Output O2

Train the Trainer Program & capacity building

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Satakunta University of Applied Sciences, Finland

Latvian Chamber of Commerce and Industry, Latvia

Chamber of Crafts and SME in Katowice, Poland

Hungarian Association of Craftsmen Corporation, Hungary

Informatikai Tavkozlesi Elektronikai Vallalalkozasok Szovetsege Egyesulet, Hungary

Language

English[1]

Content

[1] The reports on capacity development in Germany are also available in German.

1. Introduction

1.1 Project Summary

Small and medium-sized enterprises (SMEs) in the construction sector urgently need to overcome the following challenges:

a) Fast, active and efficient shaping of the digital transformation.

b) Comprehensive realization of cooperation across different organizations at all stages of the construction process.

c) Attracting the urgently needed, appropriately qualified next generation of skilled workers and entrepreneurs.

The demand for good apartments and houses has rarely been as high as it is now, and yet there is far too little affordable housing available. Hence, significant increases in efficiency and acceleration of construction planning and execution are much needed in the construction industry. Construction projects can be carried out more efficiently through the application of targeted digital tools. In fact, around 30% of planning capacities can be saved this way. In addition, digital technologies make the identification of risks in construction possible at an early stage so that they can be avoided.

When building one- and two-family houses, up to 25% of the total construction costs go to coordination work, which can be reduced to a very large extent through self-coordination using digital tools. Since the construction industry is characterized by a highly specialized division of labor, coordination errors can quickly occur, which often result in inferior quality and delays. Furthermore, energy and environmental aspects are often not given enough attention during new constructions and reconstructions. With the help of digital technologies, building owners, architects, engineers and craftsmen can plan together easily, increase the quality and ensure the adherence to deadlines. Moreover, new technologies make it possible to determine the energy costs of a building at an early stage and to eliminate risks or hidden costs. Individual priorities can be placed on technical features or environmental aspects. Although digital technologies and tools are already being tested and used in practice, the overall digitalization in the construction sector is only advancing very slowly.

Compared to other countries (e.g. the Netherlands, Denmark or Finland), Germany has a lot of catching up to do. SMEs in the construction and finishing trades, which are very active in the construction of one, two and smaller multi-family houses, are particularly hesitant when it comes to using new digital tools and are therefore the focus of the project. The shortage of skilled workers is particularly severe in the construction industry.

The attractiveness for vocational training and construction activities is clearly suffering from the high specialization, physically difficult work, heteronomy, etc. The targeted use of digital technologies can reverse these barriers and lead to decisive increases in attractiveness. Large companies and general contractors in the construction industry often use their own digital systems, which they impose on their SME subcontractors, making them dependent and completely transparent. This leads to the rejection of digitali-

zation in SMEs. There is a lack of SME specific advisory and training programs on digitalization in the construction and finishing trades. Both the owners and the employees of the SMEs have a high need for information, advice and further training. Support capacities must be expanded, and teachers and consultants of SMEs must be prepared and trained in a targeted manner in order to be able to convey to SMEs and their employees the use of digital technologies. The SME-specific training courses should highlight the intersections and interdependencies between the various trades and actors through transparent interfaces, in order to promote the need for cooperation and the use of digital technologies.

The overall objectives of the project are:

1. To quickly and productively shape the digital transformation in small and medium-sized enterprises (SMEs) in the construction sector based on the needs and challenges they are facing, so that as many SMEs as possible use digital technologies and tools in all fields of activity in their company.

2. To facilitate easier cooperation through digital technologies between all those involved in the construction work (clients, architects, engineers and SMEs in the various trades) from planning to the execution, including the management of the construction of large-scale projects.

3. To increase efficiency, quality and punctuality in the construction industry as well as the ability to include environmental and sustainability aspects in the planning, construction or renovation of buildings through the application of specific digital tools and technologies.

4. To increase the attractiveness of vocational training and work in the construction sector in order to meet the already very high and still growing demand for qualified skilled workers and entrepreneurs in this sector. In order to achieve these decisive objectives, the following action goals are pursued in the project.

a) Providing digital technologies and tools as well as cooperation methods suitable for SMEs in the construction industry by analyzing the best international practices and adapting them to the different national conditions, which are then transferred to SMEs together with individual implementation advice.

b) Providing SME specific education programs on digital competences and skills by analyzing and adapting international best practices, which are then implemented by chambers with their educational institutions, vocational schools and other VET institutions.

c) Strengthening the educational and counselling capacities as well as the qualification of teachers and consultants of SMEs so that they can give sound advice on digital transformation and implement qualification programs.

d) Increasing the attractiveness of vocational training and winning qualified young people with strong learning ability for the construction sector by developing, testing, evaluating and implementing additional qualification trainings on digitalization in the construction sector, which are completed during or directly after vocational training and result in an independent, recognized vocational qualification.

e) Enabling architects, engineers and SMEs in the construction and finishing trades to realize comprehensive collaborations through the use of digital technologies by developing, testing, evaluating and implementing a training program on collaboration management and digital skills.

f) Enabling SMEs and their employees to make full use of digital technologies in all areas of construction by developing, testing, evaluating and implementing a training program on digital competences and skills.

g) Contributing to closing the entrepreneurship gap by attracting young entrepreneurs with digital competences and skills through the development, testing, evaluation and implementation of a module program for digital entrepreneurship training.

h) Increasing the attractiveness of vocational training and work in the construction sector by offering interesting, expanded areas of activities as well as qualifications with recognized degrees at all levels of vocational training with maximum permeability.

i) Strong regional dissemination of the implementations of the results by transferring the results and demand-oriented implementation recommendations to 72 SMEs and education institutions from 13 countries.

1.2 About Train the Trainer Program & Capacity Building

Teachers and consultants of SMEs must be prepared and trained in a targeted manner in order to be able to convey SMEs and their employees the use of digital technologies. For this reason, a train-the-trainer program was developed in the project, tested in practice, evaluated and revised and finalized on the basis of the evaluation results. The results are:

- Concept, curriculum and teaching materials for the Train the Trainer program
- Implementation report of the practical testing
- Evaluation concept and report

The Train the Trainer program, which will be implemented on an ongoing basis by 24 colleges and universities from 13 countries, will significantly strengthen the capacities of training providers and SME sponsors. In Germany and Hungary, additional measures to develop SME support capacities were successfully developed and implemented, leading to the following additional results:

- Digitalization Officer for SMEs
- Craft Lab of the Schwerin Chamber of Crafts
- Improving collaboration between architects and construction companies
- Online SME consulting in the Digitization in the construction industry

2. Concept and Curriculum Train the Trainer Program[2]

2.1 Introduction

The ability to find, evaluate, and communicate information through typing and other ways to use media on various digital platforms is often called *digital literacy*. This ability can be evaluated by an individual's grammar, composition, typing skills and ability to produce text, images, audio, and designs using the modern information and communication technology. Digital literacy can be defined as *"the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills."* (ALA, 2022 [3]) Although the term initially focused on digital skills and stand-alone computers, the rise of the internet, rapidly grown use of mobile devices, and increasing number of social media applications have transferred the focus to networked mobile environment. In business, the range of digital platforms and growing demand of digital services and products challenges both the digital and business literacy of entrepreneurs and leaders. To understand how the digitalized business environment works and to recognize the opportunities and risks of digitalization is an essential foundation for new innovations, and for development of new digital businesses.

To be able to train the entrepreneurs and personnel of the small and medium size construction and finishing companies requires that trainer is well in in the digital world, knows the terminology and understands thoroughly the opportunities and risks of both the new technology and new ways to do business by using digital platforms. In training and advising the students and entrepreneurs with no or only little experience and skills in digitalization and working with digital tools, the biggest challenge is to motivate them to consider new ways to work and co-operate, and to accept and adopt new tools and ideas. At the same time, there may be also those who have good skills and knowledge in working in the digitalized world. With them, the major challenge is to help them to find the best and most beneficial ways to utilize modern technology and ways to do business.

In this curriculum, the major attention is paid to training those with deficient digital skills. However, in different countries digitalization has progressed at different speeds, and there are differences between individuals too, thus, it must also be highlighted, that it is the responsibility of each trainer, coach, consultant, and mentor to evaluate the starting level of each trainee or mentee, and to fit the course so that each participant benefits it.

Aim and target groups of the course

The aim of this course is to introduce teachers, trainers and consultants to digitalization, digital construction, and new opportunities to create new innovative business in the construction branch. The attention will be paid to motivation, fundamental terminology, digital business and collaboration, pedagogic issues, particularly to those topical in the era of digitalization, and advising, mentoring, and coaching.

[2] Compiled by Dr Kari Lilja and Dr Sirpa Sandelin, Satakunta University of Applied Sciences (SAMK)

[3] American Library Association (2022), https://literacy.ala.org/digital-literacy/

The target groups of this course are teachers and trainers of educational institutions and chambers, training and teaching the students studying construction branch, and consultants advising the SMEs in digital construction. Those working as "digimentors" mentoring entrepreneurs in their chance process are welcome to the course too.

2.2 Contents of the course

The course consists of 6 topics, and the second topic, Aspects, will be divided into 4 subtopics. The aim is that each partner takes at least one topic or subtopic (Marked with **bold** in the chapter "Program") to be prepared and presented. The question mark (?) after the name / abbreviation (see chapter "Program") means that this is only suggestion to be discussed.

The links after each topic are examples of potential inspirational material that could help when planning and designing the material and presentation.

During the course, the impacts of digitalization on the construction branch, the fundamentals of the digitalization, the best practices found from the construction industry, the best practices approaching the training of digitalization and the digital training in the construction branch, will be presented. Furthermore, the additional qualifications and training programs will be dealt with, and finally, the pedagogy, coaching, and mentoring will be discussed. The links presented below are examples and hints for material that might be helpful while planning the courses.

The "Train the Trainer" -program includes following topics, which are not necessarily in the same order in the implementation:

Class days

Introduction to digitalization and digital construction

Why digitalization is so topical – and important.

Key concepts and terms – what digitalization really is.

Business and digitalization – why should an entrepreneur consider digitalization.

Example of discussion task: Is digitalization inevitable evil, blessing or both. Are you personally open and ready for digitalization. What are the biggest problematics in your relationships with digitalization. Intro to the discussion can be personalized, for example, in author's case: "*I by myself, even if I have been involved in digitalization since I bought my first programmable calculator in 1978 (I was 17 years old), am continuously worried about the impacts of becoming more and more dependent on technology. There are many ethical and practical issues that have not yet been solved, particularly concerning the question 'What if some groups of people are not capable or willing to learn how to use new systems, how to take advantage of new ideas. How to tackle this?'*"

Issues to be considered in the SME-specific training programme

During the three- or four-days training with learning task between the modules it is not possible to deal with every skill and topic, thus, the trainers are assumed to have experience, skills and knowledge required. During the TtT-training, certain issues and aspects arising from the topics and target groups of the curricula, and from the chosen pedagogic approaches, will be discussed.

Note: The change resistance and change management are always present when discussing the digitalization and should be considered during the training too.

WP4 A1: Digital additional qualifications for the construction and finishing trades,

What are the new skills and qualifications required in the digital era. What impact the new requirements will have on work life and training, and what should be considered when training the people to gain the skills (and qualifications).

WP5 A11: Training program on cooperation through digitalization

The following topics should be discussed: The theoretical background of collaboration and societal participation. How can a company, particularly an enterprise in construction business, benefit from engaging the neighborhood in the project. Is there any cultural properties that would make the participation easier or more difficult. How to motivate enterprises to digital collaboration inside the company, with other companies, and with the public, e.g.

- Why to use collaboration tools
- Research and reports on digital collaboration
- Examples of collaboration tools

Note: The approach should as much as possible be on point of view of construction business / branch.

Example of discussion / group work: What kind of impacts on the design process might the participation of neighborhood have? How would the cultural differences between countries affect this? What about the use of digital tools as a media of participation?

WP5 A12 Coaching program for learning in practice and for the realization of building construction cooperations by means of digital technologies

In this program, a coach should know both coaching and learning in practice and have good knowledge in digital collaboration. However, it should be highlighted, that the sense of term “Digital collaboration” varies a lot depending to the context, and skills required must be defined case by case.

WP5 A21: Digital Training for the Construction and Finishing Trades

In this curriculum, some examples based on the collected best practices on digital training will be presented.

WP5 A22 Coaching program for learning in practice and for using digital technologies and tools

In this program, methodological features of coaching will become highlighted. Coaching and mentoring is important part of TtT-programme and must not be forgotten. Both topics will be dealt with during the TtT-training.

NOTE: Trainings A21 and A22 should be implemented with KAIN method. This should be considered in pedagogic part of the course.

R6 Digital entrepreneurship training.

The concept of digital entrepreneurship should be discussed and clarified. This can be done for example by group work "What do we really mean with digital business and digital entrepreneurship": Country-specific groups will discuss the topic for 10 – 15 min, results will be collected, and then groups are mixed so that people from different countries will discuss the same issues.

Note: The term "Digital entrepreneurship training" can be understood in two ways: Training entrepreneurs to become digital entrepreneurs, or training entrepreneurs by using digital (e-learning) tools. Unless otherwise stated, in this TtT-course the term is understood in first named way.

Presentation, advice, and aspects of best practices of the various digital technologies and digital technologies and the realization of co-operations in SMEs in the construction and finishing sector.

The selected best practices in the construction industry, not necessarily the whole collection, will be presented. It should be highlighted that best practices should not be implemented literally, but applied considering the whole context including country-, company- and branch-specific variables.

Presentation and advice of best practices of SME specific training programs

The selected best training practices designed for the construction industry, not necessarily the whole collection, will be presented. It should be highlighted that best practices should not be implemented literally, but applied considering the whole context including country-, education institute-, company- and branch-specific variables without forgetting the level and needs of students and trainees.

Pedagogical issues

How does the digitalization affect the pedagogy? How to use digital learning tools? How to teach trainees to use digital tools? What kind of methods are available?

Assignment to be done before online day

How would you train / coach / mentor an entrepreneur who is going to implement digital solution in a construction business, and who asks your help. Describe the process and tools you would use and how. Both digital and traditional tools and methods can be used.

Online day

Briefing of the assignment results

In the ideal situation, each participant would have a presentation of his / her results. However, it is probably, that in this case we have so many participants, that we have to collect the results and have only a summary of gained results. The way to realize this briefing should be solved case by case.

Advising, coaching and mentoring processes

The fundamentals of each method and process as well as similarities and differences between methods and processes will be discussed.

Note: Counselling, that is used in some documents, is defined as “the provision of professional assistance and guidance in resolving personal or psychological problems”. Instead of counseling, it is preferred to speak about advising.

Materials

The teaching material includes the digital handbook, and link lists of examples that can inspirate teachers and students. Each trainer has a duty to prepare the final material and to adapt it to national and local regulation and circumstances.

2.3 Facilitations of the course

The course will take three (3) days (Figure 1), two (2) of which will be face-to-face training and one online learning day. Between the classroom training and online training there will be an assignment that trainees should complete before the online day. For the classroom training a room that is big enough for all the participants and trainers, and smaller rooms or other space for group work, will be needed. In addition to rooms, the following equipment is recommended:

- Video projector with the most common plugs for connections with presenters' laptops
- A computer and internet connection for those presenters who do not have a laptop of their own
- An opportunity to wireless connect to internet for all participants is also recommended.
- Paper, pens, post it pads, whiteboard or blackboard in the classroom and flip charts in both the classroom and group-workrooms are necessary too.

If a trainer needs some special equipment or resources, he / she should inform the facilitator in advance about these needs.

Schedule of the course

The classroom training covers the first four topics, Intro and motivation, Aspects, Best practices and best training practices, and online training covers advising and pedagogic. Between classroom training and online training there will be a self-study assignment concerning the ways to motivate entrepreneurs to introduce themselves in digitalization and digital business considering the individual, local regional and country-specific characteristics of entrepreneurs and in entrepreneurship.

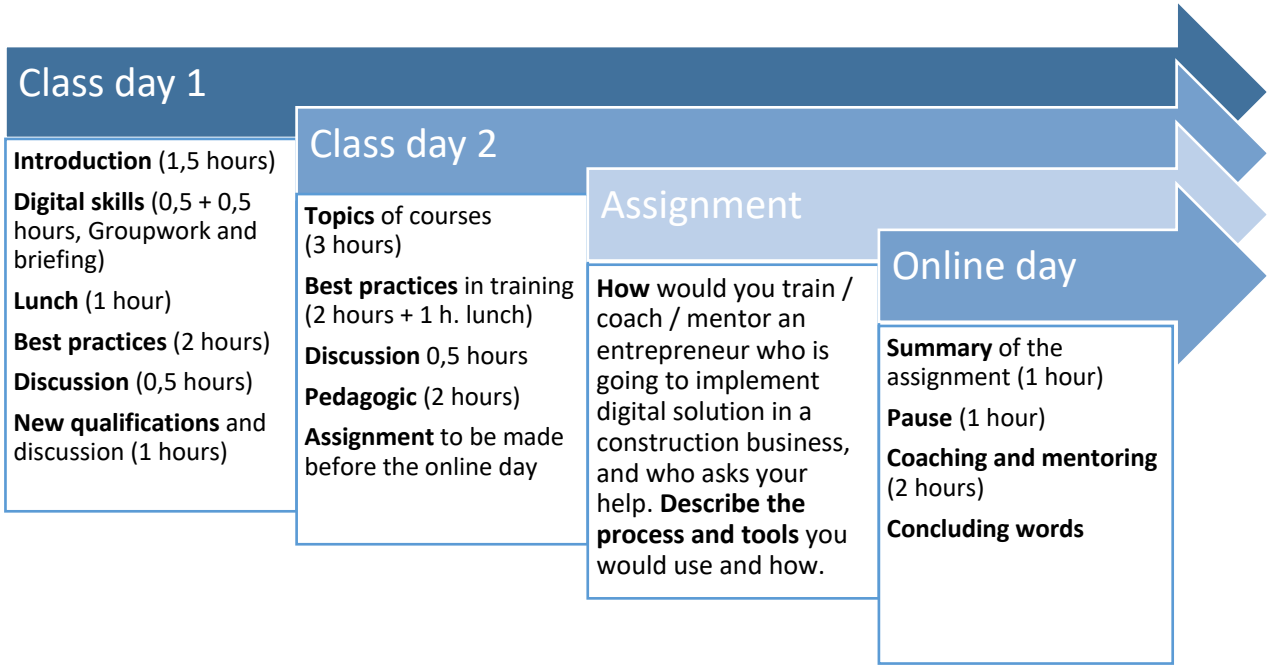

Figure 1: The example of the schedule

Methods

Varying methods will be used, e.g., lectures and presentations, group work, discussions, practices, self-studies, data searching etc. The aim is to give the trainees experience of as many methods as possible.

Handbook

All the material created will be collected as a digital handbook for trainers, thus, be aware of the immaterial property rights while creating the material for your own part.

Contents

During the course, the impacts of digitalization on the construction branch, the fundamentals of the digitalization, the best practices found from the construction industry as well as the best practices approaching both the training of digitalization and the digital training in the construction branch will be presented, the additional qualifications and training programs will be dealt with, and finally, the advising and pedagogic will be discussed. The whole content of the course will be presented in Appendix A. The links presented in the appendices A and B are hints for material that might be helpful while planning the courses. Note that Appendices A and B are direct giving and can be applied according to the participants and facilitations of each course.

Materials

The teaching material includes the digital handbook, and link lists of examples that can inspire teachers and students. Each trainer has a duty to prepare the final material and to adapt it to national and local regulation and circumstances.

2.4 APPENDIX A, Content of the curriculum

Day one

Topic and scheduled time	Issues and Notes	Further materials recommended for trainers – for inspiration
Introduction: Why is the digitalization important Time: 1,5 hours, SAMK	Motivation for the new topics - Digitalization has its place in EU's agenda, - Common claims concerning the digitalization, - What actually is meant with "digitalization", the terms and concepts, - Digitalization and business, - Discussion: is the digitalization inevitable evil, blessing or both.	• A Europe fit for the digital age: • Empowering people with a new generation of technologies • Shaping Europe's digital future • Digital transformation: importance, benefits and EU policy • Digital Transformation in the EU 2035: A Glimpse into the Future • Funding for Digital in the 2021-2027 Multiannual Financial Framework
New Qualifications. Cases and examples of best practices Time: Introduction (Emerging, changing, and outgoing skills) 0:30 hours Best practices: Each partner briefly presents 1 best practice that they have found, and that is included into Best Practices – document. Maximum 15 minutes per partner, 8 partners 2:00 Discussion: How should these practices be presented and applied 0:30	Continuous change challenges Emerging skills - What is typical for new skills, - Examples of incoming skills	• OECD: Jobs in the digital era • Forbes: Critical Career Skills • HBR: It's Time to Rethink Job • McKinsey: Rethinking Work • Towards digitizing the construction Industry: state of the art of Construction 4.0
	Changing skills - Why certain skills are remaining but changing, - Examples of changes	• Futures of robotics. Human work in digital transformation • Construction 4.0 – Digital Transformation of One of the Oldest Industries • Industry 4.0 deployment in the construction industry: a

New qualifications, PP1, 0:30 Discussion 0:30		bibliometric literature review and UK-based case study
	Outgoing skills - Are there any skills that are outgoing, if – what and why Note – these three issues above can be dealt as group work and / or with three flip charts, e.g.	• PWC: Will robots really • steal our jobs? • HBR: Why Robots Won't Steal Your Job • Guardian: Robots – stealing our jobs or solving labour shortages? • Are Robots Stealing Our Jobs?
	Cases and examples of best practices describing the skills needed. - each participant presents one best practice	• Collection of best practices
	New qualifications - PP 1 presents new qualifications and how to apply these.	• Qualification documents
	Discussion: How should the best practices be understood and applied? - As example of what can be done, or as instructions of what should be done?	

Day two

Topic and scheduled time	**Issues and Notes**	**Further materials recommended for trainers – for inspiration**
Digital collaboration tools SAMK, 1:00	What is digital collaboration. What is digital participation How to motivate SMEs to use collaborative tools	• How Entrepreneurs Are Capitalising on Digital Transformation in the Age of the 'New Normal' • Digital transformation and entrepreneurship process in SMEs

		• The effects of personality traits on digital transformation • Conceptualising digital transformation in SMEs: an ecosystemic perspective • Business innovation and critical success factors in the era of digital transformation and turbulent times
	Change and organization ➢ Change resistance ➢ Change management ➢ Resilience	• Organizational change management: what it is & why it's important • How to Deal With Resistance to Change • Three Tips For Managing Resistance To Change • Resistance: a constructive tool for change management • Resistance to organizational change • What is change management? • 5 critical steps in the change management process • Making sense of change management • Ready or Not: Managers' and Employees' Different Perceptions of Digital Readiness
	What should be remembered	•
	Examples of tools	• Teams • Padlet • Zoom • Miro • Moodle • AnswerGarden

Digital entrepreneurship training HS21, 1:00	Concept of Digital entrepreneurship – group discussion "What do we really mean with digital business and digital entrepreneurship".	•
		•
Digital Training for the Construction and Finishing Trades HS21, 1:00	What should be considered	•
Best Training Practices 2 hours + 0:30 hours	Best practices – each participant presents one of the practices they had found.	• Best Practices collection
	Discussion – how to apply them.	•
Pedagogy in the digital era 2 hours	Digital pedagogy	• What is Digital pedagogy • Digital pedagogic • Pedagogy In The Era Of Industrial Revolution 4.0 • The Emerging Concept of the Digital Pedagogy
	What changes	• Finnish Digivisio-programme • A New Pedagogy Is Emerging • How has pedagogy changed in a digital age? • Digital pedagogy practices in education • Rethinking pedagogic • Critical Digital Pedagogy: An Opportunity to Understand Learning and Ourselves • Conceptualizing dimensions and a model for digital pedagogy

	About the methodology	• Digital pedagogy toolkit • Online Teaching Methods And Pedagogy • Digital Education Is Transforming Teaching Methods • Teaching Strategies For The Digital Classroom • Teaching in a Digital Age
	What should be considered	• The experiences, challenges, and acceptance of e-learning • 'My Online Learning Experience...' see also parts One and Two • Exploring the Education Experience in Online Learning • Experiences gained from transitioning to online classes • Strengths and weaknesses of online learning • Improving student teachers' digital pedagogy through meaningful learning activities • The impact of digital pedagogy training on in-service teachers' attitudes towards digital technologies • Flipped learning, pedagogy and digital technology: Establishing consistent practice to optimise lesson time • Digital storytelling and blockchain as

		pedagogy and technology to support the develop-ment of an inclusive smart learning ecosystem

Online day

Topic and scheduled time	**Issues and Notes**	**Further materials recommended for trainers – for inspiration**
Briefing of the assignment 2-3 hours, depends on the number of participants and whether they present a work of their own or will the works be summarized.	Each participant has n minute presentation on his / her solution, or the solutions have been sent to lecturer who has made a summary.	•
Discussion and pause 1 hour		
Mentoring and coaching 2 hours	Differences of concepts - Although mentoring and coaching are commonly used as synonyms, the activities and processes in question are not similar	• What's happening in coaching and mentoring? And what is the difference between them? • According to Wikipedia, • Mentoring Coaching Training • (see also the sources mentioned in each chapter) • Mentoring VS Coaching • Colleagues helping colleagues • Supervision, mentoring, and coaching • Mentoring and coaching for professionals
	What mentoring is - voluntary - supporting - person-oriented	• What is mentoring? • Supporting professional growth

	- situation-specific - experience-based	• Supervision, mentoring and coaching • Mentoring – what is it? • The Why, How, and What Of Mentoring
	What coaching is - professional (mostly) - evidence-based (should be) - task-oriented - goal-specific	• Coaching • What is 'coaching'? An exploration of conflicting paradigms. • Coaching & Mentoring: The role of experience and sector knowledge • Do we really understand coaching? • What is Evidence-Based Executive, Workplace and Life Coaching? • Expanding the coaching: Team and group coaching • The similarities and differences between coaching and therapy
	When should we talk about training or advising rather than coaching or mentoring	• Coaching supervision • Coaching for results • Mentoring—A complex relationship • A Typology to Integrate Supervision, Mentorship, Consultation and Coaching
	Role game: Two pairs, mentor – mentee and coach – coachee present a small real life case. Rest of the group tries to guess which one is mentoring and which one is coaching.	
Concluding words		

2.5 APPENDIX B: Further material

Introduction to digitalization and digital construction

Presentation, advising, coaching, and mentoring aspects of the content-related of the SME-specific training program:

a. **R3 Digital additional qualifications for the construction and finishing trades,**
   i. https://digital-competence.eu/
   ii. https://joint-research-centre.ec.europa.eu/digcomp/digital-competence-framework_en
   iii. https://www.ocnni.org.uk/umbraco/Surface/Qualification/GetQualificationGuide?qubaId=127531
   iv. https://www.ocnni.org.uk/umbraco/Surface/Qualification/GetQualificationGuide?qubaId=127431
   v. https://www.ocnni.org.uk/umbraco/Surface/Qualification/GetQualificationGuide?qubaId=127489
   vi. https://www.ocnni.org.uk/umbraco/Surface/Qualification/GetQualificationGuide?qubaId=127490
   vii. https://www.ocnni.org.uk/umbraco/Surface/Qualification/GetQualificationGuide?qubaId=127458
   viii.
b. **R4 Training program on cooperation through digitalization,**
   Examples of collaboration tools
   i. https://snacknation.com/blog/online-collaboration-tools/
   ii. https://resources.workable.com/tutorial/collaboration-tools
   iii. https://www.techradar.com/best/best-online-collaboration-tools
   iv. https://hive.com/blog/collaboration-tools-for-teams/
   v. https://teambuilding.com/blog/online-collaboration-tools
   vi. https://www.teachthought.com/technology/best-digital-collaboration/
   vii.

   Why to use collaboration tools
   viii. https://www.ideagen.com/thought-leadership/blog/5-benefits-of-online-collaboration-tools
   ix. https://www.highfidelity.com/blog/benefits-of-digital-collaboration
   x. https://www.techtarget.com/whatis/feature/4-reasons-why-businesses-need-to-use-collaboration-tools
   xi. https://blog.bit.ai/how-digital-collaboration-workplace-improves-workflows/
   xii. https://kissflow.com/digital-workplace/collaboration/guide-to-digital-collaboration/
   xiii. https://www.digital.nsw.gov.au/delivery/digital-service-toolkit/resources/digital-collaboration-tools

   Research and reports on digital collaboration

xiv. https://www2.deloitte.com/content/dam/Deloitte/se/Documents/technology-media-telecommunications/deloitte-digital-collaboration.pdf
xv. https://ec.europa.eu/regional_policy/sources/informing/events/1806-virtual/6_digital_communication_collaboration_tools.pdf
xvi. https://www.researchgate.net/publication/287157555_Tools_for_Online_Collaboration_Do_they_contribute_to_Improve_Teamwork
xvii. https://www.zdnet.com/article/research-majority-of-enterprises-rely-on-digital-collaboration-tools/
xviii. https://www.mckinsey.com/capabilities/operations/our-insights/digital-collaboration-for-a-connected-manufacturing-workforce
xix. https://www.tandfonline.com/doi/abs/10.1080/08956308.2017.1348125 (restricted availability)
xx. https://www.igi-global.com/article/internet-based-collaboration-tools/143888 (restricted availability)
xxi. https://link.springer.com/book/10.1007/978-3-319-94487-6 (restricted availability)
xxii. https://www.researchgate.net/profile/Monika-Davidekova/publication/312159271_Collaboration_Tools_for_Virtual_Teams_in_Terms_of_the_SECI_Model/links/5b966073a6fdccfd5439d29f/Collaboration-Tools-for-Virtual-Teams-in-Terms-of-the-SECI-Model.pdf
xxiii. https://hal.archives-ouvertes.fr/hal-03782795/document
xxiv. https://onlinelibrary.wiley.com/doi/abs/10.1111/jpim.12547 (restricted availability)
xxv. https://www.emerald.com/insight/content/doi/10.1108/LODJ-05-2019-0224/full/html

On point of view of construction

xxvi. Particularly in construction industry
xxvii. http://real.mtak.hu/10662/1/1216869.pdf
xxviii. https://thecela.me/wp-content/uploads/9-1PAPER_COLLABORATION-TOOLS-TO-SUPPORT-INFORMED-PUBLIC-ENGAGEMENT.pdf
xxix. https://www.sciencedirect.com/science/article/abs/pii/S016636151530021X
xxx. https://uia.brage.unit.no/uia-xmlui/bitstream/handle/11250/194080/Merschbrock_PhD.pdf?sequence=1
xxxi. Opportunities and challenges in construction industry
xxxii. https://www.sciencedirect.com/science/article/abs/pii/S016636151530021X
xxxiii. Using building information model to…
xxxiv. https://www.sciencedirect.com/science/article/abs/pii/S092658051400154X

c. R5 Digital Training for the Construction and Finishing Trades, (PP2 Hochschule21 and PP3 HWK Schwerin?)

Research and reports

i. Digital coll. tools for teaching and learning
ii. Use of... for learning and teaching in universities
iii. https://www.learntechlib.org/p/217607/article_217607.pdf
iv. https://www.mdpi.com/2076-3417/10/13/4678/pdf
v. https://aicbimed.com/files/bimas2016proceedings.com-pressed-2.pdf#page=61
vi. https://www.emerald.com/insight/content/doi/10.1108/CI-07-2021-0136/full/pdf
vii. https://www.tandfonline.com/doi/abs/10.1080/15578771.2011.647247?journalCode=uice20
viii. VR and mixed reality technologies in construction education
ix. Enhancing Construction Education Using an Online Multimedia Collection
x. https://link.springer.com/article/10.1186/s41239-022-00343-9

d. R6 Digital entrepreneurship training. (PP5 LCCI and PP6 CCS Katowice?)

Examples

i. https://project-deep.eu/ficha_cs.php?id_ficha=76
ii. https://www.europeanbusinessreview.com/5-digital-skills-training-courses-that-will-prepare-anyone-for-digitalization-online-success/
iii. https://buildingmarkets.org/bringing-digital-training-courses-to-entrepreneurs-in-local-languages-with-moodle/
iv. https://eblues.eu/digital-experience/
v. https://sdgs.un.org/partnerships/hetaved-e-skills-digital-entrepreneurship-education
vi. https://www.thehindubusinessline.com/opinion/decentralise-digital-training-for-micro-firms/article65270539.ece
vii. https://www.lets-digital.eu/
viii. https://savestartups.erasmus.site/platform/
ix. https://www.project-ibm.com/wp-content/uploads/2021/12/File-2a_IBM-MORE-IO2-Digital-Training-Platform_DE_EN_ES_FR_NO.pdf
x. https://www.siliconrepublic.com/business/enterprise-nation-go-and-grow-online-smes-ireland
xi. https://www.griffith.edu.au/engage/professional-learning/case-studies/women-in-digital
xii.

Research and reports

xiii. https://www.emerald.com/insight/content/doi/10.1108/JSBED-01-2017-0014/full/html

xiv. https://www.mdpi.com/2199-8531/7/1/63/pdf
xv. Theory of Digital Entrepreneurship Mindset
xvi. Digital course to boost Entrepreneurship competencies
xvii. https://vc.bridgew.edu/cgi/viewcontent.cgi?article=2203&context=jiws
xviii. Productive interactions in digital training partnerships
xix. The entrepreneurial university in the digital era
xx. SMS Training and Micro-Entrepreneurship Performance
xxi. European augmented reality training needs
xxii. https://education.ec.europa.eu/fi/news/guidelines-for-teachers-tackling-disinformation-and-promoting-digital-literacy

Links concerning the digital literacy

i. https://www.rasmussen.edu/student-experience/college-life/what-is-digital-literacy/

2.6 APPENDIX C: Notes for the teachers

The material enclosed is an example showing how the topics of this course could be presented. Each teacher should adjust this to the circumstances of his/her own country, considering the local regulation the level and skills of the trainers participating to the course, and the level, state and possible study programme of their students / trainees / coaches / mentees; are they studying construction, finishing, plumber, are they entrepreneurs or working in the enterprise etc. Each programme may require different weightings and highlights, and it is on the responsibility of each teacher to consider these special needs.

Target group

The target groups of this Train the Trainer -course are teachers and trainers of educational institutions and chambers, training and teaching the students studying construction branch, and consultants advising the SMEs in digital construction. Those working as "digimentors" mentoring entrepreneurs in their chance process are welcome to the course too.

The target group of the actual programme is young people with strong learning skills, e.g., students having secondary-school graduation, and students in VET level education institutes studying for qualifications in construction and finishing fields. The course suits well to the employees and entrepreneurs working in construction and finishing branches, as well as to others interested in digital construction, too.

Work required

In the Train the Trainer course, the average work required by each trainer is measured in working hours to make it easier for teachers to plan the practical application. If the education institute requires ECTS credit units (abbreviated in this presentation as CU) to be used, the hours can be changed to CUs. One credit unit equals 27 hours workload. The course consists of two class days, self-learning phase including assignment, and one online day totalling approximately 27 hours, responding one (1) ECTS credit unit.

Teaching methods

Teachers are encouraged to use varying methods containing e.g.:

- Lectures,
- Visiting lecturers,
- Group works
- Discussions
- On line studies,
- Individual studies and
- Assignments.

Cooperation with the experienced trainers, coaches and mentors is highly recommended.

Contents of the curriculum

The variation in regulations and circumstances and qualification requirements are quite different in the BSR-countries, thus the material was written only as a form of framework

inside which the local actors should modify the contents of topics according to their own regulations and local requirements, without forgetting the needs of different study programmes. By using innovative, problem-based, and experiential educational approaches, teacher will be able to help trainers to find their own styles to support their students, coaches and mentees to acquire, create, implement, and use high-quality digital solutions at construction sites.

The overall objectives of the curriculum are:

- The trainer deepens his/her knowledge about underlying basic information concerning digitalization and digital solutions in the construction and finishing business.
- The trainer understands the impacts of regulatory framework and is able to explain essential contents of legislation on digitalization.
- The trainer is aware of context-specific nature of certain terms and can explain specific terms that relate to digitalization in common, and digitalization in construction business.
- The trainer understands the need to launch digitalization into construction branch, is aware of the benefits of digitalization and knows how it is possible to develop construction work with the help of digital tools.
- The trainer deepens his/her understanding about digitalization, digital communication, common digital tools and their usability in the context of construction business.

The curriculum is divided into modules as follows:

- Module 1: Class days, including introduction, presentation of best practices, main topics of curriculums included in program, and pedagogy.
- Module 2: Self-learning phase during which the assignment should be done.
- Module 3: On-line day, containing the briefing of the assignment, and mentoring, coaching and advising.

About the links

The links to materials have been tested during the period February – March 2023. However, the links may be changed and deleted very fast; thus, it is recommended that links which will be given to students will be checked in the beginning of each course. Some of the links may be behind the paywall and require agreement between the educational institute and publisher to be available. In such cases, contact your librarians. Some of the links refer to documents that have been written in commercial or political purposes. The authors of this document do not take a stand for or against any product, and the research results and opinions found in the links are also the responsibility of the original authors of the documents in question.

3. Implementation Report[4]

3.1 Introduction

The term "Digital Literacy" initially focused on digital skills and stand-alone computers, the rise of the internet, rapidly grown use of mobile devices, and increasing number of social media applications have transferred the focus to networked mobile environment. In business, the range of digital platforms and growing demand of digital services and products challenges both the digital and business literacy of entrepreneurs and leaders. To understand how the digitalized business environment works and to recognize the opportunities and risks of the digitalization is an essential foundation for innovations, and for development of new digital business.

To be able to train the entrepreneurs and personnel of the small and medium size construction and finishing companies requires that trainer is well inside the digital world, knows the terminology and understands thoroughly the opportunities and risks of both the new technology and new ways to do business by using digital platforms. While training and advising the students and entrepreneurs with no or only little experience and skills in digitalization and working with digital tools, the biggest challenge is to motivate them to consider new ways to work and cooperate, and to accept and adopt new tools and ideas. At the same time, there may also be those who have good skills and knowledge in working in the digitalized world. With them, the major challenge is to help them to find the best and most beneficial ways to utilize modern technology and ways to do business.

In this curriculum, major attention was paid to training those with deficient digital skills. Big variety of pedagogic methods were presented without forgetting the mentoring and coaching processes, that may be suitable methods when normal training is for reason or another out of the question. However, in different countries, the digitalization has progressed at different speeds, and there are differences between individuals too, thus, it must also be highlighted, that it is the responsibility of each trainer, coach, consultant, and mentor to evaluate the starting level of each trainee or mentee, and to fit the course so that each participant benefits it.

The course

The Train the Trainer (TtT) training that has been developed as a part of project "DIG-CON", in its Work Package 3, "*Strengthening of training and counselling capacities*", aims to give teachers, trainers, mentors and coaches capability to lead students towards the digital construction business. TtT test course consisted of three parts: Two days classroom training in Budapest 13th -14th June 2023, during which the central themes were discussed, the project phase, during which each participating partner conducted an advising, training, mentoring or coaching project or case, and online day 4th September 2023, when the assignments were reported and mentoring and coaching was discussed.

[4] Compiled by Dr Kari Lilja and Dr Sirpa Sandelin, Satakunta University of Applied Sciences (SAMK)

Aim and target groups of the course

The aim of the developed course is to introduce teachers, trainers and consultants to digitalization, digital construction, and new possibilities to create new innovative business in the construction branch. Attention will be paid to motivation, fundamental terminology, digital business and collaboration, pedagogic issues, particularly to those topical in the era of digitalization, and advising, mentoring, and coaching.

The target groups are teachers and trainers of educational institutions and chambers, training and teaching the students studying construction branch, and consultants advising the SMEs in digital construction. Those working as "digimentors" mentoring entrepreneurs in their chance process are welcome to the course too.

This training is further professional training directed to those who already have the examination required to be able to train. TtT-course does not give any specific vocational qualification, but widens the competences given by earlier examination. Depending to the participants' original qualification, TtT-training could be classified on EQF-Levels 5-7, but as a short course, no classification should be done.

Admission and organisation of the training

In the test course, two representatives of each partner were invited to participate the course. They were teachers, consultants and other persons who in common are training, advising mentoring and coaching students, trainees, employees, and entrepreneurs. The classroom days were participated by 13 participants, and in addition to them there were visitors from two Hungarian entrepreneurial organisations, Hungarian Construction Trade Union, and Hungarian Ministry of Construction and Transport. The online day was participated by nine participants, and seven partners presented the case assignment report. The course consisted of eight lessons and the presentations of cases and best practices, and approximately average of 40 hours self-study learning depending to the realised case project. The participants had during the course, and will also have after the course, access to e-learning and support site run on the Padlet platform.

The Train the Trainer course was designed and realised by Principal Lecturer Dr Sirpa Sandelin and Senior Researcher Dr Kari Lilja from Satakunta University of Applied Sciences, Finland. Dr Sandelin has long experience as teacher and nearly 40 years of experience in international project operations and more than 14 years of experience in corporate mentoring. Currently, she is involved in projects dealing with dual vocational training, entrepreneurship, circular economy, innovation management and digitalization in SMEs. Dr Kari Lilja has more than 40 year experience in business, most of this as entrepreneur, auditor, CFO and CIO in construction and machinery industry, and property management. The other lecturers were Project Manager MSc Anna Maria Czarny and Project Manager MSc Christian Wildt from Hansa Parlement, and Scientific Assistant MSc Tamas Ferenczi and Professor Dr Andreas Weise from Hochschule 21, Hamburg, Germany

Participants profile and organisation of the training

Participants were employees of entrepreneurial and training organizations.

Country	Gender
Finland 2	Male 9

Germany 5	Female 4
Latvia 3	
Poland 1	
Hungary 2	

Execution of the Training

The training was carried out according to the approved curriculum of Train the Trainer designed to be tested. The training does not have any examination and it does not give any particular qualification. The certificate for participating the training was given after the classroom part in Budapest.

To summarize the experiences, the training was considered very successful, but some of those participating to the online part missed the interactivity that they had found during the classroom days. The topics were found to be updated and topical, and the presentations interesting, but the time reserved to go through the issues could have been divided in other way. The topical issues like AI (Artificial Intelligence) could have been weighted both in lessons and in case examples.

Main Findings and Conclusions

The test was successful, and curricula tested was found to be a good base for responsive courses in the future. Topics were found to be topical and interesting, and the training was felt to be useful. Also the combination of classroom days and online day worked well although there was some criticism concerning the interactivity during the online day. In classroom teaching, pauses enable the informal communication and interactivity between participants. Detailed results of the evaluation will be presented in the evaluation report.

The strength of the training was concentrating to the pedagogical issues. Participants who were professionals in their own branches were given an introduction to modern pedagogic in the era of digitalization. In the future, it could be good to concentrate even more on this part, giving practical examples of new learning tools.

The curriculum is free for use to be applied and localized by any partner who has a need to train the trainers.

Implementation reports of specific development project within the company

PP1 Hanse-Parlament

General Scenario

I am a business consultant for the Hamburg Chamber of Crafts and advise craft businesses on all aspects of digitization

The consultation is free of charge for the member companies

The financing of the consultation is carried out at

a) 50 % from national subsidies;

b) 25 % from subsidies from the Federal State of Hamburg

c) 25 % from the own funds of the Hamburg Chamber of Crafts

Initial assessment and definition of objectives

A first detailed consultation was held only with the business owner, in which the following were discussed:

- What experience does the company have in digitalization?

  esult: So far, no applications in the company. We work primarily with Word and Excel.
- What exactly should be digitized as the first step?

  Result: Up to now, working hours have been recorded by hand on timesheets only for construction sites and for the material used by hand on material lists for construction sites. This data is manually recorded, evaluated and converted into invoices via Word and Excel. The delivery of the material to the construction sites is carried out by communication with the journeymen by telephone. This entire process is to be digitalized.
- Agreement: The consultant creates an initial rough concept, which is discussed with all employees.

The rough concept was created by the consultant and discussed in detail with all employees
Result: The employees welcomed the project. They felt it was urgently needed and provided valuable suggestions. The following challenges arose:

1. The older journeyman (53 years old) recognizes the necessity of digitalization, but does not dare to deal with it himself and does not want to complete any further training.

2. The two administrative employees are worried that the digital collection and processing of data will be associated with great simplifications and reductions in work, so that one worker could become superfluous and unemployed.

3. The software used would have to be geared to the specific conditions of a roofing company.

4. The introduction of digital processes requires further training of the staff, but in view of existing work overloads, there is limited/no time for the implementation,

It was assured that no one would be forced to do anything and no employee would be dismissed.

It was agreed that the consultant:

-creates a detailed concept for the realization of the project and coordinated it with the business owner

-conducts market and industry research, reviews existing digital solutions, and makes suggestions on software, etc.

- develops an activity plan for the realization

- creates a training plan

Choosing the right technology

The consultant conducted extensive market and industry research and reviewed existing technologies.
Result: All existing standard solutions are ruled out, as these

(a) are primarily aimed at large enterprises.

b) do not meet the specific requirements of a roofing company.

The consultant found a solution that a roofing company from Saxony developed together with the TU Dresden 5 years prior (and implemented it successfully)

Since this solution was funded by the Federal Ministry of Education and Research, it was freely accessible and could be purchased at low cost.

The Hamburg-based roofing company thus received a tailor-made, inexpensive technology and was also able to benefit from the experience of its Dresden colleagues.

Activities and Schedule

Initially, two journeymen are trained, who then apply the digital process.

Within 8 weeks, the 4 other journeymen and the three apprentices will be trained in two further training courses and apply the digital process.

For the older journeyman, the entries are first made by a younger colleague. He gains experience with it and can master the technology on his own after 6 months at the latest with learning by doing.

After 6 months at the latest, when the rationalizations and time savings in the administration are achieved, one of the two administrative employees will initially take on the following tasks to the extent of a half and later full position and will be trained separately for this purpose:
a) Delivery of material to the construction sites that is requested electronically.

b) Digital material ordering and management.

c) Follow-up support for customers and intensification of customer contact maintenance and the associated ongoing generation and realization of customer innovations with the help of digital technologies.

Optimizations, communication and feedback

- As part of the implementations, process optimizations were carried out and the desired results were achieved.
- The consultant maintained close contact with the company and intensive online and personal communication with the owner and employees.
- Team meetings were held regularly, feedback was recorded and implemented.
- A continuous optimization process was achieved with a very successful realization of the digital project in the Hamburg-based roofing company.
- Sales, productivity and profit increased significantly. Employees receive a share of the profits. Two new apprentices have been hired, and an additional apprentice is currently being sought.
- The company is now planning to work with the Technical University of Hamburg to use robotic technologies for roof coatings.

PP 2 Hochschule 21 Buxtehude

What?

I will be asked to train and coach a complex and huge construction site in Hamburg to achieve

Better time efficiency

Optimized defect management

Fluent cooperation between stakeholders on the construction side

Why?

To save time and money and reduce complexity and avoid errors on the construction site

When?

Implementing solution as soon as possible in a short time of period

Coaching and Mentoring during the whole construction project

Have a case

A construction site needs optimized working processes because of several reasons:

Lack of professionally qualified workers

Simplifying working processes

Saving time and resources

Effective and transparent defect management is needed

The complexity of the project:

Upgrade of an old (2nd World War) Building

Construction site itself starts at a height if 40 Meters above ground

5 levels that are really confusing situated

A tool is needed that offers a good solution for keeping overview about

All different corners and constructional situation

Defects

State of construction process

Building diary

the current status of the construction site on demand

Where is the beef?

Construction Documentation

Former construction diaries created using Word and Excel templates.

The construction diaries neither sortable nor traceable

documentation of the construction processes is inadequate and prone to errors.

Documentation is only possible to be made off the construction site

Construction Management

Knowledge documented on the construction site get lost on the way to the office

Cosnstruction management is time consuming and prone to errors

Paper based Plans are not always updated and available

Construction Controlling

Locating defects and clearing responsibility is confusing and time consuming

Find a solution

Several solutions will be researched and compared with each other

An exchange between all stakeholders takes place

General Contractor, architectural and engineering offices, construction managers, and craftsmen discuss several solutions

As a solution all stakeholders agree on the Use of a Construction and Project Management Optimization Software.

This software enables a fluent non-stop communication between all participants on the construction site, and responsibilities will be cleared

Thanks to the intuitive user interface, only a short training period is required for the software.

All stakeholders will be equipped by necessary hardware and will be trained how to adapt optimally the digital tool

Coaching and Mentoring all workers will be organized

Launch and implant a new skill, practice, or solution2

How to motivate an entrepreneur and enterprise to adapt and learn new skill?

- Several case studies will be presented
- Advantages will be presented
- Cost and time savings will be calculated

How to root it down to the grassroot level?

- The digital tool will be implemented by the KAIN (Knowledge Acquisition according to Individual Needs) for all participants
- The training begins with a 2-day-long educational block
- Then 12 weeks learning on the job: use of digital tool on the construction site and in the offices supported by intensive coaching and mentoring on site for all architects, engineers and craftmen.
- After that a 1-day-long advanced educational block will be offered
- Then 12 weeks learning on the job: application of digital tool supported by remote coaching according to individual needs
- After that a 1-day-long reporting day: come together with all participants and stakeholders, sharing feedbacks and exchanging

PP3 Handwerkskammer Schwerin

I. How would you train / coach / mentor

1. After initial contact, discussion with middle management (foreman, foreman, division manager, etc.) about the current focal points, tasks in the daily workflow Goal: to get a feel for the company

2. Comprehensive interview with the entrepreneur about the priorities and wishes he has. ask about his long-term goals and his ideas about what should be changed, improved and more digital.

3. Research – what solutions already exist / what is customary on the market / what are the competitors working with

4. Further discussion together with the entrepreneur and middle management to present initial ideas for the introduction of a digital problem solution / tool

5. Bring together the vendor of the solution and company management, for an intensive presentation and demonstration of the problem solution / tool

6. Project planning (activities, process monitoring, procurement, timeline, feedback)

7. Planning and implementation of user training, adaptations to the company (data transfer, definition of user hierarchies,

8. From point 5 to follow-up, monitoring and possible corrections of all activities and processes

9. Feedback and follow-up in order to have a permanent, continuous solution adapted to the company.

Tools:
1. Various MS Office applications (Outlook, MS-project

2. Cloud applications

3. Internet

II. Have a case

Starting situation

A traditionally run family business that has specialized in the conversion, expansion and new
construction, as well as in the renovation of single-family and multi-family houses since 1990. In addition to more complex projects, they also offer their services in all individual trades of building construction. Regardless of the scope of the project, it is always of utmost
importance to meet the client's requirements through high-quality consulting, planning and
execution. For this purpose, a team of engineers and skilled workers is available to the owner and managing director, who is himself a master mason and restorer.
Main medium-term task

Accompanied company transition to the next generation. Junior, himself a master craftsman
and business economist, has been working for the company for years. The generational change is intended to increase the degree of digitization in the company
and to give the senior the opportunity to support the process, even if he is no longer in the
company 24/7.

Role of our consultant

Determination of the degree of digitization and the processes that can or should still be digitized. Finding solutions and support in the introduction and implementation of new instruments.
Approach

After interviews with the senior, the junior and both together, our consultant was able to get
a good picture of the situation in the company and propose a possible solution relatively quickly.
Since this was mainly about the transparency of daily processes and the daily work results,
the craftsman software from artesa could be recommended here. Since many employees
are already equipped with a smartphone or tablet, the acquisition costs are also manageable.
Result
Our consultants continue to accompany the company to ensure a good and speedy introduction of the software.

III. Where is the beef?

The most important thing is to consciously LISTEN in order to get your own picture of the problem. Conduct the conversation in such a way that more information comes to light and
we as consultants get a realistic picture of the problem or upcoming tasks. Now it is important to round off the picture with open questions and observations and interviews in
the company.

After evaluating all the data and information, the solution approach should be presented to
the entrepreneur. It is important to observe exactly what his reactions and gestures are in
order to dispel any concerns and take away fears.

It is essential to give the entrepreneur the feeling that he is not alone, that the problems have to be eliminated and that the implementation of the solution is also realistic for his company.

IV. Find a solution

Solution-oriented work is the most important thing in order to find the right or most accurate
solution to a problem.

First, however, the problem must be identified as the right problem.

It is important to go through the company with open eyes and open to everything:
1. What exactly burdens or hinders the work or a process?

2. Who is involved?

3. What happens exactly?

4. What are the consequences of the situation for the company?

5. How did it come about?

6. What is to be achieved?

7. Who could help or support you? From within the company or from outside. These can be people, tools, or software. To achieve this?

Once the right problem has been identified and the circumstances are known, it is time to
find a solution.

1. Now it's time to collect solutions

2. Discussion and evaluation of the individual solutions

3. Decision on the solution together with all parties involved. This is important so that the decision of the entrepreneur is also supported by all employees. This is the only way to ensure positive implementation.

Now that the solution has been established, it is time to implement it.

1. Creation of a plan and the corresponding timeline. We can also call it a project.

2. Monitoring of the project process

3. Feedback to company management. joint control and discussion of the milestone

4. Accompaniment of the achievement of objectives

5. After some implementation, the success is checked.

PP4 Satakunta University

The generation gap in digitalization: The digital era may be frightening but getting old is scary...

The generation gap in digitalization: How to save the continuum of the business

- **How did the old man see the situation**
  - No one want to have offers, plans, and documents in other form than paper
  - Computers are expensive, difficult to use and needs service all the time.
  - Childrens are not willing to learn profession, or do work, they just play with computers...
- **How did younger generation see the situation**
  - Nothing must be changed
  - The Oldie does not trust us
  - New technology is a must to be able to run competitive and effective business.
- **How did we see the situation**
  - Elderly entrepreneur seems to reason why he has to shut down the business instead of transferring it to his heirs

- The main problem seemed to be, that the entrepreneur did not value new ways to do things. Why?

The first steps were

- Mentoring contract
- Terms of collaboration
- NDA
- Date of the first session.

Private interviews and discussions with owner and the younger generation:

- What do you think is the biggest problem in the company?
- What should be changed, why, how?
- What shouldn't be changed, why?
- What benefits the digital tools might give? How?

Free speech discussion approaching company, products, services, and the future of company and person himself.

During the analysis, the answers gained and the discussions had were evaluated

- Were there issues that everyone could agree
  - Yes: everyone wished that business could continue
- Were there issues that occurred more than the others
  - Yes: the mistrust of owner who argued that the next generation only spent the money. On the other hand, the kids (aged 45 and 47) felt that "Oldie" was against every attempt to rationalize and modernize the daily functions.
- What kind of topics were conflicting
  - Adopting of new technology
- Had the conflicting topics something to do with the digital tools and use of these?
  - Yes, but... "Oldie" was very worry about what will happen after him

Thus: Is the beef the digitalization or something else?

How to continue?

- Private free speech discussions with the Oldie, letting him to guide the conversation and giving him new ideas
- Cross-generational meetings where the younger generation presents their ideas, what they had done and how it has affected to the result and sales of the business.
  - To avoid suspecting, diminishing and denying comments, presentations should be audited by company's auditor, who should also be present in the meetings.

- Common projects, in which the Oldie tells, what should be done, and the young generation demonstrates how it could be done in their way.

The results

- Little by little, during the common projects, the Oldie agreed, that working with computers is not just playing, but hard work, even if much more efficient than doing the same routines manually.
- The younger generation taught how to follow the project without having to leave the office, and learnt on their side, what kind of incidents they should pay more attention, and why.
- Finally, the computer was brought to the Oldies office too, and the investments to new ERP and project management got green light.

Later, the Oldie confessed that during the discussions and projects, he had finally realised, that it was not the computers he was afraid of, but the aging, retirement and losing control of his lifetime work.

Lessons from the case

Although the problem seems to be in accepting and adapting the new (digital) technology, the real problem may be something else, and lay much deeper. To facilitate the discussion and encouraging to use the new tools in well known environment, applying them to known tasks, and giving time to change the way to think can open the knot. Involving the impartial 3rd party (Auditor, bookkeeper...), who knows the company and numbers into negotiations can make it easier to accept the facts.

PP5 Latvian Chamber of Commerce and Industry

Situation (what?)

I am approached by an entrepreneur from construction business to:

- Improve communication (between team members and clients)
- Improve planning and monitoring of the projects

Necessity (why?)

- To avoid unnecessary costs and reduce misunderstanding (both of these factors affect SMEs financial situation and public image)

Timing (when?)

- Possible solution should be provided as soon as possible, but not later than 31.12.2023

Case

Entrepreneur has identified the need to improve the exchange of information between all involved stakeholders within the project. However, it is unclear what should be done and where to start. He has an idea about possible solution, which would be simple and reliable, and digital, with following properties:

- Possibility to add external users
- Possibility to add and share files, pictures, etc.

Problems

- Progress tracking.
    - Difficulty in sharing project updates and information with clients in real-time. Manual tracking of project milestones, budgets, and documents causing errors and confusion.
- Communication Gaps.
    - Miscommunication or delayed communication between project teams and clients that lead to misunderstandings and delays.
- Cost Control.
    - Clients lack visibility into project costs, making it difficult to manage budgets effectively. Limited visibility for clients into project progress and timelines.

Possible solutions

- Project Management Tools (Asana, Trello, Basecamp):
- Real-Time Progress Tracking
- Task Assignment and Accountability
- Schedule Management
- Budget Tracking
- Risk Management
- Collaboration Platforms (MS Teams, Slack, GD):
- Real-Time Communication
- File Sharing
- Video Conferencing
- Task and Project Management

Implementation process

1. **Definition**
2. **Aim. Define the aim.**
3. **Budget. Define the expected budget.**
4. **Team. Define the team and roles, who will be involved in the project.**
5. **Preparation**
    a. Needs analysis.

i. Detailed collaboration challenges and specific requirements.

6. **Tool Selection.**
    a. Choose appropriate tools based on needs and preferences.
7. **Implementation**
8. **Introduction.**
    a. Inform and introduce team members with the tool.
9. **Training.**
    a. Provide training to employees on how to use the new tools effectively.
10. **Piloting.**
    a. Run a test with a group to identify and address any issues.
11. **Feedback.**
    a. Gather the feedback and evaluate the results.
    b. If necessary, have individual meetings.
12. **Improvements.**
    a. Make necessary adjustments or changes, based on the feedback.
13. **Finalisation**
    a. Final report.
        i. Prepare the final report on the results.
    b. Decision.
        i. Make a final decision on the tool.

PP6 Chamber of Crafts and SME in Katowice

1.THE TASK IS:
Training and mentoring an entrepreneur who plans to implement a digital solution in a construction company requires a structured approach, taking into account his specific needs,
challenges and goals. Here is the step-by-step process, tools and rationale for the choices:
1. Initial assessment and setting of objectives:
• During the interview, I will ask about his experience in construction, what goal he wants to achieve thanks to digitization. This assessment will tailor the training approach to the individual circumstances of the entrepreneur and provide clearly defined objectives that are measurable in the future.
2. Market and industry research:
• Tracking industry trends and analyzing successful implementations willprovide valuable tips and benchmarks for the entrepreneur's project.
3. Create a schedule of activities:
• A well-planned schedule will ensure systematic and effective implementation, while taking into account potential impediments early.
4. Choosing the right technology:

• Choosing the right technology is critical to the success of a project, as it directly affects functionality, user experience and scalability for the future.
5. Team training and change management:
• Organization of training for employees of the construction company to familiarize them with the new digital solution.
• A well-trained and change-oriented team is crucial for the effective implementation and use of a new digital solution.
6. Data security and privacy:
• Construction companies often deal with sensitive data, so ensuring its security and compliance is critical to maintaining customer and stakeholder trust.
7. Monitoring and optimization:
• Continuous monitoring and optimization ensure that the digital solution remains in line with the company's goals and delivers the desired results.
8. Communication and feedback:
• Regular communication and feedback sessions build strong relationships and allow you to make appropriate adjustments to your training approach.
Tools to use:
• Padlet
• Microsoft Office package
• Presentations
• Training materials
The rationale for choosing these tools is to facilitate effective communication, organization,
and data-driven decision-making during the implementation process. Overall, the mentoring
process will focus on aligning the digital solution with the specific needs and goals of the construction entrepreneur, while providing support and appropriate training for the team.

Attachments

TtT Participants classroom days in Budapest 13. – 14. June 2023

PP1 HP
Anna Maria Czarny
Christian Wildt

PP2 Hochschule 21
Tamas Ferenczi
Andreas Weise

PP3 HWKS
Jens Dettmann

PP4 SAMK
Kari Lilja
Sirpa Sandelin

PP5 LCCI Latvia
Jurijs Dubatovka
Mārtiņš Riekstiņš
Krišjānis Zaķis

PP6 CCSK Katowice Chamber
Anna Palowska – online attendance – both days

PP7 IPOSZ
Tamas Rettich

PP8 IVSZ
Klara Süveges-Heilingbrunner

TtT Visitors:
Zoltan Toth - expert from IPOSZ BP, Cadline Managing Director
Tamas Baksa – representative of the Hungarian Ministry of Construction and Transport
Laszlo Kovacs – expert from IVSZ BP, Technological Centre of the Budapest University of Technology and Economics
Pallagi Gyula – Hungarian Construction Trade Union Representative

List of Participants, On Line – course
Timestamp Full name Institution
9/4/2023 8:57:59 Kari Lilja SAMK Option 1
9/4/2023 8:58:08 Sirpa Sandelin Satakunta University of applied Sciences
9/4/2023 8:58:18 Anna Maria Czarny Hanse-Parlament
9/4/2023 8:58:18 Tamas Ferenczi Buxtehude University of Applied Sciences 21
9/4/2023 9:06:10 Jurijs Dubatovka Latvian Chamber of Commerce and Industry
9/4/2023 9:06:20 Tamás Rettich IPOSZ, Hungary Option 1
9/4/2023 9:07:00 Dr. Jürgen Hogeforster Hanse-Parlament

9/4/2023 10:11:36 ANNA PALOWSKA IZBA RZEMIEŚNICZA ORAOZp tMioAn Ł1EJ I ŚREDNIEJ PRZEDSIĘBIORCZOŚCI W KATOWICACH
9/4/2023 10:31:18 Andreas D. Weise Hochschule 21 Option 1

4. Evaluation Concept[5]

4.1 Introduction

The term evaluation is commonly used to refer to studies implemented to assess and report on the strengths and weaknesses of policies, programmes, curricula, etc., and in that way give an opportunity to improve their effectiveness (Hafeez, et al., 2022). Applying the ideas of Jody Fitzpatrick (e.g. (2004), we can distinguish three different levels in the evaluation process. *Macro level* evaluation concerns on framework and facilitations of entire education programme, *medium level* evaluation, that some authors call *Meso level* evaluation, approaches the individual course or curriculum, its content and facilitation, and *Micro level* evaluation is interested in individual student or trainee, his / her experiences and feelings, and success in the learning process. In common, evaluation covers all levels, but the focus depends on goals of the process evaluated. If the aim is to develop an education policy, the main focus is on the frameworks, concepts and facilities planned. If the task is to develop a curriculum inside the programme, the focus should be set on the content and facilitations of this course, and finally, if the interest lays on results of the training, the individual experience and feelings should be emphasized.

Concerning the evaluation there is also another dimension that is often forgotten: Timeline and the opportunity to impact. If the aim of the evaluation is to help and enable developing and improving the training, the evaluation should be focused on such issues that in a way or another tell us, how to change the process and that are under our control, thus, the focus should be directed to the future. If the goal of the evaluation is to find out how did the policy, programme or course succeed, an approach should have a look at backward and concentrate on outcomes, that not necessary are under supervision.

It is very rare, that an evaluation would focus on only one level and have a look at either the future or the past. In common, evaluations tend to be multilevel and have a look at both towards and backwards. In this case the aim of the evaluation is to support implementing and improving of the training, thus, the evaluation is multilevel, and the focus is on issues that we have an opportunity to impact on.

The evaluation should be scheduled so, that the whole course is still in the memory of respondents. If the course is single activity like lecture, practical training, or e-learning session, this is no problem. The evaluation survey or interview can be conducted immediately after the training without any risk on confusions concerning the target of the evaluation. But if there are more activities, the course lasts weeks or months, or consists of

[5] Compiled by Dr Kari Lilja and Dr Sirpa Sandelin, Satakunta University of Applied Sciences (SAMK)

many meetings with certain interval, the risk of bias, caused by uncertainty about which part the survey or interview deals with, increases. This means that in such cases either the survey should be conducted separately after each phase or questions should be written so, that the risk of bias becomes minimized.

4.2 The process

In best cases, the evaluation survey and the report cover the evaluated course as a whole. This is not always possible, because e.g., the training may have been divided into parts with long periods between each, or parts of the course are quite different from each other. In such cases, it is recommendable to conduct the evaluation and write the report separately in each phase to avoid bias caused by time. These individual reports can then be summarised in concluding report.

This evaluation concept covers different types of courses. Some of these can be evaluated as a whole, but some must be evaluated phase by phase or can be evaluated only partially. However, the evaluation method, phases and tools are similar in each case. The evaluation will be conducted using the online survey application E-lomake, which enables the anonymity of the respondents, and – If needed – follows the sent invitations and sends reminders to those who have not responded. The questionnaire will be pre-prepared and saved as a template (Appendices A - C) that will be copied and modified for each survey so that specific details of each curriculum and training will be considered. The prepared survey will be tested to see if the questionnaire is working, and if the reporting will be possible in a desired way. (Figure 2)

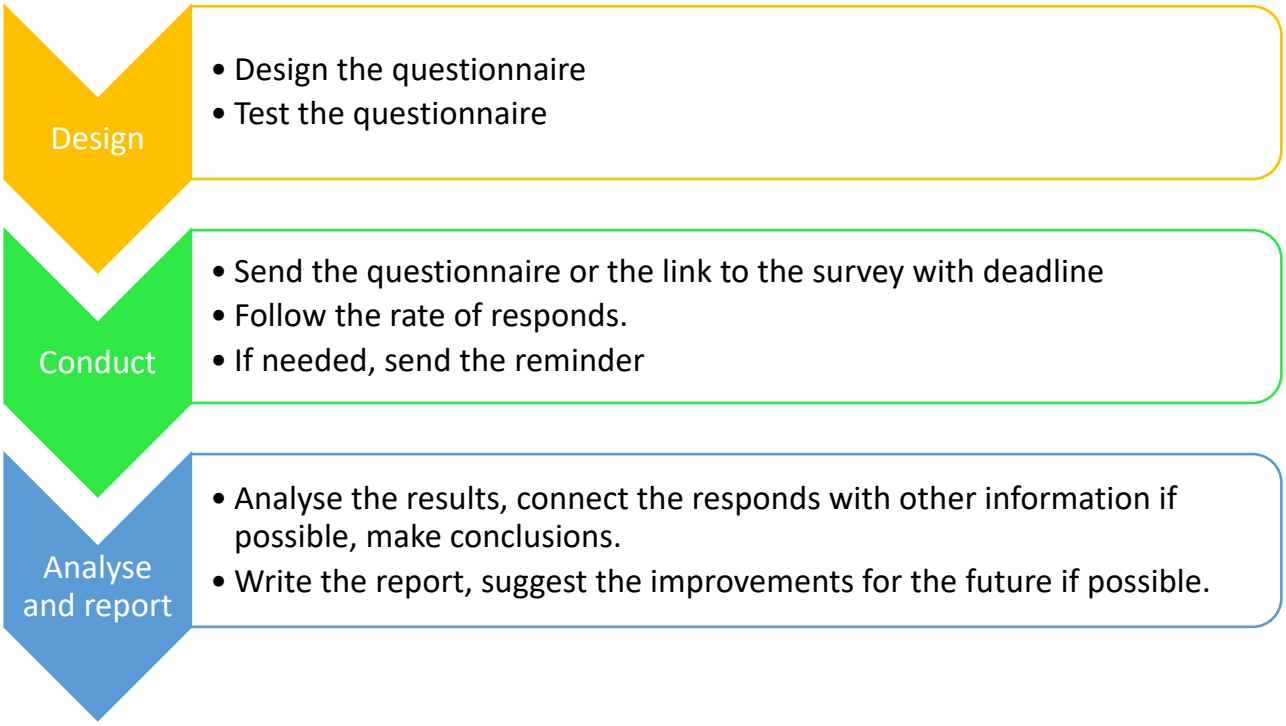

Figure 2: Phases of the evaluation

If there is a need to follow the responds and to send reminders, an invitation to participate to the survey will be sent by e-mail (sent by the survey application) in the end of each course / training. Otherwise, the link to the survey will be given during the last lecture / training session. At the same time, the deadline for responding will be announced.

In this case, there is no reason to follow the responding, thus, the latter named procedure will be in use. After the deadline of responding to the survey has passed by, the results will be downloaded and analysed, and the report will be written.

Target groups of the evaluation

The main target group is those participating the courses, i.e., students and in the Train the Trainer course the teachers, coaches and consultants participating the course. In some cases, like in the Training for SMEs (WP4 A5), also the teachers teaching in the course and representatives of those enterprises sending their employees to the course will be interviewed. The interviews will be conducted online using online questionnaires. Each target group has a questionnaire of their own.

Online questionnaires and duties of each test facilitator

The online questionnaires will be prepared course by course using the templates presented below. The finishing of each questionnaire will be made when the programme of the course to be tested and evaluated is available (Table 1). The facilitator of the test sends the programme to SAMK early enough so that SAMK has at least two weeks to finish the questionnaire for the training in question. SAMK will send the links to each questionnaire to the facilitator who delivers the links and instructs the target groups to complete the questionnaire.

Needs to translate the questionnaire.

If the questionnaire needs to be translated to domestic language, a facilitator should announce this at least a month before the training starts. SAMK will then send a preliminary questionnaire of each target group to be translated. Facilitator will send the translated (or proofed, if SAMK has made the translation) version to SAMK together with the training programme latest two weeks before the planned test course starts.

When the course starts

In the beginning of each course, the facilitator informs, that the course will be evaluated, and that participants will receive a link to the evaluation questionnaire in the end of the course. Participants should be informed that the evaluation helps the facilitators to develop and improve the course in the future.

When the course ends

In the end of the course, facilitator gives the link to the survey to students, reminding them that each answer is important, and informs the period when the evaluation survey is active. In common, this period is one week, if there are no needs for longer responding period. Also, teachers and employers should be given links to their own surveys, if such are required in the training in question.

After the responding period has finished, SAMK will collect the results from the system, analyse them and write a report.

Table: Summary of the duties, process and schedule of the test

Deadline and responsible party	Task
Latest one (1) month before the start of the course / training facilitator of the course should	• inform SAMK about the schedule of the course, • inform SAMK whether the questionnaires should be translated or not. If translation is needed, return the questionnaires included with translations written on the form. • send SAMK a brief info about the curricula (only **names** and **e-mail addresses** of the teachers, and **topics** they will teach are required).
Within one (1) month calculated from receiving the information listed above, SAMK will	• create the specific survey for this course, • translate the questionnaire – If needed – according to given instruction, and • send the links to surveys to the facilitator and inform the deadline for the responding.
When the course starts, facilitator will Inform the participants, teachers, and enterprises that	• the course will be evaluated, • the link to the evaluation survey will be given or sent in the end of the course or phase of the course, and • that it is important for developing the course that everyone complete the questionnaire.
When the course or phase of the course ends, facilitator will	• deliver the links to survey to each group of respondents (participants, teachers, enterprises) either by e-mail or in other acceptable way, • inform the respondents about the deadlines, and • remind them about the importance of the evaluation.
When the given deadline has been passed, SAMK will	• open the database and collect and analyse the results, • write a report, and • send the report to be discussed.

The report

In the report, following issues will be reported: A rough description of the group of respondents, have they been satisfied with the facilitations, topics, teachers, and their group, do they believe that the training has been beneficial, and what could have been made in other way. Furthermore, in certain courses and trainings also teachers' and employers' opinions will be surveyed and reported. These cases will be agreed together and announced separately.

In the end of each report there will be a concluding section that summarizes the findings and gives some suggestions concerning the opportunities to improve and develop the

curriculum and / or facilitations. If wanted and agreed, all the evaluations will be summarized together.

References

Fitzpatrick, J. L., 2004. Exemplars as Case Studies: Reflections on the Links Between Theory, Practice, and Context. *American Journal of Evaluation,* 25(4), pp. 541-559.

Hafeez, M., Naureen, S. & Sultan, S., 2022. Quality Indicators and Models for Online Learning Quality Assurance in Higher Education. *The Electronic Journal of e-Learning,* 20(4), pp. 374-385.

Appendices

Appendix A The template of the questionnaire for students	 E-Lomake_Survey_for_Students.pdf
Appendix B The template of the questionnaire for teachers	 E-Lomake - Teachers_questionn
Appendix C The template of the questionnaire for enterprises	 E-Lomake_Survey_for_enterprises.pdf

5. Evaluation Report[6]

5.1 Introduction

The term evaluation is commonly used to refer to studies implemented to assess and report on the strengths and weaknesses of policies, programs, curricula, etc, and in that way give an opportunity to improve their effectiveness (Hafeez, et al., 2022). Applying the ideas of Jody Fitzpatrick (e.g. (2004)), we can distinguish three different levels in the evaluation process. *Macro level* evaluation concerns on framework and facilitations of entire education programme, *medium level* evaluation, that some authors call *Meso level* evaluation, approaches the individual course or curriculum, its content and facilitation, and *Micro level* evaluation is interested in individual student or trainee, his / her experiences and feelings, and success in the learning process. In common, evaluation covers all levels, but the focus depends on goals of the process evaluated. If the aim is to develop an education policy, the focus is on the frameworks, concepts and facilities planned. If the task is to develop a curriculum inside the programme, the focus should be set on the content and facilitations of this course, and finally, if the interest lays on results of the training, the individual experience and feelings should be emphasized.

Concerning the evaluation there is also another dimension that is often forgotten: Timeline and the opportunity to impact: If the aim of the evaluation is to help and enable developing and improving the training, evaluation should be focused on such issues that in a way or another tell us, how to change the process, and that are under our control, thus, the eye should be directed to the future. If the goal of the evaluation is to find out how did the policy, programme or course succeeded, an approach should have a look at backward and concentrate on outcomes, that not necessary are under our supervision. It is very rare, that an evaluation would focus on only one level and have a look at either the future or the past. In common, evaluations tend to be multilevel and have a look at both towards and backwards.

In this case the aim of the evaluation is to support implementing and improving of the training, thus, the evaluation is multilevel, and the focus is on issues that we have an opportunity to impact on.

The evaluation should be scheduled so, that the whole course is still in the memory of respondents. If the course is single activity like lection, practical training, or online lesson, this is no problem. The evaluation survey or interview can be conducted immediately after the training without any risk on confusions concerning the target of the evaluation. But if there are more activities, the course lasts weeks or months, or consists of many meetings with certain interval, the risk of bias, caused by uncertainty about which part the survey or interview deals with, increases.

Considering what was said above, the surveys of this evaluation were conducted separately after each phase.

[6] Compiled by Dr Kari Lilja and Dr Sirpa Sandelin, Satakunta University of Applied Sciences (SAMK)

The process

In best cases, the evaluation survey and the report cover the evaluated course as a whole. This is not always possible, because e.g., the training has divided into parts with long periods between each, or parts of the course are quite different from each other. In such cases, it is recommendable to conduct the evaluation and write the report separately in each phase to avoid bias caused by time. These individual reports can then be summarised in concluding report.

This evaluation report covers the results gained from two separate surveys, first conducted immediately after the classroom part had ended, and second conducted immediately after online session. The evaluation method, phases and tools were similar in both cases, but the questions were modified to match the different facilities, methods and tools used during both sessions. The evaluation was conducted using the online survey system E-lomake, which guaranteed the anonymity of the respondents. The option to follow the sent invitations and – If needed – to send reminders to those who have not responded was not used. The prepared survey was tested to according to procedure presented in the evaluation concept. (Figure 2)

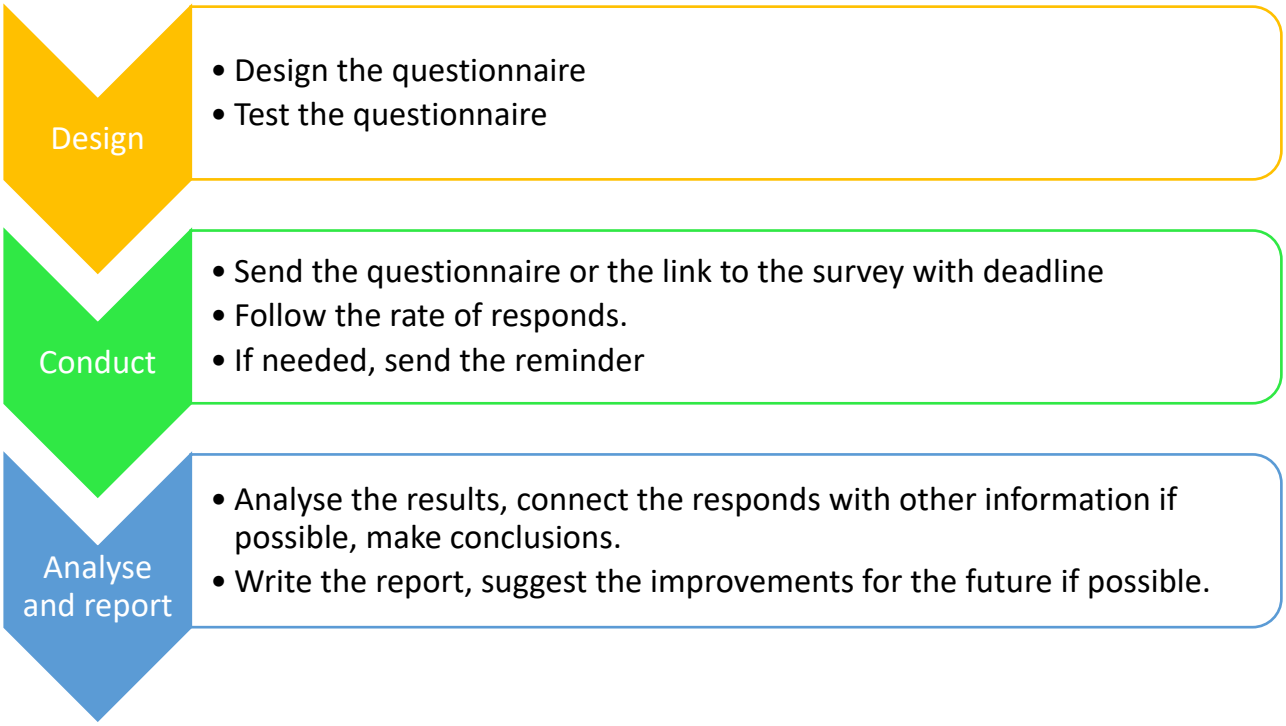

Figure 3: Phases of the evaluation

In this case, there was no reason to follow the responding, thus, the link to the survey was delivered to participants in the online learning platform in the Padlet. At the same time, the deadline for responding will was announced in the end of each phase. After the deadline of responding to the survey had passed by, the results were downloaded and analysed, and the report was written.

Target group of the evaluation

The main target group of this evaluation consisted of the teachers, coaches and consultants participating the Train the Trainer course.

Online questionnaire

The online questionnaire was prepared beforehand using the template presented below. The link to questionnaire was sent to participants in the beginning of the course. In addition to this the link was available in the course platform. The questionnaire was in English, and there were no needs to translate it into other languages.

Informing about the evaluation

In the beginning of the course, the participants were informed, that the course will be evaluated, and a link to the evaluation questionnaire was placed into e-learning platform. In the end of the course, participants were reminded about the evaluation.

After the responding period was finished, SAMK collected the results from the system, analysed them and wrote a report. After the classroom days, the participants had only 2 days to complete the evaluation questionnaire due to system breakout at Campus of SAMK. After the online day, the period reserved for responding was longer.

5.2 The report

In this report, following issues will be reported: A rough description of the group of respondents, have they been satisfied with the facilitations, topics, teachers, and their group, do they believe that the training has been beneficial, and what could have been made in other way. Furthermore, in certain courses and trainings also teachers' and employers' opinions will be surveyed and reported. These cases will be agreed together and announced separately.

In the end of each report there will be a concluding section that summarizes the findings and gives some suggestions concerning the opportunities to improve and develop the curriculum and / or facilitations. If wanted and agreed, all the evaluations will be summarized together.

The classroom days

Thirteen (13) trainers participated classroom days was hold in 13th and 14th June 2023 in Budapest, and in addition to them there were visitors from two Hungarian entrepreneurial organisations, Hungarian Construction Trade Union, and Hungarian Ministry of Construction and Transport. The evaluation questionnaire was completed by 14 persons, thus either someone had completed the questionnaire twice, or one of the visitors had completed the questionnaire too. To keep the promised anonymity, the analyses cover all the responds, without trying to find out which one was an extra reply.

The facilitations were found to been suitable for training (Figure 4), and respondents were satisfied with the topics and issues too (Figure 5). In common, they also found that lecturers explained the issues arisen well, although in this question there was more variation than in earlier replies (Figure 6). The schedule was found to be good and suitable for topics and issues dealt with, but also in this question there was more dispersion (Figure 7). The trainers participating the course felt that they had gained valuable knowledge

(Figure 8) that they could utilize in their career (Figure 9), but – for a reason or another – they were not as satisfied with the usability of the skills gained (Figure 10).

Concerning the topic “Digital skills”, the presentation was found to be clear and understandable (Figure 11), issues presented were relevant and topical (Figure 12), and the information given was found to be up-to-date (Figure 13). The topic “Best practices” gained evaluation results that were very close to those above, and so did all the other topics too. In topic, the presentation was found to be clear and understandable (Figure 14), issues presented were relevant and topical (Figure 15), and the information given was found to be up-to-date (Figure 16). The topic “Pedagogy” brought minor variation to the scale: leaving out those two who were absent from this lesson, the participants seem to have valued the pedagogic more than the other issues. Although the differences are minor class, this finding gets confirmation from free speech answers, in which the online pedagogic was considered to be good in the content of the course. The other issues mentioned in answers to question “What was good” were tight schedule, best practices, community, discussions and answers to questions. In question “What could have been better” some respondents said that timing should be shorter, and said that one day could be enough, someone wished, that during the training, partner’s future tasks would have been explained, another wondered, where to find training content, some wished shorter lessons and another more groupworks. Said in one sentence, what someone found good, was bad for another. AI applications suitable for SMEs and public procurement with digital tools should have been discussed more in the training too. However, everyone would recommend the course and most of the participants found that the proportion of topics was good. Those who didn’t think so (2 respondents), said that presentations should be shorter, and in addition to these, there should be presentations of chambers and companies.

As a conclusion of this, the weight of pedagogic issues should be increased, and shorten the presentation of curricula the trainers are supposed to use in their trainings, and in addition to these, there should be quest presentations held by chambers and enterprises. This is partially understandable, because in some of the participating countries, the chambers of commerce and crafts, and enterprises as employers, have still a remarkable role in vocational training.

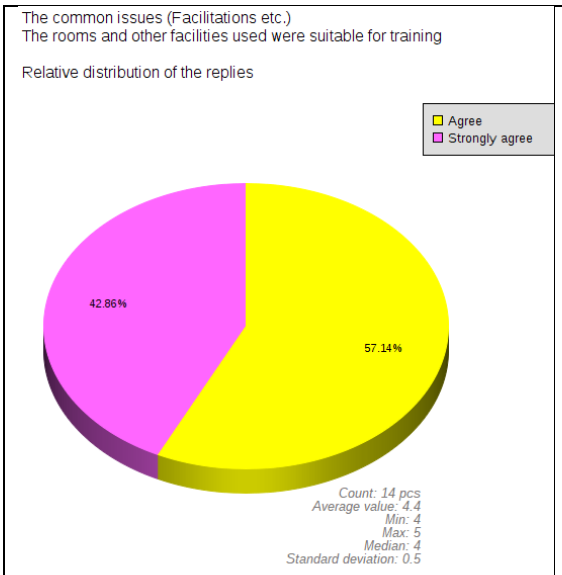

Figure 4: Facilities

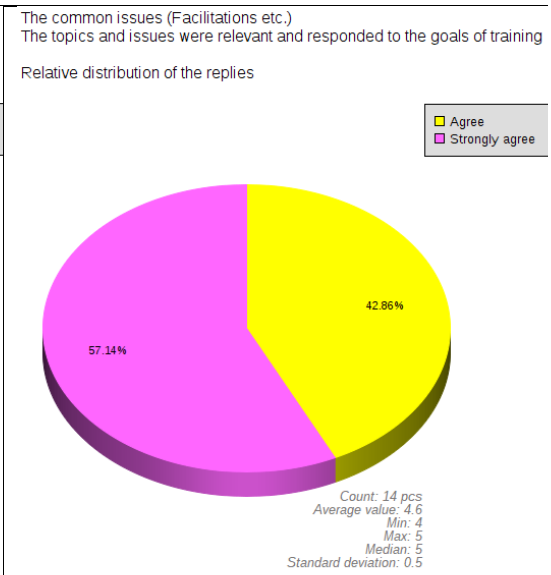

Figure 5: Topics and issues

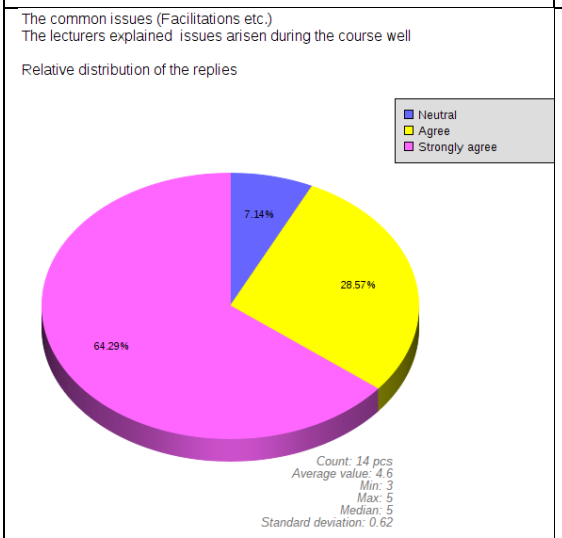

Figure 6: Lecturers explained...

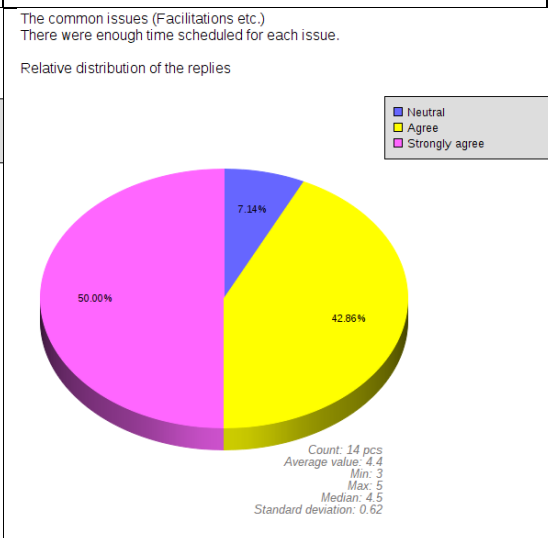

Figure 7: Schedule

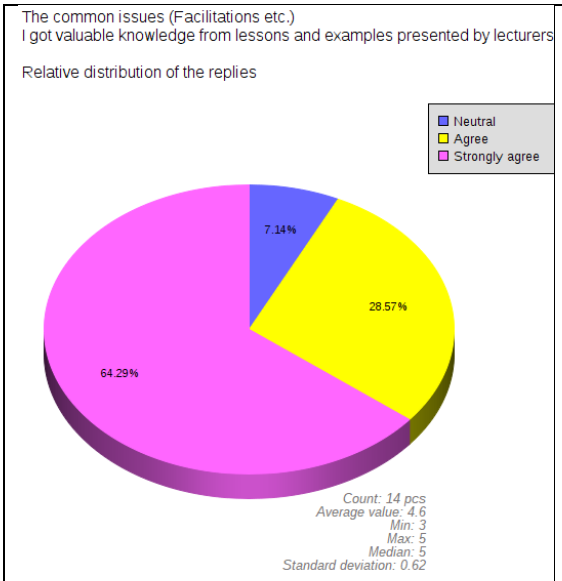

Figure 8: Knowledge gained

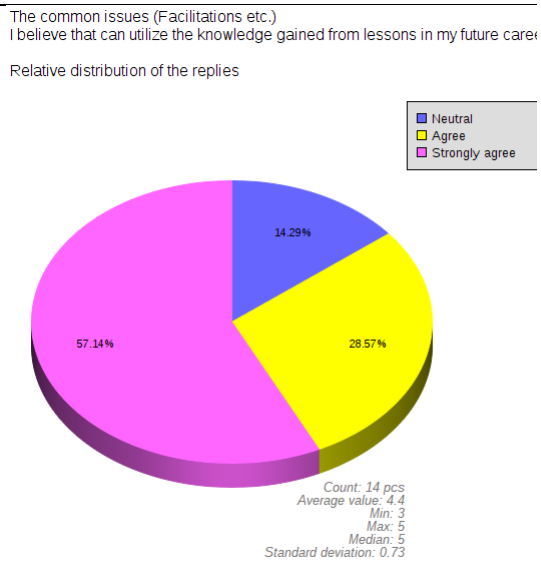

Figure 9: Usability of knowledge

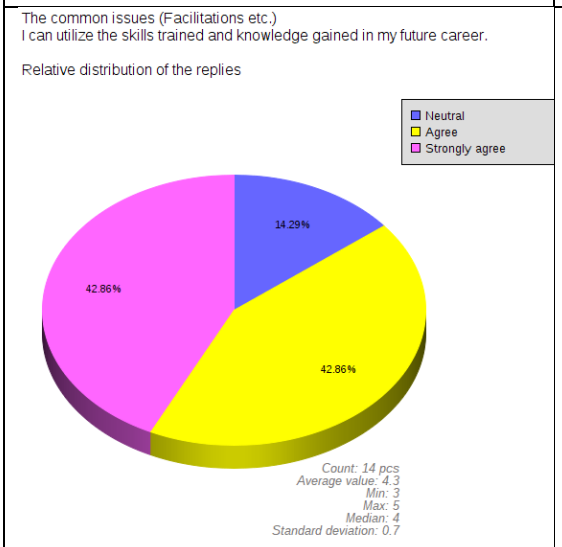

Figure 10: Usability of skills

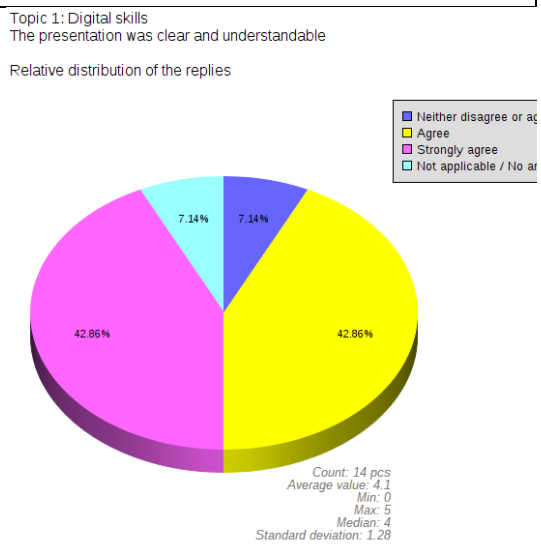

Figure 11: Digital skills, presentation

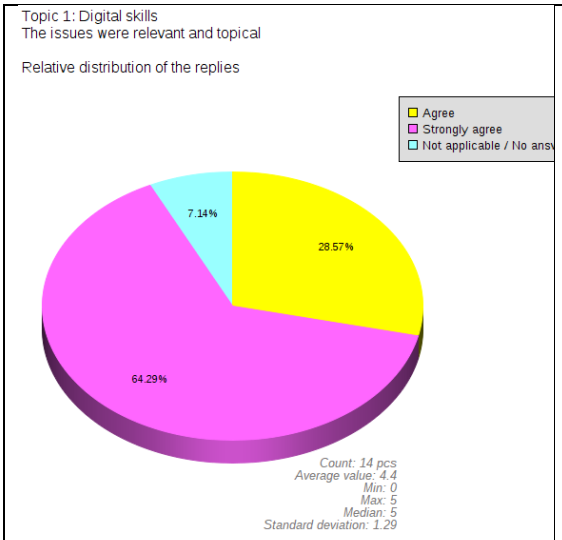

Figure 12: Digital skills, relevancy and topicality of issues

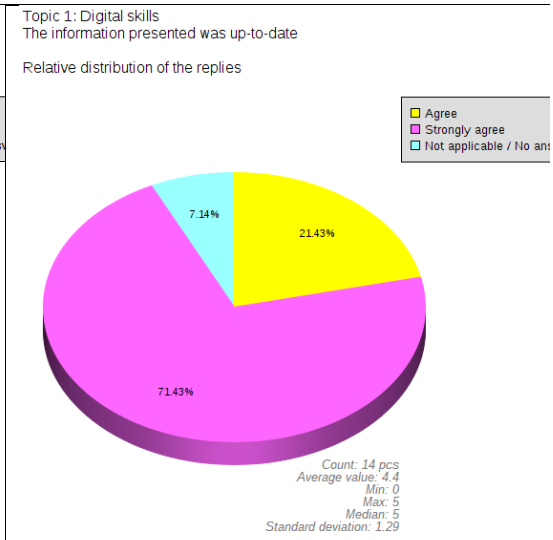

Figure 13: Digital skills, the up-to-dateness of the information given

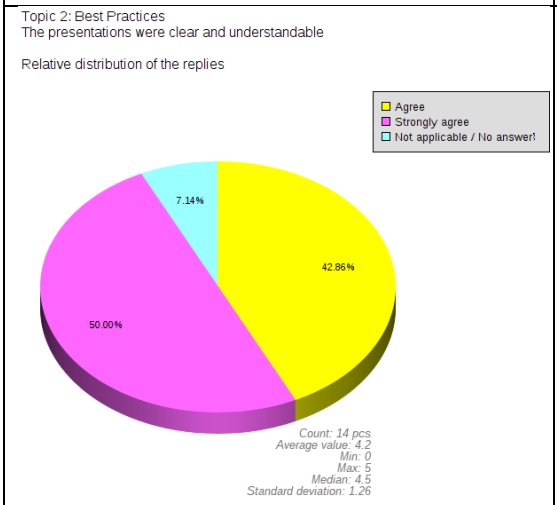

Figure 14: Best practices, presentation

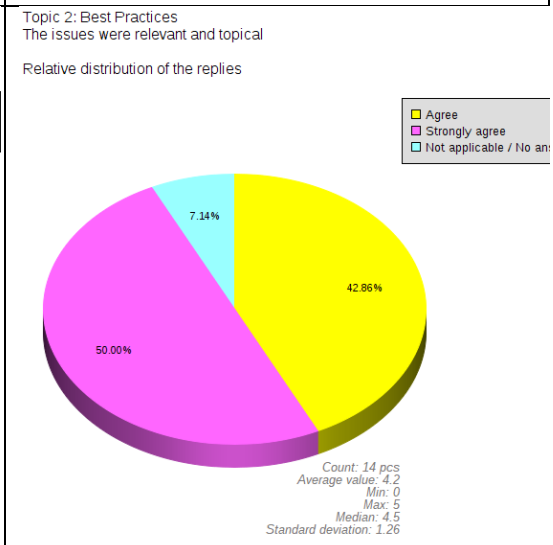

Figure 15: Best practices, relevancy and topicality

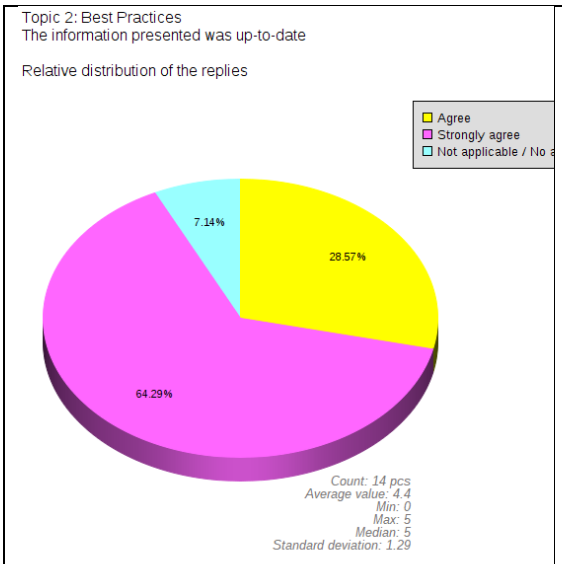

Figure 16: Best practices, up-to-dateness

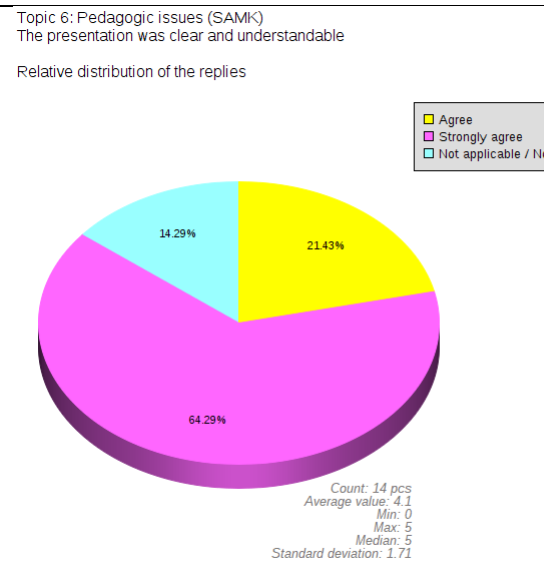

Figure 17: Pedagogic issues, presentation

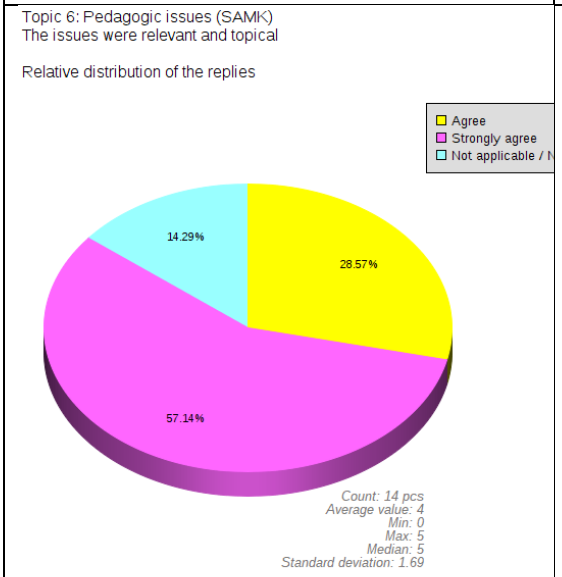

Figure 18: Pedagogic issues, relevancy and topicality

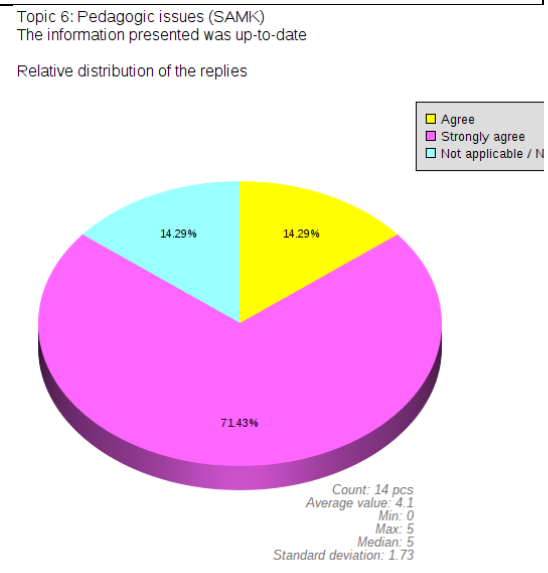

Figure 19: Pedagogic issues, up-to-dateness

The online day

The online part of the Train the Trainer was hold on 4th September 2023 with the online meeting system Zoom. There were 9 participants participating to the training. The link to the evaluating survey was delivered in the e-learning platform, and 8 participants had completed the questionnaire.

The online meeting platform Zoom was found to be suitable for this kind of training (Figure 20), and the topics were found to be relevant and match to the goals of the training (Figure 21). Lecturers explained the issues arisen clear (Figure 22), and the schedule was

found to be good (Figure 23). The knowledge gained was considered to be valuable (Figure 24) but concerning the usability of knowledge (Figure 25) and skills gained (Figure 26) there was minor scepticism. The results approaching each topic were similar to those above, thus, there is no reason to go through them topic by topic. However, there is one finding that highlights the importance of pedagogical issues found when evaluating the classroom training: The topic "Mentoring and Coaching" was evaluated to be very relevant and topical (Figure 27).

In the free speech answers, practical cases, videos, and discussions were found to be good, and more practical examples were wished. It was also mentioned that all of the participants did not present the assignment. Someone also asked whether the onsite training would wake up more discussion and other interactions. The course was said to give a good introduction to mentoring and coaching. One of the respondents had been missing further information about internet resources.

As a conclusion of online training, it can be said, that even if the system was working, some of the trainees missed the interactivity born in classroom training. Out of topics, the pedagogical methods, tools and issues and a need to discuss them more became highlighted.

5.3 Conclusion and recommendations

The test succeeded well, and the participants found the curriculum working and applicable. It is good to bear in mind, that no curriculum is made to be followed to the letter, but to be applied and localized according to the needs of each country and each training.

Out of the evaluation results and free speech answers, following recommendations were arisen:

1. The weight of pedagogic methods, tools and issues, particularly the online ones, should be increased,
2. The presentation of curricula the trainers are supposed to use in their trainings can be shortened, and in addition to presentations of trainers and trainees, there should be quest presentations held by chambers and enterprises, particularly in countries, where the chambers of commerce and crafts as training institutes, and enterprises as employers, have still a remarkable role in vocational training.
3. Even if systems are working, the weight should be put on creating the similar interactivity that is born in classroom training.

5.4 References

Fitzpatrick, J. L., 2004. Exemplars as Case Studies: Reflections on the Links Between Theory, Practice, and Context. *American Journal of Evaluation,* 25(4), pp. 541-559.

Hafeez, M., Naureen, S. & Sultan, S., 2022. Quality Indicators and Models for Online Learning Quality Assurance in Higher Education. *The Electronic Journal of e-Learning,* 20(4), pp. 374-385.

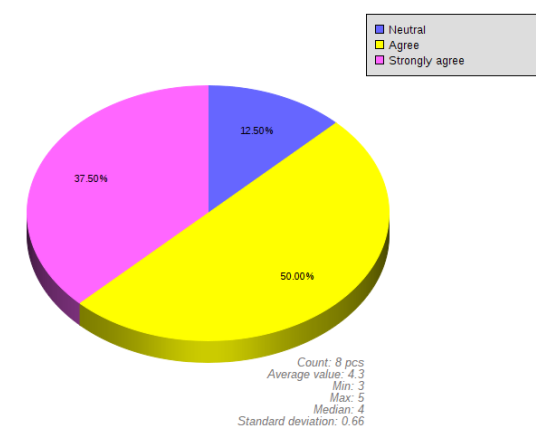

Figure 20: Online meeting platform Zoom

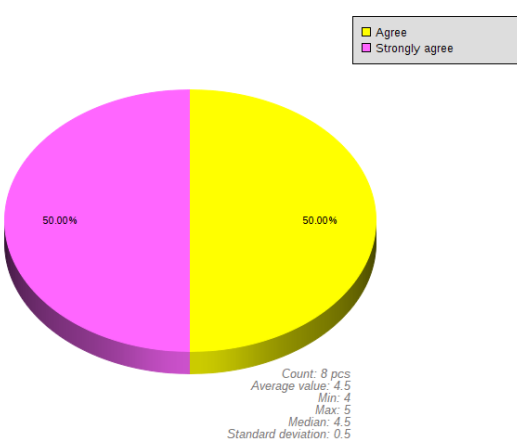

Figure 21: Topics and issues

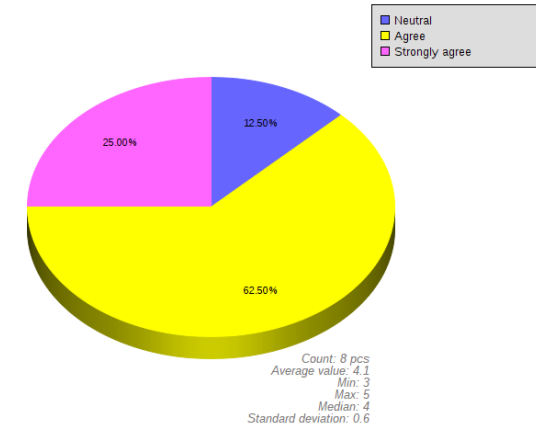

Figure 22: Lecturers

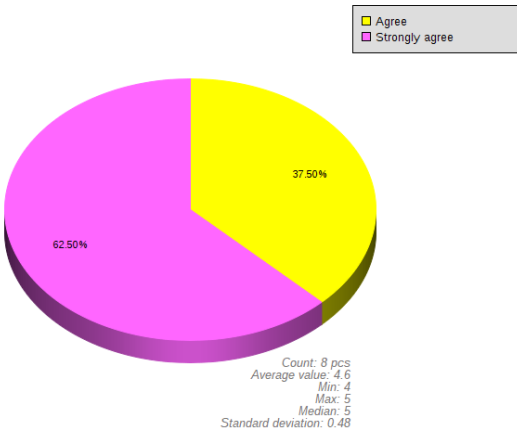

Figure 23: Schedule

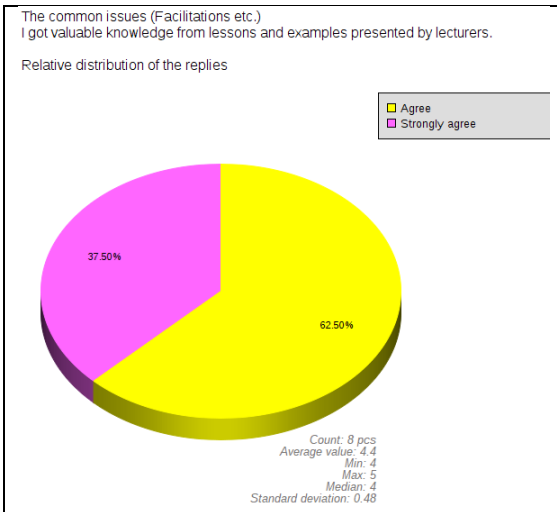

Figure 24: Knowledge gained

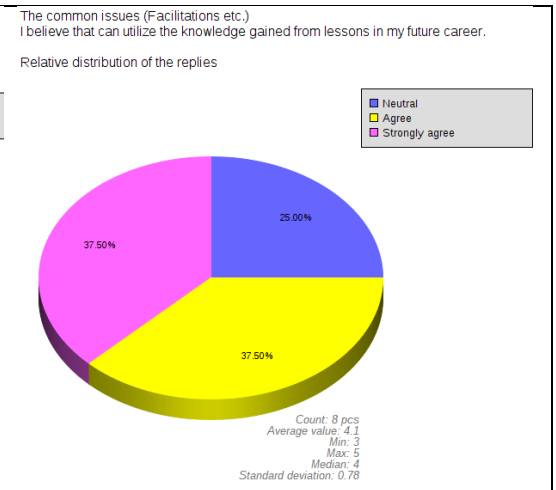

Figure 25: Usability of the knowledge

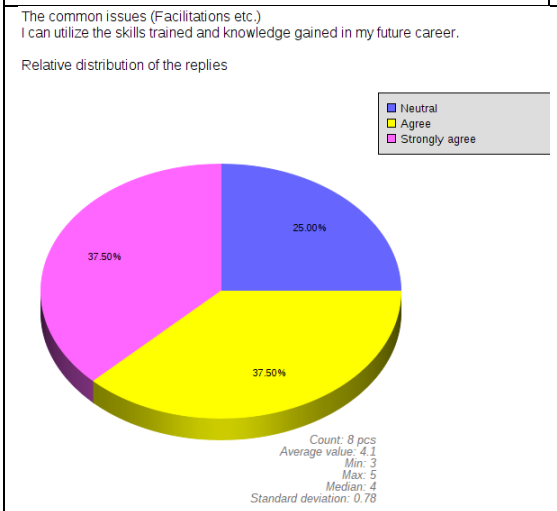

Figure 26: Usability of skills

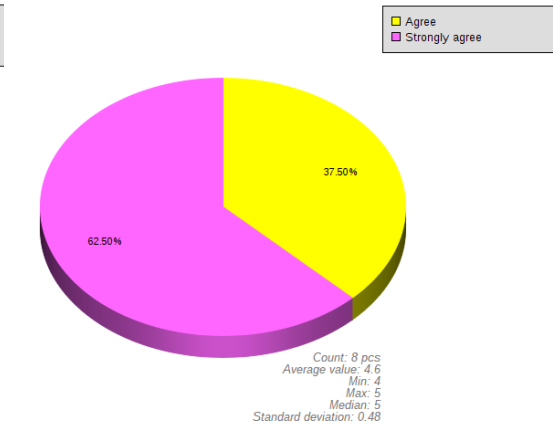

Figure 27: Relevancy and topicality of topic "Mentoring and coaching"

6. Developing capacities to promote digitalisation in SMEs

Small and medium-sized enterprises are constantly under time pressure and their management is usually heavily overloaded. They need customized help and support, which they must receive just in time. Such support, which must also be provided by the chambers and associations in particular, relates to a wide variety of business management tasks and is currently of outstanding importance for the utilization of digital technologies for SMEs. The DIG-CON project is dedicated to these important tasks for the construction industry.

At the beginning of the project, a workshop was held to discuss which additional and complementary activities could be carried out to further develop capacities to promote digitalization. As a result, three promising measures were identified in Germany and Hungary. It was decided to additionally develop these measures in the project, to test them in Germany and Hungary and, if successful, to transfer them to all other partners so that this further strengthening of promotional capacities can also be realized in the other countries after the end of the project. Brief summarized reports on all three measures, which proved to be extremely successful, are provided below.

6.1 Development of the promotional capacities of the Schwerin Chamber of Crafts in Germany[7]

Digitalisation Officer

For many years now, the Schwerin Chamber of Skilled Crafts has very successfully provided business consulting services for its member companies and start-ups. The costs are financed 75% from national funds and 25% from the Schwerin Chamber of Crafts' own funds. This counselling is free of charge for companies and start-ups. In the DIG-CON project, starting at the end of the first project year
a) to install a digitalisation officer in the free business consultancy service,
b) to provide free advice on the digital transformation of SMEs in the construction industry for the entire remaining duration of the project, and
c) to prepare a report summarizing the results and experience gained towards the end of the project, to reach a decision on the continuation of this consultancy after the end of the project.

At the beginning of the 2020s, the Schwerin Chamber of Crafts identified an increased need for advice on digitalisation in the skilled crafts sector among member companies in its chamber district (western Mecklenburg). In Mr Olaf Blesting, a colleague was recruited who not only had the skills for consultancy work at

[7] Prepared by Jens Dettmann, Handwerkskammer Schwerin, Germany

management level but also the digital expertise. Mr Blesting took up his position as digitalisation officer for the Schwerin Chamber of Crafts in January 2022.

The Digitalisation Officer is integrated into the Chamber of Crafts' day-to-day work in the area of business consulting. He primarily advises member companies on specific questions relating to day-to-day problems in order to optimise and, above all, digitise them. Mr Blesting's main business here is to identify opportunities and ways of digitalisation.

(https://www.hwk-schwerin.de/kontakte/olaf-blesting-19,0,da-detail.html?id=54)

As the results of the project progressed, the digitalisation officer became more intensively involved in the transfer of knowledge. While he had previously mainly advised companies in general, he was now in a position to provide special consulting services for companies in the ancillary and main construction trades. the digitisation officer received a consulting catalogue that was designed directly for companies in the construction industry.

The advice was now much more specific and effective for companies in the construction industry. In line with the structure of our member companies, SME companies from the electrical, heating, air conditioning and plumbing, woodworking and painting sectors were the most strongly represented.

Consultancy is provided in connection with the business consultancy services of the Schwerin Chamber of Crafts and Trades and through direct contact within the framework of the project. Not only were suggestions made regarding the business plan of the project, but advice was also given on possible qualification and further training programs for trainees, journeymen and master craftsmen and the management of the companies. These offers also result in particular from the further training programs developed in the DID-CON project:

- Digital additional qualifications for the construction and finishing trades
- Training program on cooperation through digitalisation
- Digital training for the construction and finishing trades
- Digital entrepreneurship education

In addition to the daily consulting work as part of the company consultations on the digitization of the member companies of the Schwerin Chamber of Crafts, 13 clients have received specific advice on the project to date. Of these, 5 clients were not from the chamber district.

One company is planning to introduce the ARTESA tradesman software.

Three companies have registered for the further training module INF (Excel/Outlook/Access).

One company intends to complete the CAD1-KARTON and DCT modules (3D printing and drones on the construction site section).

It can be seen that SMEs in the construction industry in our region are divided into two groups.

- On the one hand, the companies or owners and management who have recognized that a far-reaching digitalization of their companies in the construction industry also makes work easier and increases the effectiveness of administration and work preparation and follow-up. These companies were already well positioned, so that our offers were recognized but no concrete implementation took place. Only one company in this group registered for further training.
- The other group was made up of companies that had full order books and were of the opinion that smartphones and laser water scales were enough digitalization in the medium term. Only one company is thinking about introducing craftsman software.

The CraftLab of the Chamber of Skilled Crafts was also utilized for the consulting services and training offered. The CraftLab colleagues were also involved.

All colleagues, and in particular the digitalisation officer, will continue to be available to companies in the region in matters relating to the digitalization of SMEs even after the DIG-CON project has ended.

The project results will continue to be used as part of the Schwerin Chamber of Crafts' business consulting services.

Craft Lab

The Schwerin Chamber of Crafts has been operating a large inter-company training and technology centre for over three decades, which performs the following training and support tasks, among others.

- In addition to the in-company part of the dual vocational training program, the centre runs inter-company instruction courses on new technologies for trainees.
- Implementation of a variety of further training programs on technical and business management topics for companies and their employees
- Organisation of preparatory courses for all four parts of the master craftsman examination in the various skilled trades.

- Conducting retraining, education and integration programs for the unemployed and refugees

As early as 2019, the Schwerin Chamber of Skilled Crafts' business advisory service and the training and further education business of the in-house education and technology centre identified the need to support companies in the digitalisation of their businesses. In order to support existing craft businesses in their digital transformation through training and further education and to offer innovative start-ups an 'experimental and development space', the Schwerin Chamber of Crafts has developed a concept for an innovation space entitled 'CraftLab' for the regional craft sector and set up this CraftLab in its education and technology centre in Schwerin South.

2020/21 was used to evaluate and concretise requirements. An initial concept was developed and presented and discussed within the company. With the start of the DIG-CON project in 2022, the idea of setting up a CraftLap was strongly promoted and intensified. The finalised concept was presented to the Heinz Piest Institute for Craft Technology (HPI) at Leibniz Universität Hannover and the Federal Ministry of Economics and Climate Protection. The content of the concept was revised, adapted and adjusted to current requirements. With the support of the HPI, it was possible to obtain funding for the planned CraftLab as a nationwide pilot project from the Federal Ministry for Economic Affairs and Climate Protection. The construction and operation of the CraftLap was integrated into the DIG-COB project as an activity and joint events were held with partners from the region and innovation and digital centres on various topics. The CraftLap is promoted and supported by the DIG-CON project but not financed from project funds. The construction and operation of the CraftLap is financed by national funds and the Schwerin Chamber of Crafts' own resources.

The CraftLab is the next meaningful step in the further education and training programs offered by the Schwerin Chamber of Crafts. By combining innovative and digital ideas with the practical knowledge of established companies and scientific institutions from Mecklenburg-Vorpommern, the CraftLab deals intensively and practically with important developments and future topics. This promotes the emergence of a new, knowledge-based culture of innovation and supports the efforts of the state government of Mecklenburg-Vorpommern to create a new ecosystem for digital innovations. In the CraftLab, every craftsperson is to be enabled to turn their ideas into reality or products through clear and tangible training and further education, thereby overcoming the hurdles of digital transformation.

The aim is to provide tradespeople with the latest technology and the knowledge they need to turn the otherwise impossible into an economic and relevant reality. The intention is to impart knowledge in an extremely practice-orientated way, including the implementation of small series and production trials. This allows innovative ideas to be implemented and visualised in an initial practical application. This enables craftsmen to recognise whether their ideas can also be implemented sensibly and efficiently.

The CraftLab aims to initiate innovative projects or ideas from craftspeople and lead them to success. This involves going through various stages, such as researching customer needs, developing ideas and the proof of concept (PoC), as well as developing and routinising sales and marketing strategies. Only those with the necessary expertise can drive digitalisation in the company and counter the shortage of skilled workers through digitalisation. The aim is for managers, employees, trainees and master craftsmen to be able to continuously develop their digital skills. To this end, CraftLab develops events on digital transformation and offers them as face-to-face, hybrid or online events, as well as optional courses in further education and training. Even with the best qualification, the digital transformation will not be flawless. That is why the events aim to ensure that failures do not lead to the cancellation of a process but are seen as a learning effect. It is crucial to accept and master the challenges in order to benefit from the many advantages of digitalisation and reap the economic benefits.

Other educational institutions can also use the CraftLab for further training in order to establish digital teaching in their organisation.

The CraftLab is approx. 110 square meters in size and is perfect for small and medium-sized working groups of up to 12 people. Various event formats can be organised in the CraftLab. The room is equipped with modern and flexible event technology. This includes a small stage, sound and lighting technology, projector, mobile furniture, seating cubes, smart flip charts, writable magnetic walls, creative moderation material and touchscreen monitors. The CraftLab is perfect for creative moderation techniques, team-building exercises and online hybrid projects.

The CraftLab brings innovation and digitalisation to life in further education and training! The latest technical solutions and current topics are presented at various practical stations and can be tried out as part of regulated training and further education programs.

- Film & Video - Professional realisation of advertising films for the Internet and online teaching (approx. 15 m2 for preparing, shooting and editing image films, commercials, product films, web videos, event documentaries or recruiting films).
- Virtual (VR), augmented (AR) & mixed reality (MR)
  With the help of VR, AR and MR, trade services can be planned more efficiently and controlled in a more targeted manner, making processes such as production and material procurement easier. By displaying important additional information during the maintenance and assembly of machines, difficult tasks can be carried out more easily, safely, quickly and to a higher quality.
- Digital workflow - use of digital software solutions in skilled trades
- Mobile apps are in demand because mobile working characterises skilled trades. Tradespeople are usually on site at the customer's premises and need access to data and information there.
- Personnel planning, scheduling software and digital time recording - The use of personnel planning software that works with drag and drop functions and which also recognises working hours, conflicts and over-scheduled hours, thereby avoiding errors in planning, saves time and money. (e.g. artesa).
- Digital construction and defect documentation - BIM apps (e.g. REVIZtO) increase efficiency and are therefore used by many construction companies. The construction diary, for example, records the progress of construction work, including a comparison of all planned and completed services and the materials required. With digitalised construction documentation, companies increase customer satisfaction and reduce personnel costs. At this station, the CraftLab demonstrates how participants can integrate a digital construction diary into their everyday work with the simplest of means.
- Use of FLIR cameras for fault detection - Thermal imaging technology provides valuable information not only in the construction industry, but also in the skilled trades. In the meantime, thermal imaging cameras have evolved from an exotic technology to a widely used tool.
- 3D printing & modelling - 3D printing processes offer new possibilities within the process chain: whether for custom-made products, the production of casting moulds, prototype construction or the creation of individual production tools. With 3D printing, models can be produced on site and extremely cost-effectively. This saves time and money.

The CraftLab has already proved to be an extraordinarily successful way of promoting digitisation in SMEs. There are already plans for further operations that will expand and complete the possibilities of the CraftLab. Some topics for the future are

- The Intelligent Room
- Voice assistants, natural interfaces & UX
- IoT & electronics
- Mobile POS systems for the craft industry

Floor plan CraftLap

In future, a CraftLab2go could be a further development of the stationary CraftLab. This means, for example, an even more consistent implementation of the practice stations as mobile solutions. With a greater external impact (through trade fair appearances or similar), significantly more attention will be drawn to CraftLab.

The Craft Lab is an ideal consulting and demonstration location for the areas of training and further education as well as business and digitalisation consulting.

Press Mirror

Deutsche Presseagentur (dpa) Mecklenburg-Vorpommern, 6.09.2023

Zur Ticker Übersicht

06.09.2023, 15:41 Uhr

3D-Druck für Handwerker - Erstes «CraftLab» in Betrieb

Das digitale Aufmaß fürs Haus, am Computer individuell angepasste Schienen für Gelenke und Muskeln, Produkte aus dem 3D-Drucker - all das können angehende Handwerksgesellen und Handwerksmeister künftig im «CraftLab» der Handwerkskammer Schwerin lernen. Im Bildungszentrum der Kammer wurde am Mittwoch der «Innovationsraum» für das Handwerk eröffnet, wie die Handwerkskammer und das Wirtschaftsministerium MV gemeinsam mitteilten.

Das mit Computern und modernen Maschinen gespickte Labor wurde den Angaben zufolge mit wissenschaftlicher Begleitung durch das Heinz-Pienst-Institut Hannover und mit Fördermitteln in Höhe von rund 400.000 Euro aus dem Bundeswirtschaftsministerium aufgebaut. Nach den Worten von Kammerpräsident Uwe Lange soll das als «Schweriner Modell» bezeichnete «CraftLab» (Craft für Handwerk, Lab für Labor) Vorbild für weitere Innovationsräume dieser Art in anderen Handwerkskammern sein. «Mit einem derart kreativen Schulungsraum als Zukunftswerkstatt für unsere Handwerker nehmen wir eine Vorreiterrolle ein», sagte Lange.

Der Geschäftsführer des Deutschen Handwerkskammertages, Dirk Palige, betonte, das «CraftLab» sei die Zukunft des Handwerks. «Handwerk und Politik setzen damit gemeinsam ein Zeichen für mehr Sichtbarkeit und Wertschätzung der dualen Berufsausbildung. Genau diese Wertschätzung braucht das Handwerk bundesweit, um künftig mehr junge Menschen für eine Karriere im Handwerk zu begeistern.»

Auch die Leiterin der Abteilung Mittelstandspolitik im Bundeswirtschaftsministerium, Sabine Hepperle, zeigte sich begeistert. «Die Kammer setzt hier neue, modernste Maßstäbe in der beruflichen Fort- und Weiterbildung, die bundesweit ausstrahlen und viele Nachahmer finden wird», erklärte sie.

Beitrag Ostseewelle, 6.09.2023:

https://www.ostseewelle.de/nachrichten/nachrichtentickermv/3D-Druck-f%C3%BCr-Handwerker-Erstes-%C2%ABCraftLab%C2%BB-in-Betrieb-id960011.html

Beitrag Schwerin TV, Wismar TV, 9.09.2023:

https://www.youtube.com/watch?v=abSKd_O2400

Mecklenburg-Vorpommern

3D-Druck für Handwerker - Erstes "CraftLab" in Betrieb

06.09.2023, 15:50 Uhr

Artikel teilen Jetzt folgen

Schwerin (dpa/mv) - Das digitale Aufmaß fürs Haus, am Computer individuell angepasste Schienen für Gelenke und Muskeln, Produkte aus dem 3D-Drucker - all das können angehende Handwerksgesellen und Handwerksmeister künftig im "CraftLab" der Handwerkskammer Schwerin lernen. Im Bildungszentrum der Kammer wurde am Mittwoch der "Innovationsraum" für das Handwerk eröffnet, wie die Handwerkskammer und das Wirtschaftsministerium MV gemeinsam mitteilten.

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CraftLab:

Handwerkskammer Schwerin eröffnet Deutschlands ersten Innovationsraum

Von **Stefan Rochow**
Veröffentlicht **September 7, 2023**

Die Handwerkskammer Schwerin hat gestern Deutschlands ersten Innovationsraum für das Handwerk eröffnet. Das „CraftLab" wurde mit wissenschaftlicher Unterstützung und Bundesfördermitteln ins Leben gerufen und soll die Digitalisierung im Handwerk vorantreiben.

Dirk Palige, Uwe Lange, Dr. Sabine Hepperle, Jochen Schulte und Kammer-Hauptgeschäftsführer Dr. Gunnar Pohl (v.l.) eröffnen Deutschlands ersten „CraftLab" | Foto: HWK Schwerin

Bislang einziges Modell in Deutschland

Jochen Schulte, Staatssekretär im Ministerium für Wirtschaft, Infrastruktur, Tourismus und Arbeit des Landes, würdigte die Initiative. „Eine Studie zur Digitalisierung des Handwerks vom Zentralverband zeigt eindeutig, dass eine breite Mehrheit der befragten Unternehmen den Möglichkeiten der Digitalisierung aufgeschlossen gegenübersteht", betonte Schulte. „Die Handwerkskammer Schwerin geht den richtigen Weg zur Unterstützung der Betriebe. Das CraftLab-Projekt ist bislang einmalig in Deutschland und kann die Digitalisierung im Handwerk weiter voranbringen, um wettbewerbsfähig zu bleiben."

Dr. Sabine Hepperle, Leiterin der Abteilung Mittelstandspolitik im Bundesministerium für Wirtschaft und Klimaschutz, zeigte sich von der Innovationskraft der Handwerkskammer beeindruckt. „Die Kammer setzt hier neue Maßstäbe in der beruflichen Fort- und Weiterbildung, die bundesweit Aufmerksamkeit finden wird."

Konzentration auf Innovation im Handwerk

Dirk Palige, Geschäftsführer des Deutschen Handwerkskammertages und des Zentralverbandes des Deutschen Handwerks (ZDH), bezeichnete das CraftLab als „Zukunft des Handwerks, die heute schon Realität ist". Er betonte die Bedeutung der dualen Berufsausbildung und die Notwendigkeit, mehr junge Menschen für eine Karriere im Handwerk zu begeistern.

Das CraftLab konzentriert sich auf Innovationen im Handwerk und verfolgt das Ziel, digitale Technologien schneller in die handwerkliche Praxis zu integrieren, insbesondere durch die Meisterausbildung. Das Werkstattkonzept bietet verschiedene Praxisstationen, an denen digitale Arbeitsprozesse, 3D-Druck und Modellierung sowie mobile 3D-Aufmaßsysteme vermittelt werden. Diese Stationen werden regelmäßig aktualisiert, um mit den neuesten Entwicklungen Schritt zu halten. Das CraftLab ermöglicht somit, die Digitalisierung und neue Technologien schneller im Handwerk einzuführen.

DIGITALISIERUNG

3D-Druck für Handwerker - Erstes "CraftLab" in Betrieb

06.09.2023, 15:41 MERKEN

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dpa

Schweriner Volkszeitung, 8.09.2023

Zitat des Tages

„Diese Berichte und Hetzen bilden aber keinesfalls die tägliche Realität in unserer Einrichtung ab."

Patrick Böttcher
Einrichtungsleiter
Seite 9

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Es sei wichtig, ein Erlebnis dabei. Sein Standnachbar Ulf Premiumpaket frei. Collage: Verena Lukaschik

3D-Druck für Handwerker

„CraftLab" in Schwerin in Betrieb genommen

Iris Leithold

SCHWERIN Das digitale Aufmaß fürs Haus, am Computer individuell angepasste Schienen für Gelenke und Muskeln, Produkte aus dem 3D-Drucker – all das können angehende Handwerksgesellen und Handwerksmeister künftig im „CraftLab" der Handwerkskammer Schwerin lernen. Im Bildungszentrum der Kammer wurde am Mittwoch der „Innovationsraum" für das Handwerk eröffnet, wie die Handwerkskammer und das Wirtschaftsministerium gemeinsam mitteilten.

Das mit Computern und modernen Maschinen gespickte Labor wurde den Angaben zufolge mit wissenschaftlicher Begleitung durch das Heinz-Pienst-Institut Hannover und mit Fördermitteln in Höhe von rund 400 000 Euro aus dem Bundeswirtschaftsministerium aufgebaut. Nach den Worten von Kammerpräsident Uwe Lange soll das als „Schweriner Modell" bezeichnete „CraftLab" (Craft für Handwerk, Lab für Labor) Vorbild für weitere Innovationsräume dieser Art in anderen Handwerkskammern sein. „Mit einem derart kreativen Schulungsraum als Zukunftswerkstatt für unsere Handwerker nehmen wir eine Vorreiterrolle ein", sagte Lange.

Der Geschäftsführer des Deutschen Handwerkskammertages, Dirk Palige, betonte, das „CraftLab" sei die Zukunft des Handwerks. „Handwerk und Politik setzen damit gemeinsam ein Zeichen für mehr Sichtbarkeit und Wertschätzung der dualen Berufsausbildung. Genau diese Wertschätzung braucht das Handwerk bundesweit, um künftig mehr junge Menschen für eine Karriere im Handwerk zu begeistern." Auch die Leiterin der Abteilung Mittelstandspolitik im Bundeswirtschaftsministerium, Sabine Hepperle, zeigte sich begeistert. „Die Kammer setzt hier neue, modernste Maßstäbe in der beruflichen Fort- und Weiterbildung, die bundesweit ausstrahlen und viele Nachahmer finden wird", erklärte sie. *dpa*

Digitales Handwerk: „Mecklenburg-Vorpommern ist Spitzenreiter“

Eröffnung des Craft-Labs in der Landesmetropole Schwerin

VON CONSTANTIN KRÖGER

SCHWERIN. In der Handwerkskammer Schwerin ist endgültig das digitale Zeitalter eingeläutet worden: Als erste Handwerkskammer Deutschlands bietet sie nun ein sogenanntes Craft-Lab an. Hier soll die Zukunft des Handwerks dem Nachwuchs nahegebracht werden: Statt Werkbank stehen im Lab riesige 3D-Drucker und anstelle von Lackierspritzen VR-Brillen. Mit dem Craft-Lab ist man laut Pressesprecherin Petra Gansen nun Vorreiter für Kammern in ganz Deutschland. „Ich bin tiefbeeindruckt, wie hoch der hier präsentierte Grad an Digitalisierung ist. Ich sehe hier viel Potenzial“, sagt Sabine Hepperle. Die Leiterin der Abteilung Mittelstandspolitik im Bundeswirtschaftsministerium, welches den Bau des neuen Craft-Labs mit mehr als 400 000 Euro Fördermitteln unterstützt hat.

„Dank der Fördermittel konnte dieses Projekt überhaupt so umgesetzt werden“, sagt der Geschäftsführer der Handwerkskammer Schwerin, Gunnar Pohl. Er sieht das Schweriner Craft-Lab als Blaupause für viele weitere Projekte innerhalb Deutschlands Handwerkskammern.

Doch was ist das Craft-Lab genau? „Hier können Auszubildende und Meisterschüler mit digitalen Lösungen in Berührung kommen“, so Olaf Blesting, Digitalisierungsexperte der Handwerkskammer Schwerin. So würden im Craft-Lab diverse Möglichkeiten angeboten werden, welche gewerkeübergreifend genutzt werden können. So zum Beispiel eine 3D-Vermessungsanlage oder 3D-Druck.

„Diese neuen Techniken sollen dann die Schüler als Inspiration in ihre Ausbildungsbetriebe mitnehmen. Dabei beschränken sich die Möglichkeiten des Craft-Labs nicht nur auf neue Arbeitstechniken. Auch neue Schulangebote finden hier Platz. So kann mithilfe einer VR-Brille das Lackieren geübt werden. Das ist ganz im Sinne der Nachhaltigkeit, denn Lackieren, Beschichten und Sandstrahlen kann hier ohne Materialverbrauch geübt werden.

„Mit dem Craft-Lab ist Mecklenburg-Vorpommern Spitzenreiter“, sagt Dr. Gunnar Pohl. Und auch erste Handwerkskammern aus anderen Bundesländern seien schon interessiert, verrät er. „In anderen Bundesländern sind Projekte nach dem Vorbild Schwerin in Planung“.

Bei der Eröffnung waren neben Präsidenten und Geschäftsführer der Handwerkskammer Schwerin auch Jochen Schulte, Staatssekretär im Landes-Wirtschaftsministerium. Auch diverse Landtagsabgeordnete nahmen an der Eröffnungsveranstaltung teil.

Video der Eröffnung: Per QR-Code oder www.ostsee-zeitung.de/video

Hannah Jantzen übt das Lackieren mithilfe von Virtual Reality. FOTOS: BERT SCHAFFENBERG

Craft-Lab der Schweriner Handwerkskammer wurde feierlich eröffnet.


Startseite › Mecklenburg-Vorpommern › Craft-Lab in Schwerin ist Zukunft des Handwerks: Azubis üben mit VR-Brille das Lackieren
MV ist Digitalisierungs-Spitzenreiter
Azubis üben mit VR-Brille das Lackieren: Craft-Lab in Schwerin ist Zukunft des Handwerks
Feedback
Artikel anhören • 3 Minuten
Ob mit 3D-Druck oder digitaler Vermessung: Im Craft-Lab in Schwerin können Auszubildende und Meisterschüler aller Gewerke dank digitaler Lösungen modern lernen. Andere Handwerkskammer in Deutschland sind bereits interessiert an der innovativen Idee aus MV.

)9.23, 08:07 Craft-Lab in Schwerin ist Zukunft des Handwerks: Azubis üben mit VR-Brille das Lackieren

Der 3D-Drucker im Craft-Lab der Handwerkskammer Schwerin.
© Quelle: Bert Scharffenberg

Digitale Lösungen für alle Gewerke im Craft-Lab in Schwerin

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© Quelle: Bert Scharffenberg

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Craft-Lab der Schweriner Handwerkskammer eröffnet

RTL

Digitalisierung

3D-Druck für Handwerker - Erstes „CraftLab" in Betrieb

7. September 2023 um 22:50 Uhr

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s://www.rtl.de/cms/3d-druck-fuer-handwerker-erstes-craftlab-in-betrieb-f00567b9-ba22-5a21-affe-104015e33210.html

6.2 Development of the promotional capacities of IPOSZ in Hungary

Improving collaboration between architects and construction companies

A series of conferences was developed and successfully implemented in Hungary to improve collaboration between architects and construction companies through digitalization. The first conference took place in November 2024 and was attended by 34 people. The second conference was held in February 2025 with 27 participants. This successfully launched cooperation forum will be continued after the end of the project.

Architect – Constuctor Digital Discussion first day[8]

Architect- Constructor Digital Discussion I. Day was organised by IPOSZ at the headquarters of the National Association of House Painters, Varnishers, and Wallpaperers

[8] Prepared by Hungarian Association of Craftmen's Corporation, Budapest

The event held on November 22, 2024, in Dunaharaszti, aimed to facilitate collaboration between designers and contractors working in the construction industry. During the professional event, participants had the opportunity to learn about the latest technological innovations and engage in industry discussions that could contribute to more efficient and higher-quality work.

The event began with a professional presentation by József Horváth, head of the PPG Trilak Kft. Painting Academy, titled *"Innovations in Interior Wall Paints."* The presentation placed particular emphasis on new technologies and materials that can enhance the quality of design and construction processes. The event provided an excellent opportunity for designers and contractors to discuss the practical application of new solutions together.

After the professional presentation, **Gergő Németh** introduced himself and briefly summarized his experiences and insights gained at the **2024 WorldSkills competition in Lyon**. Gergő returned home from the September World Championship with an **Excellence Medal** in the **painting and decorative painting category**.
https://worldskillshungary.hu/versenyzok/nemeth-gergo

Roundtable Discussion

After the break, the **Roundtable Discussion** began, initially focusing on **thermal insulation solutions, professional training opportunities, and energy-efficient renovations**. However, the nearly 40 participants—from vocational students to experienced master craftsmen—had the chance to gain a much broader perspective on these topics throughout the discussion.

A key focus of the conversation was **how to enhance collaboration between designers and contractors** to promote **sustainable construction industry developments**. Participants discussed how **joint efforts could facilitate the introduction of innovative solutions and ensure high-quality execution**.

The discussion was led by **Balázs Tordai**, an expert from **IVSZ – Association of Digital Enterprises**. IPOSZ and IVSZ have been successfully collaborating for years in various areas of **sectoral digitalization**, particularly in the **construction industry**. Their joint **workshops and training programs** have introduced **hundreds of businesses** to the benefits of digitalization.

This roundtable and the informal discussions that followed—accompanied by a **traditional homemade goulash**—served as one of the **Hungarian closing events of the Hanse Parliament DigCon project**, in which both organizations played a significant role in Hungary.

The **five participants of the Roundtable Discussion** explored, based on the questions posed, the **collaboration opportunities in the field of energy-efficient renovations**, with a particular focus on **thermal insulation**. They examined **which stakeholders could contribute to energy-efficient renovations**, including:

- **Where could the possible financing come from**
- **Where to find and how to train a sufficient professionals**
- **How to incentivize condominium and property owners to engage in renovations.**

A key takeaway from the discussion was that **enhancing cooperation between designers and contractors is crucial**. Effective communication and joint planning were identified as essential for ensuring **successful project execution and long-term sustainability**.

Participants of the Roundtable Discussion

- **Barbara Böröcz** – Representative of the **Hungarian Energy Efficiency Institute**
- **Dr. Kamilla Virág Busa** – Chief Editor of **Társasház & Háztartás Magazine** issued by the Condominium Association
- **Ferenc Dömsödi** – Adult Education Sales Manager at **Kecskemét Vocational Training Center**
- **József Horváth** – Head of the **PPG Trilak Kft. Painting Academy**
- **János Juhos** – Vice President of the **Hungarian Association of Craftmen's Corporations (IPOSZ)**

The **roundtable discussion** at the **IPOSZ Professional Day** provided a comprehensive overview of **thermal insulation and future opportunities**, considering perspectives from **vocational training, energy efficiency, condominium management, and the painting, varnishing, and wallpapering profession**. Participants shared their experiences and recommendations, covering various aspects of the topic. However, they all agreed on the **importance of professional development, education, and energy efficiency** as key priorities.

The Role of Vocational Training

Ferenc Dömsödi, **Adult Education Sales Manager at the Kecskemét Vocational Training Center**, emphasized the **importance of Vocational Training Centers and Sectoral Training Hubs**, which provide professional education for both **young people and adults nationwide**. While state funding for education is ensured, **the low number of qualified instructors and training workshops at dual training partners remains a significant challenge**.

To facilitate the introduction of **new technologies**, it is essential to develop **online educational materials** and **supplementary resources** related to specific competencies. Additionally, there is a growing need for **up-to-date, motivated instructors** who can pass on **practical, workplace-relevant knowledge**. Dömsödi highlighted that vocational education currently holds **great development potential**. However, accelerating the involvement of **digitally proficient, highly skilled, and patient instructors** could significantly **boost progress and innovation in the field**.

Condominium Management and Digitalization

Dr. **Kamilla Virág Busa**, chief editor of **THT professional journal**, emphasized the **importance of knowledge sharing and digitalization** in **condominium management**. She highlighted that **THT journal** and the **eHÁZ condominium management software** provide **modern solutions** for property managers, simplifying **document handling** and improving **transparency** in condominium operations.

Currently, the **eHÁZ software is used by 13,000 condominiums nationwide**, proving its efficiency. Dr. Busa also proposed the **creation of a national database of certified professionals**, enabling property managers to collaborate with **reliable, verified experts**. This initiative would **enhance the efficiency** of property managers while also **increasing residents' trust and satisfaction** with condominium management services.

The Importance of Energy-Efficient Renovations

Barbara Böröcz, representative of the **Hungarian Energy Efficiency Institute**, emphasized the **significance of energy-efficient renovations**. Her organization aims to **assist residents in planning and executing renovations**, including **thermal insulation, window replacements, and other energy-saving solutions**.

She highlighted that the **quality of professionals is crucial**, as **poor execution can lead to significant energy loss**. According to Böröcz, besides **raising public awareness**, it is essential for **vocational training centers to provide high-quality education** and teach the **latest technologies** to ensure effective and sustainable renovation practices.

Lifelong Learning in the Construction Industry

József Horváth, representative of **PPG Trilak Kft.**, emphasized the **importance of lifelong learning**. Due to the **rapid evolution of construction materials and technologies**, the content of **master certification exams** can become outdated

within just a few years. Therefore, professionals must engage in **continuous education and skill development**.

Horváth suggested integrating **technical skill development into primary school education** to foster **early interest in craftsmanship and manual dexterity**. Additionally, he advocated for the establishment of **educational academies**, where **training programs combined with factory visits** would provide hands-on learning opportunities and support professional development.

The Importance of Professional Cooperation

János Juhos, Vice President of **IPOSZ**, highlighted the **significance of professional collaboration**. He emphasized that **craftsmen's corporations** play a key role in **preserving professional traditions and promoting best practices**.

However, he also pointed out the **varying levels of openness to development among professionals**, which contributes to **uneven progress within the industry**. To address this, he suggested increasing **professional awareness and the desire for growth** through **international study trips and community programs**, helping professionals stay engaged with industry advancements.

Enhancing Master-Level Training and Professional Standards

Antal Tóth, former president of the **Painters' Guild** and a seasoned industry expert, emphasized the **importance of master-level training**, which should be developed based on **international best practices**.

He highlighted that improving **professional training programs** and introducing a **credit-based system** would be essential to ensuring **high-quality standards** in the industry. According to Tóth, **education and industry collaboration** would not only **enhance the prestige of the profession** but also help **attract younger generations** to the field.

Key Takeaways from the Discussion

The main takeaway from the roundtable discussion is that **professional development, education, and digitalization** require **focused attention**, but they will only lead to **real results** if there is active **dialogue and cooperation** between the different fields within the construction industry.

The participants agreed that **strengthening the relationship between designers and contractors** in the long term can foster **innovation** in the construction industry and contribute to the development of the **professional community**.

Knowledge sharing between professionals and their successors, supporting **quality execution**, and promoting **energy efficiency** are fundamental prerequisites for a **sustainable and competitive construction industry**.

The participants concurred that the **driving force of professional development** lies in **education and cooperation within the professional community**, which can, in the long run, have a **positive impact on the economy as a whole**.

Architect – Constuctor Digital Discussion second day[9]

Collaboration between Interior Designers and Contractors

On February 11, the DIGCON Professional Day for Interior Designers took place in Törökbálint, at MaxCity, organized by IVSZ in collaboration with IPOSZ and the Hungarian National Association of Interior Designers (LOSZ). The event focused on enhancing cooperation between interior designers and contractors, streamlining work processes, and exploring opportunities for professional development. A key objective was to create a relaxed environment where participants could openly discuss the challenges of collaboration, securing new talent, and adapting to digital transformation.

Participants were from different sectors such as designer, bookbinder, painter, stonemason, electrician, and people from very different ages participated from 30 years old to 70 years old. 11 participants were women from 27.

Strengthening Professional Cooperation and Communication

One of the event's primary goals was to foster dialogue between interior designers and contractors, as successful projects rely on transparent and efficient communication. Participants discussed various methods to improve inter-professional collaboration, the everyday challenges they face, and solutions for refining pre-planning processes.

The importance of professional training and additional workshops was also highlighted, emphasizing the need for cross-sector learning. Attendees agreed that establishing a common professional forum or online platform could greatly assist in maintaining continuous communication and sharing best practices.

Adult Education and Digital Support

The event also covered current opportunities in adult education, given the construction and interior design industries' reliance on continuous learning and adaptation. Presentations showcased the latest training programs designed to keep professionals up-to-date with emerging trends and technological innovations.

[9] Prepared by Informatikai Tavkozlesi Elektronikai Vallalalkozasok Szovetsege Egyesulet, Budapest

A heated discussion emerged on whether the current educational system supports professional growth effectively and how planned changes, such as shortening training programs, might impact education quality. Many participants emphasized the need for a closer connection between independent evaluation institutions and educators, ensuring that training meets the evolving needs of the industry.

Government initiatives aimed at accelerating vocational qualification processes were also a topic of interest. These initiatives involve integrating experienced masters into educational tasks, ensuring that students gain practical knowledge directly from industry professionals. In return, businesses receive market-based compensation for their contributions to education.

The Role of Data and Lean Principles in Construction

Experts from BME (Budapest University of Technology and Economics) presented the Data EDIH and its services, highlighting how digitalization is reshaping the industry. Digital tools and platforms are increasingly critical in construction and interior design, helping professionals optimize project efficiency.

Special attention was given to the role of data in construction projects, particularly in terms of communication and data-driven decision-making. Effective data management and information flow are essential to a project's success, facilitating transparent workflows and reducing inefficiencies.

The Lean approach is playing an increasingly significant role in process optimization, particularly in identifying and minimizing waste. By leveraging data analysis, construction and interior design projects can be better planned and executed, reducing time and financial losses.

Conclusion and Future Steps

The DIGCON Professional Day proved to be a valuable platform for knowledge exchange, allowing professionals to share experiences and brainstorm future collaboration opportunities. Organizers emphasized the importance of maintaining dialogue and further developing interdisciplinary cooperation, ensuring that designers and contractors can work together more effectively in the future.

These informal gatherings are crucial, providing a space where industry players can freely express their views, discuss challenges and opportunities, and foster stronger professional relationships.

Participation in the event was free but required prior registration, and the high level of interest demonstrated that industry professionals are eager to strengthen collaboration and advance their skills. Given the event's success, similar professional forums are expected to be in high demand in the future.

Online SME consulting in the Digitization in the construction industry[10]

This activity, the regular online SME consulting for construction finishing trades, was included in the work package 3, as a new element of the project implementation. We assumed that the large number of constructions companies finishing trades that are members of IPOSZ would welcome this new regular online consulting service.

During the implementation of the online consulting service, we continuously asked for the opinions of member companies, and if they wanted to learn more about new topics, we expanded the consulting service to new topics, inviting new experts. We tried to take into account our members' interest as much as possible when we implemented the online consulting service.

This service was suitable and available for micro and small businesses from many branches of finishing trade. During the online SME consulting service we take into consider and used the results of „Best practices digital technologies and trainings ".

What service was carried out?

During the implementation of the project, the regular online consulting covered a total of 4 main areas. These 4 areas were the following:

- TERC-ETALON, Online Budgeting Software for construction finishing trades. Presentation of Terc-Etalon software to entrepreneurs for 9 different construction industry sectors, followed by personal online consulting to explain and to teach the use of the online budgeting software.
- Discussion of policy papers prepared by the EBC, the European Builders Confederation. We dealt with policy papers affecting the digitalization and technological renewal of the construction industry, in order to enable the micro and small business community represented by IPOSZ to become familiar with the decision-making process of the EU and possibly form an SME-relevant opinion on these policy papers. IPOSZ is a member of the EBC, which means we have the opportunity to learn about EU-level decision-making materials. During the online service, we examined and discussed 12 EU decision-making materials affecting the construction industry with our member companies. We also used these online opportunities to present the Best Practices developed in the project.

[10] Prepared by Hungarian Association of Craftmen's Corporation, Budapest

- Energy performance of buildings. Hungarian Home Renovation Program. Energy Performance of Buildings Directive has been reviewed, the new regulation has many specific impacts on the energy efficiency of buildings. In this context, the Hungarian government has launched a program to improve the energy efficiency of buildings, which can be achieved through multi-stage technological modernization. These technological renovations are carried out by construction companies belonging to the IPOSZ, this is why we have presented this government program several times in detail in the frame of the regular online consulting.
- Technological solutions for the digitalization of the construction industry, company presentations, altogether presentation of 24 different technological solutions, applications.

The online service included online classroom studies, presentations where the different topics were introduced and were combined with group or personal consultation where the students were able to consult with the experts.

The approach of this online service was practical and considered the background of the participants.

We organized this service mostly for the company members of IPOSZ.

Period of implementation, topics by topics

Before starting our regular online consulting service, we went to a leading TV channel on 21. December 2022, where we explained in detail the main element of our new online service.

We started regular online SME consulting on January 11, 2023. The first topic was Terc-Etalon, Online Budgeting Software for Construction finishing trades. In the frame of this topic, we held online workshops for the following professions, typically 2-2 times for every profession with the participation of 15-20 entrepreneurs on average:

- Painters, decorators
- Solar system experts
- Electricians
- Stonemason workers
- Mechanical workers
- Builders
- Plumbers
- Renewable energy system experts

These online demonstration workshops were typically held on Wednesday afternoons from January to May 2023. These online workshops were characterized by lectures. Here, entrepreneurs could get acquainted with the online budgeting software in groups.

These group sessions were followed by regular individual consulting sessions in the months following May.

As part of the regular online consulting service, we started to deal with the second major topic in January 2024. During a 3 months period, we processed and discussed the EU-related decision-making policy papers of the EBC, the European Builders Confederation issued in the field of digitalization, with Hungarian construction companies so that they could learn about the decision-making mechanisms in the EU and had the opportunity to give their opinion on these policy papers. On these occasions, we naturally presented the digital technology solutions included in the collection of Best Practices created in the project.

The third major topic we addressed during our regular online SME consulting was related to the Energy Performance of Buildings Directive, revised in 2024. In order to achieve the energy-efficiency growth requirements expected by the EPBD, Hungary has launched a number of measures. One of the most significant measures launched by the government to achieve the EPBD' objectives was that the government publication a new home renovation grant for the energy modernization of single- and multi-family houses built before 31. December 1990. This home renovation grant was available from 03 June 2024. Given the fact that such small-scale, single-family homes energy modernizations are carried out by IPOSZ member companies, we started to monitor and inform our member companies about this state-supported renovation program from April 2024 til June, by holding regularly online consulting to help the preparation of our member companies as the details of the home renovation grant changed many times. We have conducted this monitoring and information activity for months within the framework of the online service because these energy-efficiency renovations represent a huge business opportunity for our member companies.

The fourth major topic we addressed during our regular online SME consulting was when we presented different technological solutions for the digitalization of the construction industry. We held company presentations from July 2024, around 20 times. These technological solutions, company cases included the following:

- Planradar, Construction Management Software

- Archline, Computer-Aided Desing
- Orthograph, Digitalization Real Estate Surveys
- Data-EDIH
- Tool Connect
- Heat pumps, Chillers and VRF Systems
- Elco
- Stiebel Eltron
- BIM Energy
- Daikin, hybrid heat pumps
- Alliance with smart properties
- Atrox
- OOTT
- Chameleon
- Siemens
- Legrand
- Netatmo
- Aereco
- Grundfos

Special features of the implementation, organization of the online SME consulting service

The online SME consulting service was an absolutely new element of the project. There were no educational materials prepared before for this service. During the implementation period, at each consulting occasion, we have always tried to involve an expert of the given topic, the representative of the company dealing with the relevant technology. It is the basic interest of these companies to pass these technological solutions sold by the company to the widest possible range of businesses.

Of course, we also tried to promote the collection of best practices prepared in the DIG-Con project on these online occasions and relied on our own experts.

When recruiting participants, we followed several methods. There were many occasions where the businesses concerned were directly notified and anyone was free to attend the online occasions. At the same time, there were topics, typically the corporate presentations of digital technologies, where we invited only some representatives from each region to learn about the technology in detail. These regional representatives will then have the task of organizing separate information events to ensure that the digital technologies presented can reach the widest possible range of construction companies. By doing so, we also wanted to promote the self-organization of businesses in individual regions.

The participants of the online consulting examined in detail the teaching materials prepared by the teacher.

It was also determined that the online service must be flexible, if a part of the topic was deemed particularly important by the participants, then it was possible to integrate new digital solutions into the topics.

The experiences and the training materials provided by the project partners were widely discussed with the membership of IPOSZ, as well as with professionals involved in the sector.

All participants of the online SME consulting acquired new skills and new knowledge, which are necessary for their everyday work in the construction sector in today's digital world.

In addition to online lessons, the participants during the training had the chance to complete self-learning tasks in many ways, where the instructors continuously gave them feedback.

The topics used in online SME consulting could be used of course regarding enterprises of different sizes. This consulting is valuable not only for micro-enterprises, but also for medium-sized enterprises. At the same time, it should be emphasized that the main target group of the service was the staff members of finishing trade construction companies. The main goal of the online SME consulting was to make these staff members as up to date as possible in digital technologies available in the construction sector.

In a large company, there are always employees who constantly monitor the latest solutions in digital technologies. However, in a micro-enterprise, there is not necessarily time for this, there is no separate employee for this. Therefore, it is especially important for micro-enterprises, for small companies to have the opportunity to learn about the latest digital solutions through short, practice-oriented training courses or even a few hours of online presentations, consulting occasions. During these few hours' presentations, during the online consultation they can gain knowledge that can greatly help the efficiency of their business and improve communication with other construction professions and clients.

Regardless of the size of the company, no one can be exempt from the effects of digital changes, whether they are employees or employers. Everyone must learn new skills and new knowledge if they want to be actively involved in the more and more digitalized working environment, as more and more digitalized processes affect the life of construction companies.

1.67% of companies operating in the Hungarian construction industry are medium enterprises, 5.52% are small enterprises and 92.3% are micro enterprises. And of this 92.3%, 90% are companies with less than 4 people. Typically, IPOSZ's membership comes from this circle of entrepreneurs. It is particularly characteristic for micro-enterprises that they do not have such specialized knowledge; they do not have experts who could use the most up-to-date digital knowledge and applications within the enterprise. However, there is an increasingly significant group of these micro-enterprises who increasingly use modern digital technologies, including those technologies and digital solutions which were presented during the regular online SME consulting.

This circle of micro-entrepreneurs needs external help, external expertise. For them, the acquisition of digitalization skills is important, on the one hand, for the services that they provide directly to their customers and on the other hand when these companies cooperate with each other's. This can only be done with up-to-date level digital knowledge in the construction industry.

As a general comment, it can be stated that during the implementation of the online SME consulting, the participants reviewed an extremely wide range of digital solutions and adapted them to their own business needs.

There were several consulting days when more topics could have been added, when participants said that it would be good if this or that topic could be explained better, more thoroughly. But in fact, if someone had a specific question, we always ensured the possibility to discuss it in detail.

Summary assessment of implementation

Despite the fact that micro-enterprises have significantly smaller financial and human resources than large enterprises, they still see one of their possible breaking points if they educate themselves and become more digitalized in certain construction areas.

We must emphasize that many more projects, support, information and services are needed in order to speed up the catching up of the construction micro business sector to the digitalization.

We are convinced that if we are not able to address the many thousands of family and micro businesses on a wider scale in time with appropriate training, digital training, consulting services then an employment crisis may arise, as they will not be able to perform their construction work at a high level. Digitization is bringing new devices and technical solutions to the market and into the hands of wide circles of the population. Therefore, online consulting services in this direction,

such as those implemented in our present project, can contribute to keeping the micro enterprises well-trained working in construction.

Such a consulting service is extremely useful, where businesses can learn about the latest technologies. Moreover, it is at least as useful for customers as they can be educated during online consulting. This way, when formulating their orders and development plans, they will be aware of what options and technological solutions exist today. If we expand the knowledge of customers, we can also awaken new desires in them, which will ultimately lead to a better quality of life and a larger construction industry production volume.

In the long term, our plan is definitely to continue such an online consulting service, involving a much wider range of the target group. It is an obvious fact that short-term, practice-oriented online consulting services, where small businesses can improve their digital skills, can help a lot. But this largely depends on the companies creating technological solutions. They are interested in regularly informing interested parties about their solutions and want to use the IPOSZ communication channel for this. This represents a very serious opportunity for an SME association and of course it also requires a lot of organizational work from them. The DIG-CON project was a huge help in creating such an organizational capacity at IPOSZ, which can greatly help that the latest technological solutions can reach to the relevant business community directly.

Although we can't tell when the online SME consulting service will continue, we have successfully laid down the foundations of such a service in the DIG-CON project.