of its technical implementation as a PDF, while for some it made the self-learning process more concrete. So, use of the self-reflection tool was found to be difficult but self-reflection and evaluation itself useful. Some felt insecure in their ability to assume the role of an occupational therapist or in knowing their skills well enough to be able to express them in a clear and believable manner. (Reponen & Ruodemäki 2018, 18-20.) The conclusion of the Reponen and Ruodemäki (2018) thesis was that the main factors in improving the formation of

student's professional identity are self-reflection of competences and personal history, interaction and feeling of social cohesion as well as assimilation of professional values. These results from student interviews support the claim that a new tool to reflect and track competences would be useful in helping develop students' professional identity.

The second tool used for evaluation is Kyvyt.fi – a platform for students to create their own electronic portfolio and CV by documenting and reflecting skills, keeping a learning diary and adding elements from cloud services. Kyvyt.fi can be integrated with Optima- or Moodle-learning environments, so information transmission between the platforms is possible. (Mikä Kyvyt.fi on? n.d.) Kyvyt.fi utilises the same method for viewing and evaluating competences as the OT Students' Evaluation Record and is therefore encountering many of the same problems.

Both platforms lack a connection between course descriptions and learning outcomes. According to Legget (2015, 447) an evident competency "map", as a part of competency-based curriculum, will give students "transparency and clarity" and will help creating a deeper understanding of studies.

3.3 User interface and interface design

"A user interface (UI) is an interactive communication between user and computer software codes." If the interface is difficult to use, it will cause mistakes and frustration when completing tasks. When designing an interface, it is critical to ensure a consistent interface, placing the user in control and designing it in such a way that reduces the user's memory load. (Faghih, Azadehfar & Katebi 2014, 787.)

Using voice in a user interface experience can make a user feel more relaxed and creative; in addition, using informal communication can relax a reader – humanizing the interface by using more first and second person pronouns. Finally, research indicates

that using polite words instead of using phrasing that stress importance has a positive impact on learning. (Faghieh et al. 2014, 789.)

To increase user motivation, it's important to consider factors like appearance, presentation, tools, sequence of teaching materials, layout and applications. Colours can spark motivation and attention, especially when there is color variety, when it's used to group information and enough white space is used to declutter pages. (Faghieh et al. 2014, 788-789.)

In order for knowledge to stay stored in a user's long-term memory, it is important to highlight important content with learning objective lists, text size and style variants by using different colours. A way to free up working memory can be to minimize irrelevant visuals and use clear text. (Faghieh et al. 2014, 790.) Finding the right content easily should be a design priority. For example, words can have links that either show a description of the term or take them to another page that also contains that word. (Faghieh et al. 2014, 792.)

According to the Interaction Design Foundation (Visual Design n.d.), the elements (what) of visual design are texture, color, value, volume, negative/white space, shape and line. While the principles of design (how) are dominance, scale, contrast, balance, hierarchy, gestalt and unity. The aim of a visual designer should be to strategically use these factors to affect the usability and aesthetic appeal of a design in order to help build trust and interest. In the end, shaping the user experience. "Visual design as a field has grown out of both user interface (UI) design and graphic design. As such, it focuses on the aesthetics of a product and its related materials by strategically implementing images, colours, fonts, and other elements." (Visual Design n.d.)

The point is, while students have been given tools to evaluate competences, they have struggled to properly use them. This includes difficulty in understanding competences in general, unclear expectations in how to reflect and frustration in how to use the tools given. The research clearly indicates that a learner-friendly user interface enhances e-learning and that internalizing professional competences is especially important for occupational therapy students. Seeing as occupational therapy

students at JAMK are currently required to reflect on their competences online it can be concluded that by enhancing the online user experience the understanding of professional competences will also be enhanced.

4 Research methods and the development process

4.1 Design research

The methodology used is design research with a qualitative approach. Design research is not a research method on its own, but it is a combination of different research methodologies and is therefore called “blended” or “mixed methodology”. Design research is always aiming for a change and it was chosen because it offers a combination of research and development work in order to solve a problem. The combination of methodologies used, depends on the situation and what is to be developed. Both quantitative and qualitative research methodologies can be utilized. (Kananen 2013, 20, 24; Kananen 2015, 39.)

Qualitative research aims for profound understanding and is suitable for situations where there is no earlier research of a phenomenon, where a more in-depth view is needed, where new theories are created and mixed research strategies are used, and where there is a need to describe in detail the phenomenon and findings (data) with words and sentences rather than with more traditional statistical methods (Kananen 2013, 31-32). The decision to use the qualitative research method part of a design research, came from a need to have a better understanding of good interface design in the context of online learning. Seeing as the phenomenon of interface design and learning of competences had little to no prior research, a clearer and more in-depth view and description was needed to find a good solution to the problem.

In order for a problem to be solved, there must be an action that leads to change (Kananen 2013, 18). This is achieved by going through a development process that includes two phases: a research cycle and a change cycle. The development process of

the thesis utilises the research cycle in order to present a solution. (Kananen 2015, 40-42.) The thesis process modelled after a design research cycle is described in Figure 2.



Figure 2. Research cycle of a developmental process (adapted from Kananen 2015, 42)

4.2 Development process

The development process described in this chapter includes the stages of defining the problem and describing the current situation which are presented in Figure 2. Planning and searching of suitable solution require a good review of phenomena related to the problem. Well-made determination helps the understanding of phenomena or people influencing the problem (Kananen 2013, 63).

Motivation for developing the solution to its extent, was primarily based on the experiences of the thesis authors themselves and from conversations with fellow occupational therapy students. The thesis authors - being fourth year occupational therapy students at JAMK – have experienced a personal and full cycle in learning professional competences. This combined with numerous discussions with peers has revealed the struggle and frustration in documenting competences on time and in a way that promotes understanding.

At the beginning of the development process, one of the thesis authors participated in a WORKPEDA workshop to present the thesis idea. Participants included healthcare professionals, teachers and students. The idea was received with so much enthusiasm that it motivated the thesis authors to begin developing with WORKPEDA as the client – alongside JAMK.

WORKPEDA is based on integrative pedagogy and its operational models are made for reforming curriculums, for students to develop their working life skills and for work-integrated theory and guidance (WORKPEDA is transforming learning n.d.). The goal of WORKPEDA projects is to create expertise with profound understanding, active participation and versatile skills (TYÖPEDA uudistaa oppimista n.d.). The thesis product was then officially integrated into JAMK's WORKPEDA project 3B called "Support and guidance of work practice and learning at work" (WORKPEDA is transforming learning n.d.). WORKPEDA models can be seen in Appendix 2.

There was a clear idea already of what type of competence tracking tool was needed. All that was missing was evidence that supported the rough drafts. The tool needed to combine courses with competences for easy reflecting, intuitively show the learning progress and enable the possibility to view competences from a course perspective. Lastly, it needed to be visually pleasing and structurally clear. Research was conducted on what kind of interface features support learning. The results were used to develop a learner friendly competence tracking tool.

The intention was to use an existing platform to begin with and from there develop a competence tracking tool. Potential platforms were found, and contact was made with two in particular, that already had dealings with JAMK. The thesis authors attend seminars and met with the client representatives JAMK and WORKPEDA and third-party stakeholders. The feedback received was instrumental in giving direction in what to focus on and what to develop further.

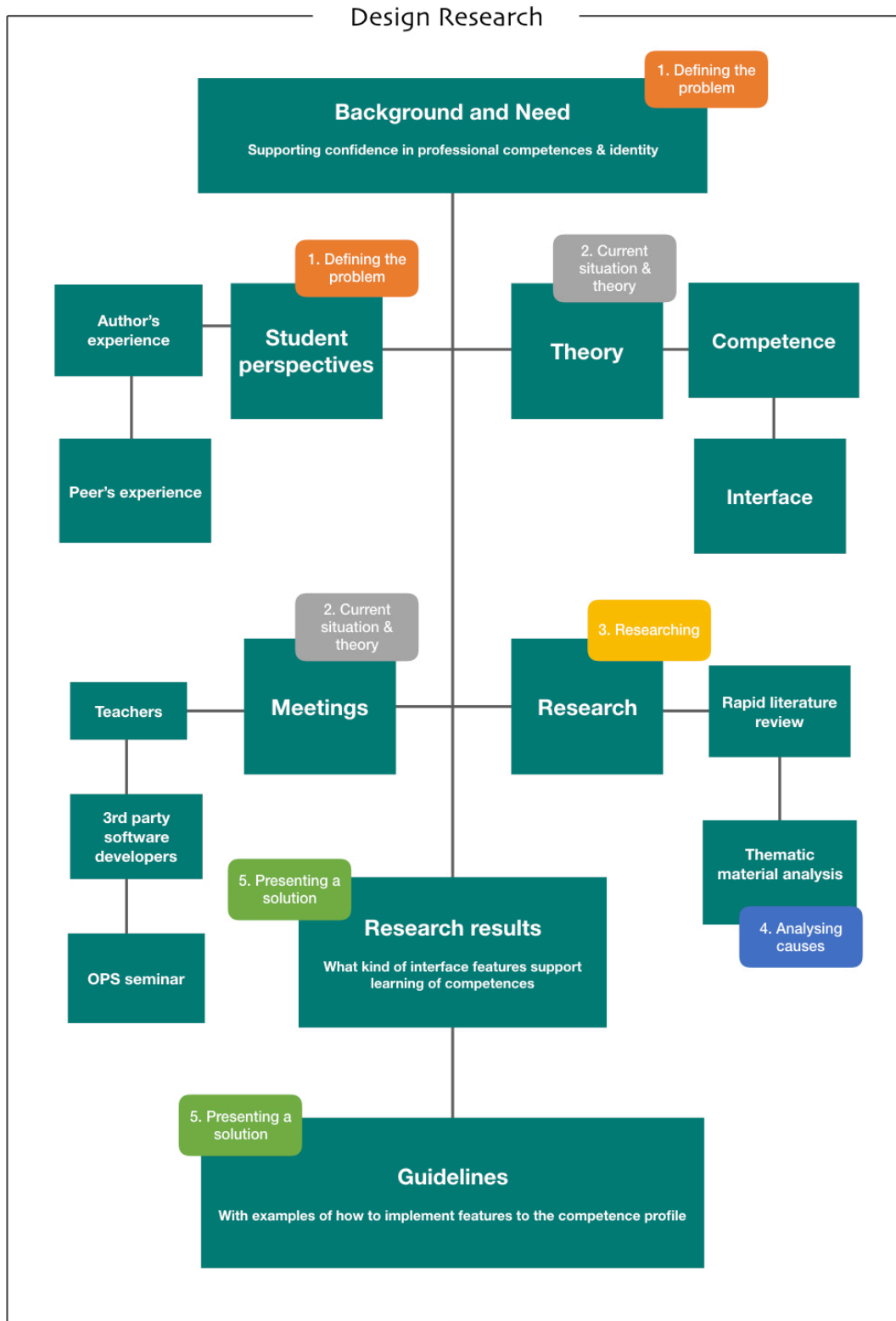


Figure 3. Development process of the thesis

The feedback also supported the development project's vision and most importantly supported the student perspective, which was that learning competences needs clear visual presentation, examples of what is to be expected and that information is concrete and easy to find. It became clear that there was interest in the development of this kind of tool, not just in the occupational therapy field, but also more widely in the university context.

The challenge of initiating a pilot study and analysing the results using a number of possible digital platforms, combined with busy school staff, meant that it was unrealistic to develop an actual competence tracking tool. Instead, the project focused on developing guiding principles. These guiding principles could be used to customize the interface and features of any future digital platform WORKPEDA decides to adopt.

The development process of the thesis and the stages of a research cycle are visually presented in a Figure 3. The research cycle stages are marked in Figure 3. with names and numbers from 1 to 5 according to Figure 2. Development process is explored with chapters on material collection and material analysis, describing the research cycle stages 3. and 4., and research and analysis methods.

4.3 Material collection

A rapid literature review was used as a material collection method because literature review is a comprehensive tool for collecting essential literature from a specific topic (Aveyard 2010, 6). A rapid literature review follows the same principles as a systematic review, but it is less time consuming and the analysis is narrower. A rapid literature review takes 1–6-months to complete and analysis of the findings is more a descriptive summary than a comprehensive synthesis. (Rapid Review Protocol 2018.) When executing a literature review the literature is examined through describing the research problem and goal which means that only those parts are picked from the literature that are essential for the research topic (Hirsjärvi, Remes & Sajavaara 2007,

253). With a rapid literature review, answers for the following research question were researched:

What kind of structure in an e-learning interface will best support self-learning of competences for occupational therapy students in higher education?

Google Scholar was chosen for a database because the research question and desired answers combined different expertise from the fields of information technology (IT) and education. Disadvantages of Google Scholar as a database are a possible large amount of search hits and lack of different search tools as truncation character (use of *) for different word endings. Truncation could have been used with a key word competence.

Search sentence and usage of Boolean operators (AND, OR):

"e-learning interface" AND self-learning OR self-leading OR competence AND student OR "higher education"

Table 1. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Full text available for students	No full text available for students
Literature between 2010-2019	Literature over ten years old
In English or Finnish language	Other than English or Finnish language
Answers to the thesis research question	Does not answer the thesis research question
Reliable publication	Bachelor or master thesis articles
Reliable research documentation	Research documentation unclear

In a search sentence, the phrase "e-learning interface" was chosen because it narrows down the search from "user interface", which was found to give too many

search hits in test searches. “E-learning” also got a lot of results without tying it with interface. “Self-learning” and “self-leading” describe the focus on independent use of an e-learning platform. “Competence” is the focus of learning. “Student” is for student perspective of learning and “higher education” keeps the focus on learning in higher education organizations and therefore with adult learners. “Occupational therapy” was taken out of the search tags because it had no relevance for the results in a test search. Biases in the search may appear if chosen parameters are too broad or if they are not the best parameters to find answers to the research problem.

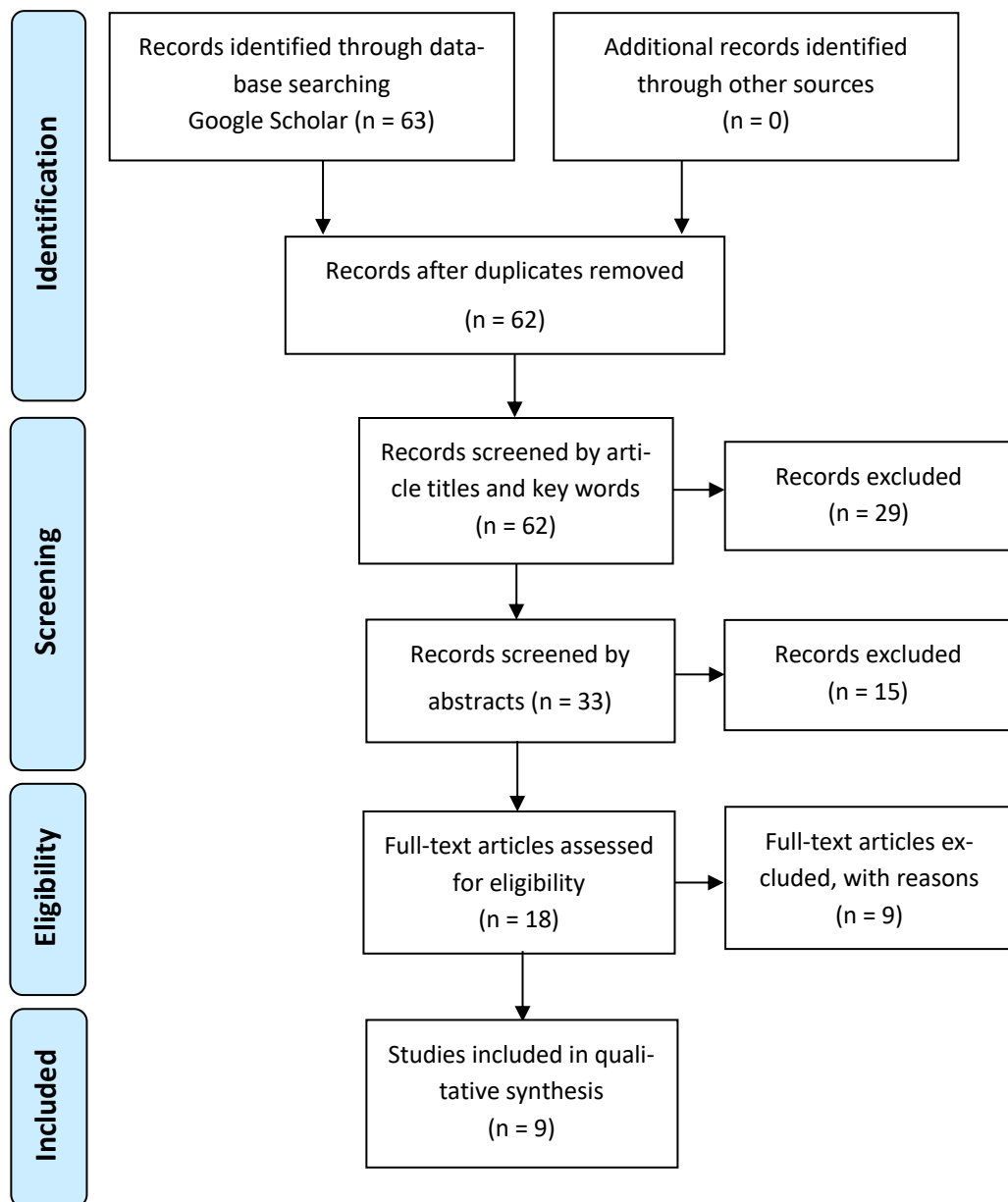


Figure 4. Rapid literature review flow chart

When screening the literature, the material was divided for authors to screen through according inclusion and exclusion criteria described in Table 1. Exclusion was justified and documented, and unclear articles were screened by both authors before exclusion. Literature needed to be available for students as a full text, to avoid any misunderstandings in analysis. A maximum of ten-year-old literature was included to ensure information is up-to-date but not too limited to find information. Literature quality was monitored, the publication needed to be reliable for which reason no bachelor or master thesis articles were included and research needed to be documented reliably - meaning that representation of the method, material collection, research question and the results needed to be documented clearly and carefully.

A total number of 63 articles were found through a Google Scholar search. 62 articles were screened after removing one duplicate. In screening of the title and abstract, articles were excluded if it was obvious that the article's interest was not focused on e-learning and interface design and most probably was not going to answer the research question. In screening of abstracts, articles were also excluded if there was no access to the article's full text. Eighteen full-text articles were viewed for eligibility. Nine (9) of them were excluded based on the following reasons: if an article's research results did not answer the thesis research question (7), the article's research results were unclearly documented (1) or if an article was a bachelor or master thesis (1). Stages of the rapid literature review process can be seen in Figure 4.

4.4 Material analysis

Material based thematic analysis is used as a qualitative data analysis method for coding and searching reviewed material for emerging themes (Aveyard 2010, 108). According to Braun and Clarke (2006, 6,18) a thematic analysis is used for "identifying, analysing, and reporting patterns" from the collected material and when it is done material based, the coding and themes are derived from the material itself. In a rapid literature review, thematic analysis focuses on finding e-learning interface structure features as is the interest of the thesis research question. By finding

themes through analysis, interface guidelines were formed as described in the thesis objective.

Nine articles were chosen for thematic analysis based on acceptance criteria described in Table 1. The first two steps of a qualitative thematic analysis are to become familiar with the material and make initial coding in it (Braun & Clarke 2006, 16-19). Nine included articles were read through, important interests in the text were coded with highlights and the notes from research type, data collection method, results and the article's main points were collected. Then codes from the text of individual articles were collected and compared to create themes and sub-themes. After that, themes were compared again to the material to clarify themes and their hierarchy and gain more specific information about the interface features that benefit learning. Lastly further definitions and more precise naming conventions were conducted and themed list for interface design features were completed. (Braun & Clarke 2006, 19-22.)

The review articles contained many different perspectives on the concept of e-learning. Some of the articles focused on finding out what makes e-learning successful or satisfying for students (Parsazadeh, Zainuddin, Ali & Hematian 2013; Al-rahmi, Othman & Mi Yusuf 2015; Haryaka, Agus & Kridalaksana 2017). These articles describe the e-learning factors important for students based on interviews. Pelet and Papadopoulou (2011) researched the benefits of colour to e-learning in areas of trust and memorization and stated that colour is also an essential element of web interface design. Many articles were focused on exactly what aspects are useful for building a good e-learning and/or interface design from a viewpoint of usability (Boateng 2016; Lin, Lee, Chen & Hooper 2010; Firat, Sakar & Kabacki Yurdakul 2016) or culture (Yu 2015). Research article of Kolås (2010) was more focused on pedagogical aspects of e-learning design, but interface design features were mentioned alongside.

One article in particular - the research of Al-rahmi and others (2015), had in their results, that interface design did not relate significantly to student's e-learning satisfaction, while the research results of Parsazadeh and others (2013) showed that inter-

face design has the second largest impact on successful e-learning after system quality. In light of the eight articles and literature stating interface design's importance, the Al-rahmi and other's (2015) article was still included and contained useful aspects of other e-learning success factors that were used for supportive interface design.

No articles included the keyword "competence" in their results. Having the competence learning perspective would have been ideal for the thesis objective, but it was not necessary because the competence aspect is taken into consideration through theory when implementing the guidelines for the Competence Profile. Interface design to support learning of competences is also a very specific subject and it was assumed that learning supportive features would include learning of any content.

No links between interface design and directly learning of competences were found from the articles. Nevertheless, it can be assumed from the results that by enhancing the overall learning in online settings the interface design will benefit learning from a viewpoint of competences as well.

5 Literature review results

Two themes from the researched material appeared to divide the field of interface design. Aesthetic appeal and information structure. In the Literature review results table in Appendix 4, the theme of aesthetic appeal is represented with the color green and the theme of interface design is represented with the color orange.

The Literature review results table consists of four columns of themes: components of interface design, principals of interface, elements of interface design and interface features that support learning. These themes all act as a guide for designing an interface that supports learning when combined in a thought process. For example, in the

interface component of “Aesthetic appeal”, features like “Similar locations for elements in different pages” in the element of “layout” – and the principle of “consistency” makes an interface design supportive for learning.

Seeing as the articles mentioned “visual design” and not “aesthetic appeal” in their results, it would have been logical to have them under a theme with visual design as the title. However, The Interaction Design Foundation defines the concept of visual design as “the aesthetics of a product and its related materials by strategically implementing images, colours, fonts, and other elements.”. They also mention visual design being in fact a combination of both interface design and graphic design. (Visual Design n.d.) This sealed the decision to use aesthetic appeal as one component theme and information structure as the other - while envisioning visual design as the over-arching topic alongside interface design.

These research results, simply described in Appendix 4, give concrete examples of what to take into consideration when designing an interface that supports learning. In the following sub-chapters, two interface design concepts of information structure and aesthetic appeal are examined closer.

5.1 Information structure

Information structure in the context of interface design has no precise definition. However, it’s meaning is close to the term *information visualization*, which is the process of making information easily understandable for a user by “representing the data in a visual and meaningful way” (Information Visualization n.d.).

Eight of the nine articles mentioned information structure or quality having an impact on an e-learning interface design. The appearance of information structure principles in review material is listed in the Table 2. In order to support learning, the information structure of a user interface should be relevant, simple, consistent, well

organized and in hierarchical order in the areas of layout, language, navigation, interaction and content.

Table 2. Appearance of information structure principles in review articles

Information structure principle	Mentioned in an article
relevancy	Al-rahmi et al. 2015; Haryaka et al. 2017; Yu 2015
consistency	Yu 2015
well organized	Parsazadeh et al. 2013
hierarchical	Yu 2015
relatability	Boateng 2016
differentiation	Lin et al. 2010
intuitive	Boateng 2016
usability	Parsazadeh et al. 2013; Boateng 2016
personalization	Al-rahmi et al. 2015; Kolås 2010
synchronization	Lin et al. 2010
simplicity	Al-rahmi et al. 2015; Lin et al. 2010; Boateng 2016; Yu 2015
documentation	Firat et al. 2016
completeness	Haryaka et al. 2017
accuracy	
currency	

For example, information structure should provide “Must know” information for the content descriptions to make the content simple and relevant. When looking for the most important information from a webpage, information in the layout should be in hierarchical order, well-organized and consistent. More on the usage of information

structure features are described in a Chapter 6, alongside guidelines for a Competence Profile. Table 3. shows a summary of the important principles and elements of information structure for designing a learning supportive e-learning interface.

Table 3. Summary: Results of the information structure in e-learning interface design

Important principles	Elements of information structure
<i>Simple</i>	Layout
<i>Consistent</i>	Language
<i>Relevant</i>	Navigation
<i>Hierarchical</i>	Interaction
<i>Well organized</i>	Content

5.2 Aesthetic appeal

The term aesthetic is defined as “a particular individual’s set of ideas about style and taste, along with its expression” and the term appeal is defined as “the power or ability to attract, interest, amuse, or stimulate the mind or emotions”. (Aesthetic n.d.; Appeal. n.d.) These words combined can mean a particular expressed style that is attractive.

Table 4. Appearance of aesthetic appeal principles in review articles

Information structure principles	Mentioned in an article
Sparks interest/curiosity	Parsazadeh et al. 2013; Firat et al. 2016
Consistency	Lin et al. 2010; Pelet and Papadopoulou 2011; Al-rahmi et al. 2015; Yu 2015
Familiarity	Yu 2015
Harmony	Yu 2015
Simplicity	Boateng 2016; Yu 2015
Usability	Lin et al. 2010; Boateng 2016
Intuitive	Boateng 2016
Motivation	Firat et al. 2016
Contrast	Pelet and Papadopoulou 2011
Trust and memorization	Pelet and Papadopoulou 2011
Interaction	Pelet and Papadopoulou 2011
Differentiation	Lin et al. 2010
Readability	Parsazadeh et al. 2013

In order to support learning, the aesthetic appeal of a user interface should be simple, consistent, spark interest, be usable and use differentiation in the areas of layout, visual cues, color, font, navigation and pictures. For example, having similar locations for elements in different pages in the layout makes the experience more consistent and large topical headings act as good visual cues – giving hierarchy and clarity.

Table 5. Summary: Results of the aesthetic appeal in e-learning interface design

Important principles	Elements of aesthetic appeal
<i>Simple</i>	Layout
<i>Consistent</i>	Visual cues
<i>Sparks interest/curiosity</i>	Color
<i>Usability</i>	Font
<i>Differentiation</i>	Navigation
	Pictures

6 Guidelines for the Competence Profile

6.1 Introduction to the competence tracking tool

These guidelines are for universities and user/visual interface designers who need an updated or new way to visually learn and track professional competences. The end users are students and teachers. The literature review results, specific interface features, principles and elements that promote e-learning are used as a guide to create a Competence Profile that each individual user will use to visualize professional competences acquired during school.

The Competence Profile is a portfolio-like competence tracking tool which is integrated with course descriptions, learning outcomes and course contents, similar in JAMK's Learning Management System. With the Competence Profile a student can track his or her studies, what has been learned and what skills and competences will be learned in following courses. In the Competence Profile student will evaluate him/herself after every course. This develops habits of reflection and articulation of

competences and later on helps with marketing skills and competences as a professional – along with a profound understanding of the profession acquired with the Competence Profile.

In order to spark motivation and curiosity for students to engage in their learning they need to be able to visually see the progress of personal growth, experience positive results in stages and see a visual representation of where they are going.

The authors of these guidelines are convinced that for students to most effectively learn competences, they need to have a personalized digital tool with an interface that promotes learning, is interactive and has relevant and simple reflection tools. If this tool can visualize a users' personal process of learning with a portfolio of competences and skills, the combination all these elements will create a more comprehensive Competence Profile.

6.2 Examples of a Competence Profile

The thesis authors have used a combination of the thesis research material results, their own experiences as students at JAMK and work experience from the IT field to create drawings of a possible Competence Profile.

HOME PAGE: Competence Profile

Why: This page is the first page the user sees. It should give a clear and calm first impression because often studies cause anxiety.

What: The user begins by opening their homepage and is greeted with a large polite welcoming text that says "Welcome (name of user)". A bird (familiar animal) is on the page using informal speech to put the user at ease. An example of the written text is, "What would you like to learn more about today?". There is ample amounts of white space to maximize a stress-free environment with three boxes to choose from. These boxes take the user to three main pages: studies, competences, and portfolio. There

are clear descriptions for text with a local design that uses JAMKS colours and logo which gives familiarity and consistency to the experience.

PORTFOLIO PAGE: Portfolio

Why: This page is the user portfolio for viewing skills and can be used for e.g. future job interviews. Building this page helps the user to get to know what kind of professionals they are and show off their abilities.

What: A user collects all skills and reflections here. Content manipulation personalization the interaction the user has with the interface. There is a section where to add different info about learned special skills like learned frameworks, evaluation methods, deeper knowledge from a certain client group or attended courses or trainings. Users can also make own groups and titles for learned skills.

STUDIES PAGE: Studies

Why: This page lets the user see their study progress for all courses.

What: There is a big pie chart with all courses. When a course is completed, the slice(course) lights up. At the bottom there is a progression tab. Simple layout and colours make focusing on the target content easier. Navigation is optimal and intuitive, giving the user the ability to quickly move to separate courses symbolized by slices of a pie. Visual cues are intuitive. Lots of white space emphasize simplicity and calmness.

COMPETENCE PAGE: Competences

Why: This page contains an overall visual of the entire learning process and provides the user a place to think and plan strategically.

What: Here the user can see all six competences visualized as pie charts. Pie charts here are useful for visually structuring information, are easily accessed from a single look, and include colours to differentiate themes, course size and progress. When a course is completed the slices of the pie are lit up making the learning progress interactive which naturally sparks motivation to visually see the progress completed.

There is harmony between the objects and a simple layout with lots of white space - giving a calmness to the user experience. The color contrast also helps with finding the right information faster.

INDIVIDUAL COMPETENCE PAGE: OT Knowledge

Why: This page is useful for seeing an in-depth view of a particular competence and themes that incorporate the competence. This page includes a skills section, example chart section and a reflection section. Together, these provide a full learning experience of that competence.

What: Each competence page has a consistent and simple layout e.g. similar shapes, a “must know” section and lots of white space. The large headings display a clear hierarchy and the important definitions and examples are near the top of the page for relevancy. Navigation is intuitive, utilising a pie chart to navigate to courses. If a course has multiple competences mentioned, selecting the competence takes the user to its page. Navigation is also possible via the bread-crum trail at the top left of the page and from a side bar on the left of the page.

Abilities in OT section:

Why: This section is important because the user is able to clearly see what abilities are required of an OT in this area of competence.

What: The skills page is a continuation from the chosen individual competence page. There are clear color separations of skills with white space and there is a hierarchy with clear heading to body ratios.

Example chart section:

Why: This section has clear and relevant examples of the abilities OT’s need to have and demonstrate.

What: There is a table with columns of “I am able to”, “Why” and “Life example”. Color is minimal and the focus is on the Life example column.

Reflection section:

Why: This is a key section in each page; the user is provided with an opportunity to review progress and reflect on all the information they have actually learnt.

What: There is a prominent tile titled “Reflections” with a small subheading “What have you learnt about this competence?” There is adequate white space with an emphasis on simplicity. There are only two questions - “What was new?” and “What was confusing?”. These elements should calm the mind for optimal reflecting.

INDIVIDUAL COURSE PAGE: e.g. Introduction to enabling occupation

Why: This page provides basic information about a course and how it is related to other competences.

What: The “Course Contents” section gives a basic overview of the course with the familiar “must know” box. Below this layout is an obvious and recognizable video box of a teacher’s introduction to the class.

The “Learning outcomes” section has a list of course goals and competences. The font is large and readable with clear lines.

The user will fill in the “Reflections” section at the beginning, middle and end of their course for a full reflection circle. There is lots of white space with an emphasis on simplicity by featuring just two questions, “Why am I learning this?” and “How will it help me in the future?” followed by text lines. These elements should calm the mind for optimal reflecting.

Must have elements in a competence tracking tool:

- Individual user credentials used to login to view personal competences
- Home page with visual progress of competences
- Clear and readable descriptions of learning outcomes/expectations with examples and explanation of why they are important
- “Must know” sections for each page
- Section for reflecting what the student has learned, why they are learning it and how this will help them - now and in the future
- Portfolio page that includes user details and competences personal information, competences and skills

7 Conclusions

In order to support learning in e-learning environments, the information structure in an interface design should be a relevant, simple, consistent, well organized and in hierarchical order. These are in the areas of layout, language, navigation, interaction and content, and the aesthetic appeal should be simple, consistent, spark interest, be usable and use differentiation in the areas of layout, visual cues, color, font, navigation and pictures.

When competences and skills are tracked and reflected upon with the use of the Competence Profile throughout a student's degree, it will result in a deeper familiarity and understanding of the occupational therapy profession. This will in turn lead to more confidence in professional identity. By using the Competence Profile throughout their studies, students will be developing a professional competence-based portfolio about his/her skills and expertise which can also be used when applying for employment.

When the digital Competence Profile based on these guidelines for a learner-friendly interface is implemented - it is reasonable to believe that JAMK occupational therapy students will be better equipped to identify, understand, articulate and defend their competences and skills and therefore have more confidence in their professional identity.

8 Discussion

Occupational therapy as a profession is complex because occupational therapist's have to professionally deal with a client's whole life which is a combination of many variables. An occupational therapist's work is client centered which means their work is dictated by the client's circumstances and uses relevant evidence based practice for reliable interventions. The bar is very high if they are to meet the expectations of being a competent occupational therapy professional because they need to be

confident in their knowledge and skills and be confident to take action when required.

The aim of this thesis is to develop interface design guidelines for a Competence Profile. The authors both agree that ample information and informative guidelines were successfully developed.

Topics other than interface features that arose from the research would also have been useful for making the Competence Profile, for example, knowledge management and self-regulation. Better orientation for interface design theory could have helped to form a more efficient research question.

If the thesis process was to be redone, many things would be done differently. A more profound review on already existing portfolios or competence tracking tools could have been conducted and immediately jotting down main points of a good references would have saved time in thematic analysis. While choosing to take on a smaller and more specific research problem would have sped up the development process, other factors like the client changing multiple times naturally extended the process.

At the very end of the development process a company was identified that ironically had already developed a product that had many similar features and ideas. Their focus, however, was on tracking competences for practical training, whereas the Competence Profile's core is primarily on tracking competences gained from academic courses.

In relation to the thesis schedule, the due date was delayed from the original date 12/2019. The transformation of an original idea to the final product was also significant. Originally, development ideas were garnered with changes coming only from the student perspective. Meetings with third-party developers helped to focus on right things in the development work and helped to see new sides of the product idea. The literature review was implemented in the autumn of 2019 and material

analysis was done in the spring of 2020. The original intention was to have a company develop a pilot version of the Competence Profile and then have students to test it. This turned out to be unrealistic, given the constraints of the project.

In the end, while the juggling of digital development progress and people's needs can sometimes turn into a marathon, the main thing is that development goes forward and that is what inspired the authors of the thesis to completion.

8.1 Thesis ethics and reliability

In a design research, which is not a method itself, credibility is observed with the criteria of the research methods used as part of a design research (Kananen 2015, 111). This was a qualitative research thesis using a rapid literature review, so credibility is observed through qualitative criteria. Qualitative elements however are not as predictable as those in a quantitative research. This posed a greater challenge to show reliability and validity. (Kananen 2013, 189.) To show credibility, several criteria were observed.

Firstly, everything presented in the text must be justified or argued - also known as scientific language and the researched information must be based on scientific methods. This means that written text must be: objective (independent of the researcher's own opinions), testable and replicable (other researchers must be able to replicate the results), public, critical (information is ready to be changed if proven false), progressive (up-to-date) and autonomous (free from economic, political or religious bonds). (Kananen 2013, 173,179.)

Secondly - to show credibility – all stages of a research paper must be well documented, and all choices are written down and justified. The beginning situation, methods and final outcome should all be documented. "Documentation progressing stage by stage in line with its justifications brings credibility and adds to the feel of

reliability of the work.” (Kananen 2013, 181.) Thirdly, having more than one researcher on a topic and the informant being satisfied with the end result also add credibility (Kananen 2013, 190).

Review steps in the thesis were documented with a flow chart while inclusion/exclusion criteria and database usage were justifiable. Documents that recorded the screening of literature review material and exclusion criteria for every article in every stage of a screening process, are all saved in excel sheets. Inclusion and exclusion criteria could have been defined more accurately at the beginning of the thesis project in order to increase test re-test reliability. Also, the search parameters could have gone through a few more test searches in order to find more accurate articles to answer to thesis research question.

As both thesis authors are occupational therapy students, the topic has been very closely related to personal thoughts and experiences of studying at JAMK. Student experiences referred in this thesis are derived mainly from the author’s own perceptions and from dialogue with fellow students. These perceptions were strongly supported by JAMK OT student interviews from Reponen and Ruodemäki’s (2018) thesis. The authors close relationship to the topic was taken into account in the research process when implementing the rapid literature review and analysing process.

8.2 Further development

Two of the six ENOTHE competencies were modified as examples for the Competence Profile. The content of competence description sentences remained untouched but the information structure/layout was changed. The other four competencies will need the same kind of information simplifying process if they are to be used in the Competence Profile. Relevance to OT work examples also need to be added. These both will need further development and are good topics for a new development projects or for a bachelor thesis.

The hope is that not only the OT program, but other programs could benefit from these guidelines and will be a catalyst to maintaining the primary focus on viewing and reflecting competences. The Competence Profile is currently simply a vision with growing evidence to support why it should be taken seriously. Further development is needed take these guidelines and make them a reality. Hopefully a pilot version of this competence tracking tool will be implemented. The authors believe that the results will validate the claims made in this thesis.

Interface guidelines for the Competence Profile will firstly benefit the occupational therapy programme since its professional competences have been the ones in the development. Secondly, the development work is beneficial for JAMK because when the profile is made and tested, the transition to incorporate other study fields is relatively simple. Finally, when the product has been piloted in JAMK, other Universities of Applied Sciences might also become interested in having a similar kind of competence tracking tool.

The authors of the thesis reserve the right to the Competence Profile product guidelines drawings in Appendix 5. They are hidden from the public thesis document but they will be handed to the WORKPEDA project 3B, in order to continue the development process.

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Appendices

Appendix 1. Occupational Therapy Competencies

Occupational Therapy Competencies

European Network of Occupational Therapy in Higher Education (ENOTHE)
Council of Occupational Therapists for the European Countries (COTEC) Co-
penhagen 2005-12-03

Knowledge of occupational therapy

The occupational therapist is able to:

1	explain the theoretical concepts underpinning occupational therapy, specifically the occupational nature of human beings and their performance of occupations
2	explain the relationship between occupational performance, health and well-being
3	synthesise and apply relevant knowledge from biological, medical, human, psychological, social, technological and occupational sciences, together with theories of occupation and participation
4	analyse the complexities of applying formal theories and research evidence in relation to occupation in the context of a changing society
5	engage and influence others in rational and reasoned debate in relation to human occupation and occupational therapy

Occupational therapy process and professional reasoning

The occupational therapist is able to:

6	work in partnership with individuals and groups in order to be engaged in occupation through health promotion, prevention, re/habilitation and treatment
7	select, modify and apply appropriate theories, models of practice and methods to meet the occupational and health needs of individuals/populations
8	use professional and ethical reasoning effectively throughout the occupational therapy process.
9	utilise the therapeutic potential of occupation through the use of activity and occupational analysis and synthesis
10	adapt and apply the occupational therapy process in close collaboration with individuals/ population
11	work to facilitate accessible and adaptable environments and to promote occupational justice
12	collaborate with communities to promote the health and well-being for their members through their participation in occupation
13	actively seek, critically evaluate and apply a range of information and evidence to ensure that practice is up-to-date and relevant to the client.
14	critically appraise occupational therapy practice to ensure that the focus is on occupation and occupational performance

Professional relationships and partnerships

The occupational therapist is able to:

15	work according to the principles of client centred practice.
16	build a therapeutic relationship/partnership as the foundation of the occupational therapy process
17	establish collaborative partnerships, consult and advise with clients, carers, team members and other stakeholders on enabling occupation and participation
18	collaborate with clients to advocate for the right to have their occupational needs met
19	appreciate and respect individual differences, cultural beliefs, customs and their influence on occupation and participation

Professional Autonomy and Accountability

The occupational therapist is able to:

20	prepare, maintain and review documentation of the occupational therapy process
21	comply with local/regional/national/European policies and procedures, professional standards and employers' regulations
22	demonstrate continuing lifelong learning to enhance occupational therapy
23	practise in an ethical manner, respecting clients and taking account of professional codes of conduct for occupational therapists
24	demonstrate confidence in self-management, self-awareness and knowledge of own limitations as an occupational therapist

Research and development in occupational therapy/science

The occupational therapist is able to:

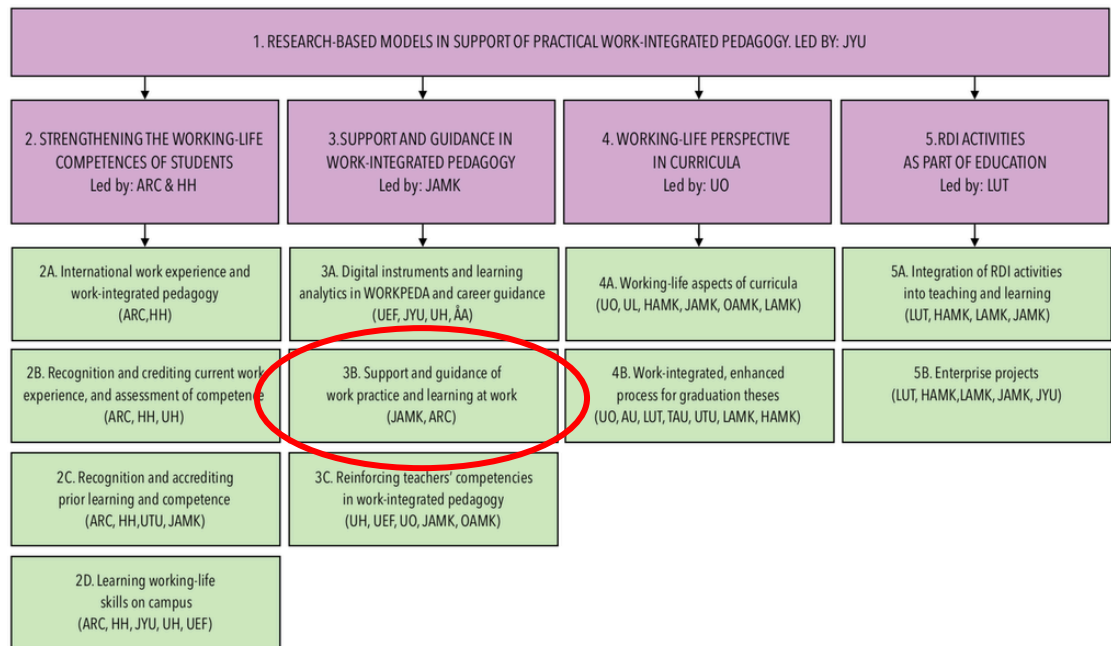
25	identify the need for research on issues related to occupation, occupational therapy and/or occupational science and formulate relevant research questions.
26	demonstrate skills in independent searching, critical examination and integration of scientific literature and other relevant information
27	understand, select and defend research designs and methods appropriate to human occupation considering ethical aspects
28	interpret, analyse, synthesise and critique research findings
29	develop knowledge of occupation and occupational therapy practice
30	disseminate research findings to relevant parties

Management and promotion of occupational therapy

The occupational therapist is able to:

31	determine and prioritise occupational therapy services
32	understand and apply principles of management to occupational therapy services, including cost-effectiveness, administration of resources and equipment, and establishing occupational therapy protocols
33	engage in a continuous process of evaluation and improvement of the quality of occupational therapy services, involve clients where appropriate and communicate the results to relevant stakeholders
34	take a pro-active role in the development, improvement and promotion of occupational therapy
35	consider developments in health and social care, society and legislation at international, national and local levels that effect occupational therapy services

Appendix 2. WORKPEDA models



Appendix 3. Literature review articles

Number.	Article
1	Al-rahmi, W., Othman, M. & Mi Yusuf, L. 2015. Exploring the Factors that Affect Student Satisfaction through Using E-Learning in Malaysian Higher Education Institutions. <i>Mediterranean Journal Of Social Sciences</i> , 6, 4, 299-310. Referenced 3.8.2019. https://www.mcser.org/journal/index.php/mjss/article/view/7010/6714 .
2	Parsazadeh, N., Zainuddin, N. M. M., Ali, R. & Hematian, A. 2013. A review on the success factors of e-learning. In <i>The Second International Conference on e-Technologies and Networks for Development</i> , 42-49. Referenced 3.8.2019. https://www.researchgate.net/profile/Nadia_Parsazadeh/publication/278785796_A_REVIEW_ON_THE_SUCCESS_FACTORS_OF_E-LEARNING/links/5b64910ca6fdcc94a70c099c/A-REVIEW-ON-THE-SUCCESS-FACTORS-OF-E-LEARNING.pdf .
3	Haryaka, U., Agus, F. & Kridalaksana, A. H. 2017. User satisfaction model for e-learning using smartphone. <i>Procedia computer science</i> , 116, 373-380. Referenced 3.8.2019. https://scholar.google.fi/scholar?q=User+satisfaction+model+for+e-learning+using+smartphone&hl=fi&as_sdt=0&as_vis=1&oi=scholart .
4	Firat, M., Sakar, N. & Kabacki Yurdakul, I. 2016. WEB INTERFACE DESIGN PRINCIPLES FOR ADULTS' SELF-DIRECTED LEARNING. <i>Turkish Online Journal of Distance Education</i> , 17, 4, 17-21. Referenced 3.8.2019. https://www.researchgate.net/publication/308892707_Web_Interface_Design_Principles_for_Adults'_Self-Directed_Learning .
5	Pelet, J-E. & Papadopoulou, P. 2011. Investigating the effect of color on memorization and trust in e-learning: The case of KMCMS. net (knowledge management and content management system). In <i>Impact of E-Business Technologies on Public and Private Organizations: Industry Comparisons and Perspectives</i> , 52-78. Referenced 3.8.2019. https://www.researchgate.net/publication/287873168_Investigating_the_effect_of_color_on_memorization_and_trust_in_e-learning_The_case_of_KMCMSnet_Knowledge_Management_and_Content_Management_System .
6	Lin, J. Y., Lee, A. S., Chen, C. W. & Hooper, H. H. J. 2010. A Study on Cognition Design in Interface Usability of E-Learning Websites. <i>THE INTERNATIONAL JOURNAL OF ORGANIZATIONAL INNOVATION</i> , 3, 1, 72-90. Referenced 3.8.2019. https://scholar.google.fi/scholar?q=A+Study+on+Cognition+Design+in+Interface+Usability+of+E-Learning+Websites&hl=fi&as_sdt=0&as_vis=1&oi=scholart .
7	Boateng, J. K. 2016. Usability Issues and Support Needs for E-learning Important to Ghanaian Learners. <i>School of Continuing and Distance Education. University of Ghana Learning Centres. University of Ghana</i> . Referenced

	3.8.2019. http://ugspace.ug.edu.gh/bitstream/handle/123456789/7453/Boat-eng%20Kwame%20John_Usability%20Issues%20and%20Support%20Needs%20for%20%20E-learning.pdf?sequence=1&isAllowed=y .
8	Yu, H. H. 2015. A Culturally Aware Approach to Learning System Interface Design. Doctoral dissertation. University of Kansas. Referenced 3.8.2019. https://kuscholarworks.ku.edu/bitstream/handle/1808/19518/Yu_ku_0099D_14016_DATA_1.pdf?sequence=1 .
9	Kolås, L. 2010. Implementation of pedagogical principles into the software design process of e-learning applications. Doctoral thesis. Department of Computer and Information Science. Norwegian University of Science and Technology. Referenced 3.8.2019. https://ntnuopen.ntnu.no/ntnu-xmlui/bitstream/handle/11250/250014/332225_FULLTEXT02.pdf?sequence=1 .

Appendix 4. Literature review results

Interface design that supports learning			
<u>Big themes</u>	<u>Medium themes</u>	<u>Small themes</u>	<u>Mini themes</u>
Components of Interface Design	Principals of Interface Design	Elements of Interface Design	Features of Interface Design
Aesthetic appeal 2, 4, 5, 6, 7, 8 (article num.)	Sparks interest 2	Layout 8, 7	Use same location for elements in different pages 7
	Consistency 1, 8		Use same layout in whole system 8
	Familiarity 8		Definite color, size, font placement for elements 7
	Harmony 8		Apply predominate local design 8
	Simplicity 7, 8		Harmonious relationship for objects & background 8
			Emphasize harmonious relations for objects 8
			Enhance content, not overshadow 7
			Obvious and recognizable tabs and actions 7
		White/blank space 7, 8	
	Usability 7	Visual Cues 7, 4	Navigation bars 7
	Intuitive 7		Headings 7
	Sparks curiosity 4		Section/page numbers 7
	Motivation 4		Signposts (back, next) 7
			Real life components 4
	Contrast 5	Colour 5, 6, 7	Use contrast to find info better 5
Trust & memorization 5	Fade irrelevant content to minimize distractions 5		

	Interaction 5		Use contrast to enhance content 7
	Consistency 5		Definite color for every element 7
	Differentiation 6		Suitable color combinations for every content 6
	Simplicity 7		Frequent color for course/content 5
	Contrast 5	Font 2, 6, 7	Distinguish size and color 6
	Readability 2		Definite color, size and placement 7
			Make words recognizable with colour & style 6
	Usability 7	Navigation 6, 7	Distinguish color, font and placement 6
	Intuitive 7		
	Differentiation 6		
Consistency 6	Pictures 6	Only 2D or 3D, not both 6	
Usability 6			
Infor- mation structure 1,2, 3, 4, 6, 7, 8, 9	Relevancy 3, 8	Layout 2	Sub-categories for showing content 8
			Highly structured information 1, 8
			Useful features 2
	Individual func- tionality 8		Emphasize objects with info boxes. 8
	Consistency 8		A logical way to organize information 8
	Organization 2		Compartmentalize information with assigned priority. 8
	Hierarchy 8		Use deeper hierarchical structure and imposed sequences 8
			Relationship oriented, items presented on the basis of relevancy 8
	Relatability 7	Language 7	Use of natural, relatable, daily words 7

	Relevancy 8		Use examples & scenarios 7
	Differentiation 6	Navigation 6, 7, 8, 9	Distinguish font, color & placement 6
	Intuitive 7		Navigation bars 7
	Usability 7		Buttons like “end”, “next” 6
	Personalization 9		View content based on e.g. hierarchical structure of themes, chronological order & media types 9
	Hierarchy 8		Emphasize hierarchical relationship 8
	Task driven/ori-entation 8		Task/Action oriented design, items arranged by functional attributions or alphabetically 8
			Supportive navigational tools; breadcrumbs, sub-menu, sidebar 8
	Personalization 1	Interaction 6	Content manipulation by user 6
	Relevancy 1		Fundamental (relevant) knowledge 1
	Synchronization 6		Synchronizing pictures among text 6
	Simplicity 1, 6, 7, 8	Content 6	"must know" information 7
	Usability 2 (easy to use)		Simple info structure 8
	Personalization 1		Fundamental knowledge 1
	Differentiation 6		Section abstract 6
	Relevancy 3		Highlight or flash 6
	Documentation 4		Learning analytics to track progress 4
	Completeness 3		
	Accuracy 3		
	Currency 3		

Appendix 5. Product drawings

jamk.fi **Competence Profile** Matti Jamkilainen
95/125 op



Welcome Matti,



What would you like to learn
more about today?

Competences

All your skills, knowledge and abilities

Portfolio

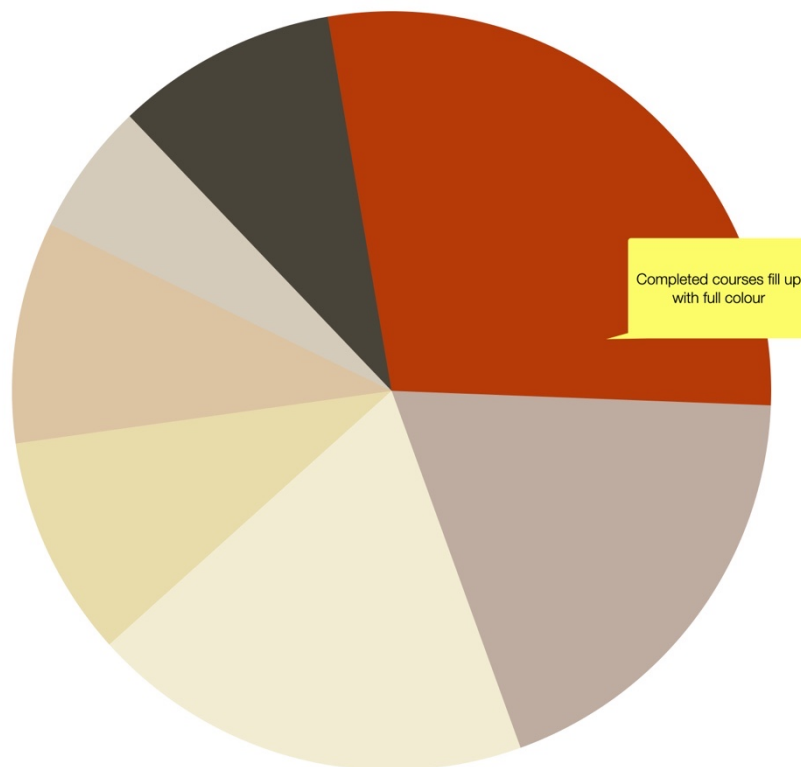
All your reflections in one view

Studies

Progress of all your courses

Studies

My OT Study Progress for all courses



20 op 210 op



Portfolio

Matti Jamkilainen



This is me

OT Competeces

History

Contact info

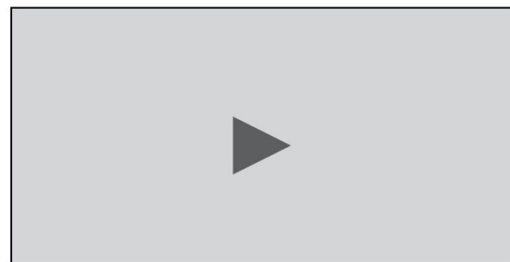
Personal info

Name:

Education / Profession:



Who am I?





OT Competences

Matti Jamkilainen

All user reflections are collected under each competence

These are the original competences with more informal names

What I know	How I make decisions	Interpersonal skills
Evidence based practice	Developing and marketing OT	Ethics and professional identity

e.g. 5 year learning plan



User can choose what they want to add here..

Practical training

Evaluation of client groups

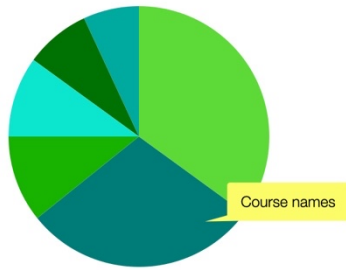
Methods / Frameworks

+

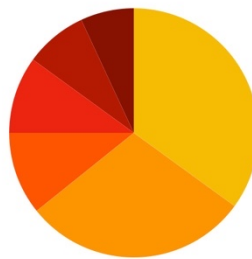
Competences

The circles are your OT competences and the slices are your courses!

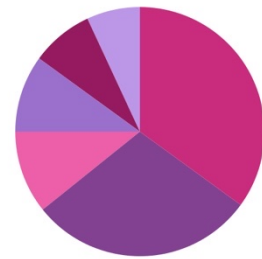
Knowledge of occupational therapy



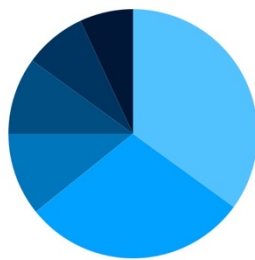
OT Process and Professional Reasoning



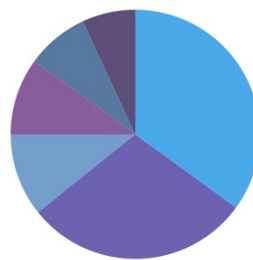
Professional relationships and partnerships



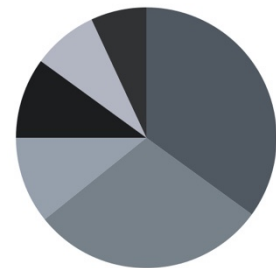
Research and development in



Management and promotion of occupational



Professional Autonomy and Accountability





Knowledge of Occupational Therapy

Check out the basics of this competence!



Overview

Occupational Therapists need to have sufficient general knowledge in order to make safe and professional decisions for any client group

Themes:

1. Models
2. Performance Analysis
3. Overall understanding of a human

Quick definition

How do these link to the courses

Overview of all courses that include OT knowledge



- Introduction to Enabling Occupation
- Professional Practise I
- Neuropsychology and Functional Anatomy
- Occupation Centred Assesment
- Professional Practise II
- Enabling Occupation
- Enabling Occupation II



Abilities

These are the things OT's are able to do!



Skill of combining and using knowledge for any situation →

With theories of occupation and participation

Synthesise and Apply relevant knowledge of:

- Biology
- Medicine
- Human science
- Psychology
- Social science
- Technology
- Occupational science

Skill of Explaining OT Theory →

Relationships, performance and nature

Explain:

- Theoretical concepts underpinning occupational therapy
- Occupational nature of human beings
- Performance of occupations
- Relationship between occupational performance, health and well-being

Skill of sharing your knowledge →

Engage and influence others in:

Rational and reasoned debate in relation to human occupation and occupational therapy

Skill of applying theory and research into practice (EBP) →

In relation to occupation in the context of a changing society

Analyse complexities of:

- Applying formal theories
- Research evidence



Examples

The what, why and how of OT abilities



I am able to	Why	Life example
Explain the theoretical concepts underpinning occupational therapy, specifically the occupational nature of human beings and their performance of occupations	<div data-bbox="895 757 1023 846" style="background-color: yellow; border: 1px solid black; padding: 2px;"> What, why & how so that student understands tasks on a practical level </div>	
Explain the relationship between occupational performance, health and well-being		
<div data-bbox="336 907 408 952" style="background-color: yellow; border: 1px solid black; padding: 2px;"> Explanation of cognitive verb </div> Synthesise and apply relevant knowledge from biological, medical, human, psychological, social, technological and occupational sciences, together with theories of occupation and participation	You need to use a broad understanding of all aspects of a human to form professional and safe decisions for any patient situation	You meet a patient with __ condition and you know that you should __ with that kind of patient. So you decide to first do __
Analyse the complexities of applying formal theories and research evidence in relation to occupation in the context of a changing society	When applying You need to learn the skill of how to put theories and research into practice. When you use evidence based	If you use evidence based practice (the skill of how to put theories and research into practice), your...
Engage and influence others in rational and reasoned debate in relation to human occupation and occupational therapy		



Reflections

Reflections from all **OT**
knowledge courses



Introduction to enabling occupation
02.04.2022



I am able to synthesize and apply relevant knowledge together with theories of occupation and participation.

" I know the basics of OTIPM model... "



Introduction to enabling occupation

What will I be learning in this
course?

Course contents

- Occupational therapy process
- Human occupation according different theories
- Occupation-centred and client-centred occupational therapy intervention approaches to enable clients' occupations

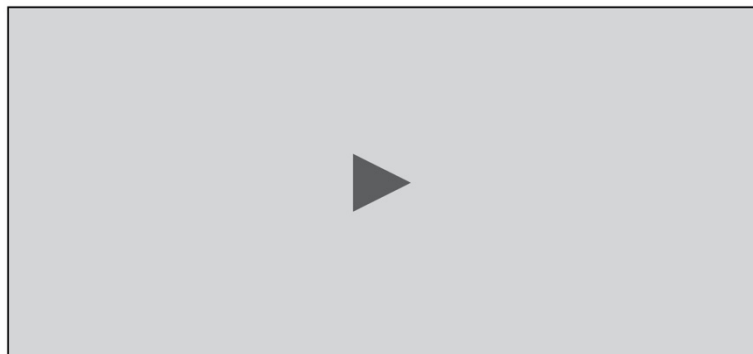


Occupational therapy process and professional reasoning



Knowledge of occupational therapy

Teacher greetings








Learning outcomes

What I should know at the end
of class

Goals

 Students learn how to **explain** and **adopt** the theoretical concepts underpinning occupational therapy, specifically the occupational nature of human beings and their performance of occupations.

 I am able to **separate** different kinds of interventional approaches for the client to enable occupation and participation.

 I am able to **synthesize** and **apply** relevant knowledge from biological, medical, human, psychological, social, technological and occupational sciences, together with theories of occupation and participation.

Competences



Occupational therapy process and professional reasoning

[Click for definition](#)



Knowledge of occupational therapy



Reflections

What have I learnt in this class?

Why am I learning this?

Student fill in at
beginning of
course

How will it help me in the future?



Reflections

What have I learnt based on the learning outcomes of this class?



I am able to **synthesise** and **apply** relevant knowledge from biological, medical, human, psychological, social, technological and occupational sciences, together with theories of occupation and participation.

I know the basics of OTIPM model...



Students learn how to **explain** and **adopt** the theoretical concepts underpinning occupational therapy, specifically the occupational nature of human beings and their performance of occupations.

I know the basics of OTIPM model...
