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Development of digital skills training for work-age adults:

experience, obstacles, and further improvements

Master's Thesis 2022

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ABSTRACT

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The Finnish education system is recognized for its high excellence and innovativeness, especially for its effective elementary education. In its turn, the Finnish adult education is undeservedly not so commonly identified, but solid, and offers a wide range of opportunities for lifelong learning and self-actualization. This research focused on the identification of innovative trends that are visible in Finish non-formal education. Such observations and analysis are made possible through the application of action research methods, literature review, surveys, and implementation of digital skills course development project at Etelä-Karjalan Kansalaisopisto, Lappeenranta. In the research mixed methods of data collection were used. That allowed gathering empirical data and comparing it with academic studies done by other researchers. The theoretical findings of the research show that innovative educational trends recognized by international researchers were also identified in the educational and managerial initiatives of the Finnish non-formal adult education organization. That could be a sign that Finnish education and its organizational processes are keeping pace with global trends. Moreover, the work that was accomplished made it possible to achieve the essential goal of the study's empirical part: to bring practical benefits, formulate recommendations and achieve the satisfaction of the educational organization and its clients.

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Olga Kryuchkova

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ABBREVIATIONS

AEC - adult education centers

EKKO - Etelä-Karjalan Kansalaisopisto

SSM - Soft Systems Methodology

TIEKE – Finnish Information Society Development Center

VST - Vapaa Sivistystyö ry is a national advocacy organization for free cultural work.

VET – Vocational education and training association

1 Introduction

1.1 Background

This master's work contains an analysis of data obtained during the development and implementation of the educational project for Etelä-Karjalan Kansalaisopisto (EKKO). In the academic year 2021–2022, EKKO organized free digital skills courses for working-age people to support the accessibility of information for diverse groups of people with different cultural backgrounds. The learning initiative was organized within the framework of the project Myö, työ ja digitaidot, funded by the Finnish Ministry of Education. The courses were organized in Finnish, but also in English and Russian and supported to gain and update digital skills and best practices that were needed in working life, job search and study. The main idea behind the courses was to help improving everyday life, increase the level of stability in the context of COVID restrictions, situations of uncertainty and social disturbance. The research that was presented in this paper **reveals two sides:** technological and pedagogical. It was important to study what was the background of innovative processes that influenced the changes in non-formal education in Finland. Action research was used as a base for this work and aimed the collaboration between the researcher and members of EKKO in the direction to understand the current situation and outline pathways in a rapidly changing environment for further sustainable development. And finally, this paper attempt to **formulate possible practical recommendations for EKKO further strategy improvement** based on observations and implementation of course development.

The collaboration between technology and education revealed transformative powers these days. From the early stage of the pandemic, researchers started to underline that the Covid-19 and social upheaval would undo several decades of progress, especially in the opposition to poverty and inequality (Menta, 2021, Yeganeh, 2021, Mason et al., 2022). The pandemic has already clearly shown that we all live in one interconnected world, due to social and economic binding. The technology significantly enhanced the educational environment, and this provided us with hope to cope with the emerging situation (Schwartz-Bechet et al., 2012, Bower, 2017, Menon et al., 2022). Education is the universal good of the world, one of the most powerful instruments in attaining 17 sustainable development goals and the basis for

an unbiassed, equal, inclusive, and peaceful society. The task of building a world of a prosperous and productive society becomes impossible to realize when education systems have difficulties or even crumble. That is why applying an innovative approach, collaboration of technology and education are inevitable and crucial in the current situation.

This paper will be pertinent for those who want to dig deeper into the current situation and experience of course development for work-age people, based on the South Karelia Citizen college example in Lappeenranta. Additionally, this work can be interesting for those who are interested in understanding what is the current landscape of instruments and approaches that are applied in the organization and management of adult non-formal education. The experience presented in the work could be interesting not only to people directly related to education but also to a circle of stakeholders associated with the systematic qualification maintenance and staff adaptation in state and private companies.

The research presented in this paper has societal relevance because gathered data and experience helped to understand the local community better and how social institutors support the adaptation of citizens to changing environments. Also, this research has practical relevance, and the findings could be applied in real-life situations to improve processes in educational organizations.

1.2 Objectives and Research questions

The main purpose of this study is to systematize collected data for understanding how adult non-formal education can absorb innovative methods and combine them with the traditional didactic approach.

Let's note the **main aims** of this thesis:

- To categorize what are the innovation trends behind the evolution (changes) of adult non-formal education,
- To review pedagogical theories that are actual in the current situation,
- To formulate and provide practical recommendations to EKKO based on research and project results.

The main research question: What educational and organizational recommendations can be offered to a non-formal educational organization, taking into account global innovation trends?

Sub-question 1: What are the recommended practical instruments and approaches to increase the flexibility of organizational processes?

Sub-question 2 How to absorb innovative methods in the management and development of educational initiatives?

Services (Eksote, TE-toimisto, Migri and other state services) in South Karelia are offered in 3 languages: Finnish, English, Russian. South Karelian Citizens' College keeps up with the times and supports a diverse approach to offering accessible education in different languages for people with different cultural background. EKKO tries to prove the hypothesis that digital literacy courses are in demand not only in the Finnish language but in Russian and English too. They come to the decision to develop and promote such short free courses twice a year in autumn and in spring.

The theoretical framework for this thesis allows building a solid base for the application part of the research. It had the following main **contributions**: identification of innovative trends that were absorbed by contemporary non-formal education and the offering of practical recommendations based on the assessment of the literature, actual pedagogical theories, and innovative learning methods. The next step was gathering and analysis of data from the literature and other resources and planning experiential research, and after that, the practical study was directed. After all, data evaluation and interpretation took place. **The environmental framework** for this study was non-formal adult education.

1.3 Scope and limitations

The small size of samples was the main limitation of the research (5 college representatives, 24 currently working employees of Finish companies, 13 registered participants of the course). Another limitation of this research was that one person had responsibility for the research design and its implementation, course development and its delivery and at the same

time to collecting and analyzing all the data. A significant addition to the study would be the opinions of reviewers and subject matter experts who could help to reduce the degree of bias in the description of the design and implementation of the project, as well as in the interpretation of the results.

1.4 Methods

In this work, the choice of methods was made at the preliminary stage of the project. The basis of the theoretical part of the study was the literature review, the choice of methods and tools for the practical part. Empirical research as a methodology was chosen since the project was not limited to theoretical exploration, but also required to participate actively in the course conduction in the studied environment. Observations, surveys, and interviews were chosen as the main tool to study the audience, requirements, and environment. Observations of current courses made it possible to get acquainted with the current situation, get familiar with the approaches already applied in the educational organization. The analysis of the courses offered by other vendors and the courses recommended by the working employees of the companies allowed to correct the content of the designed courses. Interviews with representatives of the organization allowed to obtain additional information, find out the requirements and expectations for the implementation of the project. The surveys for participants helped to monitor the expectations, process, and results of the project.

During the work with scientific articles in the context of the project, it was important to understand the place of Finnish adult education in the European context, what skills are in demand today and will be in the near future. Motivation in learning, pedagogical methods and global innovation trends were also important to study in order to correlate with the current standards in Finnish non-formal adult education. The literature review covered five topics that are crucial in the context of the empirical part of the project:

- Results of the previous research, statistics and legislative base for adult education and non-formal education in Finland,
- The special role of motivation in adult education as main driving force of the learning process,

- The European skills agenda and digital skills that are actual currently and near future,
- Overview of the classical pedagogical educational approaches that support increasing flexibility and accessibility of contemporary adult education,
- The technological impact on these approaches and innovative contemporary approaches in adult education.

Questions in the practical part:

Concerns that were formulated by EKKO:

- What technical instruments and pedagogical methods can be used to reach a wider audience and provide higher accessibility of the courses?
- What kind of new digital courses are recommended to develop in near future?
- What are the recommendations on the organizational level?

1.5 The structure of the thesis

The master thesis consists of 7 main parts.

Table 1 Structure of the thesis

Input	Part	Output
Introduction to the topic and the thesis	I Introduction	Aims of the research, research question, content, structure, gaps
Recourses for the topic	II Literature review	The current situation in non-formal finish education, validation of technical tools and pedagogical approaches significant for covering the research question and aims of the work

Input	Part	Output
Overview of possible ways to conduct the research	III Research design	Tactical steps and practical actions for each step
Data that was collected from semi-structured interviews, observations, surveys, project implementation (experiment).	IV Empirical analysis	The explanation of data collection and analysis methods, assessment of the data
Results and findings	V Discussion of the results	Answering research questions and practical recommendations
Discussed results	VI Conclusions	Final summary of results of the research and further actions

2 Literature review

The highlighted five topics below are essential in the context of the research project, as it was important to understand the place of Finnish adult education in the European context, and what skills are in demand today and in near future. Motivation in adult learning, pedagogical methods and global innovation trends are interconnected and it was critical to correlate them with the current situation in Finnish non-formal adult education, legislative base and to consider them in the development of the project and in the formulation of further recommendations.

In the first part of the literature review documentation revealing the **current situation in non-formal education** in Finland and the legislative framework were considered. In the second part, the role of **motivation** in adult education revealed the nature and roots of the learner's intentions. This topic was important because the motivation could vary from socio-cultural circumstances, and it had to be considered and managed for the successful design and implementation of courses for adult learners. Since the focus of the practical part of the study was related to digital courses, it was crucial to understanding the current structure of **demanded digital skills** and the dynamics of their need in the near future. That was why the third part of the literature review touched upon the topic of current required skills, the evolution of their demand based on previous surveys and studies and considered specific digital skills that are promising in the future work context. To develop any effective courses for adults, it is important to understand the **pedagogical foundations of education,** to understand the difference between the techniques used when working with children and adults, to consider patterns and recommended approaches. That was why in the fourth part of the literature review, the most relevant theories and their key principles were mapped in a compact form. One way or another these theories were considered during the development and delivery of the courses in the empirical part of the research. Finally, in the conclusion of the literature review, the main six **innovative trends in adult education** were considered. It was important to do this to compare with the current situation in the Citizen college and answer the main research question posed at the beginning of the work.

2.1 Adult education and non-formal learning in Finland

To adapt to a rapidly altering environment and respond to the challenges of the time, the need for innovation and technology for the sustainable development of organizations is crucial as ever, and educational organizations are no exception. Education was always the basis for adaptive changes. Contemporary education started to saddle such disruptive technologies as augmented reality, virtual reality, artificial intelligence, big data processing, the internet of things and others for supporting personalized learning processes, individualized and immersive learning materials.

The Finnish education system is recognized for its high excellence and innovativeness, especially for its effective elementary education (Silke et al., 2020, Rantapero-Laine, 2022, Marjo Kenttälä, 2021). In its turn, Finnish adult education is undeservedly not so commonly identified, but solid and offers a wide range of opportunities for lifelong learning and self-actualization (Oecd, 2020).

Life-long learners are supported by the Finnish education policy (Valtioneuvosto, 2021, Finnish Government, 2019, Jatkuvan oppimisen kehittäminen Työryhmän väliraportti, 2019) and the Finnish education system offers versatile tracks to upgrade knowledge and skills. In our days when the labor market landscape changes rapidly, adults may entirely transform careers and study a new profession.

In Finland, adults of all ages can access education. Adults can claim and obtain education equally with young students. The adult education system in Finland offers a vast variety of courses specifically for adults. Classes can be organized in a such way that it is possible to study at the workplace, or combine with work, or study in own time with a flexible schedule. (Oecd, 2020).

According to the latest adult education and training report (European Commission /EACEA /Eurydice, 2021) in Finland in 2019 people aged 25–64 years who participated in adult education and training was 29 %. In compaction with the EU, data shows a lower percentage of involvement in education and training – only 10.8 % of adults of the same age category.

The adult population of Finland actively participate in different types of events to stay up to date or develop knowledge and skills.

Versatile forms of adult education and training can be recognized in Finland according to Opetus- ja kulttuuriministeriö (2021):

- General upper secondary education for adults,
- Vocational adult education and training,
- Staff training,
- Adult education in higher education institutions,
- Liberal adult education (nonformal education, not aiming for a degree),
- Labor market training.

Finnish universities with the help of government funds usually offer a formal form of education. In some situations, it is possible to participate in non-degree courses in higher education institutions or summer schools at universities. Though in situations when it is necessary to emphasize practical skills and recreation adults frequently use the services of non-formal learning without targeting qualifications or diplomas. These factors provide high-level of involvement in learning and its accessibility for adults. The liberal adult education in Finland is offered by the educational institutions gathered in the list below (Opetus- ja kulttuuriministeriö, 2021):

- General upper secondary schools for adults,
- Folk high schools,
- Adult education centers,
- Study centers,
- Sports institutes,
- Institutions providing basic art education (for example, music institutions),
- Summer universities.

These organizations by themselves formulate the objectives for the teaching agenda. These institutions as a rule join the associations and foundations and may exemplify various

ideological opinions and be responsive in their decisions to the local cultural and educational needs of the community.

Vapaa Sivistystyö ry (VST) The Finnish Association for Free Cultural Work (Swedish: Fritt Bildningsarbete rf) is a national advocacy organization for free cultural work. Its main members are the central organizations of five forms of free educational work based on the law on free educational work (Finlex, 1998):

- the Association of Citizens' Colleges (Kansalaisopistojen Liitto),
- the Study Centres Association (Opintokeskukset ry),
- the Finnish Folk High School Association (Suomen Kansanopistoyhdistys),
- the Finnish Summer Universities (Suomen Kesäyliopistot),
- the Association of Sports Colleges (Urheiluopistojen yhdistys).

The data from Silvennoinen and Lindberg (2015) report shows that staff training is the most common type of adult training in Finland, about 66 % of all annual adult trainings in total (Figure 2). And according to Statistics Finland (Seppänen, 2015) in 2015 it was spent 551 euros per employee on course training. The second most significant type is VST training, which accounts for about 14 per cent of all training.

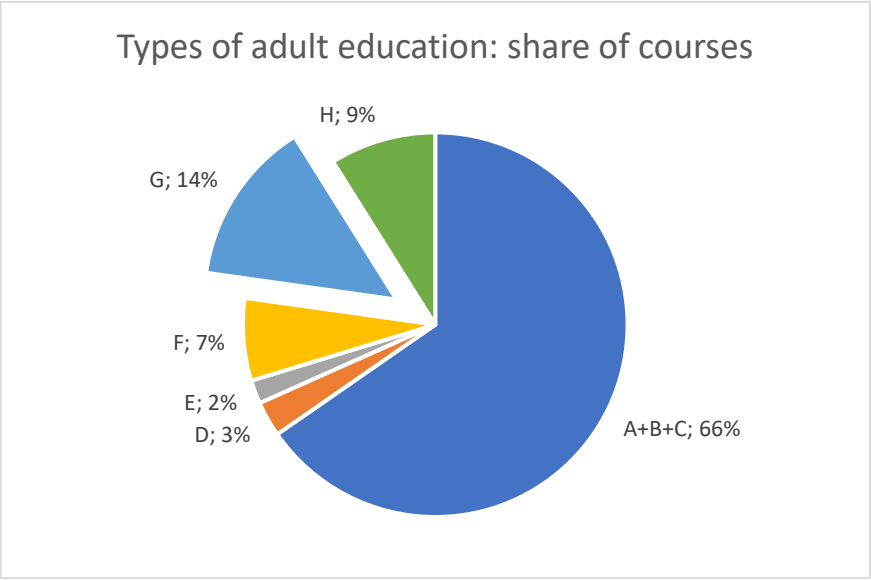


Figure 1 Types of adult education: share of courses (Silvennoinen et al., 2015).

A+B+C. Staff training (Henkilöstökoulutus)

D. Other trainings at work (Muu työpaikaikoilla koulutus)

E. Formal training relater on work or profession (Työhön tai ammattiin liittyvä formaali koulutus)

F. Other work and professional trainings (Muu työhön tai ammattiin liittyvä koulutus)

G. **VST-trainings (VST koulutus)**

H. Other hobby trainings (Muu harrasteperustainen koulutus)

Based on the information provided by kansalaisopistot.fi (2018) Finnish adult education colleges are a unique education system that is suitable for everyone who wants to learn and develop. Training organized as free cultural work aims to encouraging the integrity of society, human values such as impartiality and lifelong learning based on an active citizenship attitude. The aim of training organized as free cultural work is to encourage the additional various progress and well-being of people, to support the fulfilment of fairness, diversity, sustainable development, multiculturalism, and internationality. Free cultural work highlights self-directed learning, community, and inclusion. The courses that are offered by citizen colleges and adult education centers can be divided into two groups: self-development and recreation or hobbies. Participation in such courses is usually supported by great self-motivation and is not targeted to obtain a formal qualification. A vast variety of actual subjects such as Finnish and foreign languages, computer science, arts and crafts, music, sports, cooking, etc. are taught in adult education centers. Educational centers also quite often organize lectures and discussion groups on various topics, such as, for example, social and political problems of the current time. Usually, adult education centers offer Finnish as a foreign language course for immigrants to support their integration into Finnish culture. The variety of courses offered, as well as the scheduling of the school year, varies and reflects the needs of what the people of the region really want to learn. Citizen colleges are available to every inhabitant of the area, regardless of age, level of education and cultural background. Every year, more than 1 in 10 Finns, or 600,000 people in total, study at an

adult education center. The affordable price or even free-of-charge participation for the courses is explained by the fact that the educational centers are subsidized by the main government and local authorities. There are currently 176 adult education centers in Finland located throughout the country. Often, courses are held at a number of locations throughout the city, including schools, after school hours. This is quite common for large cities and cities with two or more educational centers. The main goal of the Finnish Adult Education Centers (Kansalaisopisto) is to provide education and learning opportunities that promote social cohesion, equality and the active participation of citizens, in accordance with the concept of lifelong learning. In this work, we will focus on the development and delivery of digital skills courses according to the requirements of Citizen college, and this experience will be the base for further recommendations.

The Statistics Finland report (Niemi, 2017) gives more detailed figures on involvement in adult education and training in 2017 in Finland. Worth mentioning is that the most demanded courses are the courses related to business and law, service, safety and hobbies, these courses have a share of about 30% of the total courses as it is shown in figure 2 below. On the other side, those courses dedicated to information technology and foreign languages occupy about 10% of the total figures. The scale can be more understandable in conjunction with the data that 93 per cent of the Finnish population spoke at least one foreign language in ages from 18 to 64 years old.

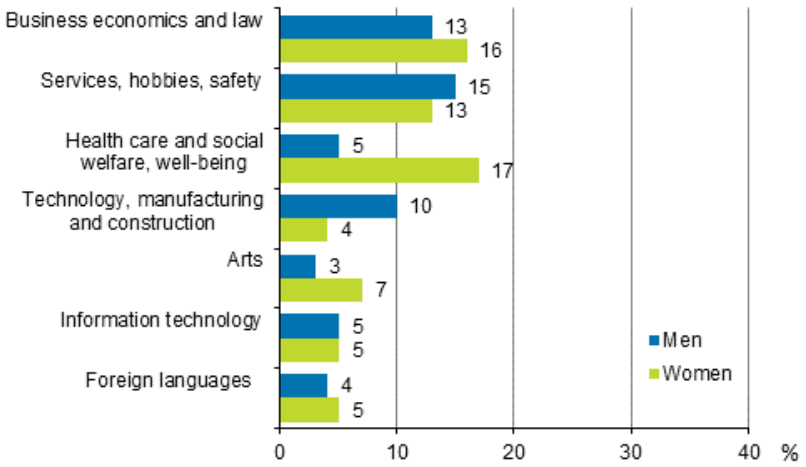


Figure 2 Participation in adult education in 2017 by education content and sex (Niemi, 2017).

A lot of services are providing help in choosing the place and appropriate form of study in Finland (For example, such services as aikuis-koulutus.fi/ and opintopolku.fi/konfo/fi/).

The education for adults is mainly free for EU citizens, it creates the opportunity to continue their study, even as an adult. Moreover, financial support can be provided for adults who desire to continue their education (Finlex, 2021).

One more important topic worth mentioning in this part is the assessment of knowledge and learning materials that were provided in such courses and their relevance to the already existing experience and skills of participants. There are several papers that provide different models for quality assurance of knowledge and learning materials (Dimou et al. 2016, Luka et al, 2020). Individual needs are focused on Finish society. **Validation of non-formal and informal learning** in Finland has solid and well-recognized regulatory ground. Though it is difficult to point one law concerning the certification of non-formal and informal learning, and there are separate legislative grounds for each area of education. The legislative base supports the idea that "validation of non-formal and informal learning is a subjective right of the individual and the competencies of an individual should be validated regardless of when and where they have been acquired". (Eurydice/Validation of non-formal and informal learning, 2017) Initially, Finland had Vocational Adult Education Act (631/1998) (FI: Laki ammatillisesta aikuiskoulutuksesta), containing comprehensive regulation of non-formal learning validation. In 2018, the legislation was transformed, and the Act on Vocational Education (630/1998) and The Vocational Adult Education Act (631/1998) was combined to a single Act: Vocational Education and Training Act (531/2017). The reasons for the changes were to simplify the system in terms of legislation for meeting proficiency needs and allowing more autonomy and flexibility. The very basic idea stays behind adult non-formal education: the **previously acquired competence of adults should be identified**. The competence-based vocational qualifications system prevails in Finnish adult education and proposes prospects for work-age people to obtain proper qualifications grounded on the value that "full and partial competence-based qualifications can be awarded regardless of how and where the competencies and knowledge have been acquired". Identification of earlier education is the foundational idea of this approach, and in notion, adults "can obtain

such qualifications without any formal training et all". In other words, "there are no requirements to complete a certain number of studies and the requirements are described in terms of learning outcomes" (Cedefop, 2019). In the beginning, a **personal competence development plan** was developed for all students. If it is applicable before the educational process starts the teacher or counsellor of the company together with the student formulate an individual plan. It can be changed, if necessary, along the course of study. The study plan may contain data on different characteristics:

- identification and recognition of prior learning;
- how and which missing skills are acquired based on the learner's current competence and the qualification requirements;
- how competence demonstrations and other demonstrations of skills are organized;
- what guidance and support may be needed (Cedefop, 2019).

The existing knowledge grounds are assessed before the study and then students' study only subjects that they do not know, filling the gaps in knowledge and obtaining needed skills. Training validation procedures are developing with time and becoming more common and frequently used.

2.2 Role of motivation

Motivation is the fundamental base for successful development of the person and fast progress in getting new skills, this has repeatedly been emphasized by several researchers (Boshier, 1973, Boshier, 1985, Cropley, 1985, Long, 1992, Dweck, 2000). Many research studies have shown that motivation impacts the learning process in many ways. For example, it directs our focus toward specific learning goals, it increases our energy and drives to succeed it sustains our attention and commitment, and it lifts our performance higher. Not all forms of motivation have the same effect on learning. Educational psychologists have identified two broad categories of learner motivation. Intrinsic, or internal and extrinsic, or external adults in Finland have a very positive attitude and strong **internal motivation** for learning and many individuals pursue prospects to improve their specialist capabilities or expand their qualified skills and knowledge. Such internal factors as enhanced job

satisfaction, self-esteem, raising the quality of life and others, are traditionally considered the most powerful motivators (Knowles et al., 2015). The Finnish society also does actions in support of **external motivation** of employees and citizens by encouraging the understanding that "it is never too late to study and learn new things". Among other external factors that stimulate further development are job change, career advancement and higher salary. Both types of motivation help people stay open-minded and curious about learning during life. The topic of motivation is studied already for several decades by researchers, but it is being rethought and does not lose its relevance in current rapidly changing living and working conditions. The following noted motivating factors inspire to study adults in different educational organizations across Finland (Hiltunen, 2020):

- Self-development
- Unemployment or its threat
- Career advancement
- Maintaining professionalism
- Improving skills
- Better earned income
- Pursuing a permanent job
- Formal competence
- General education
- New hobby
- New friends
- Others are also studying

Motivation intersects with learning at three points, and they tend to stand one after the other: the first one is when a decision to participate in learning is done, for instance, the decision to buy, or register for a course, participate in a conference, or devote time to self-study. Here, motivation can affect whether a person wants to learn, what he/she decides to learn and which of the proposed options he/her chooses for him/herself. The next intersection happened during the training itself. Here, motivation determines how much attention the student pays to his/her educational experience, how actively he/she invests in learning itself. And finally, motivation intersects with learning at the moment of application of what was discovered. Here, motivation affects how effectively the learner will apply what was studied in real-life situations and whether this learning will be applied et all. Scientist Eduard Desi noted that the more variations and solutions for each of these three items, the higher the internal motivation of the adult learner, and, accordingly, the learning itself is more effective. (Deci et al., 1985).

Self-development, maintaining and improving professional skills, and better-earned income are the biggest reasons for studying in adulthood. According to a survey conducted by Statistics Finland, in 2017, 42 per cent of 18–64-year-olds needed to develop vocational skills or promote a career (Hiltunen, 2020). Unemployment or its threat drives adults to study. The Finnish state and privet organizations also actively encourage and promote employees' qualifications at any age. Many citizens feel that advancing in a career or achieving a permanent job requires additional training. People who progressed directly in the world of work, later study to gain formal qualifications or recognition in the eyes of others in their profession. Sometimes the reasons for starting studies are not so obvious. Some study to break routine processes, to gain general education or a new hobby while others want to make new friends. Some people study just because acquaintances do. It has been studied that women study on average more for non-work-related reasons.

Researchers (Long, 1992, Hubackova et al., 2014) pay special attention to the following features of motivation in adult education:

- Inconstancy of motives,
- It is hard to measure motivation accurately,
- Usually, not the progress motivates adult learning, but the solution to the specific problems,
- Practical and social motives play an essential role in adult learning,
- Socialization and exchange of experience increase the motivation of adults.

Adults have a complex of motives that are inconstant, therefore it is erroneous to determine the motives of adult students only in the middle of training. As a rule, the development of learning motives, especially social and practical ones, begins from the moment adults adapt to learning, and these motives most often become the main ones. Therefore, it is important to determine the reasons why adults have decided to start learning before the start of the educational process (Taheri et al., 2022).

The concept of motivation is too broad. It covers will, desire, expectation, interest, purpose, etc. In addition, as was noted, the motives of adults are constantly changing, which further

reduces the validity of such studies in education. But, starting from practice, it is worth noting that conducting research for a specific group of students provides a more valuable understanding of their motives than searching for answers in other people's research, even on a larger sample (Nafukho et al., 2017).

Adult learners enjoy solving their own specific problems (Hämäläinen et al., 2017, Rigolizzo, 2019). That is why, during the entire training, it is so important to orient adults toward the attitude that learning is a toolkit that allows them to solve their current life and work tasks.

Practical motives may include the need to enhance the financial situation through advanced training, the desire to change the type of activity by completing education, the need to obtain a diploma, etc. Social motives may include a conscious attitude and a holistic attitude to the learning process, a conscious direction of responsibility to social needs, for example, the need to complete education in order to develop the progress of science and technology in society, the desire to increase one's role in society, for example, change the status and, etc. (Davies et al., 2017).

For a better understanding of which methods and instruments to use for course development and delivery initially we need to take into consideration the motivation of our potential or current audience and manage motivation if the context of the situation requires it.

2.3 European Skills Agenda and Digital skills

Another actuary dimension of this work forth our reflections is to indicate what are the actual skills today and in nearest future, which skills will be in demand especially connected with the possibility to cope with the digital environment, innovation, and rapidly developing technologies. This knowledge helped to understand the level of relevance of existing courses and took into account recommendations and trends in future developed courses of an educational organization.

European Commission formulated the European skills agenda, a five-year plan devoted “to help individuals and businesses develop more and better skills and to put them to use, by

strengthening sustainable competitiveness, ensuring social fairness, putting into practice". The EC formulated the fundamental value of the European Pillar of Social Rights as "access to education, training and lifelong learning for everybody, everywhere in the European Union and also to support the building resilience to react to crises, based on the lessons learnt during the COVID-19 pandemic" (ec.europa.eu, 2021).

Attempts to comprehend relevant skills are regularly carried out by various organizations (Institute for the Future, 2011, WEF, 2020, Candlefox, 2021, McKinsey, 2021, Milken Institute, 2021) during the last decades. Institute of Future defined global connectivity, smart machines, and new media and other contemporary phenomena as the fundamental drivers that significantly influence the way that people "think about work, what constitutes work, and the skills we will need to be productive contributors in the future". The Institute for Future report (2011) presented the analysis of key six factors that would significantly influence the labor market and skills in demand. These six main drivers are that are presented in figure 3 and listed below:

- New media ecology,
- Globally connected world,
- Rise of smart machines and systems,
- Superstructured organizations,
- Computational world,
- Extreme longevity.

This research does not take into consideration what will be the jobs of the future and try to avoid certain job categories and work constraints. Rather than focusing on future jobs, this report looks at future work skills—proficiencies and abilities required across different jobs and work settings (Davies et al., 2011).

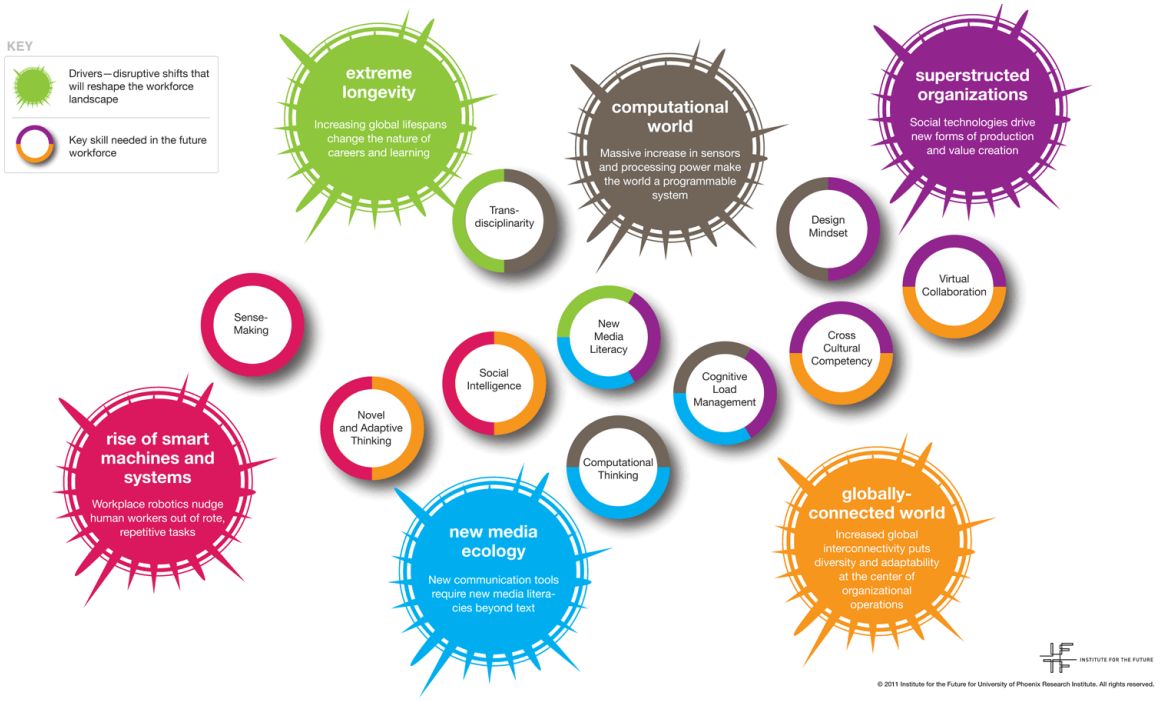


Figure 3 Future work skills 2020 (Institute for the Future).

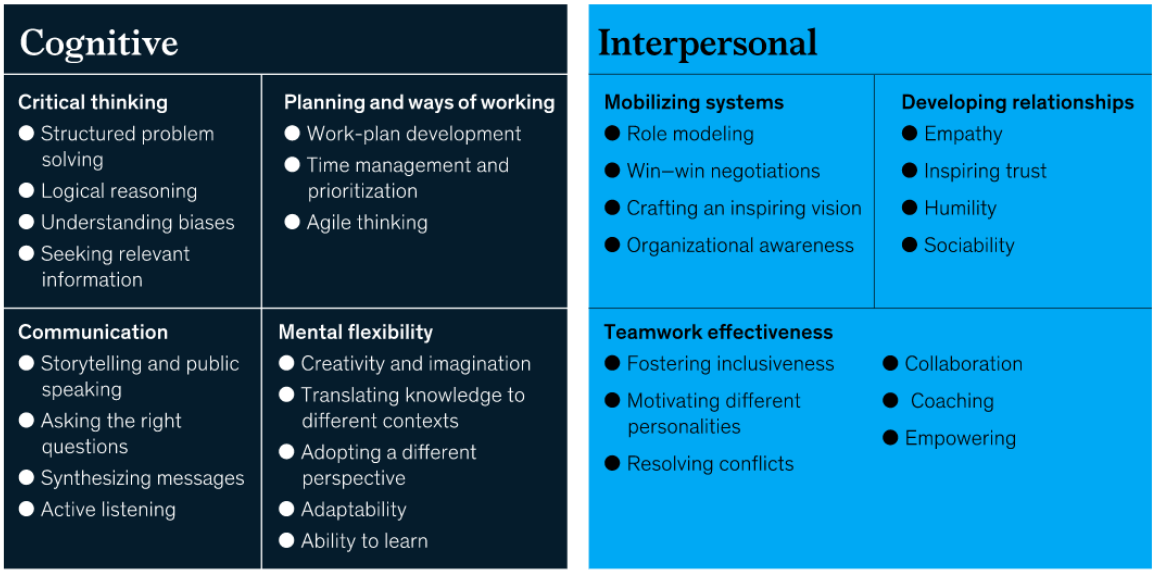
Annual job surveys for World Economic Forum try to track the tendencies of skills and it is interesting to observe the evolution of demanded skills along the timeline. As we see in table 4 below complex problem-solving skill stays in a persistent trend at least for 10 years but has lost two positions in the predictions for 2025. The similar tendency we see for critical thinking and people management, the tenancy fluctuates from rising to falling between 2015 and 2025. The interesting trend relates to the prediction that, innovation and active learning, analytical thinking and learning strategies (marked yellow) will be the prevailing tendency in near future for 2025. A similar situation we see for the technology connected skills: technology design and programming, control and monitoring, technology use both appeared on the list and are expected to be in need. Based on the World Economic report of 2020 it is expected that up to 50% of employees will need reskilling by 2025 (WEF, 2020). Such statistics indicate "that although learning a new skill set is increasingly accessible through digital technologies".

Table 1 Top 10 skills in 2015, 2020, 2025 (annual job surveys for World Economic Forum analysis).

#	2015	2020	2025
1	Complex problem-solving	Complex problem-solving	Analytical thinking and innovation ↑
2	Cooperating with others	Critical Thinking ↑	Active learning and learning strategies ↑
3	People management	Creativity ↑	Complex problem-solving ↓
4	Critical Thinking	People management ↓	Critical Thinking and analysis ↓
5	Negotiation	Cooperating with others ↓	Creativity ↓
6	Quality control	Emotional intelligence ↑	Leadership and social influence ↑
7	Service orientation	Judgement and decision making ↑	Technology use, monitoring and control ↑
8	Judgement and decision making	Service orientation ↓	Technology design and programming ↑

#	2015	2020	2025
9	Active listening	Negotiation ↓	Resilience, stress tolerance and flexibility ↑
10	Creativity	Cognitive flexibility ↑	Reasoning, problem-solving and ideation ↑

The other research by Marco Dondi, Julia Klier, Frédéric Panier, and Jörg Schubert (McKinsey, 2021) based on a survey of 18,000 people in 15 countries identified 56 foundational skills (distinct elements of talent) across 13 skill groups and four categories (Figure 4). One-third of the total skills that were defined related to digital literacy and consist of three main groups of skills, such as software use and development, understanding of digital systems, digital fluency, and citizenship. This research refers to digital collaboration skills (as part of digital fluency and citizenship set) as to the top 10 most obligatory skills required in the modern workplace.



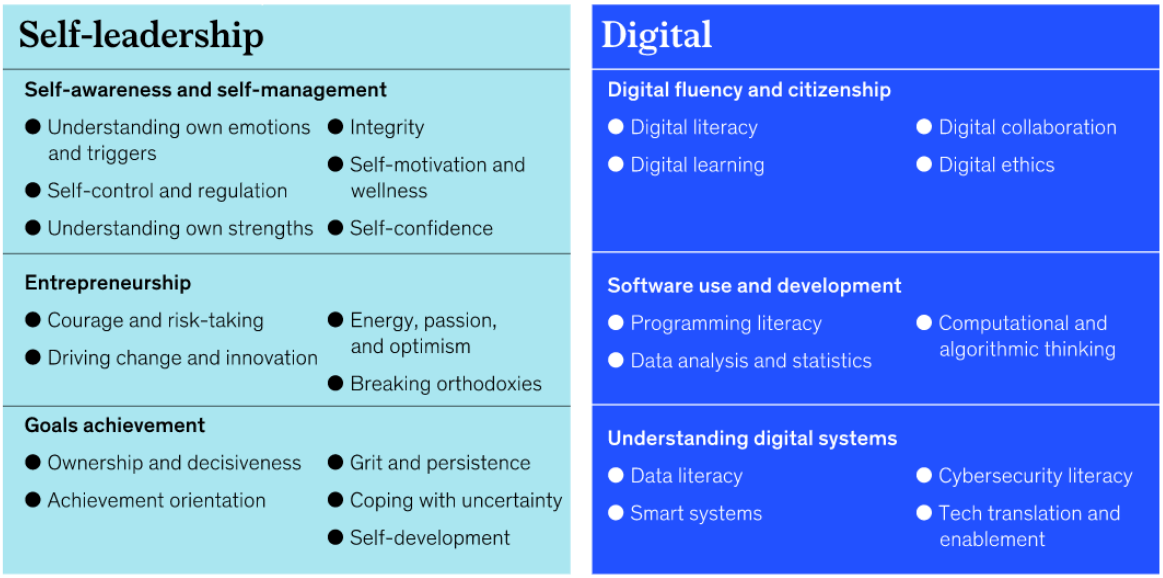


Figure 4 Foundational skills (by McKinsey, 2021)

The Digital economy and society index (DESI) reports that 56% of the EU population have at least basic digital skills (figure 5). According to the latest data, Finland is leading in Human capital evaluation of about 70, followed by Sweden, the Netherlands and Denmark.

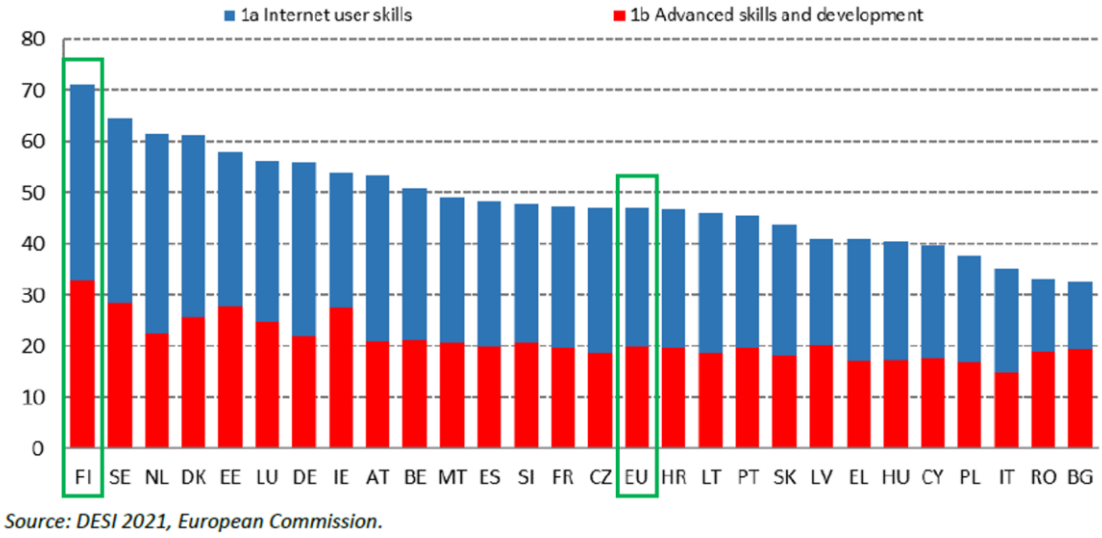


Figure 5 European human capital dimension, 2021.

The data supports the need to increase training offers and opportunities for both categories: for people who desire to keep and maintain the up-to-date level of foundational digital skills and stay competitive, and for employees who want to get advanced skills and get a new profession or further development.

Several investigations specify (Musset , 2015, Finnish National Agency of Education, 2019), that the need for digital skills will grow the most in the Finnish transport and logistics sector in the next decade. However, the need for digital literacy is gradually growing in all industries, including services and other traditionally low-tech sectors such as culture. According to the forecast results, programming, and the ability to use technical equipment are only a small part of the digital competence package - it is equally essential to understand how the digital environment works and how digital applications could be utilized. This applies to all task levels. In the future working life, more customer-oriented service development and knowledge of sustainable development expertise will be needed.

2.4 Actual pedagogical approaches in adult education

Another important topic is the andragogy. This approach in the broadest sense of its notion is the discipline of individual self-realization ways during life. Individuals in some moments of life return to the idea "to find themselves", and many need time to accumulate experience, knowledge, and practical skills in order to express themselves to the fullest. Sometimes life situations are changing, and people need to go through the evolution process. It is andragogy that comes to reveal personal hidden potential and supports his/her growth. The contemporary environment alters so fast that if we graduated 5-10 or even more years ago, then the probability is high that today we already have outdated knowledge to some extent, and their renewal is not only a matter of personal growth but also the degree of success of the organization she/he works in. Due to the growing complexity of problems, we meet every day and rapid changes in the environment. This situation do not allow a modern person to receive an education once, and then works for 30-40 years according to the ready-made formula. Therefore, it can be assumed that the future of the educational process lies with andragogy. Of course, the principles of andragogy differ from the pedagogical principles of teaching children. In this regard, principles of adult learning should be applied to

successfully training creation and delivery. The foundations of the modern andragogy approach were laid by Malcolm Knowles (1913 - 1997). He paid special attention to the characteristics of adult students. Already by the mid-1980s. He formulated five key features (Knowles, 1984) that have been considered and generally accepted since then and associated with personality maturation:

- the desire for independence and **need for meaning**, authorship of one's decisions, authorship of one's own life, the possibility to formulate the learning needs and goals, to identify resources for learning and evaluate learning outcomes,
- a significant amount of **life experience**, education, and professionalism that can be used as a support and base for further learning,
- **desire and willingness to learn** in accordance with the development tasks that are under the person's social roles, orienting learning toward the skills necessary for the job,
- focus on the **practical application** of the experience that was gained, a shift of interest from cognitive to practical, problem-solving orientation,
- the development of **intrinsic motivation**, prevailing internal desire for self-development.

Knowles formulated five main principles of adult education. In table 2 below characteristics of pedagogical and andragogical learning models that were formulated based on Malcolm Knowles work (Knowles et al., 2015):

Table 5 The compactions of pedagogical and andragogical learning models' characteristics (Knowles, M.S. et al., 2015).

Parameters of comparison	**Pedagogical model**	**Andragogical model**
Learner's self-awareness	Learner is dependent on the teacher. Teacher is the one who evaluates progress and assumes full responsibility for what is taught and its efficacy. **Feeling dependent**.	Learner is depending on self. The method requires self-evaluation and direction, and self takes responsibility for the process. **Awareness of increasing self-management**

Parameters of comparison	Pedagogical model	Andragogical model
Learner's experience	Learner comes to study with little life experience. Child-like learning comes with a blank slate and the educator is one of the most influential figures, as peers likely have the same lack of experience. **Lack of experience**	Learner uses life experience as a foundation. Instructors build on existing knowledge and require an understanding of diverse backgrounds. Adults learn from the instructor, but also from one another. **Experience is the rich foundation for self-learning**
Learning strategy	Students advance once they have completed the necessary steps. Child learners are told what they need to do to master a topic in order to move onto the next one. **Sequential study**	Learning is triggered by any number of life experiences and not necessarily led by a designated instructor. Learners don't advance to another topic, but rather fill knowledge gaps as where needed. **Filling gaps strategy**
Orientation in learning process	Learning is prescribed by an instructor and sequenced in a way that makes logical sense. Topics are broken down into content units. **Orientation on learning topic/subject**	Learning is prescribed by self. Learners see a problem or knowledge gap and organize topics around life/work solutions. **Orientation on problem-solving**
Planning of learning process	Leading role of the teacher	Learner together with teacher
Identification of learning needs	Leading role of the teacher	Learner together with teacher
Formulation of learning objectives	Leading role of the teacher	Learner together with teacher

Contemporary adult learning does not base on a single pedagogical or phycological theory and is worth a separate study. It was important to understand the contemporary landscape of actual practices that form approaches in human resources development. This knowledge, and analysis of psychological literature, empowered educators and scientists to develop and deliver a better learning experience. In table 6 below main theories and the key concepts that contributed to the foundations of adult education were mapped in a condensed form.

Table 6 Some major theories contributed to the adult education

Theory, influencers and main resources	**Founders and main developers**	**Key principles and concepts contributed to adult education**
Behaviorism (Influenced by classical conditioning, I. Pavlov) Merriam and Bierema 2014). MacKeracher (2004)	John Watson (1878-1958) Edward L. Thorndike (1874-1949) B.F. Skinner (1904-1990) (Skinner, 1971, Thorndike et al., 1962, Watson, 1928)	• all behaviors are acquired through conditioning, • learner begins as 'a clean slate' and adopts behaviors through positive or negative reinforcement, • controlling every aspect of a learner's education, and positively reinforcing good observable behavior, • learner passively receives information, • instruction is repetitive and reinforced follows to a targeted skill, • focus on how the environment (the response to one's actions) shapes behavior.
Social cognitive theory (In response to behaviorism, bridge between behavioral and cognitive learning theories) Bandura A. (2001)	Albert Bandura (1925-2021) (Bandura and Walters, 1964, Bandura, 2002)	• stimulus-response process drives human behavior, • the rewards and punishments of prior actions determine future actions, • the importance of humans' thoughts and motivations in driving learning by observation and role modeling, • learner observes others to create a mental model of a behavior that can be recalled and applied later, • behavior modelling and formation learners' own understanding of how the behavior is performed,

Theory, influencers and main resources	Founders and main developers	Key principles and concepts contributed to adult education
		• reflections on the outcomes of learners' own performance.
Sociocultural theory (In response of stages to cognitive development) Daniels, H. (2016)	Lev Vygotsky (1896-1934) (Vygotsky et al., 1987)	• focus on children, • cognitive development is a continuous process and dependent on social-cultural context, • learning through social interactions, where the child builds knowledge by working with others, • language drives cognitive development, • role of the teacher is to assist the child to progress through the zone of proximal development and scaffolding (ZPD) by using scaffolding.
Transformative learning theory Under the influence of John Dewey's progressive education theory, Thomas Kuhn's concept of paradigms, Paulo Freire's theorizing of conscientization and psychiatrist Roger Gould	Jack Mezirow (1923-2014) (Mezirow et al., 1974)	• there are three fundamental components that facilitate the learning and transformation of adults: critical reflection, the centrality of experience, and rational discourse, • adults exhibit two kinds of learning: instrumental and communicative • the theory defines ten phases of transformative learning, • gaining knowledge usually happened through the execution of responsibilities involved and obtaining practical experience of the role of a senior member that is in a position that the learner desires to be in, • scenario-based learning in a safe environment, carried out by a senior member helping to progress to a student.
Information processing theory (cognition study, under influence of	George Armitage Miller (1920-2012)	• learning is an internal and complex process which involves mental processes, • the capacity of the working memory, which can generally hold up to seven plus or minus two items, • "chunking" describes the functionalities of short-term memory,

Theory, influencers and main resources	Founders and main developers	Key principles and concepts contributed to adult education
Edward C. Tolman's sign and latent learning theories) Rogers, P. R., et al., (1999), Sala, S. D. (2007), Goldstein, E. B., (2005), Baddeley, A. D., (2019)	John William Atkinson (1923-2003) Richard Shiffrin (1942-) (Miller et al., 1988, Atkinson et al., 1978, Shiffrin, 2004)	• multi-stage theory of memory, which is one of the leading models of information processing theory, • main elements of information processing theory: information store, cognitive processes, executive cognition, • sensory memory holds the information that the mind perceives through various senses such as visual, olfactory, or auditory information, • information in short-term memory only lasts around 30 seconds, • cognitive abilities, focus and attention affect how individuals process information in working memory, • various methods are used to store information in the long-term memory such as repetition, connecting information, relating information to meaningful experience or other information, and breaking up the information into smaller chunks.
Self-determined learning (Heutagogy) (Under the influence of cognitive theories domain and M. Knowles) Kenyon, C., & Hase, S. (2001), Blaschke, L.M. (2018)	Stewart Hase, Chris Kenyon (Hase and Kenyon, 2015)	• learner-centred educational theory, extension to andragogy, where learners have the leading role in directing their learning activities, • the approach is applicable for learners that had a high level of metacognitive and cooperation with others' abilities, • learners are independent and able to manage their learning, • teacher empowers and provides resources and materials, and the learner decides the path of learning, • learning is not necessarily planned or linear process and is based on the identification of the potential to learn in novel situations, • the teacher is the only facilitator of the learning process, • the special role of technology.

Some research (Arghode et al., 2017, HRMID, 2021) emphasized the following six theories among others, important for the improvement of in-class and online adult education in the digital age:

- social learning cognitivism,
- transformative learning theories,
- Vygotsky's zone of proximal development (ZPD),
- heutagogy,
- connectivism,

The integration of technology is supported by heutagogy, connectivism and cognitivism. Most of the theories are relevant due to their capabilities to improve both in-class and online instructions. Technology and media-based instruction design, and self-directed learning are promoted by these three approaches. (Arghode et al., 2017).

It is hard to overrate the role of adult learning theories in influencing in-class, online and hybrid teaching. Deeper research of these theories and their application deserves special attention and versatile qualitative studies but is out of the scope of this work.

2.5 Innovative adult education trends

The paradigm of modern European culture is based on the priority of a person's values, his/her interests, and aspirations. Due to the use of modern technologies, innovative approaches together with proven classical educational techniques give a new impulse to the development of modern adult education. Scientists are trying not only to comprehend the role and influence of information technology on the evolution of modern adult education (Vander, 2017, Collins et al., 2010, Kahle, 2010, Scardamalia et al., 2014), but to systematize innovative approaches and trends of adult education (Bi et al., 2020, King, 2017, Guzik et al., 2015, Tan, 2017). In this final part of the literature review, it will be overviewed five main innovative trends identified by researchers.

2.5.1 Personalization of education as the key component of adult education

Personalization puts the learner at the center of the educational process (Figure 6) and gives him/her the choice to settle on what, how and when to learn.

Figure 6 Components and organization of personalised learning (Guzik et al., 2015)

Personalized learning also includes an individual educational trajectory, compiled in collaboration with a mentor. Over time, the role of the mentor could be widely enhanced with the support of an intelligent adaptive learning system (Shamsutdinova, 2021) and assist dynamically changing trajectories during learning. In addition, students themselves determine the individual learning rate: upon completion of the educational module, they can think about where and how to apply the acquired knowledge and skills in practice, do practical work and then return to learning again when the need for new knowledge arises (Poell et al., 2018, Vander, 2017b). The idea of personalization of learning itself is not new and has been around for over 100 years. Until recently, there have been problems with the organization of versatile personalization of educational processes, but due to the use of technology, analytics and big data, the feasibility of the approach has increased and acquired its innovative connotation.

The personalized learning approach tends to analyze the learner's preferences in absorbing the information and focus on multimodal delivery. Educational experts also call the multimodal approach "deep learning". This is a strategy that is based on the use of various

tools for learning and perception of information. A learning management system (LMS) today can support this approach from the organizational point of view. The multimodal learning system uses not only text or voice, but also other types of content: videos, pictures, audio and practical tasks. All of this increases the effectiveness of learning (Ortlieb et al, 2018, Hutchison et al., 2018, Beschorner et al, 2018, O'Brien et al, 2018)

2.5.2 Gamification, storytelling and edutainment for the continuous support of motivation of adult education

Gamification is the application of game elements (Figure 7) into a non-game context: study, work, and everyday life. Gamification, laying out dry facts and figures in the form of a story, transfer knowledge entertainingly and attractively helps to organize learning with maximum involvement (Jorge et al., 2017, Alsawaier, 2018, Mulcahy et al, 2018, Santos et al., 2021). Gamification exploits people's natural tendencies to compete, collaborate, and achieve. These techniques motivate learners to achieve goals and increase productivity. Involvement tools can be levels to be achieved, rewards or ratings. The idea of such an approach appeared a long time ago but is gaining popularity recently, as the old systems of motivation for adult employees lose effectiveness in all cases. The conventional "carrot and stick" method has ceased to be effective, and educators are looking for other ways to increase engagement. Moreover, these elements like amassing points, winning badges, rewarding progress, and recording new levels of mastery help to create positive feedback loops and a positive emotional atmosphere that reinforce a productive learning process.

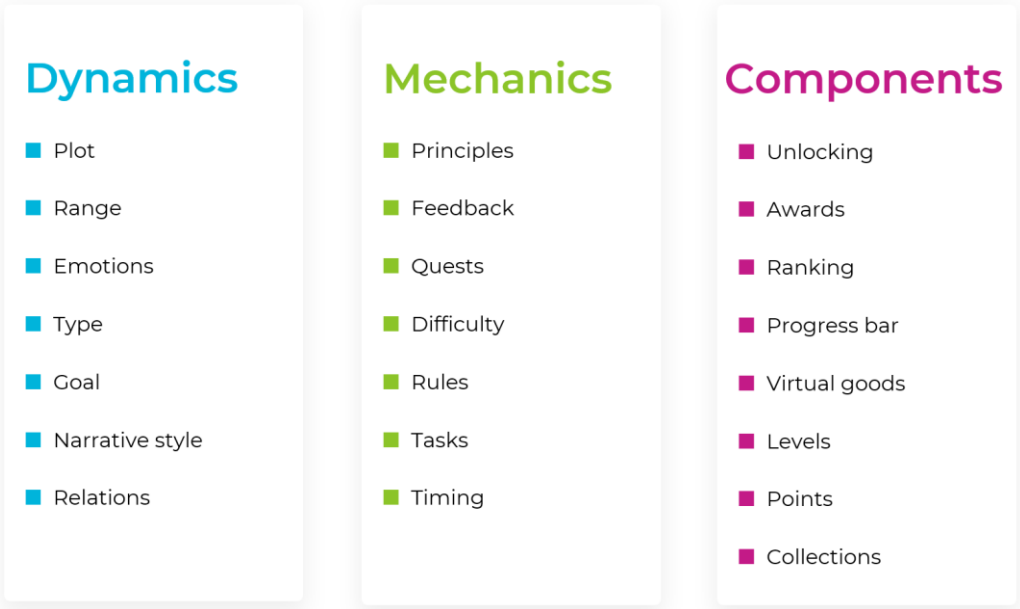


Figure 7 Three types of gamification elements (based on Jorge et al., 2017, Alsawaier, 2018, Mulcahy et al, 2018, Santos et al., 2021).

Scientists noted that for new generations of employees, students and customers who are millennials and zoomers, gamification of learning and boring work processes are very attractive. They have been accustomed to video games and technology since childhood, so the transfer of competitive and rewarding methods fits into their lives organically (Zichermann et al., 2013, Raycove, 2016, Mcgonigal, et al 2017, IRMA, 2018).

2.5.3 Collaborative approach

The ability to cooperate with others is not just a hot contemporary trend, but a crucial skill which is based on fundamental human needs. Combining learners' and teachers' contribution to the learning process creates so cold "collective intelligence" (Huang et al., 2018, Yu et al., 2018, Lee et al., 2022). In this context, teamwork may solve a vast variety of problems with more efficient results and allows to reach targeted results for less time and in a more effective way. The use of modern technologies such as the internet, social media, networks, flipped classroom, open-source learning breathed new life into the collaborative approach.

2.5.4 Lifelong and informal learning

The process of constantly updating, perfecting, and achieving better qualifications between youth and maturity age is another educational reality. The environment around us is rapidly changing at an unprecedented pace and it's doubtful to reduce speed. The faster adaptation strategy in changing environment is the best way to cope with unpredictable reality. Lifelong learning is a foundational pillar of such a strategy because it's difficult to acquire all necessary knowledge and skills at the beginning of the career that will be needed along the path of work life. "New tasks and new problems appearing in completely new environments will require constant learning" (Ceschi et al., 2021, Boyadjieva et al., 2005).

The idea of lifelong learning was formulated as part of the learning society paradigm at the end of the 1960s by Robert Hutchins who noted that "In the 21st-century education can, at last, become what it is in itself... The learning society will not only offer opportunities for developing everyone's education through all stages of one's life but will also succeed to transform its values in such a way that learning, self-regulation, humane behaviour will become its goals and all in situations will be oriented towards them" (Hutchins, 1968: 134). The wide use of technology creates lifelong learning more friendly than ever before. AppStore and Google Play offer find wide variety of free educational programs for mobile devices, Massive Open Online Courses (MOOC) online courses are available for free, designed and validated by the broad range of educational institutions, chat rooms, forums, blogs, social networks. All these instruments support lifelong learning and make it more accessible today. Today education is flexible, can occur anytime anywhere and may not be attached to a specific place and time. The European Union's strategy of growth supports lifelong learning (EU LLL, 2021). All these examples confirm the idea of the relevance of the trend and the expansion of its support through modern information technologies.

2.5.5 The extensive presence of technical tools

The use of technology became one of the pillars of contemporary education. The Internet provides constant access to interactive multimedia content and to courses from the universities that were not accessible before, and to new teaching aids like robots, holograms or 3D prints. Wearable technologies, mobile technologies provide a new environment to

study outside the boundaries of the traditional educational organization anymore and learners can absorb new knowledge and skills anywhere while performing everyday activities. Technology creates social nets for learners and constructs the inspiring environment for creativity and co-creation of learning content.

The other side of technology usage is the considerable challenges for conventional educational organizations in the digital world around. Educational organizations constantly struggling with the necessity of continuous infrastructure modernization. The enhancement of pace and efficiency of learning and teaching is the aim of technological solutions modernization (Guzik et al., 2015).

In adult education one more promising area of technology field worth further research is the exploitation of augmented reality. Augmented reality is the instrument that allows to add additional information to the objects around and see it through a device (smartphone, tablet, laptop with camera). This data can be the animations, graphics, sounds, GPS coordinates and feedback. The augmented reality expands the visual representation of the surrounded environment and provides a new level of assistantship in learning new skills. In this way, the environment become more interactive (Cabiria, 2012, Sungkur et al, 2016). The founder of AR technology Ronald Azuma, specified the following fundamental properties of AR:

- it blends virtual and real objects in the real world,
- it is allowing real-time interaction,
- real and virtual images are accurately aligned with each other. (Azuma, 1997).

Continuous learning can be enhanced significantly by using virtual data supplied by software and real images and video. This idea is supported by practical solutions that are offered by vendors (Microsoft, 2021) and innovative educational organizations (Boston University, 2022).

In this part of the literature review, five main innovative education trends that are closely connected with technology overviewed. The innovations that can be used to manage and organise better a learning environment are not limited by these five trends and are worth separate study.

3 Research design

3.1 Research methods

The foundation of this work is the action research methodology. This methodology was chosen first of all because it was necessary not only to study academic sources on the topic but also directly participate in course conduction in the studied environment. The methodology provides an advantage of collecting information interactively, where the primary goal is to improve processes, to find out the solution for a critical situation or solve the problem in a certain organization: educational, state or business organization. And the secondary goal of this methodology application is to obtain new knowledge, confirm hypotheses, collect empirical facts. (Denzin et al., 2005). Action research expands the possibilities of science since participation does not require very high scientific qualifications and deep knowledge of mathematical statistics. Not only university professors, but also students, officials, teachers, doctors, hospital patients can take part in this type of research. AR is not only a soft systems methodology (SSM) that provides flexibility in research in a rapidly changing environment, but also a very democratic and accessible way of participating in solving important social problems. (Coghlan, 2014) The wide scope of action research application and the use of this methodology in a wide range of areas such as management, business, education, medicine allows us to talk about its universality and multipart structure. The strategies of the methodology coexist and are similarly valid for application in versatile areas of anthropogenic activity.

Action research as a scientific pragmatic approach focuses on two areas: knowledge and practice. To focus on these areas simultaneously in the other methodologies is quite problematic. That leads to the idea that in action research there is a connection with an experiment, it involves knowledge, transformation and evaluative research since action research is analyzing the results of certain practical steps. All methods of action research are applicable both in fundamental and applied fields. An example that could be provided is connected with education where a teacher is constantly perfecting the course or in the medical field where laboratory experiments of curing despise need to go through a long

period of iterative tests. In both cases, the practical application and applicable results are the desired goals and help to advance the system of scientific knowledge.

Scholars (Clem, 1993, Denzin et al., 2005, Checkland et al., 2007, Greenwood et al., 2013, Mertler, 2019) try to outline the specifics and functions of action research. They note that action research helps to find out practical strategies for data gathering, an issue or a problem recognition, check out a plan. The outcome could be flexible, innovative, and applicable. Action research makes it easier to put closer to the contributors and the researchers and is useful in situations when the problem is still not stated clearly and changing, or it is necessary to organize the pilot testing of the hypothesis with practical steps and results.

Methodologically, action research has two main parts: **practical action** and **scientific research**. **Practical action** introduces a visible change in the life of a community (group, settlement community), the functioning of an organization (educational organization, course, company, bank, etc.) or the implementation of a program (social, educational, administrative, etc.). With the help of **scientific research**, the customer and the project developer can trace the trajectory of action research, its initial, intermediate, and final stages, changes in value orientations, attitudes towards implementation, motivation and attitudes of participants. Taking into consideration the contradictory parts of action research (dual and opposite: practice and knowledge)), it is possible to recognize it as a research-implementation methodology. In action research, the most important components are learning, practical intervention (action), participation and research.

Action research offers the following strategy research management that is demonstrated in figure 8 (Mertler, 2018) that will be taken as a base in this research. The research cycle consists of 4 stages and can be repeated iteratively for refining the goal at each iteration and flexibly approaching the desired result.

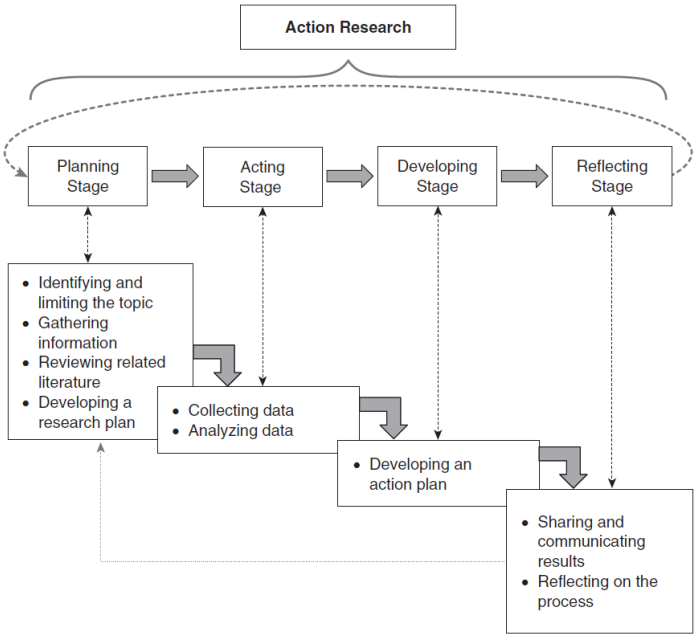


Figure 8 Full cycle of stages and steps of action research (Mertler, 2018).

Problem identification or awareness of change necessity is the first phase in the cycle. It consists of four main sub-topics that are usually covered in this stage and are connected with problem identification and limitation of the topic, data collection related to the research and literature review, and final formulation of practical steps. In the next **acting stage** implementation of data collection and analysis implementation taking place. The next **developing stage** is the logical continuation of the previous stage and is devoted to the implementation of the practical action plan. Active and development stages are closely interconnected and can be interpreted as the central and essential stage of the research which is the base for further recommendations and improvements. And finally, in the **reflection stage** systematization, reflections, sharing and communication of the results take place.

In practice, during the implementation of the project, this methodology was used as the basis for an iterative approach in the development and implementation of courses. In the first stage, it was determined the planning of the project stages, as well as the resources that were required, selected list of resources for the literature review. In the second stage, the data was collected from decision-makers and stakeholders (administration, work-age people), technical requirements and requirements for course development were formulated, and

stages of the research plan were formulated. In the third stage, work with literature continued, the plan and content of the course were developed, and the course was implemented. In the final stage feedback was collected on the courses and the project, reflection was carried out, and the results were summed up. The data obtained at the last stage of the project implementation was enough to initiate the process start all over again next year, which will allow using the first iteration of the project implementation as a basis for further development of the course and formulating further recommendations.

3.2 Design

The exploratory nature of this research helps to formulate strategic and tactical steps that could be recommended to reduce COVID impact on courses delivery, communications, education, managerial aspects, and marketing strategy of the organization. The main strategies that were used for the research are **semi-structured interviews, observations, surveys, experiment**. The mixed data collection was assigned as the most appropriate base on the context of the project. For better representativeness of data, similar methods are recommended to apply in the next iterations of the project.

3.3 Credibility

Consistency of discoveries is endorsed by the main stakeholders of the project: the administration of the Citizen college and participants of the course, who assessed the practical value of the developed courses, materials and offered recommendations for further development. The prevention of errors and inaccuracies is carried out through MS Excel for data analysis from surveys. The authenticity of research is maintained by the straight logic for the surveys, observations, and implementation of the project itself. In the research, I tried to avoid a subjective approach in which there is a focus and search only positive aspects. It was important for me to formulate what did not work or what negative effects took place. The generalization of the study results can be related not only to a specific non-formal adult educational organization but to companies that are interested in human capital development. Even dough jumps in logic and the influence of the personality factor cannot be completely eradicated.

3.4 Research process

3.4.1 Stages of the research project

It was mentioned in the introduction that action research was taken as a base methodology for this work. All the workload was divided into 3 main parts: the **preliminary stage** of data collection and planning, the **project implementation stage** united two main steps of acting and developing the project and, finally all reflection and final analysis in the **post-project stage** were done. Table 1 below represents the practical steps that were planned and done at each stage.

Table 1 Practical actions at each stage of the research project

Preliminary study stage (planning and data collection)	**Project implementation stage (acting and developing)**	**Post-project stage (analysis and reflection)**
• Preliminary interviews with rector and project manager and teachers of EKKO, • Observations of digital courses in Finnish currently delivered in EKKO, • Literature review, • Survey for currently working people to narrow the range of topics for the courses content development,	• Development of materials: ○ Development of courses programs based on data analysis in the previous stage, ○ Development of learning materials (handouts, self-assessment materials, presentations), ○ Marketing materials and announcements, ○ Registration form for digital courses,	• Feedback from participants of the courses, • Feedback from EKKO administration, • Recommendations for EKKO and further plans for the next iteration of the courses, • Master thesis writing.

Preliminary study stage (planning and data collection)	Project implementation stage (acting and developing)	Post-project stage (analysis and reflection)
• Learning resources analysis (training centers, learning platforms, training providers, vendors) current best practices, most challenging and demanding topics	○ Feedback form after courses, ○ Digital badges, certificates, • Courses delivery, schedule (8 classes in February – March)	

3.4.2 Samples

For this research, the analysis of two main samples was used. The first simple is the group of people who currently work in Finnish companies. Through the survey, they volunteered to share their experience and recommendations on which topics and best practices can be recommended to cover in digital courses for work-age people who are looking for a job and want to keep qualifications up to date. 24 people were included in this sample. The 13 registered course participants belong to the second sample. 7 of 13 people were currently unemployed and were looking for a job and the rest 6 were currently working employees of different state and private organizations.

3.4.3 Data collection

The analysed data were collected in the following ways: through semi-structured interviews, observations, surveys, data collection from open resources and project implementation (experiment) with the consent of EKKO administration. In table 2 below the instruments, resources and goals of data collection are structured according to three main groups of data resources. The literature review is not mentioned in table 2 below as it is a separate independent block of data collection and analysis work.

Table 3 Instruments, resources, and goals of data collection within the project.

	Instruments / resources that were used for data gathering	Goal of data gathering
Internal resources	Semi structured interviews with staff members of EKKO	To get familiar with organization and processes that are supported currently in citizen's college, understand the requirements for the planned courses
	Official EKKO site and open data resources	To get familiar with the organization and processes that are supported currently in citizen's college, with the legislative base of adult non-formal education in Finland
	Observations of already existing and currently delivered digital skills courses in Finnish	To get familiar with organization, processes and pedagogical methods and instruments that are supported currently in citizen's college
External resources	Survey for currently working adults	To understand and narrow the range of actual topics for the planned courses
	Learning resources analysis (training centers, learning platforms, training providers, technology vendors)	To formulate the current best practices and most challenging and demanding topics
Reflections on results	Project implementation self-reflection	To analyze what was successfully done, want can be changed and what could be done better on next iteration of the course
	Feedback surveys	To understand the opinion of the participants, whether were they satisfied with the course and what would be done better
	Feedback from EKKO administration	To systematize the recommendations for further course development

3.4.4 Data analysis

Quantitative data from surveys were analysed with the help of MS Excel and statistical functions. Qualitative data was gathered from interviews, observations, and survey open answers. This data was presented in words, descriptions, and ideas, so the thematic analysis method was used to group similar data into main topics or themes.

4 Empirical analysis

4.1 Internal resources analysis

In the initial stage of the project, it was necessary to get familiar with the values of EKKO, get to know the organizational and educational processes, understand, and formulate the requirements for the planned digital courses in English and Russian language. For these purposes, the set of interview questions was prepared for the rector of the citizen college (Appendix 1), the communication coordinator and digital courses project manager (Appendix 2), and two teachers that deliver a digital course in the Finnish language (Appendix 3). To form a more complete picture, in addition to the interview, data from the EKKO site and other open sources were also used as supportive materials. In further paragraphs collected and systematized information obtained from these interviews and open resources are presented.

South Karelian Citizens' College (Etelä-Karjalan kansalaisopisto) is a private educational institution run by the Foundation. The college was founded in August 2005. At that time, the colleges that had been operating in Lappeenranta for decades - Saimaa Citizens 'College and Lappeenranta Workers' College - closed down and were replaced by the South Karelian Citizens' College (EKKO).

The area of operation of the South Karelian Citizens' College is currently Lappeenranta and Luumäki regions. Teaching is provided in about 70 different locations in the center of Lappeenranta, in the suburbs, in sparsely populated areas and in the area of partner municipalities.

College organized about 19,000 lessons every year before COVID restrictions time and has three full-time teachers and about 135 part-time teachers and lecturers each year. Approximately 12,000 courses participants and approximately 6,000 individuals participate in courses each study year (Etelä-Karjalan kansalaisopisto, 2020). During the pandemic time, the number of participants was reduced due to limitations and recommendations of THL. But despite this, the courses remained in demand as before the pandemic. Partially, the problem of access to courses was solved through the organization

of distance learning through Zoom for a number of courses, for example, some Finnish language courses. The college supports the foundational idea of civic colleges and offers opportunities for lifelong, self-directed learning and the development of civic competencies. The study program for the academic year is created from the needs and wishes of the residents of the area of operation. In the spring of 2015, the OKKA Foundation (Opetus-, kasvatus- ja koulutusalojen säätiö, https://okka-saatio.com) awarded the college a certificate of sustainable development. The re-audit of the sustainability certificate took place in April 2018 and in the spring of 2021. It means that the college successively supports the principles of sustainable development and institutional values through all performed activities such as courses, events, public lectures and the physical environment already for more than 7 years (EKKO peda.net, 2022).

Speaking about the organization of educational processes Citizen college uses mainly the following instruments, tools and platforms presented in table 4:

Table 4 Instruments and tools that are used in South Karelia Citizen college.

Instrument/tool	Functions
Zoom	Remote teaching and organizational communications
WhatsApp groups	Learning groups coordination and information sharing
SMS Notifications	Reminding, important notifications
Podcasts https://anchor.fm/ekkoopisto	Informing and current news, marketing
EKKO Facebook group https://www.facebook.com/ekkokansalaisopisto	Informing, marketing and promotion
https://fi.pinterest.com/ekko_opisto/	Informing, marketing, and promoting materials
https://www.instagram.com/ekko_opisto/	Informing, marketing and promotion
Annual printed information magazine	Informing, marketing and promotion

Instrument/tool	Functions
YouTube channel https://www.youtube.com/channel/UCNvdKWuX1L9y5wypLVuho1Q	Informing and knowledge base (recordings of classes, promo video materials)
Google forms	Tests and surveys
Google documents and spreadsheets	Collaborative workflow in the organization
Digital badges platform (system of national open badges)	Competence-based and competence evaluation, gamification element in the educational process
Finnish e-learning learning portal peda.net	Knowledge base (educational materials and internal documentation)

All instruments are possible to classify into two main categories: instruments that help to unify the organizational and learning processes (Zoom, WhatsApp, Google Docs, Digital badges platform, learning portal peda.net, sms notifications), and informing and marketing instruments (podcast, printed magazine, Pinterest, Instagram, YouTube) that are helping share the information about courses and attract new participants.

Most of the instruments in this list are well-known, but the review of the digital badge platform and learning portal deserves special attention. Both instruments were developed with the support and collaboration of several Finnish organizations (Open Badge Factory, 2021). Even though there is no knowledge testing in the form of mandatory tests and exams in a Civil college, however, for the purposes of self-control and audit of the course materials quality, participants can use the system of national open badges. They were created for the following aims:

- to recognize competencies, skills, achievements, or attitudes of their recipients,
- to provide a requirement framework of digital competencies for education, work, and society,
- to motivate and inspire participants of the courses to assess and develop their digital skills.

The national open badges are used as a gamification element of the digital courses and help participants not only get some formal recognition of knowledge and skills but to get this identification in an entertaining and competitive form.

From a technical point of view, an Open Badge is a digital picture, which contains metadata that informs who has issued the badge to whom and on what basis. It is a standard and verifiable digital credential whose metadata aligns with the Open Badge standard created by the Mozilla Foundation and further developed by IMS global (Open Badges for Lifelong Learning, 2012). In 2020 – 2021 the project team from Oulu, Häme Universities of Applied Sciences, VET, TIEKE and some other associations offered a hierarchical set of five-level digital badges shown in figure 8.

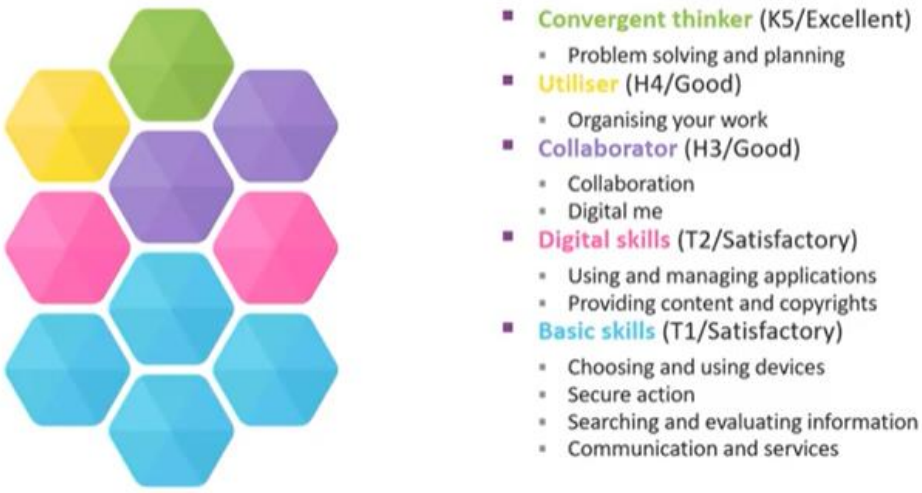
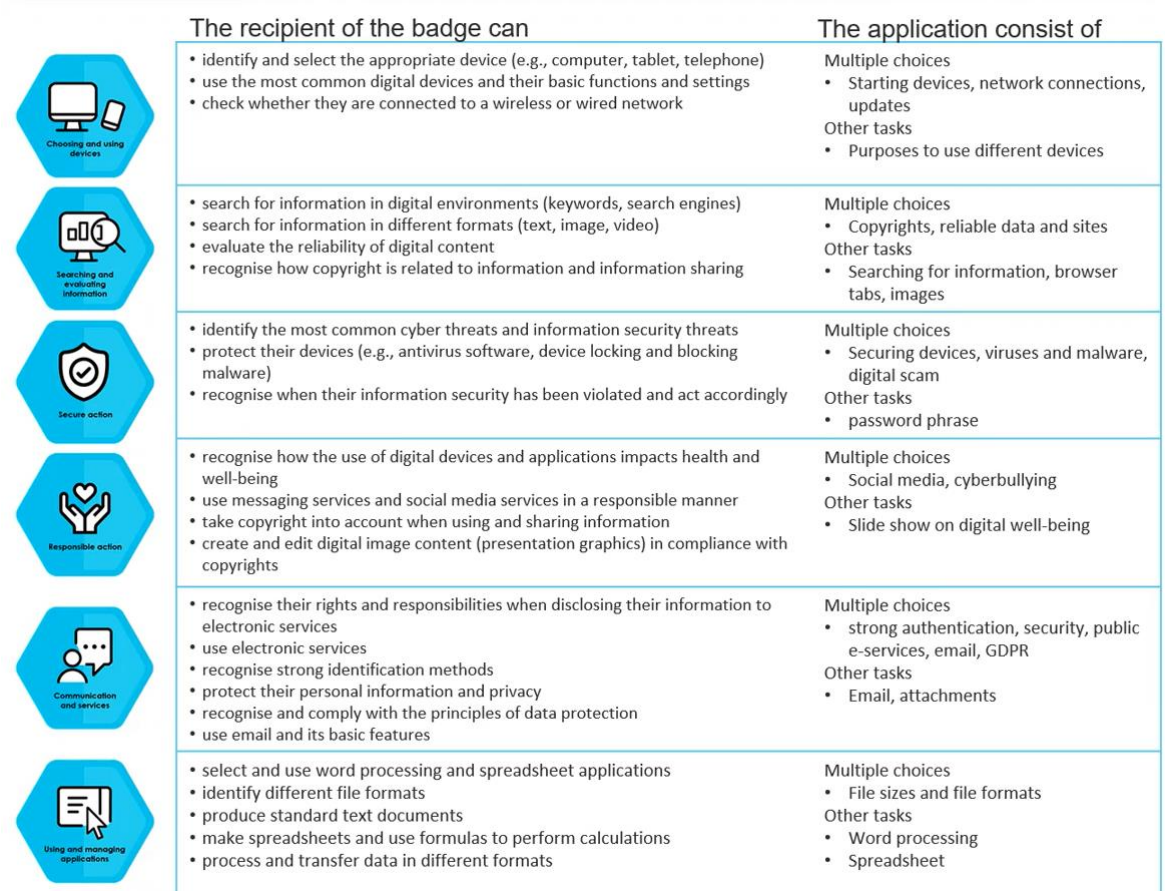


Figure 9 Digital skills open badges constellation (illustration by TIEKE)

To get each badge the participants must answer several control questions and fulfil practical tests that will demonstrate that necessary skills were obtained. On the list below it is possible to get familiar with the practical tasks and questions that EKKO offered and in table 5 below is possible to get familiar with the list of verifiable skills for each badge.

Table 5 Verifiable skills and forms of assessment (by Merja Sjöblom, TIEKE)



	The recipient of the badge can	The application consist of
Choosing and using devices	• identify and select the appropriate device (e.g., computer, tablet, telephone) • use the most common digital devices and their basic functions and settings • check whether they are connected to a wireless or wired network	Multiple choices • Starting devices, network connections, updates Other tasks • Purposes to use different devices
Searching and evaluating information	• search for information in digital environments (keywords, search engines) • search for information in different formats (text, image, video) • evaluate the reliability of digital content • recognise how copyright is related to information and information sharing	Multiple choices • Copyrights, reliable data and sites Other tasks • Searching for information, browser tabs, images
Secure action	• identify the most common cyber threats and information security threats • protect their devices (e.g., antivirus software, device locking and blocking malware) • recognise when their information security has been violated and act accordingly	Multiple choices • Securing devices, viruses and malware, digital scam Other tasks • password phrase
Responsible action	• recognise how the use of digital devices and applications impacts health and well-being • use messaging services and social media services in a responsible manner • take copyright into account when using and sharing information • create and edit digital image content (presentation graphics) in compliance with copyrights	Multiple choices • Social media, cyberbullying Other tasks • Slide show on digital well-being
Communication and services	• recognise their rights and responsibilities when disclosing their information to electronic services • use electronic services • recognise strong identification methods • protect their personal information and privacy • recognise and comply with the principles of data protection • use email and its basic features	Multiple choices • strong authentication, security, public e-services, email, GDPR Other tasks • Email, attachments
Using and managing applications	• select and use word processing and spreadsheet applications • identify different file formats • produce standard text documents • make spreadsheets and use formulas to perform calculations • process and transfer data in different formats	Multiple choices • File sizes and file formats Other tasks • Word processing • Spreadsheet

At the basic expert level, six competence marks are shown and the competence criteria of which are listed below. The Basic Competent badge is awarded when all six competency badges have been passed.

TIEKE Information Society Development Center formulate the requirements for getting the digital badges. The recipient of the Basic Expert label can use digital devices and services safely and responsibly in communication and transactions. He/she can search for information in digital environments and evaluate the reliability of information as well as protect personal information and privacy. He/she can use the most common office applications and exploit, produce and distribute digital content in compliance with copyright (TIEKE, 2022).

The other instrument that is used in EKKO is the Finnish **e-learning environment (portal) peda.net**. This instrument has already quite long history from 1997 and gets roots in the

University of Jyväskylä. The idea behind this tool is to help educational organizations in networking, provide an open and democratic collaborative space and environment, where teaching and content are provided with the system, is based on the concept of personal space (PS) and users have permissions according to their role but are not divided into groups as administration representatives, teachers, and students. Users can collaborate on content even if he or she left the educational organization. It ensures continuous, transparent and seamless communication between educational organizations unrelatedly of the level of education, geography, course, or any other aspects (Koskela., 2018). In South Karelia Citizen college this tool is used as a knowledge base that helps to provide learning materials to participants of the courses from one side. And from the other side, the tool helps to accumulate the experience of employees in the form of open documents, instructions, regulations, useful articles that reflect useful information.

The main aim to **observe currently delivered digital** skills classes in Finnish was to get familiar with standard procedures and delivery methods that are used in EKKO. It was permitted with the consent of EKKO administration to visit 2 trainings on presentation creation and communication and collaboration instruments. Observations were fixed within the classroom observation forms used for digital classes analysis (Appendix 4).

Both classes had a similar structure: in the beginning, the teacher got familiar with the participants and the level of their knowledge through Mentimeter activities and questions. The main part was devoted to the content, practical tasks and questions and answers session. In the end, it was provided with a summary of what was discovered during the session. The teacher used contemporary tools (Zoom, MS teams, Google tools) to support the educational process and organized a friendly and collaborative environment. All materials were demonstrated with the presentation support and a sequence of steps demonstrations with comments were provided. Useful learning materials were shared via peda.net. The teacher exhibited sensitivity to students' personal culture and responded appropriately in a non-threatening manner and stimulated questioning and active participation in discussions. The audience of the class consisted of work-age people. Most of the participants shared that they

were currently in the job search process, and they decided to participate in the course because they want to be up to date with technology.

4.2 External resources analysis

Twenty-four currently working employees of Finish state and privet companies participated in the **survey** in November and December 2021 (Appendix 5). The main purpose of this survey was to understand actual topics for currently working people and this will help to narrow the range of themes for the planned courses. There were no limitations in participation in the survey, anybody who desire was able to answer the question. The only limit was the deadline, the survey was closed before the start of January 2022. The most represented professions were project managers and administrative workers 42% and 29% respectively, also salespersons, logistic managers and a journalist took part in the survey (Figure 10).

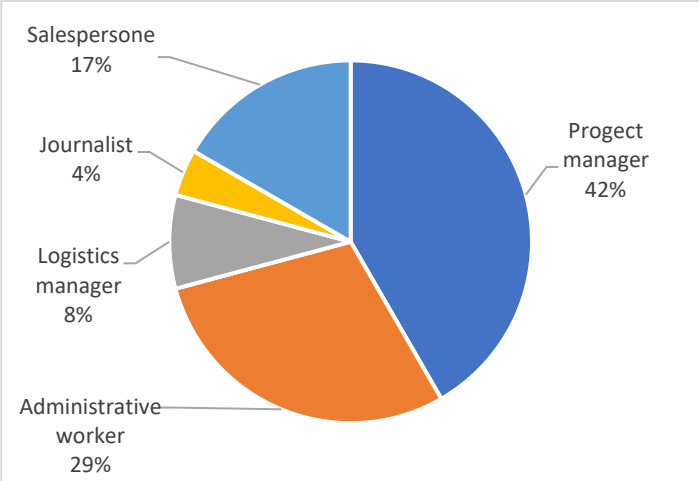


Figure 10 Audience representation by the profession.

The first three questions were devoted to understanding the audience, as well as confirmation of permission to the processing of data and used for the reasons of scientific research exclusively, without further sharing of personal confidential data.

The fourth and fifth questions helped to find out what type of digital skill was announced as a priority for getting the current position. 50% of respondents indicated the ability to analyze data and 29% specify data visualization as an advantage skill (Figure 11). In the other category, remote work and online collaboration skills were defined.

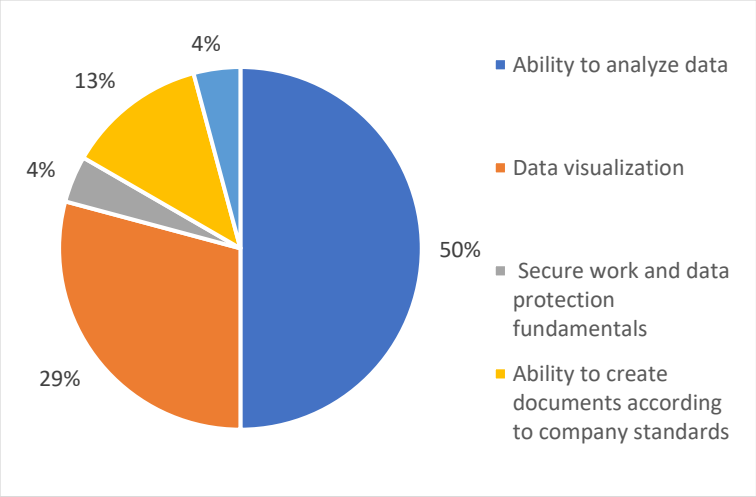


Figure 11 Prioritized digital skills that helped to get current position.

Question number six and seven was targeting how regular respondents try to keep qualification and if the company provide training or support self-development. 72% of respondents regularly learn every week to keep up to date with their digital skills, 13 % try to participate in any learning every month and 8% respectively try to study every day or do not study regularly, but from time to time.

For question 8 all answers were consolidated as a list of recommended resources and platforms for self-learning or learning in groups.

- https://www.linkedin.com/learning
- https://www.udemy.com
- https://www.coursera.org
- https://www.edx.org/
- Companies' internal recourses
- Vendor sites with learning resources
- Learning courses providers (Sulava.com, corellia.fi, nobleprog.fi)

Most of the learning platforms that were mentioned are paid and required investments from employees, that are usually compensated by the employer. Also, it was noted some resources that contain free content.

The ninth question was about the specific courses and course providers that can be recommended to colleagues, and they could be grouped on three main topics:

1. Data analysis
    - Create and use analytics reports with Power BI (Microsoft Learn)
    - Effecting Digital Transformation with Data Analytics Projects (EDX)
    - Data Analysis and Presentation Skills: the PwC Approach Specialization (Coursera)
    - Excel Basics for Data Analysis (Coursera)
    - Excel for Everyone: Core Foundations (EDX)
    - Excel Skills for Business: Essentials (Coursera)
    - Learning Data Analytics (LinkedIn)
    - Data Fluency: Exploring and Describing Data (LinkedIn)
    - Data Analytics for Business Professionals (LinkedIn)
    - Introduction to Transforming with Data Analytics and the Digital Organization (EDX)
    - Data Visualization and Dashboards with Excel and Cognos (Coursera)
2. Collaboration and remote work
    - Connecting and Collaborating in a Virtual or Hybrid Workplace (LinkedIn)
    - The Complete Guide to Microsoft Outlook 2016 (Udemy)
    - Collaborating with Microsoft Teams (Microsoft Learn)
    - Microsoft Word 2016 Learn to Become a Master (Udemy)
    - Learning How to Learn: Powerful mental tools to help you master tough subjects (Coursera)
3. Data visualization
    - Data Analytics: Dashboards vs. Data Stories (LinkedIn)
    - Data Visualization: Storytelling (LinkedIn)
    - Data Visualization: Best Practices (LinkedIn)

To sum up the data: the survey helped to understand what are the prioritized digital courses (connected with data analysis) for the respondents and what are resources they use now. This

information helped to formulate and narrow down the list of topics for digital courses in EKKO.

The other resource of information for courses programs development were the sites of learning providers, learning platforms, open courses (for example, on YouTube) and vendor's learning resources. It was important for two reasons: to synchronize with up-to-date learning courses and to narrow down the list of topics of the developing digital courses.

- https://www.linkedin.com/learning
- https://sulava.com/kauppa/
- https://corellia.fi/kurssit
- https://www.nobleprog.fi/excel/training/helsinki
- https://www.excelkursdirekt.eu/courses/excel/locations/excel-courses-vba-training-helsinki-tampere-turku-oulu
- https://go.courses/landing-microsoft-excel-training-training-in-finland
- https://www.udemy.com
- https://www.coursera.org
- https://www.edx.org/
- https://www.theknowledgeacademy.com/fi/courses/#!office-applications
- https://www.koenig-solutions.com/55154a-office-365-end-user-training

After the analysis of the content and programs of the courses from the learning resources (the list above), main themes based on keywords clustered into topics were formulated. Initially, it was made topic-entry recognition to extract the most requested topics, then keyword extraction was executed to find out the most relevant terms and to identify specific characteristics within the content of the courses. Finally, the topics were associated with main general themes that pointed out the area of application for each topic. This analysis supported the formulation of actual programs and content for the developed digital skills courses for EKKO.

Table 2 Key themes of digital courses based on learning resources analysis.

Keywords ⇨	**Topics ⇨**	**Themes**
Table of content, data creation and processing, list types, filling forms, tables, graphs, quick search	Comfortable workspace, templates, document navigation	Proficient work with multipage documents
Fast data entry and formatting, tables, data ranges, absolute, relative, and mixed links, types of diagrams, power query, power pivot	Data creation and processing, connection to data sources, dashboards	Data analysis and visualization methods
Creation and formatting graphical objects, structure of the presentation, navigation, animation	Content structure, composition, design, visual aids	Storytelling with visual aids
Protection, Strong password rules, Regular updates, Legal software, Fishing, two steps authentication, data encryption, antivirus, VPN	Digital security Physical security Operational security	Secure work in digital environment
Resources, fake news, evaluation rules, search engines, search query syntax	Rules of search, fake information identification,	Search and use of information

4.3 Project implementation self-reflection

The preliminary stage of the project (data collection) was the foundation for the implementation stage. Three categories of requirements influenced the choice and structure of the developing courses (Figure 13). Based on EKKO requirements, programs, and observations of courses in the Finnish language it was possible to understand the current situation with the courses' delivery and expectations. The survey of currently working people helped to keep the content of the courses actual and relevant to the practical application of knowledge. Learning providers and vendors' research allowed to get acquainted with popular commercial courses content, as well as to orient in the prospects for the development of the studied tools.

Figure 12 Resources influenced the course's content formation.

All three categories of requirements and data influenced the courses' programs (Appendix 5). The content of the programs was agreed upon with the administration of the Citizen college and after confirmation, the development of handouts was started. Handouts were planned as the reference materials for both the teacher and the participants of the training. Handouts had an important role in structuring the learning materials in a visual, concise, and concentrated form. The form of structuring materials based on illustrations and comments on actions as step-by-step instructions helping to achieve the desired result. The

content of each course also was limited with the duration (3 hours for each course) and covers up to 5 topics. The content of each course was divided into modules (3 modules per course). Each module consisted of sub-themes that can be delivered in 5-7 minutes and represented as a sequence of actions leading to the targeted result. Each module has the following structure:

- module overview (brief explanation and list of subtopics),
- 5-7 subtopics covered as step-by-step actions and visual demonstration, leading to the development of a specific skill,
- description of an exercise for doing in the class or for self-study,
- the conclusion that allows to summarize and repeat what has been learned,
- 5-7 questions for self-assessment of learned materials.

The courses were short and could not contain all desired information, that is why additional consolidation materials (Appendix 6) were also prepared. These materials were targeting those courses' participants who would like to dig deeper into the topics after the course on their own. These materials contained a brief overview of the topics and links to video demonstrations offering in-depth hints on the course topics and other important topics that were behind the scope. These materials were open for use, hosted on YouTube and prepared by certified trainers.

Alongside the preparation of training materials, the development of a marketing strategy for the course was also carried out. A series of posts (Appendix 7) had been designed and provided a short description of the courses and invited potential participants. A series of posts were published on social media and the college website. Information booklets for printing were also prepared to be placed in public places to attract the attention of potential course applicants.

Also, in parallel with the development of marketing materials, the registration form for enrolling on the courses was prepared (Appendix 8). The purpose of this form was also to collect information about course participants and to get an idea of their level of knowledge in the chosen course. Knowledge of the level and expectations allowed to adjust the course

content on the go directly during the classes and ensure maximum individualization of the materials presentation. It was registered 13 people for the courses and 12 of them corresponded to the foundational level of knowledge. The situation would be more complicated if the group had a stronger stratification, for example, when half of the group corresponding to the foundational level and the second half would be an advanced audience. This situation would not be desirable, but it was anticipated in the design of educational materials that contained varying degrees of content depth (handout and consolidation materials). Ideally, in a situation of many registrations and an obvious stratification of the audience with basic skills and the audience with advanced skills, it would be advisable to divide such groups and work with them separately.

The courses were delivered on agreed dates and upon the schedule. The content of the courses met positive perceptions in the classes. The structure of the interaction during the classes consisted of three main parts: demonstration of the topic materials, when the audience repeated after the trainer, exercise part where participants were able to apply knowledge and skills they got and checking if the materials were clearly understood, and finally, questions and answers session helped to keep the connection with the participants, providing them with the possibility to get answers on questions related with their specific case situation.

4.4 Feedback survey from participants and EKKO administration

After the course participants got a feedback survey (Appendix 9). It was not an obligatory procedure to fill the survey, that is why not all, but just 75% of learners answered the questions. Answers helped to understand the perception of participants' progress during the course. About 66% of learners rated initial knowledge of the subject quite low (2 and 3) on a scale from 1 to 10. And only 33 % rated their knowledge white high and equal to 8. After the course, subjective perception of the progress moved to the right on the scale and became higher and equal 5, 8, 9. This shift of indicators (Figure 14) to the right can be interpreted as a positive learning experience and the understanding that a new body of knowledge and skills was acquired during the courses.

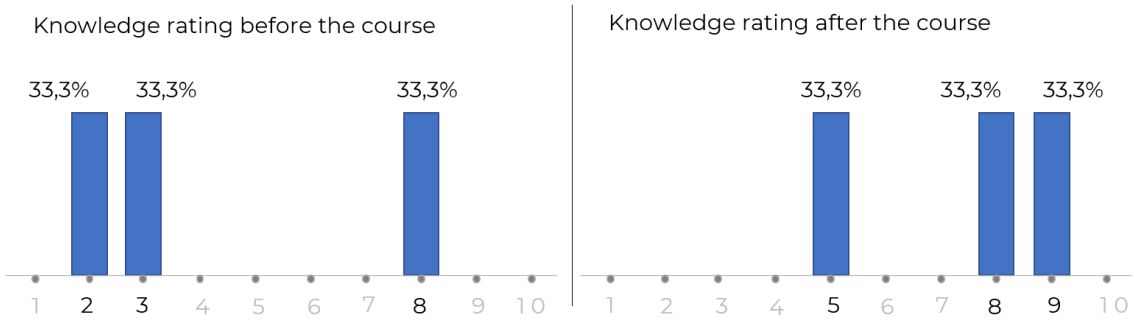


Figure 13 Participants' perception of learning progress before and after the course

Learners' expectations, quality, and relevance of course content were rated quite high: as 30 % gave 7 and 66% gave 10 respectively on a scale from 1 to 10. All participants were satisfied with the trainer delivery methods and learning materials (handouts, presentations). The comment from learners about handouts was that it would be nice to have simpler organized materials. Learners' perception of the content difficulty level as if it was prepared for a more advanced audience and materials were quite intensive. Most of the participants planned to use acquired knowledge and skill and would recommend these courses to colleagues and friends.

The administration of Citizen college relied on feedback from the course's participants in the analysis of the results. For the educational organization, the outcomes were satisfied, and it was the basis for the initiation of a new iteration of courses in autumn 2022. Based on responses it was planned to start three sets of courses: two in the Russian language (free digital skills course and free of charge individual consultations for analysis and help in particular cases) and one digital skills course in English.

5 Discussion of the results

5.1 What are the innovation trends behind the changes?

Like other areas of education, non-formal education is also undergoing changes and absorbing or listening to new innovative trends that appear in national and international education. Adult education provides conditions that support development in accordance with individual cognitive interests. In this direction, the Citizen college organizes an environment where the learner can attend only those classes that are relevant and does not oblige to attend those parts of courses that are not important for a particular individual. The possibility of building an individual learning trajectory is also supported by the opportunity to provide individual lessons and **consultations** with an educator. To organize the learning process at a pace convenient for the learner, materials are provided in a such way that she/he can repeat what has been learned or go through the materials again at a convenient pace. An innovative component in this process is the involvement of information technologies for easier access to materials, simplification of interactions between students, students and educators, students, and the administration of the educational institution. The collection of statistics along the educational process has a special value in this context when it is possible to track the progress of the learner during the work with educational materials. This opportunity becomes possible when the organization deploys and uses content management systems.

Working with student motivation using gamification elements is another cutting-edge direction in education. Citizens College is moving forward in this direction, using national digital badges to encourage course completion and self-assessment of knowledge gained.

The collaborative approach is another direction that is successfully used for working with students in a Citizen college. First of all, cooperation is encouraged in the classroom when mastering new materials, learners can share their experiences and offer their own illustrative examples for the material being studied. In such situations, students become co-authors of educational content along with the teacher and equal with the teacher. And in this context, the technology also brings an innovative touch to this approach. Based on modern applications today, it is possible to organize the collaborative creation and editing of

documents, organize feedback in real-time, provide the opportunity to study not only in the classroom, but also remotely, or in a hybrid mode. With the support of multimedia learning content (not only text and pictures, but video, animations, and audio) collaborative approach offers a powerful learning environment where the learner can access new knowledge and skills any time, at any place and on any device. All these examples above confirm the innovative trend of active penetration of digital technologies into the learning and organizational process in a Citizen college.

5.2 Recommendations for further development

During the development of modern courses, there are some difficulties that the course developer faces. One of the main challenges is the rapid change in technology, which must be quickly reflected in course content. Earlier it was possible to develop a course and teach it for years, today the developed course is already becoming obsolete during its delivery process. That is why today the course developer needs not just to develop a course, but to keep it up to date very often. This requires constant monitoring of vendors, subject matter experts, and actual literature. At the same time, the old lecture approaches are outdated, and the new realities of teaching require dividing the content into small blocks that can be combined in different orders of study, as well as using enough tools to actively involve students in the learning process and maintain a strong interest in regular learning over a long period. This “marathon” approach requires a lot of effort from both the teacher and the student, which can guarantee a stable presence in the flow of rapidly changing information. It is certainly important in this context for the teacher to constantly maintain the relevance of pedagogical skills and monitor current innovative trends. This versatile approach to course development requires a significant investment of time and effort from the trainer, and it becomes clear that it is difficult just for one person to develop up-to-date courses that meet the requirements of today's work market.

Here, the support of an educational organization (or a company involved in the constant development of its workforce) interested in developing and maintaining didactic content comes to the forefront. It is important to create an enabling environment within such an organization that supports iterative approaches to content development and creates a positive

environment for the development of both educators and other staff (project managers, coordinators, experts, managers). It is the iterative approach to course development that allows to make changes to an existing course without fundamentally reworking existing content. The development of high-quality and in-demand courses today can no longer be the result of the work of one person, but the result of the work of a whole team. In this situation, information technology can be a valuable part of such a productive environment for teamwork and support conditions for cooperation, tracking new trends and automated data analysis.

This project was the first try to develop and deliver digital skills course for the non-formal educational organization in Russian and English languages. The organization of educational processes in such an organization has its specifics that must be studied and taken into consideration during the development of the courses. It should be considered the level of knowledge, skills, and motivation of the adult learners. It is possible to tell that this was the first test run, that was successful, and it is the starting point for further development of the digital skills courses. The administration of Citizen college confirmed the continuation of the development and implementation of courses in fall 2022.

Summarizing the experience gained and feedback on the course, the following recommendations can be noted: first, it is worth simplifying the materials and looking towards the development of multimedia interactive materials, containing not only text illustrations, but also video and audio and interactive tasks. Further development of the course conveys considering innovative trends, and associates with the development of learning management system in the educational organization. The further development of such a platform will allow not only storing materials and accumulating a knowledge base, as is happening now but will also increase the flexibility of maintaining educational processes and reinforce further collaboration with courses participants. This flexibility relates to building individual trajectories that allow learners to work with educational materials without rigid binding to the place, time, or device, collect data for learning processes analysis. To accumulate educational materials and develop the promotion of courses, it is also worth paying closer attention to the development of the organization's

YouTube channel. It is worth planning a specific schedule for recording and uploading educational content, that will help to increase the awareness and visibility of the educational organization in the region.

To sum up the further directions of the educational organization and courses development they could be formulated in a condensed form in the following list:

- Development of learning materials (simpler and more visual, more versatile multimedia content based on a learning management system),
- Enhance the capability of a learning platform that stores learning materials and a knowledge base,
- Continue to unlock the potential of the YouTube channel (regular schedule of recording, and uploading short informational and educational videos),
- Maintain the use of social network's potential to educate the adult population, as well as to increase the visibility of the educational organization in the region,
- Crowdsource the ideas of courses and methods of communications/information exchange from the local community more intense.

The first two items in the list relate to internal development activities and the next three are connected with external policy and activities in the educational organization.

5.3 Topics for further research

In this work, several topics were touched upon, and the format of the work certainly limits further deeper research in this paper. But despite this, the topic of evolution and changes in non-formal learning under the influence and active dissemination of innovation and technology into learning for a long period of time is worth special attention and additional exploration. It would be interesting to compare how quickly innovative trends, new tools and educational approaches penetrate non-formal education compared to, for example, general, higher, and corporate education. How do the educational interests of the adult population involve in non-formal education change? Whether the interests are changing during a specific period or do learners want to strive to maintain their qualifications without radical changes in their educational path? These and many other questions arose along the

development and conduction of digital skills courses, as well as during the writing of the master thesis work itself. And of course, a more thorough quotative study of topics related to the use of disruptive technologies such as the internet of things, big data processing, virtual reality, artificial intelligence, augmented reality, and others for educational purposes is worth special attention in future.

6 Conclusions

It was prolific and intensive work during several months of project planning, implementation, and results analysis. This research was for me not only a way to reflect on previous work experience but also the possibility to gain new pedagogical and scientific experience in a new cultural context. As a result, this work expands the knowledge about innovation trends that are visible in Finnish non-formal educational organizations and contributes mainly to the educational field. The impact of the research, first, has a practical contribution and set the ultimate practical goal to benefit the educational organization and its clients. The possibility to develop and implement digital skills courses for such an organization helped to dive deeper into the practical side of the research and match it with theoretical investigations that were done by previous studies. The data collected along the project helped to correlate the main innovative approaches that were identified by earlier scientists with those approaches that are used in a particular educational organization. This helps to understand the diffusion degree of innovative approaches in an educational organization and form a further strategy for creating new courses and for the development of non-formal educational organizations in general.

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8 Appendices

Appendix 1 Interview questions for EKKO director

1. Good day, Emilia, can you please tell us a bit about yourself and about Etelä-Karjalan kansalaisopisto? How do you see the main function of Adult Education Centre in South Karelia region?

2. What is the current situation in Etelä-Karjalan kansalaisopisto? I know you have very wide range of courses and they are very popular among the inhabitants of Lappeenranta and nearest regions. Can you please share with us some statistics about courses in generally and about IT courses in particular?

3. Please tell us what educational methods are used today for teaching adults in Etelä-Karjalan kansalaisopisto? Which contemporary approaches in teaching do you apply in EKKO in response to the challenges of COVID time and limitations?

4. Etelä-Karjalan kansalaisopisto carry very important social function in South Karelia region, give an opportunity for participants for self-development, to get new skills and even to find new friends here. What are the plans for the future development of Etelä-Karjalan kansalaisopisto, which directions are in priority today?

5. Nowadays problems of unemployment, integration and life-long learning have special importance. Very soon unemployed people will be in responsibility of local municipalities. Does Etelä-Karjalan kansalaisopisto plans to the deepen cooperation with TE toimisto, other authorities and potential employers to develop educational initiatives? Do you already have any plans on this direction?

Appendix 2 Interview questions for EKKO digital courses project manager

1. Good day, Kaisa, could you please tell us about yourself and what are your responsibilities in EKKO? Could you please share why do you think that digital skills courses are so popular and what kind of feedback from participants do you usually have after courses?
2. What is your opinion on what are the ways to make courses even more popular, accessible, and diverse?
3. As a project coordinator, what kind of feedback from teachers of the courses do you have this year in the context of COVID limitations? Is courses delivery becoming more demanding for them or they were able to adapt to the constantly changing situation?
4. What do you think what is the most difficult in digital skills courses development and organization?
5. What are the instruments do you use in EKKO to organize learning and administrative process?

Appendix 3 Interview questions for EKKO teachers of the IT courses

1. Good day, can you please share some information about your experience in teaching, which courses you deliver and what is you competence in IT field?
2. Which teaching methods and principles do you use on your courses?
3. How often do you update the content of your courses?
4. Which resource do you use for self-development and keeping up to date your qualification?
5. How did you change your approach in teaching during the COVID pandemic time?
6. What do you think how your courses will change in next years?
7. Which instruments and platforms do you use to organize and deliver learning?

Appendix 4 Classroom Observation Form

Instructor: _____

Course _____

Peer/Observer: _____

Date and Time _____

Use criteria that apply to format of course observed (Review Section)

1. Subject matter content - shows good command and knowledge of subject matter; demonstrates breadth and depth of mastery.

2. Organization - organizes subject matter; evidences preparation; is thorough; states clear objectives; emphasizes and summarizes main points, meets class at scheduled time, regularly monitors on-line course.

3. Rapport - holds interest of students; is respectful, fair, and impartial; provides feedback, encourages participation; interacts with students, shows enthusiasm.

4. Teaching methods - uses relevant teaching methods, aids, materials, techniques, and technology; includes variety, balance, imagination, group involvement; uses examples that are simple, clear, precise, and appropriate; stays focused on and meets stated objectives.

5. Presentation - establishes online course or classroom environment conducive to learning; maintains eye contact; uses a clear voice, strong projection, proper enunciation, and standard English.

6. Management - uses time wisely; attends to course interaction; demonstrates leadership ability; maintains discipline and control; maintains effective e-platform management.

7. Sensitivity - exhibits sensitivity to students' personal culture, gender differences and disabilities, responds appropriately in a non-threatening, pro-active learning environment.

8. Assistance to students - assists students with educational problems.

9. Personal - evidence self-confidence; maintains professional comportment and appearance.

10. Physical aspects of classroom (optional) - state location and physical attributes of classroom, number of students in attendance, layout of room, distractions if any; list any observations of how physical aspects affected content delivery

Appendix 5 Interview questions for currently working people in Finnish companies

1. Name
2. Company name and job title
3. Conditions of information sharing (personal data will not be shred, all data will be presented in anonymized form):
    - I agree that information I will share in this interview can be used for scientific research
    - I agree to share the information of the interview anonymously for scientific research
4. When you got the offer for your current job, which digital skills was requested as an advantage?
    - Ability to analyze data
    - Data visualization
    - Secure work and data protection fundamentals
    - Ability to create documents according to company standards
    - Other
5. If you choose other, please, specify here
6. How often do you try to learn new things to keep up to date your digital skills for maintaining your qualification?
    - Daily
    - Weekly
    - Monthly
    - I do not learn regularly
7. Does your company provide digital skills trainings for employees?
    - Yes, the company organize learning for me
    - No, I study by myself
    - No, I study by myself, but company compensate my expenses
8. Which resources and platforms do you use for self-development, keeping up to date your digital skills, and you can recommend to your colleagues and for the people who are looking for the job?
9. Which digital skills courses can you recommend among the courses that you participated recently?

Appendix 5 Digital skills courses programs and main outcomes

Data analysis foundations course program (3h)	
After the course user can: • customize interface for convenient work • enter and analyze data on the sheet • distinguish between absolute and relative links • create formulas and functions • build diagrams	**После курса пользователь сможет:** • настраивать интерфейс для удобной работы • вносить и анализировать данные на листе • различать абсолютные и относительные ссылки • создавать формулы и фикции • строить диаграммы
Main topics: Introductory information. Customizing the Excel interface for the convenience of everyday work. Collaboration and 3 ways of work with Excel *Useful links and handouts in English.* Techniques for quickly filling out data on sheets Data ranges and tables Absolute and relative links Working with formulas and functions Quick summary option Working with large data sets: sort, filter, slice Construction of diagrams of different level of complexity.	**Основные темы:** Общая вводная информация. Настройка интерфейса Excel для удобства повседневной работы. Совместная работа и 3 способа работы с Excel *Раздаточные материалы и полезные ссылки на русском языке.* Приемы быстрого заполнения данных на листах Диапазоны данных и таблицы Абсолютные и относительные ссылки Работа с функциями и формулами Быстрые итоги Работа с большими массивами данных: сортировка, фильтрация, срезы. Построение диаграмм различной сложности.

Course results: *We create a family budget workbook.* ***Recourses:*** https://support.microsoft.com/en-us/excel	Создание сводных таблиц. ***Результат работы*** *на курсе: создаём бюджетную ведомость семьи.* **Полезная информация:** https://support.microsoft.com/ru-ru/excel https://office-guru.ru/excel

Table 3 Data analysis foundations course program.

Visual storytelling course program (3h)	
After the course user can: • customize interface for convenient work • create slides • add and format text and objects on slides • setup animation and transition • To create structure and navigation in presentation	**После курса пользователь сможет:** • настраивать интерфейс для удобной работы • создавать слайды • добавлять и форматировать текст и объекты на слайды • настраивать переходы и анимацию • создавать структуру и навигацию в презентации
Main topics: Introductory information. Overview of applications for creating presentation Main steps of creating presentation Customizing the PowerPoint interface for the convenience of everyday work. Collaboration and 3 ways of work with PowerPoint *Useful links and handouts in English.* Text formatting	**Основные темы:** Общая вводная информация. Обзор приложений для создания презентаций Основные этапы создания презентаций Настройка интерфейса PowerPoint для удобства повседневной работы. Совместная работа и 3 способа работы с PowerPoint *Раздаточные материалы и полезные ссылки на русском языке.*

Adding and formatting objects on slide Animation and transition Structuring and styling PowerPoint presentations. ***Course results**: We create a basic presentation about hobby* ***Recourses:*** https://support.microsoft.com/en-us/powerpoint	Форматирование текста на слайдах Добавление и форматирование объектов на слайдах Настройка переходов и анимации Структурирование и единообразное оформление презентаций в PowerPoint. ***Результат работы** на курсе: создаем презентацию про хобби.* **Полезная информация:** https://support.microsoft.com/ ru-ru/powerpoint

Table 4 Visual storytelling course program.

Work with multipage documents course program (3h)	
After the course user can: • customize interface for convenient work • add and format text • understand Styles in Word • add and format graphical objects • create navigation in text documents	**После курса пользователь сможет:** • настраивать интерфейс для удобной работы • добавлять и форматировать текст • понимать ситуации использования стилей в Word • добавлять и форматировать графические объекты • создавать навигацию в текстовом документе
Main topics: Introductory information. Customizing the Word interface for the convenience of everyday work. Collaboration and 3 ways of work with Word	**Основные темы:** Общая вводная информация. Настройка интерфейса Word удобства повседневной работы. Совместная работа и 3 способа работы с Word

Useful links and handouts in English. Three levels of text documents formatting Text formatting, styles Adding and formatting graphical objects in text documents Navigation in multiple page documents. Adding and formatting tables in text documents. ***Course results:*** *formatted text document with graphical objects and navigation (CV, multipage document with navigation)* ***Recourses:*** https://support.microsoft.com/en-us/word	*Раздаточные материалы и полезные ссылки на русском языке.* Три уровня форматирования текстовых документов Форматирование текста, использование стилей Добавление и форматирование графических объектов Способы навигации в многостраничных документах. Эффективная работа с таблицами. ***Результат работы*** *на курсе: отформатированный текстовый документ с графическими объектами и навигацией (Резюме или многостраничный документ).* **Полезная информация:** https://support.microsoft.com/ru-ru/word

Table 5 Work with multipage documents course program.

Data security and information search course (3h)	
After the course user can: • recognize main principles of secure work in office and at home • apply principles of secure work with e-mail • apply principles of secure search in Internet • apply principles of secure work with computers and mobile devises	**После курса пользователь сможет:** • знать основные принципы безопасной работы в офисе и дома • применять принципы безопасной работы с электронной почтой • применять принципы безопасного поиска в Интернете

• identify potentially insecure situations	• применять принципы безопасной работы с компьютерами и мобильными устройствами • узнавать потенциально небезопасные ситуации
Main topics: Physical, digital and operational principles of secure work in office and at home. Rules for secure work with e-mail, how to identify and resist phishing scams. Rules for secure work and search in Internet, search engines, main search principles. Copyrights. Rules for secure work with computers and mobile devises. ***Course results:*** *The knowledge the identify potentially insecure situations* ***Recourses:*** *Useful links and handouts in English.*	**Основные темы:** Физические, цифровые и операционные принципы безопасной работы в офисе и дома. Правила безопасной работы с электронной почтой, как выявить и противостоять фишингу. Правила безопасной работы и поиска в Интернете, поисковые системы, основные принципы поиска. Соблюдение авторских прав при использовании контента из Интернета. Правила безопасной работы с компьютерами и мобильными устройствами. ***Результат работы на курсе****:* *Приобретение знаний и навыков для распознания потенциально небезопасных ситуаций* **Полезная информация:** *Раздаточные материалы и полезные ссылки на русском языке.*

Table 6 Data security and information search course.

Appendix 6 Excel class consolidation materials

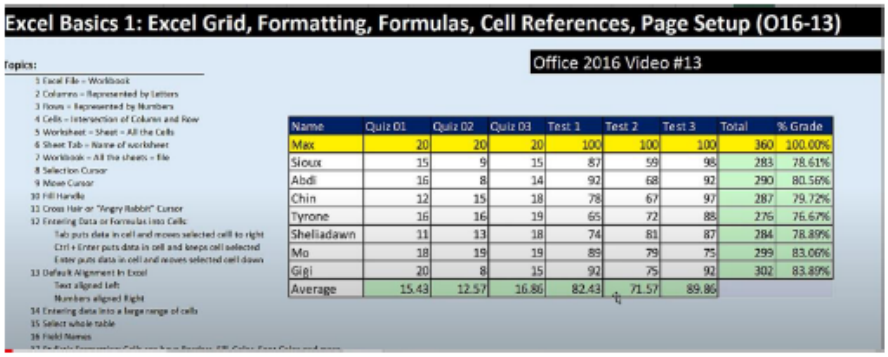
1 Getting familiar with Excel

Video tutorials

Take a look at the video and practice with Excel at the same time. There are "homework" in the "Excel is Fun" -channel for each video, so take a look at those also and practice! Download a data file below video and follow instructions on how to accomplish the learning task.

- Excel Basics 1: Introduction To Excel 1: Formatting, Formulas, Cell References, Page Setup https://youtu.be/c_ZJLJK5PjM

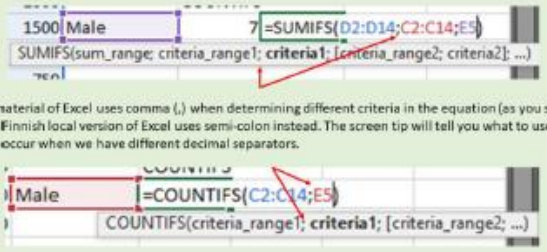
Note that the keyboard shortcuts depend on the keyboard and language settings. Language settings also influence the use of autofill with the fill handle.



Guides and documents

- Office support site has a lot of material for learning and training excel. For getting started, here are two useful tutorials for basic functions and charts.

Notice the following difference in regional settings of Excel compared to the video material when writing the equations:

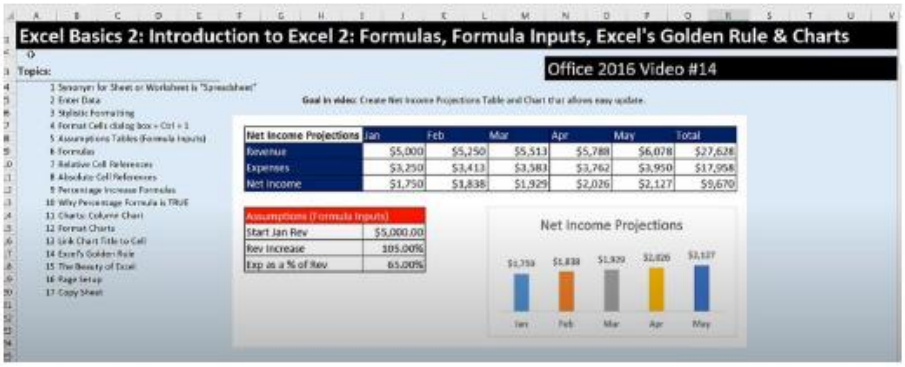


The video material of Excel uses comma (,) when determining different criteria in the equation (as you see in the video). The Finnish local version of Excel uses semi-colon instead. The screen tip will tell you what to use! The differences occur when we have different decimal separators.

2 Counting and summing

The second section introduces the basic mathematical functions in Excel.

- Excel Basics 2: Introduction to Excel 2: Excel's Golden Rule for Formulas, Formula Inputs, & Charts https://youtu.be/PNnvuADkg1o



Note that the keyboard shortcuts depend on the keyboard and language settings.

Language settings also influence the use of autofill with the fill handle.

- Excel Formulas & Functions in 10 Minutes https://youtu.be/2tK8OVB7rdA

Guides and documents

- Formula tutorial https://templates.office.com/en-gb/formula-tutorial-tm16400656?omkt=en-GB
- Ten tips for charts https://templates.office.com/en-us/ten-tips-for-charts-tm22516108
- HubSpot guide to Excel formulas, functions, shortcuts and tips https://blog.hubspot.com/marketing/microsoft-excel

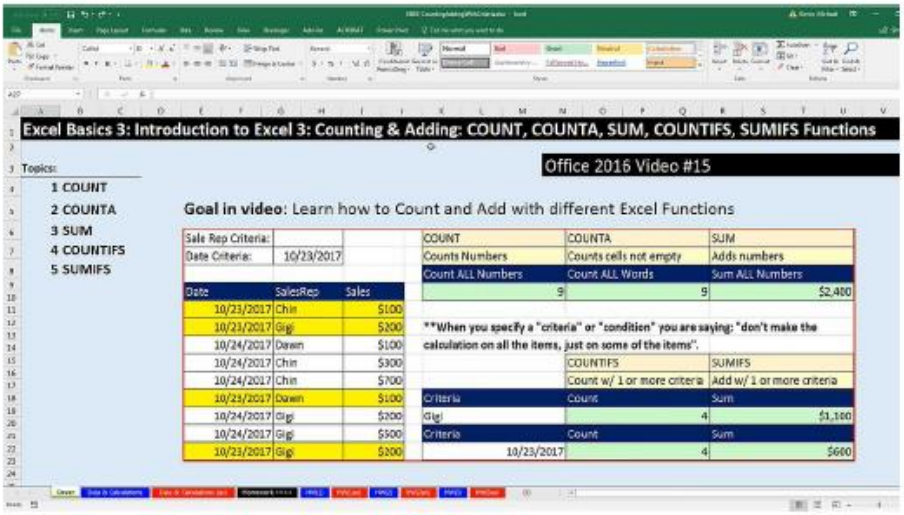
Excel Basics 3: Count & Add with COUNT, COUNTA, SUM, COUNTIFS, SUMIFS Functions

https://youtu.be/fQsz6mKDobE

https://support.microsoft.com/en-us/office/excel-functions-alphabetical-b3944572-255d-4efb-bb96-c6d90033e188 - Excel functions (alphabetical)

https://trumpexcel.com/excel-functions/ - 100+ Excel Functions (explained with Examples and Videos)

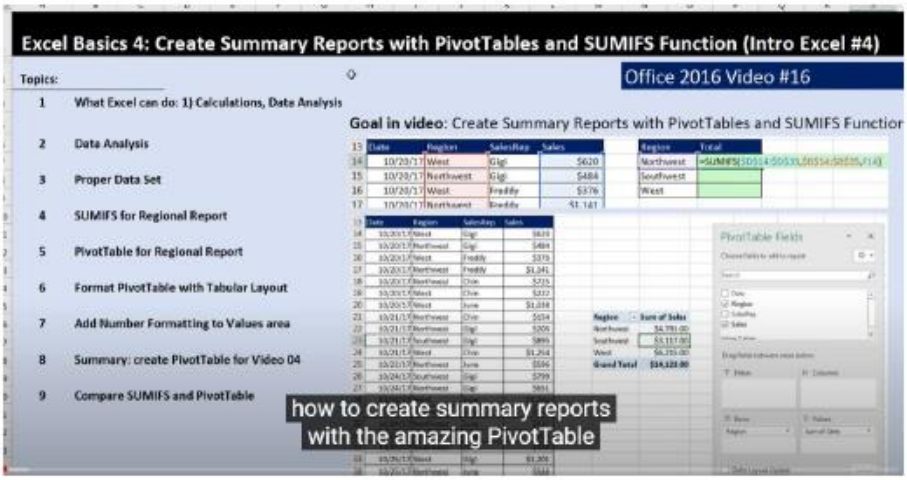
https://www.excel-easy.com/functions/formula-errors.html - Formula Errors



4 Pivot Tables

Excel Basics 4: PivotTables & SUMIFS Function to Create Summary Reports

https://youtu.be/uGNdFW_3NnY



Recommendations for self-study

Book at advance:

- Calendar time for advance preparations for training, studying and for reviewing learning
- Prepare your workspace, so you can focus and study on your peace

Make sure that:

- You have the required software for studying installed on your device
- You have all necessary information near you
- Connections are working
- You can focus on training in peace and not disturb others (e.g. in the workplace)
- Learning materials are printed
- Clean up other things from your desktop, this will help you focus

Close:

- Email and instant messaging during study

Appendix 7 Marketing materials for digital skills courses

Figure 14 Marketing materials for social networks

Figure 15 Marketing materials for print

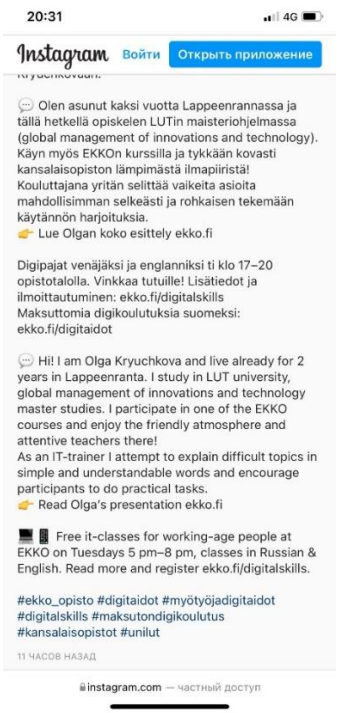


Figure 16 Marketing materials for Instagram

Figure 17 Marketing materials on EKKO site.

Appendix 8 Registration form for digital skills courses

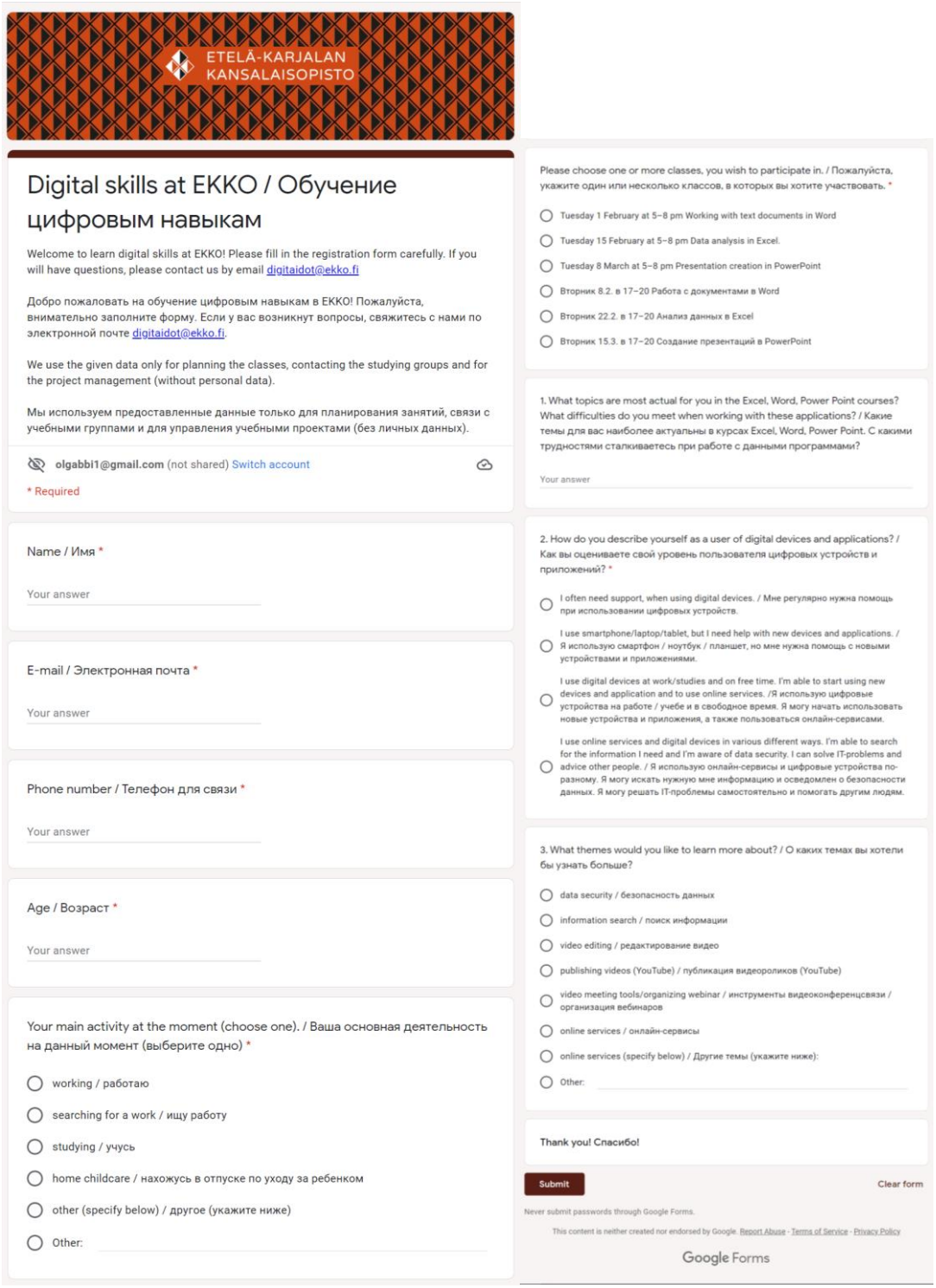


Figure 18 Registration form for digital skills courses

Appendix 9 Assessment surveys after the courses

https://forms.gle/roB6B8KQe88V4VEfA - Word

https://forms.gle/xQK4fnR5GjsdFG6H7 - Excel

https://forms.gle/K2YSE6jtgbLyWLWz5 - PPT

https://forms.gle/un1ygKnHWCHtJxEZ7 - data security