PROMOTE – Course Design

Deliverable IO 3

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1. The PROMOTE Course Design

1.1. Target groups

The PROMOTE Course is an innovative study concept, which is transferable to the three different target groups, their diverse learning settings and frame conditions:

- It firstly aims at students at the interface of Bachelor and Master since in some cases a 60 ECTS transfer course is needed to reach the required ECTS points (in case of a 180 points Master like at PFH Göttingen)
- Secondly it addresses P&O professionals worldwide (who reached a comparable EQF level 4 or 5 in VET who intend to go for an Higher Education qualification (e.g while learning on the job)
- And thirdly it addresses PhD students in Orthobionics and robotics since they often lack basic P&O competences (as emphasised in the stocktaking phase).

1.2. Diversity and Modularity

Based on the stocktaking these three target groups represent a large number of potential candidates with different educational starting points – equivalent to EQF levels 4/5 (VET practitioners) to 6 (BSC), 7 (Master) and 8 (PhD).

This diversity within the potential target groups is a challenge for a mainstream qualification design. The challenge is even bigger if we also consider the different social, national and cultural contexts of potential learners. It goes without saying that a Master course for students in Germany cannot be compared with a qualification of P&O experts in Afghanistan or other humanitarian crises areas. However, PROMOTE seeks to offer qualification starting points and pathways also for extremely disadvantaged professionals in the sector – and at the same time high quality Professional Development opportunities for highly qualified persons for the P&O sector, such as for professionals working in global healthcare providers.

PROMOTE developed a modular concept and has been made use of state-of-the-art learning technologies and didactic designs to bridge this large scope of professionals. This concept covers a sufficient array of ECTS points for the uplifting master course (60 points target).

1.3. Methodology

From the methodological point of view, it offers a professional blended learning design which consists of a fully fledged Open Source Learning Management System (moodle based) which contains the following contents:

a. P&O with 3 modules Orthotics and Prosthetics each which may be delivered in both asynchronous and synchronous modalities and are also connected with practical workshops,
b. 2 Business Management modules with 12 courses and which may be delivered as asynchronous online modality and
c. 1 Entrepreneurship module which was delivered with an international group of students in a format that we call “Design Based Collaborative Learning” since it is based on Design Thinking methodology, aiming at developing prototypes and at the same time at synchronous online collaboration. A group of selected students was also invited for face-to-face workshops to design and accomplish their workshops and present them in a pitch in front of a large international audience.

1.4. Contents

Content-wise the survey showed that potential candidates of the three target groups did not only need domain specific competences (P&O) but also support to develop innovative ideas for potentially new products and services (entrepreneurship) and also knowledge related to future business development.

1.5. Summary and Conclusion

Based on these findings, the PROMOTE qualification has been based on the following principles:

All three content areas will be offered in different learning modalities – knowledge can be delivered online and assessed in traditional asynchronous formats (business management), practical knowledge and skills related to P&O are best to be delivered (also to cover long distances for professionals on the job) in a blend of online and practical modules and workshops and innovation can be best triggered in diverse groups via Design Thinking, both online and on the spot.

The learning approach has to be modular, as it may support the professionalisation of the learners in different learning modalities, be it face-to-face courses, e-learning as self-directed learning or blended learning arrangements PROMOTE also has to explore its feasibility to provide different learners access to different parts of the study programme or just singular units as described above.

The PROMOTE Qualification Programme is clustered along the following areas:

1. Prosthetics and Orthotics (P&O); Domain Specific Competences I, covering potentially 63 credits
2. Business management; Organisational Competences, 2 modules, 12 courses covering 30 credits and
3. Entrepreneurship and Design Thinking; Social, Personal and Organisational Competences, 4 units covering 2 ECTS points.

Learning Fields	Number	Subject	Delivery Mode	Examination	Location	ECTS	Prereq.	Responsibility
Prosthetics and Orthotics **63 ECTS**	**Module 1**	**Introduction to P/O**	**B/W**	**-**	**home/campus**	**3**		**TM**
	Module 2	**Orthoics I - Lower Limb Orthotics 1**				**10**		
	2.1	DAFO Theory	B	BOE	home	4		HS
	2.2	DAFO Practical	W	PE	lab	6	I/W/S	HS
	Module 3	**Orthotics II - Lower Limb Orthotics 2**				**10**		
	3.1	KAFO Theory	B	BOE	home	4		HS
	3.2	KAFO Practical	W	PE	lab	6	I/W/S	HS
	Module 4	**Spinal Orthotics**				**10**		
	4.1	Spinal Orthotics Theory	B	BOE	home	4		HS
	4.2	Spinal Orthotics Practical	W	PE	lab	6	I/W/S	HS
	Module 5	**Prosthetics I - Partial Foot Prosthetics**				**10**		
	5.1	Partial Foot Prosthetics Theory	B	BOE	home	4		HS/TM
	5.2	Partial Foot Prosthetics Practical	W	PE	lab	6	I/WS	HS/TM
	Module 6	**Prosthetics II - TT Prosthetics**				**10**		
	6.1	TT Prostheics Theory	B	BOE	home	4		HS/TM
	6.2	TT Prostheics Practical	W	PE	lab	6	I/WS	HS/TM
	Module 7	**Prosthetics III - TF Prosthetics**				**10**		
	7.1	TF Prosthetics Theory	B	BOE	home	4		HS/TM
	7.2	TF Prosthetics Practical	W	PE	lab	6	I/WS	HS/TM
Business Management I **12 ECTS**	**Module 8**	**Business Management I**				**12**		
	10.1	Self Organised Individual Learning	CS	OE	home	1		PFH
	10.2	Project Management	CS	OE	home	4		PFH
	10.3	Management Techniques	CS	OE	home	3		PFH
	10.4	Creativity Techniques	CS	OE	home	2		PFH
	10.5	Communication and Negoiation Skills	CS	OE	home	2		PFH
Business Management II **18 ECTS**	**Module 9**	**Business Management II**				**18**		
	11.1	Teamwork	CS	OE	home	1		PFH
	11.2	International Human Resources Management	CS	OE	home	3		PFH
	11.3	Innovation and Network Managament	CS	OE	home	3		PFH
	11.4	Employee Leadership	CS	OE	home	2		PFH
	11.5	E-Marketing	CS	OE	home	3		PFH
	11.6	E-Business Policies and Models	CS	OE	home	4		PFH
	11.7	Brand Marketing	CS	OE	home	2		PFH
Entrepreneurship **2 ECTS**	**Module 10**	**Entrepreneurship**				**2**		
	12.1	Spotting Ideas	DBCL	A	home/project	0,5		Blinc
	12.2	Client and Market	DBCL	A	home/project	0,5		Blinc
	12.3	Refuining	DBCL	A	home/project	0,5		Blinc
	12.4	Prototyping	DBCL	A	home/project	0,5		Blinc
Internship **Variable ECTS**	**Module 11**	**Internship**				**5**		
	13.1	Intership (varibale Duration)	I	IR	home	per month		

Table 1: Overview of the modular PROMOTE Qualification Design

In the course of the project, the PROMOTE trainers were trained to develop and deliver selected modules from this array (see CPD for trainers, IO5) and to pilot one module per sector with the envisaged number of students to test the feasibility of the approach (see IO6 piloting).

The course design was based on the competence framework and learning objectives. It substantiates the envisaged learning outcomes with a list of contents that will be delivered in the blended learning modalities to the learners.

2. Modules, Courses and Learning Units

The following modules are available on the online sources and connected to the PROMOTE learning platform.
In the following they are clustered according to the three content areas:

1. P&O
2. Business management
3. Entrepreneurship and Design Thinking

2.1. Prosthetics and Orthotics

2.1.1. DAFO

L01: Anatomy of the lower limb
L02: Review of Lower Limb Myology
L03: Biomechanics
L04: Skeletal Muscles
L05: Introduction to foot pathology
L06: Assessment Lower leg
L07: Gait Biomechanics I
L08-1: Gait Biomechanics II
L08-2: Integrated function of the limb
L09: Cerebral palsy (CP)
L09-2: Spina bifida
L09-3: Stroke
L10: Treatment Goals
L11: Orthoses for Cerebral Palsy I
L12: Orthoses for Cerebral Palsy II

2.1.2. KAFO

L01: Anatomy of the lower limb
L02: Review of Lower Limb Myology
L03: Biomechanics
L04: Skeletal Muscles
L05: Introduction to foot pathology
L06: Assessment Lower leg
L07: Gait Biomechanics I
L08-1: Gait Biomechanics II
L08-2: Integrated function of the limb

L09: Cerebral palsy (CP)
L09-2: Spina bifida
L09-3: Stroke
L10: Treatment Goals
L11: Orthoses for Cerebral Palsy I
L12: Orthoses for Cerebral Palsy II

2.1.3. Spinal Orthotics

L1: Anatomy of the trunk 1
L2: Anatomy of the trunk 2
L3: Diseases and deformities of the spine
L4: Scoliosis & Classification
L5: Biomechanics of the spine
L6: Biomechanics of Scoliosis
L7: Patient assessment
L8: Scoliosis – Orthotic Management with the Sorbeinheim Technique
L9: Scanning and Casting for corrective spinal orthoses
L10: Rectification technique for corrective orthosis for scoliosis
L11: Fitting Parameters
L12: Final fitting checks
L13: Ongoing Treatment
L14: Reflective and Evidence Based Practice

2.1.4. Partial Foot Amputations

L01: Anatomy of Lower Limb and Foot
L02: Biomechanics of Partial Foot Amputation and Ankle Disarticulation
L03: General Prosthetic Principles,Treatment Protocol in Ankle Disarticulation & Partial Foot
L04: Patient Assessment for Partial Foot Amputation (PF)
L05: Variation of Materials in Partial Foot Amputation Prostheses
L06: Variation of Prosthetic Designs for Partial Foot Amputations I
L07: Partial Foot Amputation Prosthetic Prescription
L08: Casting Technique of Partial Foot Amputation
L09: Rectification Technique for Partial Foot Amputation Protheses (PFA)
L10: Fabrication Technique in PF amputation Prosthesis
L11: Partial Foot Amputation Prosthetic Fitting
L12: Partial Foot Amputation - Gait Analysis
L13: Device Evaluation and Adjustments
L14: Finishing Partial Foot Amputation (PF) Prostheses
L15: Follow up:
W1.2 - Biomechanics - Fundamental characteristics of normal motion and human locomotion
W2.1 Variation of Prosthetic Designs for Partial Foot Amputations II (Silicone Prosthesis)

2.1.5. Trans-tibial Prosthetics

L01: Review of Lower Limb Osteology
L02: Review of Lower Limb Myology
L03: Biomechanics - Fundamental characteristics of normal motion and human locomotion
L04: Pathology
L05: Transtibial Biomechanics
L06: Pathology – Transtibial amputation level
L07: Patient Assessment
L08: Transtibial socket designs and basic biomechanics
L09: Common prosthetic feet
L10: Prosthetic alignment
L11: Transtibial Problem Solving

2.1.6. Transfemoral prosthesis with Ischial Containment Socket

L01: Anatomy - Review of Lower Limb Osteology
L02: Anatomy - Review of Lower Limb Myology
L03: Biomechanics – Comparison between Ischial Containment and Quadrilateral Socket designs
L04: Patient Evaluation and measurement taking
L05: Ischial Containment Casting Technique
L06: Ischial Containment Rectification Technique
L07: Thermoforming and Bench alignment
L08: Ischial Containment Fitting Protocol
L09: Problem solving

2.2. Business Management

2.2.1. Fundamentals of Business Administrations

1. **Introduction**
2. **Essential contents of economic sciences**
3. **Development and classification of economic science**
4. **Fundamentals of economic activity**

2.2.2. Self Organized and Individual Learning

- *The fundamentals of experiencing and learning: leveraging the brain*
- *Organizing learning by yourself, designing brain-friendly learning*
  - *Organizing the framework conditions of learning yourself*
  - *Designing learning in a brain-compatible way*
- *Organizing learning individually: handling focal points of learning/ studying*
- *Questions and case studies.*

2.2.3. Project Management

- *Success and failure factors*
- *Project organization*
- *Behavioral sciences and project management – The human factor*
- *Phase and procedural models*
- *Project start and project definition*

Management Techniques

1. *Fundamentals of management*
2. *Concept and function of select management techniques*
3. *Fundamentals of management decisions*
4. *Decision-supporting management systems*

2.2.4. Creativity Techniques

1. *Development of creativity*
2. *Confidence in the own creativity*
3. *Creativity techniques*
    1. *Brainstorming*
    2. *Mind Map*
    3. *Thinking hats and thought chairs*
    4. *Method 635*
    5. *Brainwriting pool*
    6. *Collective Notebook*
    7. *Morphological Box*
4. *Management of innovation processes*
    1. *Creative process*
    2. *5Creativity killers*
5. *Influence of corporate structures*

- Note – these creative competences are also tackled in part 3

2.2.5. Communication and Negotiation Skills

1. *Theory of communication*
2. *Fundamentals of conversational skills*
3. *Problem and conflict communication*
4. *Negotiation*

2.2.6. Teamwork

- Significance for personnel management
- Operational benefit
- Models of the temporal development and change of teams
- The Input-Process-Output model of Teamwork
- The 4-factor theory of innovation in teams
- Team development and organizational support for teamwork
- Team roles
- Team leadership
- Basic rules for the introduction of teamwork
- Possible problems with teamwork

- Note – these teamwork competences are also tackled in part 3

2.2.7. International Human Resources Management

- Understanding the context of International Human Resources Management and its specific requirements
- Know some concepts of "culture" as well as the functioning of intercultural communication and competence in action
- Develop an understanding of the functioning of international organizations
- Understand the importance of international personnel management as a strategic management task
- Question and apply leadership models to international requirements
- Have an idea of the practical implementation of international personnel development

2.2.8. Innovation and Network Management

- Knowledge of the macroeconomic, national, and global economic backgrounds of structural changes in the economy as a whole and in individual business sectors
- Recognizing the importance of renewal and maturing processes for the competitiveness of companies
- Selecting, systematizing, externalizing, and developing corporate knowledge
- Knowledge of important (technical) aspects of knowledge and innovation management in companies
- Know the advantages and disadvantages of adequate organizational forms to promote culture, innovation, knowledge, and competence
- Distinguish between collective and individual learning
- Know that the perception of knowledge, ability, and experience is subjective
- Mastering essential concepts around constructivism and the approach of interpretation patterns
- Recognizing the maturity of a company based on the prevailing human image and the lived culture
- Innovation and knowledge management: systematisation and control of innovation and knowledge processes
- Understanding the effects of transfer subsystems and understanding the impact of promoters on the objectives of the company and its employees

2.2.9. Network management:

- Introduction to different forms of cooperation in the economy and in the service sector
- Understanding the structure and functions of network management
- Ability to plan and implement the development of a network management system
- Ability to perform network management in different phases
- Introduction to and use of network controlling tools
- Get to know and use the network-balanced scorecard

2.2.10. Employee Leadership

- The importance of leadership in organizations
- Leadership success
- Challenges for tomorrow‘s leaders
- Relationships between leadership and personality
- Implicit leadership theories
- New leadership approach
- Charisma and transformational leadership
- Diagnosis of leadership
- Personnel development measures for managers
- Women in leadership positions
- Employee appraisals
- Assessment and development interview
- Training and coaching on the job
- Team leadership
- Basic rules for the introduction of teamwork
- Possible problems with teamwork

2.2.11. E-Marketing

Main objectives:

- Be able to transfer the fundamentals of marketing to the field of e-commerce
- Be able to look at new developments in the further development of the internet from a marketing perspective

Subordinate partial objectives:

- Recognize the role and importance of the internet and e-commerce for companies offering products and services.
- Distinguish supplier/customer relationships in transactions
- Be able to recognize and assess characteristics and types of electronic characteristics
- Be able to assess user behaviour in terms of effects on marketing
- Know the concept and background of Web 2.0 and be able to critically examine it
- Know and understand ways to pursue a multi-channel strategy
- Know and understand the impact of the internet on primary and secondary market research
- Identify the special features of brand management on the internet and be able to critically assess brand management in the course of e-marketing
- Know and understand the impact of the internet on product policy
- Differentiate between offline and online price management differences and critically assess aspects such as price differentiation and price transparency on the internet
- Know variants of marketing communication on the internet and be able to evaluate differences
- Be able to evaluate the use of the internet as a sales channel with regard to effects and developments
- Recognize the importance of value orientation also in e-marketing

2.2.12. E-Business Policies and Models

- Know and be able to define the concepts of net economy and e-business.
- Be able to recognize the strategic effects that exist due to the changed market situation of the Net Economy compared to traditional markets.
- Be able to differentiate between the different business models of the Net Economy.
- Identify market mechanisms and the associated opportunities and risks for Net Economy companies.
- Classify and differentiate price models.

2.2.13. Brand Marketing

- Be able to describe the characteristics of brands
- Recognize the brand's benefits for suppliers and customers
- Know selected brand management target metrics
- Differentiate trademark types
- Describe and evaluate selected brand management approaches
- Identify legal fundamentals and problems of branding
- Describe phases of the brand management process with typical tasks and goals
- Know the prerequisites for use, the manifestations, advantages and disadvantages of the different brand strategies
- Describe and evaluate possibilities for structuring brand portfolios
- Highlight the special features of international brand management
- Derive and evaluate strategic options for international brand management
- Describe issues/problems of integrating international brand policy into the identity-based brand management approach
- Know the goals, tasks and selected instruments of brand controlling
- Present the model of the brand value chain and show examples of key success factors for the individual phases
- Compare and critically assess selected models for brand evaluation

3. Entrepreneurship and Design Thinking

3.1. The Design Thinking Process

3.1.1. Introduction

Content (information material[1]):
Design Thinking process: Definition of terms and context of the concept (in moodle via video https://www.youtube.com/watch?v=gHGN6hs2gZY&t=147s)
Overview of structure and contents (along the Train the Trainer Design Thinking Brochure)
Introduction of application scenario: Story to exemplify the steps of the design thinking process

Changes in this world are often driven by innovation. Innovation means to create something new, may it be from already known parts which are assembled in a new fashion, or something entirely new and unknown before. The Innovation is present in all fields of our society, it is fuel for economic growth and progress, provides new solutions to problems and challenges. An important pre-requisite of innovation is creativity, the soil in which new ideas root and flourish.
Design thinking provides us with a systematic and structural approach to solving complex problems from many fields and to find new solutions that meet the needs of those involved. It is often used in the field of idea and innovation development.
The method is based on a multi-step, agile and iterative process. This design thinking process helps us to narrow down and actually understand our problem, identify solution spaces and generate concrete ideas. In each step of this process, we apply different creative techniques and thus approach innovative solutions for our problem. Users and their needs are always in the foreground.
The Design-Thinking Method is a client-centred approach which was initially developed by Larry Leifer (director of the Hasso Plattner Design Thinking Programme at Stanford University), Terry Winograd (co-founder of the Hasso Plattner Institute at Stanford) and David Kelley (founder of the IDEO agency).
This module introduces the steps of the design thinking process, explains them and provides a number of methods and tools which can be applied to facilitate each step.
Each step is substantiated with a practical exercise to be applied to a scenario, in which a team of educational project designers has set out to develop a new product.

[1] Information material along the definition within the Classification of learning activities (CLA): https://ec.europa.eu/eurostat/documents/%203859598/7659750/KS-GQ-15-011-EN-N.pdf/978de2eb-5fc9-4447-84d6-d0b5f7bee723

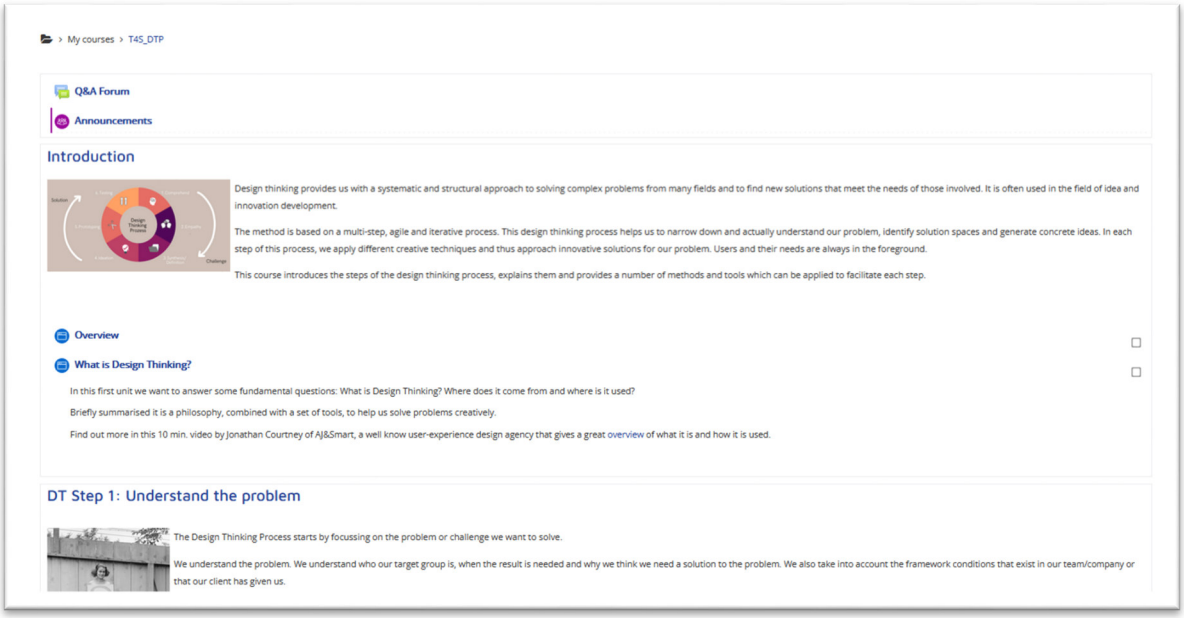

Fig. 3: Screenshot from the Learning Module on Design Thinking and Creativity Techniques

- **Learning goals**: to create a consciousness about DT and general processes, to know and understand the module concept, to gain understanding of the practical applications of design thinking
    - Understanding what design thinking is and what it is used for
    - Reading the texts and watching the video
    - Feeling motivated to learn more about design thinking

3.1.2. LU1: Understanding the problem

- Content (information material):
    - Explanation of step 1 in the design thinking process
    - Presentation of methods to facilitate step one
    - Scenario example
    - Assignment

In the first phase we focus on the problem or challenge we want to solve. What problem does our client have? We understand the problem. We understand who our target group is, when the result is needed and why our client thinks they need a solution to the problem. We also take into account the framework conditions that exist in our team/company or that our client has given us.

The aim of this phase is to formulate a so-called design challenge. This is our project assignment, so to speak, which we want to solve with the Design Thinking process.

Suggestions for methods to be used in this phase (to be presented in detail in the moodle course):

- Mind map: Organize thoughts and ideas by putting them on paper as a "map"
- Analogies & role models: Use analogies to change the perspective on the challenge.
- 6 W Method: Get a basic understanding through questions.
- Semantic analysis: Develop a common knowledge base for the challenge in a team.

Scenario: Our team of project developers gets together and creates an extended mind map to define their design challenge…

Task: Define your own design challenge by using one of the tools suggested.

- Learning goals: to
  - Understanding the relevance of understanding in the DTP
  - Identifying and understanding the design challenge
  - Applying methods from the design thinking toolkit
  - Engaging with the task, being motivated to solve it

3.1.3. LU2: Empathy

- Content (information material):
  - Explanation of step 2 in the design thinking process
  - Presentation of methods to facilitate step 2
  - Scenario example
  - Assignment

In the second phase, we focus on our potential clients and users. Who are they? What are their needs? We become experts in understanding them better.

The aim of this phase is to build empathy for our target group, the beneficiaries of our idea. In order to understand them, in this step of the process we identify them and try to find out as much as possible about them. We can do this with explorative interviews, a self-test or by actually observing our clients, e.g. with the Shadows method.

Suggestions for methods to be used in this phase (to be presented in detail in the moodle course):

- 5 Whys method: Raising awareness for a specific challenge or situation
- Emotional Journey Map: to understand users' emotions
- Interviews: Receive qualitative information directly from users
- Mind mapping: described under DT1: Understanding
- Shadows: Be there inconspicuously at every turn

Scenario: The design challenge identified in the previous stage was to create micro-sized learning bits on digital literacy in every-day life, presented through an app.

The team starts out phase 2 with the 5 whys-method to firstly explore their clients' views theoretically. Based on these results they designed question sets and interviewed a number of HR representatives in large companies who seem to care for digitalisation, but also regular employees about their work life and learning at the workplace in general. They also inquired users' practices and preferences regarding learning apps.

Task: Collect information about your target group's habits and needs by using one of the tools suggested.

- Learning goals:
  - Understanding the relevance of the empathy phase in the DTP
  - Understanding the users' propositions and needs regarding the aspired solution/product/idea
  - Identifying and understanding the design challenge
  - Applying methods from the design thinking toolkit
  - Engaging with the task, being motivated to solve it

3.1.4. LU3: Synthesising

- Content (information material):
  - Explanation of phase 3 in the design thinking process
  - Presentation of methods to facilitate phase 3
  - Scenario example
  - Assignment

In the third phase we summarise our findings and knowledge. What insights can we gain? We share our knowledge in the team. We interpret our previous analysis and draw new insights and weight the findings. The picture of our users clearly increases in detail.

The aim of this phase is to share the knowledge with our team and to generate tangible findings. We summarise our findings in a persona, for example. The persona represents our user group with its needs. This persona allows us to feel empathy in the generation of ideas in the next phases of the Design Thinking process. We finally conclude this phase with a How Might We question.

Suggestions for methods to be used in this phase (to be presented in detail in the moodle course):

- Personas: getting to know potential users and understanding what they want
- Emotional Journey Map: described under DT2: Empathy
- Interviews: described under DT2: Empathy
- Mind mapping: described under DT2: Empathy
- Shadow: described under DT2: Empathy

Scenario: In order to structure their findings and to prepare to synthesize the team presented their results to each other. These were visualized on a mind map (with miro).

Task: Bring together all findings you have had so far and conclude their relevance in order to create a persona of your client by using one of the methods presented above.

- Learning goals:
  - Understanding the relevance of the synthesis phase in the DTP
  - Understanding the connections and priorities of information regarding the aspired solution/product/idea
  - Identifying and understanding the aspired client via a persona
  - Applying methods from the design thinking toolkit
  - Engaging with the task, being motivated to solve it

3.1.5. LU4: Ideating

- Content (information material):
  - Explanation of phase 4 in the design thinking process
  - Presentation of methods to facilitate phase 4
  - Scenario example
  - Assignment

In the fourth phase of the process, we develop ideas and outline solutions. Which idea solves the problem? We use various creative methods to develop new solutions with our extensive knowledge. Our focus is on quantity. We develop as many ideas as possible in order to come up with innovative solutions afterwards.

The goal of this phase is to generate as many ideas as possible and then prioritise them. For example, we can use the Wow-How-Now method for prioritisation. It is then important to agree on one or two ideas to be then tested in the next phase.

Suggestions for methods to be used in this phase (to be presented in detail in the moodle course):

- Brainwriting: brainstorming (initially) for yourself
- Brainstorming: developing new ideas in the group
- Bodystorming: experiencing and understanding the challenge first-hand
- Bisociation: break through established thought patterns
- How -Wow- Now Matrix: How good are our ideas? Assessment of feasibility and innovation
- Mind mapping: described under DT1: Understanding

Scenarios:
One could for instance transfer the scenario for different contexts and target groups, all of them tackle different projects that all have a connection to digitalisation and digital literacy.

In case of disadvantaged target groups or people with only few digital skills the learning fields would be rather simple and under-complex while the approach can also be scaled up to CPDs for IT experts. The skeleton of the reference system stays the same, as well as the design concept.

Task for the facilitators: Generate some ideas for solving your design challenge in a user-centred approach by using one of the methods presented above.

- Learning goals:
  - Understanding the relevance of the ideating phase in the DTP
  - Understanding the connections and priorities of information regarding the aspired solution/product/idea
  - Identifying a number of ideas that are feasible to solve the problem/design challenge
  - Applying methods from the design thinking toolkit
  - Engaging with the task, being motivated to solve it

3.1.6. LU5: Prototyping

- Content (information material):
  - Explanation of phase 5 in the design thinking process
  - Presentation of methods to facilitate phase 5
  - Scenario example
  - Assignment

In the fifth phase of the process, we bring our idea(s) identified in the previous phase to life. Now our solution is made tangible for our clients. How do we visualise the idea?

The goal is to test the solution with our users and gain new feedback and further insights. We focus on creating prototypes as quickly as possible and with little effort. The prototypes are continuously adapted based on feedback from our customers. At the beginning, a sketch or a handcrafted element is often sufficient. A wide variety of materials can be used for this. Examples of analogue models include paper, modelling clay, theatre performances and building blocks. Digital tools can be used just as well, for example to display an app or to realize an object with the aid of a 3D printer - there are no limits to creativity!

Suggestions for methods to be used in this phase (to be presented in detail in the moodle course):

- Paper prototyping: visualization of the main product features
- Digital prototyping (mock- ups): simulation, digital dummies
- Role play: test through the eyes of the user
- Storyboard: visualize the user experience

Scenario:

Task: Build a prototype of your idea by using one of the methods presented above.

- Learning goals:
  - Understanding the relevance of the prototyping phase in the DTP
  - Identifying and highlighting key features of the product/idea in a prototype
  - Applying methods from the design thinking toolkit
  - Engaging with the task, being motivated to solve it

3.1.7. LU6: Testing

- Content (information material):
  - Explanation of phase 6 in the design thinking process
  - Presentation of methods to facilitate phase 6
  - Scenario example
  - Assignment

In the final phase, we test the prototype with our clients/users. What feedback do they give us? We get qualitative feedback. We continue to test and develop our idea until our client - our user - recognises our idea as a problem solution. The aim is to test our ideas to find out whether our solution meets the needs of our users.
For example, we can use the card sorting method to test our features. Ideally our product or service is rated by external, uninvolved people.
It is important that our prototype is continuously adapted and that we pay attention to our users' feedback. If an idea is not well received by them, we go back to phase 4 and choose another idea to test. Feedback should ultimately contribute to an improvement of the prototype in iterative loops.

Suggestions for methods to be used in this phase (to be presented in detail in the moodle course):

- User tests: carry out tests with users
- Feedback Capture Grid: clustering of the test results
- Testing Card: Assistance for a well-prepared test scenario
- Wizard of Oz prototype: test functionality in advance

Scenario:

Task: Create a testing scenario for your prototype by using one of the methods presented above.

- Learning goals:
  - Understanding the relevance of the testing phase in the DTP
  - Understanding the connections and priorities of information regarding the aspired solution/product/idea

- Identifying and understanding whether the solution is feasible or if a new idea needs to be developed
- Applying methods from the design thinking toolkit
- Engaging with the task, being motivated to solve it

3.1.8. Module Design Thinking - Table of learning units

Module/Topic/Duration		Learning Unit	Material	Assignment Attitude	Assignment Knowledge	Assignment Skills
	The Creative Thinking process					
		1. Understanding		A2: Reflect what problems/issues you find interesting	K2: Summarise/ describe phase 1 of the DTP and related methods	S2:Describe phase 1 of the DTP
				A3: Reflect your own attitude toward the problem and related aspects	K3: Gather information regarding the problem you are interested in	S3: Visualise all aspects of the issue and structure them
				A4: Reflect what you would be ready to do to solve the issue	K4: Define your design challenge	S4: Create a motto for your design challenge
		2. Empathising		A2: Reflect for whom you want to solve the challenge	K2: Identify potential target groups and approaches to gather data	S2: Visualise potential target groups and data collection approach
				A3: Reflect your own attitude towards the target group and your motivations/aspirations	K3: Research and identify target groups' features	S3: Apply methods from the DT Toolkit to identify target groups'

Module/Topic/Duration		Learning Unit	Material	Assignment Attitude	Assignment Knowledge	Assignment Skills
						features and needs
			Moderated discussions, Visualisations	A4: Reflect which barriers or attitudes may blurr your objective view on the target group	K4: Analyse and prioritise target groups' features and aspects	S4: Create a common understanding of aspects and needs to consider in next phases in the team
		3. Synthesising		A2: Reflect your attitude towards the challenge having a bigger picture than in phase 1	K2: Collect and structure all information gathered so far	S2: Discuss the information in the team
				A3: Reflect on the communication process in your team to identify the most relevant aspects	K3: Extract the most relevant features aspects to further consider	S3: Visualise the most relevant features/ aspects to further consider
				A4: Reflect in how far you identify with your persona, here there are differences and similarities between you	K4: Analyse all data and define a persona	S4: Visualise the persona and create a common understanding in the team

Module/Topic/Duration		Learning Unit	Material	Assignment Attitude	Assignment Knowledge	Assignment Skills
		4. Ideating		A2: Reflect about thinking barriers/thinking outside the box and your personal attitude towards it	K2: Decide upon a procedure to approach ideating, i.e. which methods from the toolbox to use	S2: Discuss and agree the next steps in the team
				A3: Reflect about your creativity and open mindedness	K3:	S3: Apply creativity techniques and CT tools and generate as many ideas as possible
				A4: Reflect how your opinions have shaped/influenced the ideating process in the team	K4: Analyse and prioritise your ideas in the team	S4: Create consensus in your team about the selection of ideas to prototype
		5. Prototyping		A2: Reflect your own role and aspirations in the prototyping process in your team	K2: Identify team roles and process for building the prototype	S2: Brainstorm ideas for prototypes in the team and visualise them
				A3: Reflect your own view on features' relevance an in how far	K3: Define and reason the most relevant features of the prototype	S3: Discuss different methods how the prototype can be built

Module/Topic/Duration		Learning Unit	Material	Assignment Attitude	Assignment Knowledge	Assignment Skills
				it contrast your team members views		
				A4: Reflect about your attitude towards the final prototype	K4: Develop a design for the prototype that covers all relevant features	S4: Create a prototype (virtually or physically)
		6. Testing		A2: Reflect your personal preferences against the decisions taken in the team	K2: Define a testing strategy	S2: Visualise the testing strategy and assign tasks to the team
				A3: Reflect your attitude towards the testing activites	K3: Identify relevant questions and target groups for testing	S3: Apply the testing scheme you have developed
				A4: Reflect the results of testing and what consequences should be taken	K4: Identify and analyse the test results, decide whether to improve or go back	S4: Create ideas for improvement based on test results in the team

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