

Methodological recommendations

Improving distance learning materials based on perceptual types

Developed as a result of the activities of the European Union Erasmus+ Programme Key Action 2 (KA2) school-sector Small Scale Partnership Project No 2021-1-LV01-KA210-SCH-000031400 'On the Way to Self-Directed Learning'

Authors: Linda Vecums-Veco (Latvia)

Kristina Mazmanyan (Slovenia)

Sona Stefkova (France)

Tuomo Polo (Finland)









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These methodological recommendations for improving distance learning materials based on perceptual types were developed under European Union Erasmus+ Programme Key Action 2 (KA2) school-sector Small Scale Partnership Project No 2021-1-LV01-KA210-SCH-000031400 'On the Way to Self-Directed Learning', in which four EU Member States (Latvia, Slovenia, Finland, and France) put together their experience and good practices in working with learning materials for distance learning.

The project's lead organisation is the Jelgava Regional Correspondence School (Latvia). We work in education, and every day we deal with pupils that have poor learning skills, which affects their motivation to learn and creates a risk of dropping out. Recognising this problem, we joined forces with partners from other European countries, to work together on mitigating these risks and improve distance learning materials by sharing our collective experience. At the same time, we worked on developing methodological materials, to enhance learning skills and self-directed learning.

On a larger scale, nine out of ten new jobs in Europe require workers to have secondary or higher education, while one in seven young people leave formal education without a secondary education diploma. According to Education and Training Monitor 2019, some 20% of pupils (who on average are 15 years old) across Europe are still at risk of poverty due to dropping out, which had a rate of 10.6% across Europe in 2018. This indicator saw a 9.4% increase in Europe, compared 2018 (Structural indicators on..., 2017).

Distance learning is problematic for learners who drop out because of poor learning skills. This increases their risk of poverty and social exclusion. To address these risks, teachers working with distance learning need to be able to help pupils develop their learning skills and to design their learning materials such that they suit different learning styles. Learning materials must be appropriate to the perceptual type and learning style of the pupil.

According to the data of the Latvian State Education Information System, as of 1 September 2021, there were 5576 pupils in distance education programmes. However, with the recent COVID-19 pandemic, almost all pupils, both nationally and globally, had to learn remotely, so teachers had to improve their digital skills and improve their knowledge in creating learning materials that can be used digitally. So far, the education institutions of the participating member states have not used the identification of the perceptual types of their learners, or engaged in the development of learning materials tailored to these types in their

practice. Because the project aims to improve and test innovative learning materials based on the learner's perception, it involves working directly with researchers who study how people perceive different types of learning materials. The project is unique for the organisations involved as it offers new forms of support that will help education institutions improve their teachers' everyday work skills and reduce the drop-out risk for their pupils.

Taking into account the current situation with distance education, the project, in cooperation with the scientists from the Riga Technical University (RTU) Distance Education Centre and based on their research, has improved the learning materials, taking into account the specific features of perceptual types, in order to facilitate the internalisation of the materials. The improved learning materials contribute to making information more accessible to pupils, as demonstrated by the results of the testing of the learning materials improved as part of the project. The methodological recommendations are useful for teachers developing new or expanding existing learning materials.

These methodological recommendations were developed using a variety of innovative information and communication technology (ICT) tools. The methodological recommendations also highlight the experiences and good practices of the partners involved in the project. The project has resulted in the development and implementation of innovative learning materials tailored to specific perceptual types, perceptual characteristics, and learning styles, and in the provision of professional experience in distance learning to teachers, thus reducing the risk of pupils dropping out.

PERCEPTUAL TYPES AND THEIR IDENTIFICATION

Perception is a mental cognitive process that creates a direct representation of real objects, phenomena, and events in consciousness through the senses of sight, hearing, touch, etc. and in the context of certain recognition and understanding of what is being represented. (Blinkena, 2000).

According to Smith's theory, there are **three main perceptual types**: visual, auditory, and kinetic. Smith's research shows that 34% of people have auditory perception, 29% visual perception, and 37% kinetic perception (Smits, 2000).

By observing pupils, the teacher can determine their perceptual type (see Table 1) and thus better organise the process of learning.

Table 1 **Perceptual types, their identification and use in learning** (based on Smits, 2000)

Perceptual type, its strengths	Physiology	Language	Techniques facilitate perception and learning
 VISUAL Imagines places and events easily. Sees self working in different conditions. Often sees images associated with words or feelings, and only then confirms that having understood something new. When writing, often sees the word in terms of how it will look when written. 	 Breathing with the upper chest High voice pitch Shallow breathing Perceives information by looking upwards 	 'I see what you think' 'Looks good' 'Can you imagine this?' 'Imagine that' 'Well, how does it look to you?' 	 Use your appearance, your body movements. Use visual aids above eye level. Videos, colourful reference materials. Colourful, engaging textbooks. Preparation of memory cards, collages and visual note-making tools. Posters on the walls explaining basic concepts.

Perceptual type, its strengths	Physiology	Language	Techniques facilitate perception and learning
 AUDIAL Auditory dominance is manifested through internal dialogue and language in general. Often 'hears' the word before they write it. When preparing for a new situation, rehearse it in their mind what they would be told and what they will say. 	 Level eye movements Breathing steady Clear, resonant voice intonation Even muscle tension Receives information with their head bowed 	 'I am listening' 'Sounds good' 'I hear in it' 'How does it sound?' 'I've heard that before' 	 Work in pairs, group discussions, group reports. Guest speakers. Short debates. Rap, rhythm, verses, poetry, reading by roles. Use of sound recordings. Music for encouragement, relaxation, imagination, revision.
 KINETIC Strong connection with feelings: emotions and tactile sensations. When writing a word, feels self writing it letter by letter, or just feels that they are doing it right. Expected events are associated with strong emotions. Physical situations are perceived along with the emotions they evoke. 	 Eyes moving downwards Deep breathing Lots of movement Perceives information by looking down 	 'Somehow it doesn't seem right' 'Can you grasp that?' 'I haven't come in touch it' 'Put yourself in my shoes!' 'I stand against it' 	 Miming, facial expressions. Gestures or movements learned to demonstrate a concept. Exercises for breaks. Exercises in designing and construction. Expeditions and trips. Physical movements (e.g. maps drawn on a hard surface help you learn the geography of countries and trade routes).

The pupil can determine their own main perceptual type by answering the questions in the questionnaire (see Annex 1).

Knowing their perceptual type makes it easier for the pupil to look up and learn directly through the learning materials that are more accessible to them. There is no single best way to learn in a self-directed way, so it is up to each individual to identify the best ways to learn and to use the most effective learning aids. It is also important for the teacher to understand their own dominant perceptual type and to work on developing the other types.

To teach effectively, teachers need to assess their pupils' strengths and develop learning materials for each perceptual type.

With the international experience of the teachers in creating learning materials, we have prepared an overview of teaching recommendations (see Table 2).

Table 2

Learning materials for each perceptual type

Learning materials based on perceptual type Kinetic Visual Auditory Practical tasks Presentations Videos (simulations. Images, photos Stories told by the laboratory tasks, Videos teacher collages, • Diagrams, Playing music for posters) encouragement, symbols Creating charts Colourful visual relaxation, Making notes materials imagination, revision Collages Discussions Posters Brief debates Verses Posters Reading by roles

Important to remember!

The teacher's role is to provide the pupil with a variety of learning materials and to point out the ways in which the new material can be learned.

According to David A. Kolb's (see Figure 1) experiential learning theory, learning happens naturally. Kolb stresses that experience is crucial for the development of knowledge, because learning takes place through discovery and active participation. Kolb defined learning as a process, by which knowledge is created through the transformation of (lived) experience. This is based on a belief that learning is a continuous and cyclical process in which the individual integrates ways of perceiving, thinking, acting, and feeling, thereby creating concepts that are then used to select new experiences. The way an individual learns is a determining factor in the development of personality (Kolb, 1984).



Figure 1. David Allen Kolb — American education theorist

Kolb's theory of experiential learning consists of two parts:

<u>Part 1: *learning*</u> takes place in four *learning stages*, as indicated in the learning circle (see Figure 2). Kolb believed that, in an ideal situation, the pupils move through the stages to complete the cycle, converting their experience into knowledge as a result. This process (concrete experience, reflective observation, abstract conceptualisation, active experimentation) helps one evaluate and analyse experiences in order to understand them and find practical applications for them.

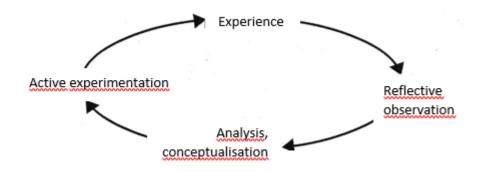


Figure 2. Learning cycle (Kolb, 1984)

Part 2: focusing on learning styles or the learning processes that take place to acquire knowledge. It is the basis for a continuous process of focus actions and evaluating the consequences of those actions. A pupil's individual knowledge can be assessed through feedback, which shows whether they will be able to apply what they have learned in a new situation.

Kolb's entire theory is based on the idea of turning experience into knowledge. The pupil can assimilate new observations into their prior experience. Ideally, the pupil should be enabled to go through each stage.

Experience is a key component of Kolb's theory, because he saw it as a process in which something needs to be changed or transformed. Kolb's model of learning shows that something must be created from experience in order to be defined as learning (Kolb, 1984).

Kolb has developed a test to determine learning styles (see Annex 2). Based on the results of this test, everyone can independently determine their or her own learning style: learning by doing; learning by watching; learning by thinking, or by feeling. It is a tool to help one understand how to learn more effectively, to increase own confidence and to be aware of one's strengths and weaknesses, making it possible use the right learning method for a task or subject.

Important to remember!

It is rare to find people who have only one learning style, as learning varies from one method to another across all stages of learning, but every person has their own dominant learning style, so there could be pupils in any classroom who need very different teaching methods.

Teachers teach many different types of lessons in their daily work, but not every lesson stays in their pupils' memory. How can we encourage every pupil to actively engage their thinking with the lesson and to have learned new knowledge and skills by the end of the lesson? It turns out that a part of the solution lies in planning the lesson. What needs to be taken into account when planning a lesson to ensure that every pupil achieves their objectives; what events of instruction need to be planned for; in what order do they need to be experienced to help the pupil to understand the context, to make conclusions, to create, and to retain what they have learned? (Driscoll, 1999).

We will now look at the model for planning instruction proposed by the American education researcher Robert Mills Gagné. The model takes account of the processes take place in the pupil's head as they learn, and of how the teacher can facilitate and use them to ensure that every pupil achieves the lesson objective. How a teacher teaches has a close connection to how a pupil performs. When planning a lesson, teachers need to consider not only what they want to teach, but also how to organise learning in a way that encourages and supports the learning by their pupils. Otherwise, the teacher may find themselves in a situation where the pupils recognise having studied a topic, but it turns out that the knowledge is in their long-term memory.

The information a pupil receives, finds out, or discovers when learning goes through different types of memory: from sensory, where they first perceive the incoming information, to short-term, and then to long-term memory. For information to actually reach long-term memory and stay there, the pupil needs to hold attention during the learning process, to associate the information with what is already known, to recognise patterns within it, to revise it, and to be able to locate it in the system that already exists in the pupil's memory. Learning only happens if all these processes are active, so according to Gagné's theory of instruction and his model of 9 events of instruction (see Table 3), the main task of teaching is to activate the processing of information in the pupil's brain.

Lesson recall/actualisation sections

(after Ganjé, Wager, Golas, & Keller, 2007, Olina & Ušča, 2020)

THREE PARTS OF THE LESSON	NINE EVENTS OF INSTRUCTION
	Gain pupil's attention
Recall/ actualisation	Communicate the learning objectives
Accum accumisation	Stimulate recall of prior learning
	Present new content
	Provide learning guidance and support
Comprehension	Elicit the use of new content
	Provide feedback
Reflexion/ consolidation	Assess performance
	Foster transfer/generalisation

Gagné proposes nine events of instruction that are necessary for each outcome: whether it is a single learning outcome in a single lesson or a complex learning outcome that requires longer time and multiple lessons. To understand the role and rationale for each event of instruction, we explain how they relate to the pupil's learning process. Below we offer structured information about the activities and techniques a teacher can use to implement each event of instruction. It is important to emphasise that this model is designed for teacher-directed learning situations that have clear outcomes. Children and adults can also learn a lot in informal learning situations.

Education researchers point out that events of instruction do not all have to happen in the same sequence, nor do teachers have to implement them all in the same lesson. Pupils may experience some of the events in a previous lesson, and a brief reminder to what they did before is enough in such a case. Some events of instruction can be handled by the pupils themselves. The amount of time spent on each event is closely related to the amount of teacher support the pupil needs for the above cognitive processes to take place. There are pupils and situations where everyone manages on their own, but there are other cases when the teacher's support in stimulating the thinking processes is vital for the pupils to achieve the outcome of the lesson and to be able to apply what they have learned in the future. The main purpose of events of instruction is to stimulate the internal information processing within the pupils.

Many teachers will recognise in Gagné's nine-event model the three-part model of lesson planning that is already widely used. The three-part lesson planning model consists of recall/actualisation, comprehension, and consolidation. As shown in Table 2, the *recall/actualisation part of* the lesson, which includes the first three Gagné events of instruction, aims to stimulate the learner to think about the topic to be covered during the lesson. The mid-lesson *comprehension part* aims to teach the learner the new content and includes Gagné model events of instruction 4–7, and the *consolidation part* aims to strengthen what has been learned and encourage transfer (events of instruction 8–9 in the Gagné model). There are, of course, dozens of lesson planning models around the world, each of which is also better suited to different types of learning outcomes (Ganjé, Wager, Golas, & Keller, 2007).

Important to remember!

When planning a lesson, it is important to include the nine events of instruction (the three parts of the lesson: recall/actualisation, comprehension, consolidation).

Based on Gagné's nine events of instructions, teachers must plan and structure lessons according to a specific structure (see Annex 3). The same lesson structure applies to online lessons.

A teacher preparing for *online distance learning lessons* faces several problems in the implementation of Ganjé's nine events of instruction. Below, we describe four problematic events, with recommendations for how to improve teaching:

<u>Communicating the learning objective</u>: the learners do not answer the teacher's questions about the outcomes. They often feel shame or lack of knowledge.

Suggestions: give the pupils very simple questions at the beginning of the lesson to stimulate conversation. Give a simplified collage as an example, starting with simple things that the pupil knows (warm-up exercises). The teacher offers probing questions at the beginning of the lesson to stimulate discussion.

Stimulate recall of prior learning: when giving answers on a previously learned topic, pupils do not turn on their microphone, are shy to speak or do not communicate at all due to fear and lack of knowledge. There are also individual pupils who take longer to engage with the lesson. Suggestions: ask probing questions to supplement the offered material, encourage the pupils to provide feedback.

Provide learning guidance: the pupils participating in the lesson have different levels of communication skills, knowledge, and perception.

Suggestions: Before the lesson, the teacher plans tasks for different levels of knowledge.

Differentiated approach. Work in groups, dividing the pupils into knowledge levels. The teacher guides, encourages, praises, and supports the pupils.

Enhance transfer/generalisation: pupils often do not spend the time they need at home to consolidate their knowledge.

Suggestions: ask probing questions. Give a task for the next lesson to make the pupils look for answers in a different environment (with family, friends). Give praise during lessons. Encourage the use of knowledge in other subjects and in relation to reallife situations.

RECOMMENDATIONS FOR TEACHERS TO ENHANCE SELF-DIRECTED LEARNING

Self-directed learning is a process in which a person consciously operates and uses tools to regulate thinking, emotional processes, and behaviour in order to systematically acquire new knowledge and skills (Zimmerman, 2002).

Self-directed learning skills need to be trained and worked on in order to be developed. Pupils need to be able to motivate themselves, plan their activities, and assess their progress in order to be more effective next time. If a pupil can do this, they have good self-directed learning skills (Veenman, 2013).

There are three stages of self-directed learning: **Planning** — **Monitoring** — **Evaluation** (**P-M-E**). Reflection is an integral part of P-M-E.

To REFLECT means to be able to **manage** (plan, monitor, and evaluate) **your own learning** by asking yourself questions and answering them.

PLANNING (before the task/activity) — before we start doing something, we plan how to do it. The pupil thinks about the learning goals (task) and figures out how to achieve them, and with what techniques and strategies. Create an action plan and criteria to determine if the plan has been fulfilled.

Questions to ask yourself at the start of planning:

What is the purpose of the lesson?

What do I want to learn?

Could it be related to what I already know?

How will I learn to complete the task? What will help me learn?

How much time will I need?

MONITORING (happens during the task/activity) — during the task/activity, we analyse whether we are progressing towards the goal as intended. The pupil implements their plan and monitors their work, progress, and achievement of the milestones and goals. They check for mistakes. Look for better solutions. The pupil can decide to change the plan, its individual steps.

Questions for the pupil to ask themselves when monitoring:

Am I doing as planned?

How will I know that I am learning things?

What could be done differently?

What will I do if I do not understand something during the lesson?

How do I check that I am not wrong?

Do I understand everything?

EVALUATION (after the task/activity) — once everything is finished, evaluate how well we have done what we planned. The pupil assesses how well they have achieved the goals (completed the task) using the chosen strategies, determining what worked well and what could be done differently and better next time.

Questions that the pupil asks themselves as part of the assessment:

At the end of the lesson, what will show me that I achieved the goal?

How will I 'measure' my knowledge?

How will I consolidate my new knowledge? (Vanags, Pašvadīta mācīšanās – kas tas ir?, 2019).

These three core activities are equally important and need to be developed because of their long-term significance: achieving and evaluating one goal enables more efficiency achieving it next time.

Reflecting on learning involves two further events of instruction: assessing performance and encouraging transfer and generalisation. Reflection is a way for the pupil to enjoy the satisfaction of what they have achieved, to evaluate it, and to plan their next steps.

Important to remember!

Self-directed learning is a key competence that pupils need to learn as quickly as possible.

Pupils with good self-directed learning skills demonstrate:

- more willingness to learn,
- better recall of knowledge,
- ability to work together strategically,
- ability to be more productive and flexible in their work (Hartman, 2001).

In order to achieve the results, the teacher has to answer a number of questions when preparing the teaching materials and during learning (see Table 4).

Table 4

Self-directed learning questions

(based on Vanags, Kas ir pašvadīta mācīšanās, 2018)

Teacher's question	What the teacher encourages and stimulates in their pupils through the questions
What could you do if there are problems?	Encourages thinking about strategies.
How do you know it?	Reflecting on knowledge.
What will you do next?	Looking for information, planning. Highlights explanation.
Will it help? Will it work?	Encourages predictions.
How will we do it? What do we need to think about?	Planning and planning expectations
Have you checked what you have done?	Encourages checks, monitoring. Reflect on own thinking.
Do we all need to think hard about this together?	Points at thought processes. We will solve this problem by doing. Teaching of techniques and strategies.
Was it hard or easy? What have we succeeded at?	Encourages assessment.

Motivation is the needs, interests, rights, and other elements that encourage and guide behaviour and which, along with the corresponding activity, also characterise a person's personality (Breslavs, 1999).

The actions of humans are closely linked to their needs, but motives drive action in a particular direction. **A motive** is an internal, encouraging factor, reason, or circumstance (Baldunčiks, 1999).

Needs describe a person's willingness to perform a general activity, while motive provides the activity with meaningful nature.

There are external and internal motives. 'Motivation is a set of motives that are associated with a given action and arise from a particular need, through the interaction of external and internal motivators' (Baltušīte, 2006).

Action with little or no motive, either does not happen at all, or is very unstable. As teachers, we can influence our pupils' external motivation and foster their internal motivation.

Purpose is also an important concept when it comes to motivation in learning. A goal is a known result, towards which the action related to meeting a known need is directed at a given point in time. Motives, needs, and goals are the basis of human motivation. Augusts Milts also identifies interests as a key factor that defines domains of motivation (Milts, 1999).

An interest is a certain evaluative attitude towards something; interest can also refer to an evaluation of a particular activity that creates a positive emotional experience in the person. If the need for such experience becomes the basis for an interest, then interest is already a need, then it becomes an active motive and an encouragement for action, which satisfies that need for experience. This can build interest in performing a particular task, as it brings emotional satisfaction from overcoming difficulties (Laizāne, 2014).

Motivation to learn is essential for distance learning in general secondary education, as distance learning means less opportunity for the teacher to have face-to-face contact with the pupil.

Motivation to learn is a prerequisite for success in learning. Motivated pupils have an internal drive to learn and are more likely to be actively engaged in learning. Motivating pupils in distance learning is difficult, especially when the intensity of interaction between the teacher and the pupil is low (direct contact only happens during online lessons when a specific topic is taught).

In the context of publications by the psychologists Richard M.Rayan and Edward L. Deci on the topics of self-determination and intrinsic motivation, social development and well-being, it is important to note the motivational regulation of learning (see Table 5).

Table 5

Factors governing a pupil's motivation to learn (Rayan & Deci, 2000)

Impersonal motivators	External motivators	Self-regulated personal motivators
Unconscious actions	External rewards	Personal relevance, conscious choice of values
Incompetence	Consequences of not following rules	Acting in accordance with own values
Lack of self-control		Interest, enthusiasm, satisfaction

The teacher encourages the motivation of the pupils to learn during the online lesson. It takes an average of 40–45 min. It is not much, but it is enough to do the following:

to answer the question pupils don't ask — why do I have to do this?

to give confidence in knowledge,

to generate interest in learning,

to challenge to learn,

to check learning performance

to provide feedback.

Pupil motivation for learning is enhanced by:

setting achievable goals,

providing feedback on has been a success,

identifying success and achievements (Daniela, 2021).

Important to remember!

Motivation to learn is a prerequisite for success in learning.

USE OF INFORMATION TECHNOLOGY IN CREATING DISTANCE EDUCATION COURSES

Using information technology to create distance learning courses

In order to make learning materials easier to understand, more varied, and better suited for all types of learners, they need to be designed using a variety of appropriate ICT tools.

Before we look at the capabilities of different ICT tools in more detail, let us mention a few important facts about teaching and learning in distance education, including brain activity and learning, and what skills distance education learners need to develop.

Our brains and learning. What we remember depends on:

- 1. our emotional reaction to experience;
- 2. how new the information is;
- 3. where and when the event happened;
- 4. our level of attention and motivation;
- 5. how we process these thoughts and feelings in our sleep.

Whether we are remembering the events of the day or are using a skill we have learned, millions of neurons in different regions of the human brain associate to create a coherent memory that links emotions, sights, sounds, smells, sequences of events, and other stored experiences.

Skills needed for distance (remote) learning:

- 1. pupil management;
- 2. reading and writing skills;
- 3. online presence;
- 4. communication;
- 5. knowledge of the content;
- 6. mixed pedagogy;
- 7. organising and structuring;
- 8. technical knowledge;
- 9. strategy.

Below is a list of free ICT tools, platforms, apps, websites, and virtual labs used by the project's partner schools, which teachers can adapt and use to create their own subject-specific teaching materials and online lessons.

Important to remember!

Learning materials should not be overloaded with different IT tools, so as to avoid confusion and missing the main purpose of learning

Online platforms Description Logo Website MOODLE — distance learning platform https://moodle.com to organise distance learning, upload learning materials, run online lessons, create tests, communicate with pupils. ZOOM — cloud platform for video and https://zoom.us audio conferencing, collaboration, chatting, and webinars. Screen sharing chat zoom Breakout rooms Polls/surveys Whiteboard Reactions Video recording Microsoft Teams — chatting, online https://www.microsoft.com/ en/microsoft-teams/log-in meetings, calls, collaboration using the Microsoft tools of Microsoft Office software. Adobe Connect — chatting, online https://my.adobeconnect.co m meetings, calls, and collaborations. **Adobe Connect** Google Meet — online platform for https://meet.google.com business and conferencing.

Creating video tutorials			
FreeCam	FreeCam — creating video tutorials (no more than 15 min).	https://www.freescreenrecording.com	
SCREENCAST MATIC	Screencast-o-matic — short 15-minute video tutorials with and without you appearing in them.	https://screencast-o- matic.com	
POWTOON THE VISUAL COMMUNICATION PLATFORM	Powtoon — creating videos, animations, visual communication, building attractiveness.	https://www.powtoon.com	
Flipgrid	Flipgrid — create and transform video tutorials. Create frame,then you film Can modify video and cut it up, confirm Work on exercises Set up a learning environment Create a free account Create a video Create a group of students Invitation to my video share	https://my.flipgrid.com	
Creating posters, presentations, announcements, infographics			
Canva	Canva — create videos, presentations, posters, cards, planners, charts.	https://www.canva.com	

	Padlet — visualisation tool for creating reports, picture collages, or assigning	https://www.padlet.com
	practical work to pupils.	пирэ.// w w w.pauict.com
:Padlet		
Prezi	Prezi presentations — creating attractive and engaging presentations on given topics.	https://www.prezi.com
m iro	Miro — visual platform to organise planning meetings, collaborate and create something new together.	https://www.miro.com
wooclap	Wooclap — interactive presentations, meetings, training sessions.	https://www.wooclap.com
	Create free account/button try for free Choose language Examples gallery Create an event Add to presentation Participation	
HФ	H5P – create, share and reuse interactive html5 content in your browser.	https://h5p.org/
	Apps	
VITA	Vita.app — app for interactive video and photo processing, video storytelling.	Vita.app
i¦ slack	Slack — tool for online chatting/communication, creating groups.	Slack.app

Tools for providing feedback			
	Kahoot — creating interactive tasks.	www.kahoot.it	
Kahoot!	Create account – start with a free version: https://kahoot.com/ Start with Home version as free to try out Discover other Kahoot!s just to see how it looks and what can be done Create a Kahoot! Create a course		
Mentimeter	Mentimeter — interactive feedback tool for pupils to provide a brief evaluation of the lesson, or tell what they gained.	www.mentimeter.com	
Welcome to WeBoard!!! A web whiteboard app for real-time collaboration	Webwhiteboard — virtual whiteboard where you can perform various tasks remotely.	https://webwhiteboard.com	
Murai	Mural — working in groups using whiteboard functions.	https://www.mural.co	
Quizlet	Quizlet — best digital memory cards and learning tools.	https://quizlet.com	
nearpod	Nearpod — real-time overview of the pupils' understanding through interactive lessons, interactive videos, games, and activities.	https://nearpod.com	

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	Klaxsoon.com — whether the learning	https://klaxoon.com
	takes place in a face-to-face or remote	
	format, Klaxoon's technology makes	
	every participant matter, resulting in very	
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	Free trial button Profile: you can change the language	
	Discover templates	
	Use 3 free templates	
	Wordwall — create customised activities	https://wordwall.net
	for your class. Quizzes, games, word	
	games, and more.	
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Wordwall		
	Classroomscreen — lesson support tool	https://classroomscreen.co
	to boost engagement and help your pupils	m/
Classroomscreen	get started using Classroomscreen's	
	intuitive tools.	
	intuitive tools.	
	Whiteboard — whiteboard tool for	https://whiteboard.fi/
WHITEBOARD FI	interactive tasks.	
Free online whiteboard tool for teachers and classrooms!		
	Tools for virtual laboratories	
	District the second	14 // 1 2 2 2
	Phet — interactive simulations for science	https://phet.colorado.edu
	subjects in 116 languages.	
MT		
INTERACTIVE SIMULATIONS		
	Go-Lab — interactive simulations for	https://www.golabz.eu
	science subjects in 116 languages.	
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The Go-Lab Initiative		
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During the C4 project activity in Finland, Henri Huumonen, a special needs teacher at a partner school in Oulu, shared experience of supporting pupils with learning difficulties.

When we learn, we use all our senses. In some situations, one sense may become more important than other senses. Here are some tips for different types of learning:

It is important for student to recognize own learning skills. Learning usually happens as a result of the following chain: Perception > attention > working memory > learning > storage memory.

The following are examples of how to encourage motivation and planning among pupils, to train their memory and accuracy in tasks.

Motivation and planning are particularly important in learning, which must be paid attention to before the actual studying even begins. Everyone should think about what exactly motivates one to learn. Internal or external motivation? Setting goals helps. What is the long-term goal? What is this month's goal? How about this week's goal? What is the objective of this lesson? Setting interim goals is important for motivation. Planning keeps the student in rhythm. When do you study? What do you study? What is your goal? When is free time? Think about how long it takes you to learn things.

To make your **memory** more efficient, you can try using, for example, the following methods: When you start the day's work, do the difficult work first. Focus on what you are doing at that moment. Don't multitask. Break big jobs into parts first. Only grab one part at a time. Use a new word or think about a thing to remember as often as possible so that it sticks in your memory.

Accuracy is important in studying. Think about what can disturb your concentration and in which situations are particularly challenging. Anticipate and eliminate unnecessary stimuli. Think about the environment in which you can concentrate best. Plan and schedule your work in advance. A regular rhythm of life is important for high-quality studies. Motivation and a positive mood support concentration. Just do one thing at a time.

Here are some researched tips for students to promote studying:

The Cornell technique advises on how to take notes.

Divide the paper into three parts as follows:

- 1) Leave 9 lines of space at the bottom and delimit the area with a line.
- 2) Leave 6 lines of space to the left and delimit the area with a line.

- 3) Make notes in the big box on the right. Write short sentences in your own words. You can also draw patterns, make lists of things (1.2.3.4...) This is done during the lesson.
- 4) Compact things in the left box. Write keywords, concepts, abbreviations or questions. This is done when you do homework.
- 5) Write a summary of the most important things in your own words in the bottom box. Do this when you retake the exam.

SQ3R technology - active text reading.

- S (survey/skim)= Skim the text
- Q (question)= Write questions to which you expect to find an answer in the text you are reading.
- R (read)= read the text and find answers to the questions you asked.
- R (recall)= recall the most important points.
- R (review)= Repeat. Think about what you read and look for connections between things. Try this!
 - 1) Look at the text for a few minutes (headings, subheadings, concepts, pictures)
 - 2) Write questions to which you expect to find an answer (e.g. titles can be changed to question format)
 - 3) Read the text. Find answers to your questions. Pay attention to stimulants. Stop before the new subheading and summarize the main points of the paragraph you read. Answer the questions you asked!
 - 4) Come back to your answers in 1-2 days. Answer the questions you asked again either by writing in your own words or speaking the answers out loud (explain in your own words).
 - 5) Repeat before the next lesson. Go back to the questions you asked, cover the answers you wrote and try to answer the questions orally. Open the matter in such a style as if you were explaining it to someone who knows nothing about the subject.

You can use the **Leitner system**, for example, to learn words, concepts or, for example, people's names.

- 1) Write the words on the slips of paper. One word/paper. In addition, you need three small boxes in which you can put the notes.
- 2) The words in box 1 are repeated every day, box 2 once a week and box 3 less often, etc. If you remember/don't remember the word, it changes the box.

The Pomodoro technique is a time management system:

- 1) 4x25 minutes of studying, 5 minute breaks,
- 2) after this, take a longer break,
- 3) think about what you can study in 25 minutes.

If possible, the educational institution can offer students, for example, the following services to support learning:

- 1. individual/small group counseling for learning difficulties, learning techniques, planning studies, how to use a calendar and setting motivation and goals,
- 2. make support plans for students (because of learning difficulties, health problems, difficult life situations),
- 3. create a support course in a distance learning environment that includes information about different support activities, as well as the contact details of the support person to contact in case there are learning difficulties,
- 4. entire personnel supports students with their needs.

PROFESSIONAL DEVELOPMENT TRAINING FOR TEACHERS

During the C1 project activity in Latvia (28.03.2021–01.04.2021), with the participation of representatives from the project partner countries, there were 18 hours of professional development training for teachers, provided by professors from the Distance Education Study Centre of Riga Technical University. The main topics covered were:

- 1. Cognitive theory of multimedia learning.
- 2. Learning styles and collaboration in distance learning.
- 3. Structuring e-learning materials, activities, and assessments.
- 4. Developing H5P content types to support active learning.
- 5. Creating audiovisual learning content (planning, shooting, processing, editing, publishing).
- 6. Monitoring progress in learning.
- 7. Virtual labs.

At the course, the teachers learned a variety of new ICT tools, several of which are mentioned in the section 'Using ICT to create distance learning materials' of these methodological recommendations.

Videos of the professional development training sessions (in English) are available to all project partners and can be shared with other teachers in the partner schools who find it interesting and useful.

Link to the training videos:

https://www.youtube.com/playlist?list=PLmB3NK0jvFQe34f_3uE-jHDyPs6xFr2b7

Also, participants who attended the course in person have access to the theoretical course materials in the MOODLE learning environment at: https://students.mii.lv/

At the end of the course, the teachers that participated in the training received a professional development certificate for the course.

Conclusions

- 1. As a result of the experience shared among the project partner schools (Latvia, France, Finland, Slovenia), methodological recommendations were developed for teachers to improve their learning materials for distance education.
- 2. The methodological recommendations for teachers are intended for the preparation of a variety of learning materials, taking into account the specific features of different perceptual types and learning styles.
- 3. Learning materials that are suitable/adapted for all perceptual types contribute to motivation to learn among pupils.
- 4. Learning materials can be improved using modern ICT.
- 5. The methodological recommendations are available to anyone interested and can be downloaded as a PDF file on the websites of the project partner organisations.

Recommendations

- 1. Teachers should design learning materials taking into account the specific features of all three types of perception.
- 2. Use ICT tools in a balanced amount, appropriately to the topic of each lesson (without overloading the material and online lessons).
- 3. Offer pupils a variety of learning materials in their courses and indicate the ways in which the new material can be learned.
- 4. When planning a lesson, it is important to include the nine events of instruction (the three parts of the lesson: recall/actualisation, comprehension, consolidation).
- 5. Whenever possible, teachers should share examples of good practice in the methodological commissions.
- 6. Teachers should follow of new developments in ICT, improve their knowledge in this field.
- 7. Teachers and available support staff should support pupils in their learning as much as possible.
- 8. Develop new projects and provide opportunities for teachers to actively collaborate with international colleagues in solving problems and sharing experience for better education.

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ANNEX 1 SELF-ASSESSMENT QUESTIONNAIRE ON PERCEPTUAL TYPES

Circle or tick the answer that best describes your behaviour (visual/auditory/kinetic test based on Smits, 2000).

- 1. When I learn how to use something new, I usually:
 - a) read the manual first;
 - b) get an explanation from someone who has already used it;
 - c) understand it immediately and try to use it.
- 2. When I need travel directions, I usually:
 - a) look at a map;
 - b) ask someone for verbal guidance;
 - c) follow my intuition.
- 3. When cooking new food, I like to:
 - a) stick to a written recipe;
 - b) call a friend for a verbal explanation;
 - c) follow my instincts.
- 4. If I teach someone something new, I tend to:
 - a) create guides on how to do it;
 - b) give them a verbal explanation;
 - c) demonstrate first and then let them do it themselves.
- 5. I tend to say:
 - a) watch how I do it;
 - b) listen to what I say;
 - c) try to do it yourself.
- 6. What I like to do most in my spare time:
 - a) visit museums and art galleries;
 - b) listen to music and talk to friends;
 - c) play sport or exercise at home.
- 7. When buying clothes in a department store, I tend to:
 - a) imagine what they would look like on me;
 - b) discuss my choice of clothing with the shop assistant;

- c) put them on and see how they look on my body.
- 8. When choosing what to do on weekends, I usually:
 - a) read a lot of brochures;
 - b) listen to my friends' advice;
 - c) imagine what it would be like to be in a particular place.
- 9. If I were buying a new car, I would:
 - a) look up and read information available online;
 - b) consult with a knowledgeable friend;
 - c) do a few test drives.
- 10. I find it easiest to learn new skills by:
 - a) observing what the teacher is doing;
 - b) discussing with the teacher what exactly I need to do;
 - c) trying to do it practically myself.
- 11. When choosing food from a menu, I tend to:
 - a) imagine what the food will look like;
 - b) discuss the best choice with a person with me or a waiter;
 - c) imagine what the food will taste.
- 12. When I focus, I most often:
 - a) concentrate on the words or images in front of me.
 - b) think about the problem and imagine possible solutions in my head.
 - c) move around a lot, flick a pencil with my fingers, touch things.
- 13. When choosing furniture, I pay attention to
 - (a) its colour and texture;
 - (b) its technical specifications;
 - (c) its texture and feel.
- 14. When I'm anxious, I:
 - a) visualise the worst-case scenario;
 - b) think about what worries me most;
 - c) can't sit still, I'm constantly moving and doing something.
- 15. I feel particularly connected to other people
 - a) because of their appearance;
 - b) because of what they say;

- c) because of the feelings they give me.
- 16. When I have to take an exam, before it I usually:
 - a) make a lot of notes;
 - b) discuss the tasks to be done with other people;
 - c) imagine how to solve a problem or apply a formula
- 17. When explaining something to another person, I:
 - a) show them what I want to explain;
 - b) explain it in different ways until they understand;
 - c) encourage them to imagine what it could be like.
- 18. I very much like to:
 - a) watch films, look at photographs, works of art;
 - b) listen to music, the radio, or talk to friends;
 - c) take part in sports activities, dance and partake in fine dining.
- 19. I spend most of my free time:
 - a) watching TV;
 - b) talking to friends;
 - c) engaging in physical activity or making something.
- 20. The first time I meet a stranger, I usually:
 - a) organise a face-to-face meeting;
 - b) talk to them on the phone;
 - c) try to meet in an informal setting, for example over lunch.
- 21. I notice first how people:
 - a) look and dress;
 - b) sound and talk;
 - c) hold themselves and move.
- 22. If I am angry, I tend to:
 - a) continue thinking about what has upset me;
 - b) raise my voice and say how I feel;
 - c) raise my voice, leave, and slam the door.
- 23. It is easiest for me to remember:
 - a) faces;
 - b) names;

- c) things I've done.
- 24. I can usually tell if the other person is lying because:
 - a) they avoid looking at me;
 - b) their voice changes;
 - c) they give me an odd vibe.
- 25. When I meet an old friend:
 - a) I say: 'Good to see you!'
 - b) I say: 'Good to hear you!'
 - c) I hug them.
- 26. I remember information best when I:
 - a) make notes or print it out;
 - b) say it out loud or repeat the words in my head;
 - c) perform the action and imagine how it is performed.
- 27. If I have a complaint about a product, I will:
 - a) submit a written complaint;
 - b) express my dissatisfaction by phone;
 - c) return the product to the shop or contact the shop management.
- 28. I tend to say:
 - a) I see what you mean;
 - b) I hear what you are saying;
 - c) I know how you feel.

Results

Count up how many instances of each letter you have in your answers!

- A -
- B -
- C -

If you mostly chose A, you have a VISUAL learning style.

If you mostly chose B, you have an AUDITORY learning style.

If you mostly chose C, you have a KINAESTHETIC learning style.

Some people find that their learning style can be a mix of two or three styles, in which case read about your styles in the explanation below.

Once you have identified your learning style(s), read the descriptions of learning styles and think about how this knowledge can help you and improve your learning!

Description of perceptual types

A person with a **visual** learning style has a memory for things seen or observed, including pictures, diagrams, demonstrations, displays, handouts, films, charts, etc.

These people will use phrases such as 'show me', 'let's have a look at it', and do best at a new task after reading a manual or watching someone else do it. These people will work based on lists and guides.

A person with an **auditory** learning style prefers information provided by listening: spoken word, sounds, and noises. These people will use phrases like 'tell me', 'let's talk about it' and are best able to perform a new task after listening to an expert's instructions. These are people who appreciate information being presented orally and who can remember all the lyrics in the songs they hear!

Individuals with a **kinaesthetic** learning style absorb new information through physical experience. These people will use phrases like 'let me try', 'how do you feel?' and will be best able to complete a new task by doing it and trying it out, learning how to solve it. These people like to experiment, think of their own solutions, and never look at guides.

There is no right or wrong learning style. The key is that you know your learning style and use the techniques that help you get the best results.

(https://www.businessballs.com/freepdfmaterials/vak_learning_styles_questionnaire.pdf)

ANNEX 2 LEARNING STYLE QUESTIONNAIRE

Read each statement carefully. Answer honestly: there are no right or wrong answers. It is best not to think too long about each question, because this can lead to wrong conclusions.

SECTION 1

Do or Watch: mark what represents you best

- 1. Do I often come up with unusual ideas that might seem silly or impossible at first.
 - Watch I am methodical.
- 2. Do I am usually the one who initiates the conversations.
 - Watch I like observing people.
- 3. Do I am flexible and open.
 - Watch I am careful and cautious.
- 4. Do I like to try new and different things without too much preparation.
 - Watch I research a new topic in depth before I try it.
- 5. Do I am happy to try new things.
 - Watch I make lists of possible courses of action when starting a new project.
- 6. Do I like to get involved and participate.
 - Watch I like to read and watch.
- 7. Do I am loud and I attract attention.
 - Look I am quiet and a bit shy.
- 8. Do I make quick and bold decisions.
- Watch I make prudent and logical decisions.
- 9. Do I talk quickly as I am thinking.
- Watch I speak slowly, I stop to think.

SECTION 2

Think or Feel: mark what represents you best

- 1. Think I ask questions looking for information when learning a new subject.
 - Feel I easily notice cues and actions from other people.
- 2. Think I am rational and logical.
 - Feel I am practical and grounded.

3. Think — I plan events down to the last detail.
Feel — I like realistic but flexible plans.
4. Think — I like to know the right answers before trying something new.
Feel — I try things out in practice to see if they work.
5. Think — I analyse reports to find underlying assumptions and inconsistencies.
Feel — I rely on others to give me the gist of key ideas.
6. Think — I prefer to work alone.
Feel — I like working with others.
7. Think — others could describe me as serious, reserved, and formal person.
Feel — others could describe me as talkative, expressive, and informal person.
8. Think — I use facts to make decisions.
Feel — I use feelings to make decisions.
9. Think — I am hard to get to know.
Feel — I am easy to get to know.
Assessment procedure
Add up the two options in the first section (Do or Watch). The one with the higher number is
your choice for the task:
Total number of Do
Total number of Watch
Add up the two options in the second section (Think or Feel). Whichever number is higher
determines whether you have thought or emotional preference:
Total number of Think
Total number of Feel
If you got the most answers in Watch and Feel, your learning style is reflexive.
You prefer to learn from activities that allow you to see, think, and look back at what has
happened, such as brainstorming and collaborative groups.
Lectures can be useful, but only if they provide expert explanations and analysis.
You like innovative and imaginative approaches to doing things.

You prefer to see situations from different perspectives.

You are interested in people and tend to be feeling-oriented.

If you got the most answers in **Watch** and **Think**, your learning style is **philosophical**.

You prefer to gradually compile a number of different observations and thoughts into an integrated whole (from individual details to the bigger picture).

You prefer to reason logically and develop models, theories, and projects.

You like lectures, analogies, systems, and case studies.

Talking to experts is usually not useful.

If you got the most answers in **Do** and **Think**, your learning style is **analytical**.

You give preference to the practical application of ideas, problem-solving, feedback, and decision-making (where there is a clear link between the task and the problem).

Your prefer technical problems to interpersonal problems.

You prefer to put new learning into practice to see if it works.

You like laboratory activities, fieldwork, observation, and training.

If you got the most answers in **Do** and **Feel**, your learning style is **organisational**.

You adapt well to changing circumstances and solve problems intuitively, by trial and error, e.g. through learning by discovery.

You tend to be comfortable with people.

You prefer challenges involving new experiences, involvement with other people, assimilation, and role-play.

You like all that is new, problem-solving, and small-group discussions.

ANNEX 3 LESSON PLAN

G 1.		
Subject:		
Form: Lesson duration		
Lesson topic:	•	
Lesson created l	. ·	
Prior knowledge		
Resources neede		
Expected outcom	е	
for the pupil		
	Lesson progress: steps, specific activities, tasks	Methodological comments
Revision		
Review of		
previous		
knowledge		
Comprehension		
Use		
Ose		
Reflection		
For each percept	ual type, indicate the learning material/resource use	d in the lesson:
Visual	T	
Auditory		
Kinetic	+	
Miletic		