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HYBRID LEARNING COMMUNITIES
- Designing for learning in digital communities

Curriculum

Hybrid Learning Communities

Designing for learning in digital communities

Authors: Erik Leschly & Thomas Kjelgaard

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Kópavogsbær

Esbjerg Realskole
-bedre tid

SOSU Østjylland

OSNOVNA ŠOLA OLGE MEGLIČ P T U J

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Purpose and introduction

The Hybrid Learning Communities (HLC) Curriculum describes the framework for understanding the project's intended teaching results for the participating learners – primarily the professional teachers. It also represents a framework for the learning and experiences the students should gain by participating in courses designed by teachers in the HLC project.

The curriculum describes the development of HLC in both learning objectives and activities and their context of practical teaching experiences, primary theoretical and principled considerations regarding the selection, sequencing, and dissemination of the learning content.

It is the intention that the curriculum can be the starting point for a common understanding of the direction of development in hybrid learning communities and specific action instructions. However, those who wish to develop HLC inspired by this curriculum must always consider local experiences, contexts, and needs.

Background

Based on the research and design principles from a master thesis (Master in ICT & Learning at Faculty of Humanities, University of Aalborg Denmark) by Erik Leschly, Thomas Kjelgaard & Anne Veiergang (2020), the HLC project generated a survey and an analysis of participants' needs for digital competencies.

On this basis, the HLC project developed a curriculum concerning teachers' competencies to collaborate in hybrid learning communities. The first draft came in March of 2022. After implementing and evaluating the project's learning activities, this curriculum in December 2022 will be based on these experiences.

The learning activities were developed, targeting first the development of digital competencies among the participating teachers. The target group of the curriculum is educational professionals (the participating teacher teaches students between the age of 12 to 17 years).

Design theory & Didactic design principles - approach and method

The ideas and didactic designs of the curriculum are an extension of the concept of “teaching as a design science” (Laurillard, 2012), where didactics and teaching are considered as “malleable” areas rather than the science of humanities: In this perspective, learning activities must be continuously designed and re-designed to fit the learners and their local context.

Organizing knowledge into learning processes is complicated, E.g., transferring knowledge from research into educational practice, where knowledge should be used in different contexts. Didactic designs must be enriched with experience, theory, and research knowledge. Also, design knowledge must be “served” in size and form that is understandable to the user/designer and meets the needs of learners. So, to concretize design knowledge into functional theory, the master thesis (Leschly, Kjelgaard & Veiergang, 2020) proposed using "design principles" (Bell & Baumgartner, 2002): Design principles are "generalized frameworks for design" that can "inform and form the basis for design efforts.” This application of design principles offers the advantage of being able to contain knowledge from very different perspectives, e.g.:

- Theory and knowledge from research in education and technology.
- The local understanding of the teacher's practice and perspective.
- Partners pragmatic knowledge of what is helpful in the classroom.
- How to adapt the didactic design to specific needs.

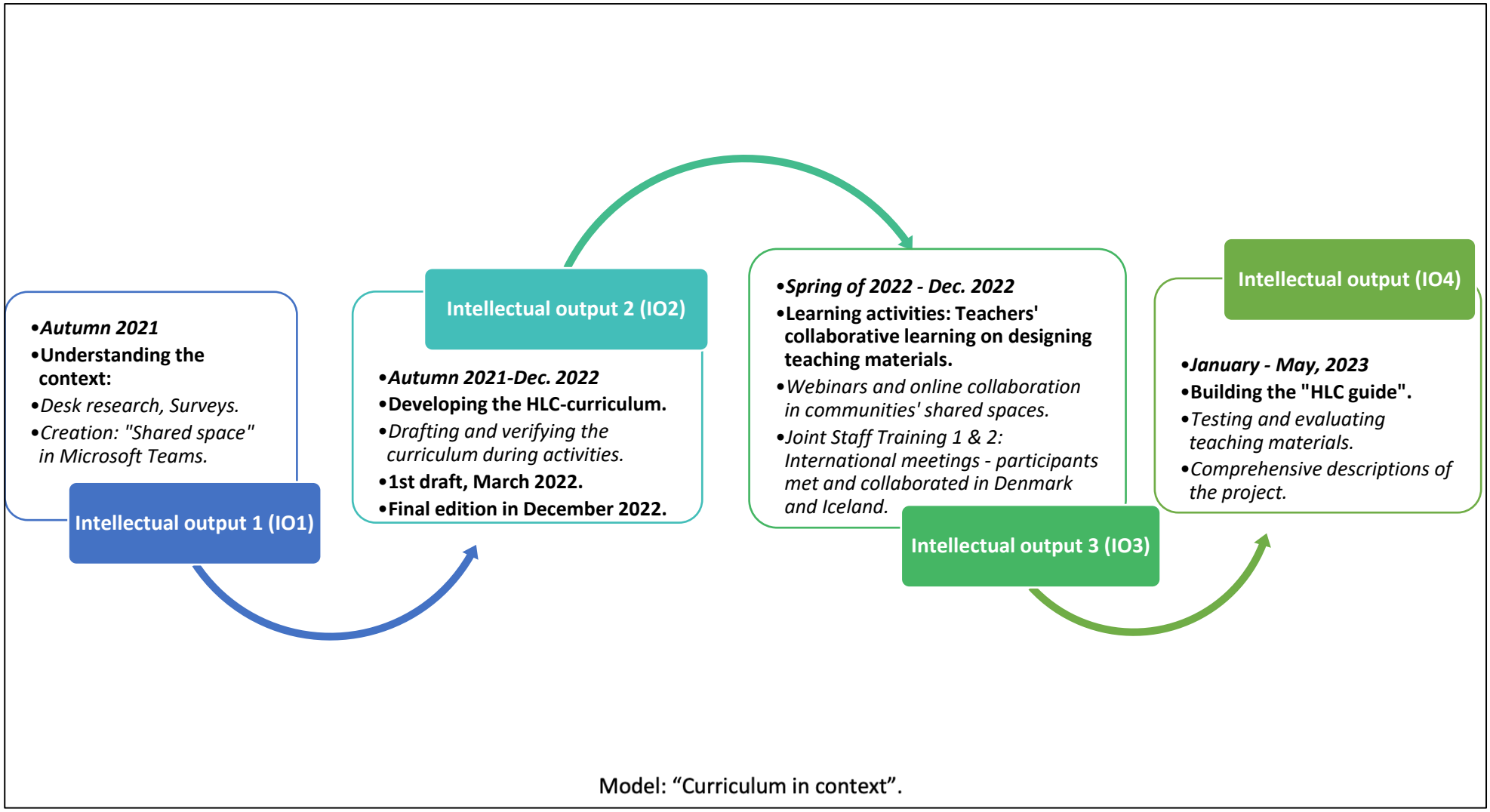
Design knowledge, then, is the understanding that can inform and contribute to the practice and processes of design. Design principles should offer recommended, helpful solutions to common problems but are not to be perceived as restrictive or prescriptive. This approach – formulating “design principles” (See frameworks in appendix) was a *method* for driving the participant’s actions in a common direction, all the while the evaluation of learning experiences during the project’s activities changed, validated, and further developed the design principles – finishing the curriculum.

HYBRID LEARNING COMMUNITIES

- Designing for learning in digital communities

Curriculum in context - Conceptual clarification and process

Different concepts of activities are used, which might not be immediately familiar to the reader. Here is an overview of the most important concepts in their context.



Model: “Curriculum in context”.

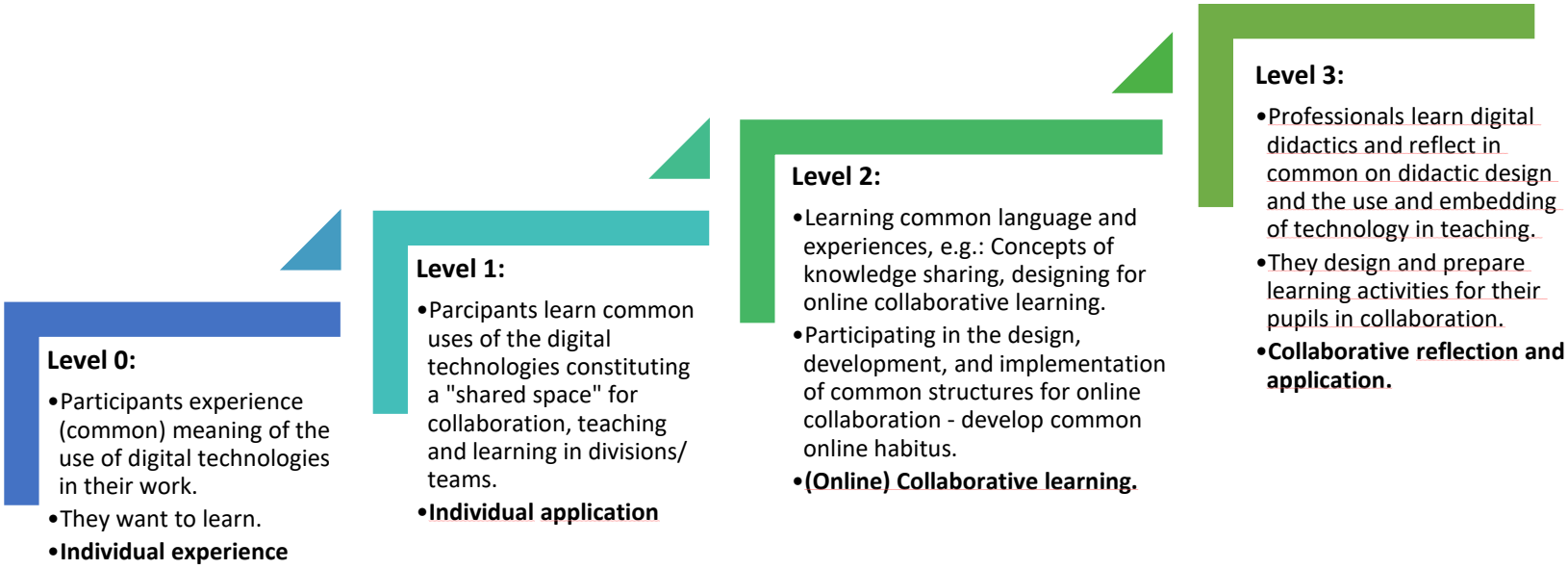
Outcome: What will learners be able to do?

After participating in the learning activities of the curriculum, teachers will have developed their individual and collaborative digital competencies to be leading participants in a hybrid learning community:

They will (as a community/team) be able to cooperate and learn collaboratively in a shared virtual space[1] to develop and produce teaching courses for their students.

They will be able to use ICT (technical, media, and online tools) in a much more comprehensive, targeted, and competent way to strengthen their students' learning with several topics and subjects.

We can understand teacher's development of competencies that supports a hybrid learning community in four steps/stages (see model below)



"HLC–process": The development of digital competencies of the team/ learning community of teachers can be understood in steps/ stages.
Point of attention: The participating teachers in the HLC-project were characterized by already having some digital skills in education. However, these skills were linked to the use of different digital educational technologies. Thus, the teachers had differing starting points in learning with the technologies of the project.

[1] Using the features of the Microsoft Teams platform.

Educational standards Alignment – The DigCompEdu Framework

Competency descriptions and learning objectives in the curriculum are based on the "European Framework for the Digital Competence of Educators" (DigCompEdu) by Christine Redecker & Yves Punie (2017).

The competency descriptions give a common framework across partner countries written in English to understand digital competencies. It is helpful to describe the key learning objectives in the project's activities - The content of the competencies and the progression in learning them.

The DigCompEdu framework distinguishes six different areas in which educators' Digital Competences are expressed with 22 competencies. The areas focus on various aspects of educators' professional activities:

- Area 1: Professional Engagement: Using digital technologies for communication, collaboration, and professional development.
- Area 2: Digital Resources: Sourcing, creating and sharing digital resources.
- Area 3: Teaching and Learning: Managing and orchestrating digital technologies in teaching and learning.
- Area 4: Assessment: Using digital technologies and strategies to enhance assessment.
- Area 5: Empowering Learners: Using digital technologies to enhance inclusion, personalization, and learners' active engagement.
- Area 6: Facilitating Learners' Digital Competence: Enabling learners to use digital technologies creatively and responsibly for information, communication, content creation, wellbeing, and problem-solving.

"The core of the DigCompEdu framework is defined by Areas 2-5 [pedagogic competencies]. Together these areas explain educators' digital pedagogic competence, i.e., the digital competencies educators need to foster efficient, inclusive, and innovative teaching and learning strategies." (Redecker & Punie, 2017).

In the HLC project, however, extra focus is given to the teachers' competence development within area 1 – the teacher's "*professional engagement*":

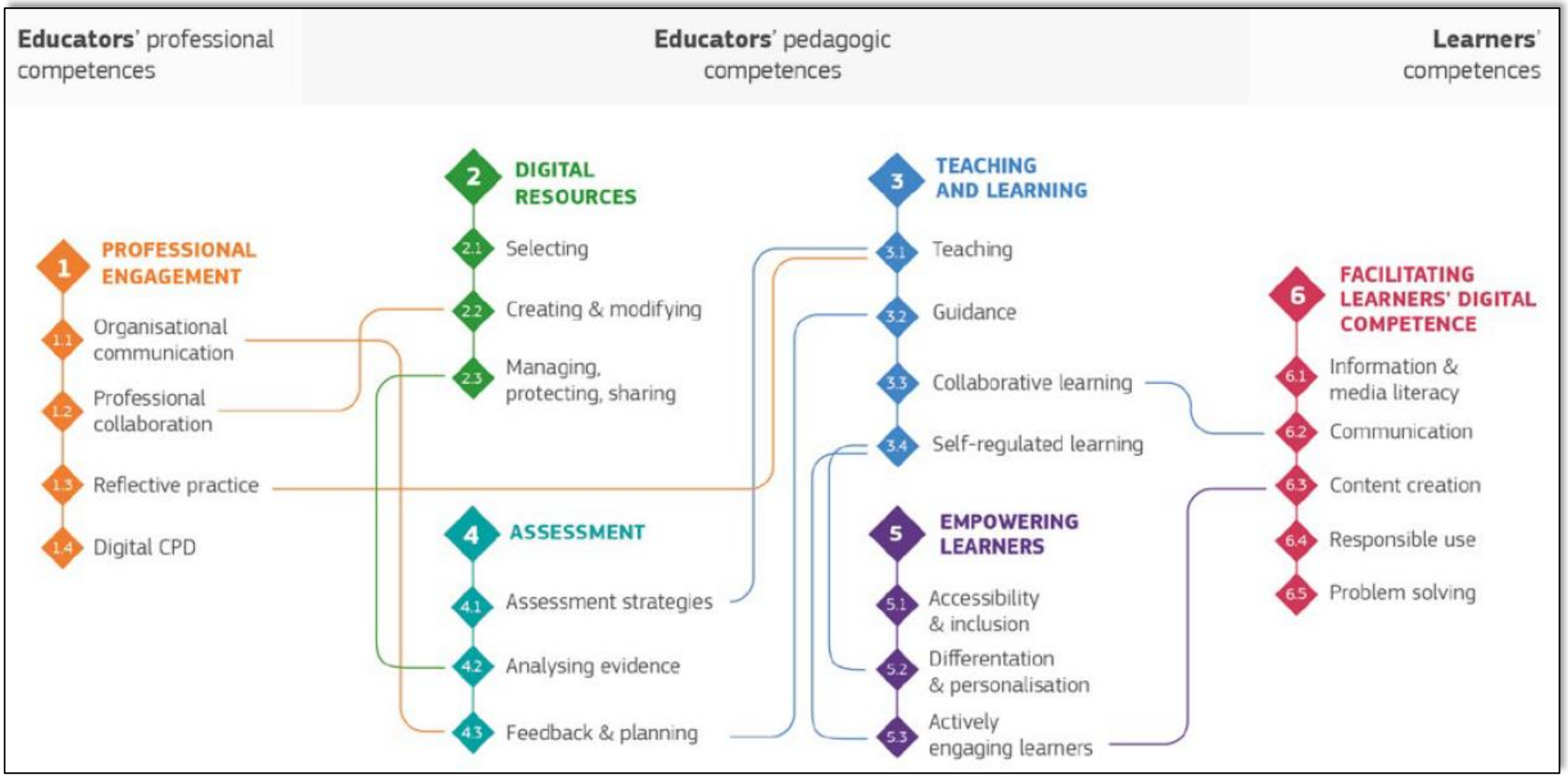
"Area 1 is directed at the broader professional environment, i.e., educators' use of digital technologies in professional interactions with colleagues, learners, parents, and other interested parties, for their individual professional development and the collective good of the organization." (Redecker & Punie, 2017).

When working with teachers' digital competencies in practice and educational research, it has often been focused on didactic training in the classroom and the teacher's use of digital technologies with the students. Danish research shows that competence development in the workplace is only offered to a lesser extent for teachers, with a focus on collaboration between the teachers (e.g., Bundsgaard, Pettersson, & Puck, 2014).

The same research, however, indicates that strengthening teachers' digital competencies to collaborate and share knowledge outside of teaching is a prerequisite for enhancing teachers' development of didactic competencies to use digital technology to promote students' learning in the classroom. Thus, a primary focus in the HLC curriculum is first on the

teachers' competence in using digital technologies for communication, collaboration, and professional development.

Therefore, it is thought that the teachers in interaction also develop their digital competencies in the classroom, even with possible common approaches that can support common practice.



The DigCompEdu Competencies and their connections (Redecker & Punie, 2017, p. 16).

Chosen key learning objectives (DigCompEdu) for professionals:

Between the 22 "DigCompEdu-competences," the HLC-project activities focused on the following areas and competencies:

Area 1: Professional Engagement:

1.1 Organizational communication: *To use digital technologies to enhance organizational communication with learners, parents, and third parties. To contribute to collaboratively developing and improving organizational communication strategies.*

1.2 Professional collaboration: *To use digital technologies to engage in collaboration with other educators, sharing and exchanging knowledge and experiences and collaboratively innovating pedagogic practices.*

1.3 Reflective practice: *To individually and collectively reflect on, critically assess and actively develop one's digital pedagogical approach and that of one's educational community.*

Area 2: Digital Resources:

2.1 Selecting digital resources: *To identify, assess and select digital resources for teaching and learning. To consider the specific learning objective, context, pedagogical approach, and learner group when choosing digital resources and planning their use.*

Area 3: Teaching and Learning:

3.1 Teaching*: To plan for and implement digital devices and resources in the teaching process to enhance the effectiveness of teaching interventions. To appropriately manage and orchestrate digital teaching interventions. To experiment with and develop new formats and pedagogical methods for instruction.*

3.3 Collaborative learning: *To use digital technologies to foster and enhance learner collaboration. To enable learners to use digital technologies as part of collaborative assignments to improve communication, collaboration, and knowledge creation.*

Chosen key learning objectives in student's learning activities:

Area 5: Empowering Learners:

Using digital technologies to enhance learners' active engagement.

- *5.3 Actively engaging learners*

Area 6: Facilitating Learners' Digital Competence:

Enabling learners to use digital technologies creatively and responsibly for information, communication, content creation, wellbeing, and problem-solving.

- *6.1 Information and media literacy*
- *6.2 Digital communication & collaboration*
- *6.3 Digital content creation*

Theories on didactics and technology in education:

A later section in the curriculum, *"Considerations on common pedagogy and didactics,"* presents basic pedagogical and didactic theories for the teachers. Thus, it could be applied in learning activities for students and participating teachers.

Learning prerequisites and progression (DigCompEdu)

Teachers' development of competencies is, of course, a very personal and subjective process. However, the curriculum must take a common approach to the level of competence that the learning activities should address; The DigCompEdu progression model (Redecker & Punie, 2017, p. 29). See the model on the next page.

The teachers' progression can be considered differently within DigCompEdu's different areas. The learner's progression in DigCompEdu area 1 might not be similar to the progression in, e.g., area 3. However, in designing learning activities, we - the partners - generally perceived the participating teachers as "explorers" (level A2) at the start of the project:

- A2 Explorers *"are aware of the potential of digital technologies and are interested in exploring them to enhance pedagogical and professional practice. They have started using digital technologies in some areas of digital competence without, however, following a comprehensive or consistent approach. Explorers need encouragement, insight, and inspiration…."* (DigCompEdu, p.30).

Through their online interaction and collaboration in the project's learning activities, the participants should develop the competencies of an "integrator":

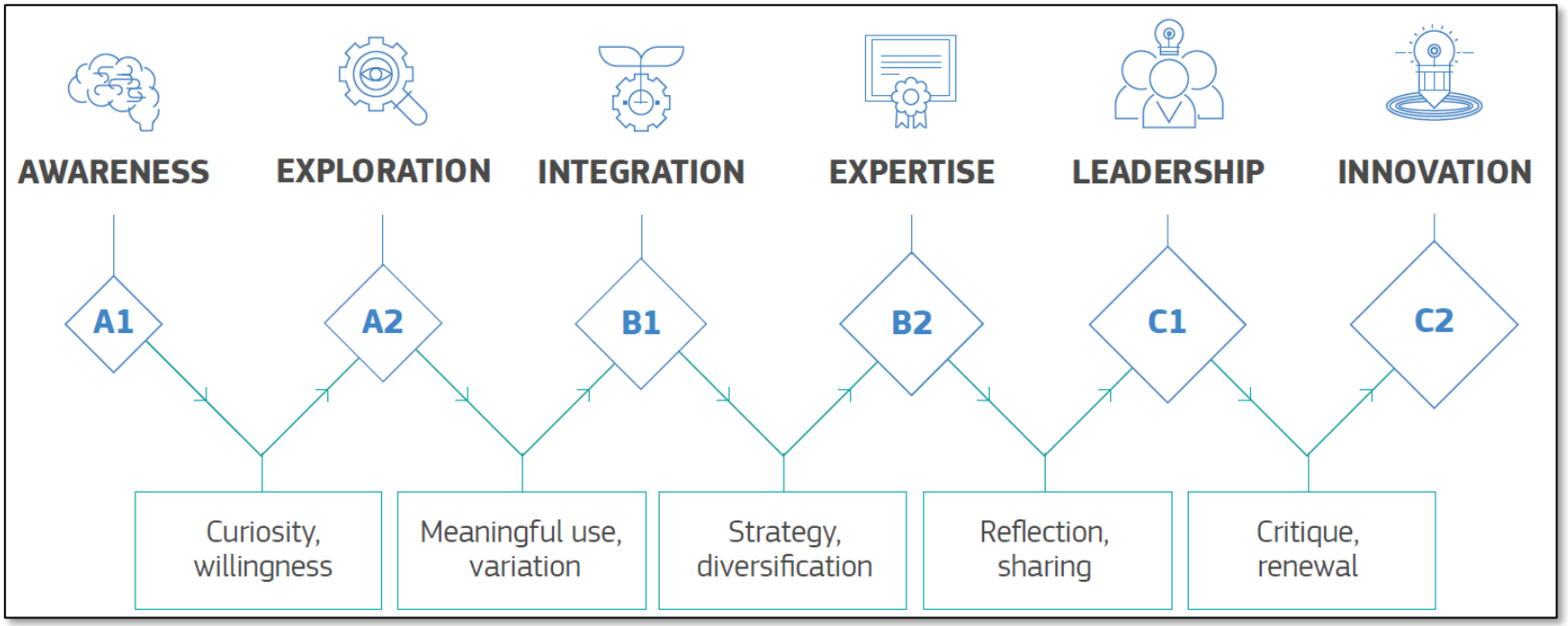
- B1 Integrators "*experiment with digital technologies in a variety of contexts and for a range of purposes, integrating them into many of their practices. They creatively use them to enhance diverse aspects of their professional engagement. They are eager to expand their repertoire of practices. They are, however, still working on understanding which tools work best in which situations and on fitting digital technologies to pedagogic strategies and methods. Integrators just need some more time for experimentation and reflection, complemented by collaborative encouragement and knowledge exchange to become Experts."* (DigCompEdu, p.30).

Some participants should even approach the level of "expert" (level B2), who passes on knowledge to other professionals:

- B2 Experts *"use a range of digital technologies confidently, creatively, and critically to enhance their professional activities. They purposefully select digital technologies for situations and try to understand the benefits and drawbacks of different digital strategies. They are curious and open to new ideas, knowing that there are many things they have not tried out yet. They use experimentation as a means of expanding, structuring, and consolidating their repertoire of strategies..."* (DigCompEdu, p.30).

Summarizing:

1. Participants and educators assimilate new information in the first stages and develop essential digital competencies to communicate and collaborate.
    1.1. Webinar before “Joint Staff Training 1” (Workshops in Esbjerg).
    1.2. Collaboration in online communities on didactic designs before, during, and after Joint Staff Training 1.
    1.3. “Joint Staff Training 1” (5 days).
2. In the following stages, they apply, further expand and structure their digital practices
    2.1. Testing in the local classroom.
    2.2. Webinar 2 before Joint Staff Training 2.
    2.3. Collaboration in online communities on didactic designs before, during, and after “Joint Staff Training 2”.
3. At the final stage, they pass on knowledge and develop new practices.
    3.1. Testing in the local classroom and collaboration in online communities – finishing and publishing didactic designs.
    3.2. Webinar 3.
    3.3. Knowledge sharing with colleagues and “Multiplier events.”



The DigCompEdu progression model (Redecker & Punie, 2017, p. 29).

HLC-project - Progression of competencies through project activities

The following schedules describe the connections between the learning objectives, the project activities, and materials with examples of learning activities in keywords.

The materials (frameworks/design principles) for organizing learning activities and digital learning spaces can be found in the appendix.

	Examples of activities + use of HLC-framework/ Digital technologies	**Competence areas and key learning objectives**
Erasmus+ "Intellectual Output 1"		
Preliminary study/desk research.	Small online questionnaire survey. The target group was the participating teachers (20). • **Framework 1F: Questions for the online survey - Uncovering the contexts of the participants** • **Technologies: Microsoft Forms.**	To uncover the context of the participants, Common interests, subjects and skills, and the participants' level of digital competencies. To understand the prerequisites for developing learning communities.
Design + Establish an online learning community for participants.	We are designing a common professional online learning community for cooperation. • **Framework 1C: Basic principle for digital technology as a shared space.** • **Framework 1D: Didactic design principle: Basic organizational communication and collaboration using Microsoft Teams** • **Technologies: Microsoft Teams.** Participants are divided into smaller "learning communities" based on their teaching subjects. They are invited to the online platform, where each community is assigned a "shared space" (an online channel) for communication and collaboration. First experience of learning; Learning by doing.	Increase the capacity to cooperate, communicate and share knowledge effectively during the project. **Organizational Communication:** Explorer A2: Exploring digital options and using digital technologies to communicate with partners. -Building an online community by participation.
Erasmus+ "Intellectual Output 2" started here.		
Prepare 1st Draft for the common HLC Curriculum (March 2022).		

Erasmus+ "Intellectual Output 3"		
The present common direction for learning.	-Read and watch: Participants read documents and watch a video presentation about the curriculum (summary) and common didactic model: • **Framework 2: Theoretical model - Teacher and the student as didactic designers and learning through digital production** • **Framework 3: Framework for teacher's collaborative didactic design in HCL.** • **Technologies: Microsoft Stream (Video).** -Chat/ write: Participants are invited to ask questions, share thoughts/comments or criticize in the online community's chat wall.	**Area 1: Reflective Practice:** Presentations on common didactics: Didactic design for Teacher and student learning. - Framework 2: "Before, During & After model" (Levinsen & Sørensen, 2014): **Area 3:** **Teaching and Learning:** Explorer A2: Exploring digital education and learning strategies.
Webinar 1	Moving together from awareness to joint exploration: -Presentations and online socialization. Participants moved from exploration toward the common use of digital technology for collaboration. **Technologies: Microsoft Teams.**	**Area 1:** **Organizational communication and professional collaboration**: Explorer A2: Fitting digital resources to the learning context. - Establish the beginnings of "learning friendship" in a "Community of practice" (Common domain, practice, and community – Wenger, 1999) **-** Understand the common objectives and build trust: Recognizing the teacher's different understandings/ approaches to digital technologies in collaboration. **Area 2:** **Digital Resources:** Explorer A2: Exploring digital resources: **Area 3: Teaching and Learning:** Exploring digital teaching and learning strategies. <u>Online Collaborative Learning:</u> Start phase of "Idea generation" - Objective is to spark common reflections: 1) What are the common subjects/ teaching domains? Key earning objectives? 2) Which common apps for student learning?
The asynchronous online	<u>Preparing for JST 1</u> Org. communication: - To use digital technologies to communicate with colleagues.	**Area 1:** **Professional Collaboration:** Explorer A2: We are continuing the collaboration of the webinar in the shared virtual space (e.g., chatting, document sharing, and collaboration).

collaboration in Microsoft Teams.	- To communicate through a digital platform. -Online collaborative learning - teacher's asynchronous collaboration. Reflective Practice: To reflect on individually and collectively, critically assess and actively develop one's digital pedagogical practice and that of one's educational community. • **Technologies: Microsoft Teams.**	**Reflective Practice:** Explorer A2: Being aware of one's development needs. -To critically reflect on one's own digital and pedagogic practice. -To identify competence gaps and areas for improvement. -To help others in developing their digital pedagogical competence.
Joint Staff Training 1 ("JST 1")	Presentations/ workshops. Expanding: We are moving toward integration through meaningful use: Jointly creating digital educational resources with others. Teachers experiment with and develop new formats and pedagogical methods for instruction (e.g., digital production, flipped classroom, OCL). -Collaborating in a common template for documenting OCL (Framework 4). Pro Collaboration: -To use digital technologies to collaborate with other educators on a dedicated task. -To use digital technologies to develop educational resources collaboratively. -To use professional collaborative networks to explore and reflect on new pedagogic practices and methods. • **Framework 2: Theoretical model - Teacher and the student as didactic designers...**	**Moving from "Explorer" (A2) toward "Integrator" (B1):** **Area 1: Organizational communication & professional Collaboration:** From Explorer A2 toward Integrator B1: Using digital technologies to share and exchange practice. - Learning common skills to collaborate and developing common culture in the online community. **Reflective Practice:** - Creatively experiment with and reflect on new pedagogical approaches enabled by digital technologies: <u>Presentations on common didactics:</u> On hybrid learning - Didactic design for Teacher and student learning. - Learning theory: Online collaborative learning theory (Harasim, 2017) (for teachers collaborative learning) – for asynchronous collaboration. and template for collaboration – (framework 4) - Theories on Didactic design: Teaching as a design science - Digital didactics and learning theory (Laurillard, 2012). + Basics in "Arena Based curriculum design" - 6 learning types (University College London, 2017) **Area 2: Digital resources:**

	• **Framework 3: Framework for teacher's collaborative didactic design in HCL.** • **Framework 4: Organizing ideas …** • **Framework 5: Template for HLC- groupwork - Establishing a common culture...** • **Framework 6: The 6 learning types...** • **Framework 1B: Basic didactic design principle...** • **Framework 1D: Didactic design principle...** • **Framework 1E: Basic didactic design principles...** • **Technologies: Microsoft Teams/ Office 365.**	We are exploring digital resources and appropriate digital resources to the learning context. **Area 3: Teaching and Learning:** From Explorer A1 toward Integrator B1: Exploring digital teaching and learning strategies. - Integrating available digital technologies meaningfully into the teaching process. - Integrating available digital technologies meaningfully into the teaching process. **Area 5: Empowering Learners:** Exploring learner-centered strategies. **Area 6: Facilitating Learners' Digital Competence:** Encouraging learners to use digital technologies. - Enabling learners to use digital technologies creatively and responsibly for information, communication, content creation, wellbeing, and problem-solving.
Teachers are testing materials in the classroom (also online?)	Reflective practice: - Using experimentation and peer learning as a source for development; new pedagogical approaches enabled by digital technologies. Teaching: - Teachers use classroom technologies to support instruction. - To reflect on the effectiveness and appropriateness of the digital pedagogical strategies chosen and flexibly adjust methods and strategies. Empowering learners:	**Moving from "Explorer" (A2) toward "Integrator" (B1):** **Area 1: Organizational communication & Professional Collaboration:** Expanding professional practice -Using digital technologies to share and exchange practice. - Continuing the collaboration of the JST1 in the shared virtual space (e.g., chatting, document sharing, and collaboration). **Reflective practice:** - Using experimentation and peer learning as a source for development. - Creatively experiment with and reflect on new pedagogical approaches enabled by digital technologies. **Area 2: Digital resources:** EWe are exploring digital resources and fitting digital resources to the teas' learning context.

	To use digital technologies to allow learners to engage with the subject matter at hand actively. Select appropriate digital technologies for fostering active learning in a given learning context or for a specific learning objective.	**Area 3: Teaching and Learning:** Exploring digital teaching & learning strategies. - Integrating available digital technologies meaningfully into the teaching process. - To use digital technologies to experiment with new formats and methods for collaborative learning. **Area 5: Empowering Learners:** Exploring learner-centered strategies. **Area 6: Facilitating Learners' Digital Competence:** Encouraging learners to use digital technologies. - Enabling learners to use digital technologies creatively and responsibly for information, communication, content creation, wellbeing, and problem-solving.
Asynchronous online collaboration	Teachers meet and communicate online in their communities. They share experiences and collaborate on the didactic design of materials. Consider how educator-led digital interventions – face-to-face or in a digital environment - can best support the learning objective. To reflect on how suitable the different digital technologies used are in increasing learners' active learning and to adapt strategies and choices accordingly. • **Technologies: Microsoft Teams.**	**Area 1: Organizational communication, Professional Collaboration, and Reflective Practice:** Expanding professional practice -Using digital technologies to share and exchange practice. - Continuing the collaboration of the JST1 in the shared virtual space (e.g., chatting, document sharing, and collaboration). - Using experimentation and peer learning as a source for development. **Area 2: Digital resources:** We are exploring digital resources and fitting digital resources to the teachers' learning context.
Webinar 2	Webinar participation and individual online presentation. Teachers participate, and community-groups present their experience from testing materials, and participants share design ideas.	**Reflective Practice:** Toward Integrator B1: - Seek to improve and update digital pedagogical competence through experimentation and peer-learning. -To help others in developing their digital pedagogical competence.

	• **Technologies: Microsoft Teams.**	
Joint Staff Training 2 ("JST 2")	Using digital technologies to: - collaborate with other educators to develop educational resources. - share and exchange knowledge, resources, and experiences with colleagues and peers. - explore and reflect on new pedagogic practices and methods. - Use professional collaborative networks as a source for one's professional development. Reflective practice: - To critically reflect on one's own digital and pedagogic practice AND to seek the help of others in improving one's digital and pedagogical practice. Digital resources: - Select appropriate digital resources for teaching and learning, considering the specific learning context and objective. - Assessing the usefulness of digital resources in addressing the learning objective, the competence levels of the concrete learner group, and the chosen pedagogic approach. • **Framework 3: Framework for teacher's collaborative didactic design in HCL.** • **Framework 4: Organizing ideas…** • **Framework 1B: Basic didactic design principle…** • **Framework 1G: Questions for the online survey – Collecting qualitative evaluation data...** • **Technologies: Microsoft Teams/ Office 365.**	**Communities moving toward "Integration" (B1) and "expertise (B2) together:** **Area 1:** **Organizational communication and Professional Collaboration:** Integrator B1: Using digital technologies effectively and responsibly to share and exchange practice. - Using digital technologies for communication in a structured and responsive way: E.g., to select the most appropriate channel, format, and style for a given communication purpose and context. **Reflective Practice:** Using experimentation and peer learning as a source for development: Teachers evaluate, reflect on, and discuss with peers how to use digital technologies to innovate and improve educational practice. **Area 2: Digital resources:** Identifying and assessing appropriate resources. Selecting resources that learners may find appealing using essential criteria. **Area 3: Teaching and Learning: T**oward Integrator B1: Integrating available digital technologies meaningfully Into the teaching process: - Organizing and managing the integration of digital content and devices (e.g., classroom technologies, students devices) into the teaching and learning process. **Area 5: Empowering Learners:** Fostering learners' active use of digital technologies. **Area 6: Facilitating Learners' Digital Competence:** Implementing activities fostering learners': - information and media literacy.

		- digital communication and collaboration. - digital content creation.
Teachers are testing materials in the classroom.	Teaching: - Teachers use classroom technologies to support instruction. They structure lessons so that different digital activities jointly reinforce the learning objective. - Teachers set up learning sessions, activities, and interactions (also) in a digital environment. - Teachers develop new formats and pedagogical methods for instruction and production.	**Moving from "Explorer" (A2) toward "Integrator" (B1) in all areas:** **Area 1: Organizational communication, Professional Collaboration, and Reflective Practice:** Expanding professional practice **Area 2: Digital resources:** Fitting digital resources into the learning context **Area 3: Teaching and Learning:** Implementing digital technologies into the design of collaborative activities. - To implement collaborative learning activities using digital devices and resources. - To require learners to digitally present their collaborative efforts and assist them in doing so. **Area 5: Empowering Learners:** Fostering learners' active use of digital technologies. **Area 6: Facilitating Learners' Digital Competence:** Implementing activities to foster learners' digital competence.
Asynchronous online collaboration	Teachers meet and communicate online in their communities. They share experiences from testing and collaborate on the didactic re-design of materials. Consider how educator-led digital intervention face-to-face or in a digital environment - can best support the learning objective. Reflective practice: At the organized organization, reflect on and provide critical feedback on digital policies and practices. • **Framework 3: Framework for teacher's collaborative didactic design in HCL.** • **Framework 4: Organizing ideas for the courses/ materials the community will create together** • **Technologies: Microsoft Teams/ Office 365.**	
Webinar 3		
Erasmus+ "Intellectual Output 2" Ends here.		
Finalizing Common HLC Curriculum (December 2022).		

Considerations: Digital technologies in education

The common use of technology constitutes a shared space for collaboration

The initial survey data of the project validated one of the Master Thesis' (Leschly, Kjelgaard & Veiergang, 2020) essential starting points: Lack of possibilities for physical meetings is a significant constraint on teachers' team collaboration. Face-to-face collaboration is perceived as vital for teachers but can rarely be implemented. Thus, online collaboration has the potential to mediate parts of the need for collaboration and learning together among teachers. How can we then understand social processes of learning supported by digital technology?

In the HLC curriculum, the idea of the teachers' social learning and collaboration is based on the concept of "communities of practice" (Wenger, 1999) and "digital habitats" for learning communities (Wenger, White & Smith, 2009). Research into creating a framework for online communities on learning has historically moved between two "poles" (Wenger et al., 2009):

Before	Now
Technology as tool	*Technologies as habitats*
Digital technologies are seen as tools for information seeking, dissemination and acquisition.	Digital technologies are seen as unique habitats for the team, which enable co-creation, collaboration, and knowledge sharing.

The theoretical starting point of this curriculum is near the "habitat pole": The shared virtual space for a hybrid learning community (mediated by the functions of interactivity in, e.g., Microsoft Teams) should be considered and developed as a habitat rather than just a tool. Research shows that if a community is to emerge through digital technologies, it is vital that digital technology can constitute a "shared space" (Baym, 2015). Thus, if an online community is to emerge among teachers, they must use a few common technologies where the group of teachers can develop their community of practice with the qualities associated with an "online community" (Baym, 2015):

The HLC project's desk research and survey showed differences across schools in teachers' use of digital technology for collaboration. Across schools, however, it was seen that telephone calls and emails/file sharing were used to a great extent in teacher collaboration and knowledge

sharing. These digital technologies, however, cannot adequately mediate a “shared space” for the teacher’s learning. They simply do not support the teacher's (online) learning because their ongoing intellectual discourses are not maintained in a common space. Research and experience indicated that part of the solution is to use a few common technologies in teacher collaboration.

Both the survey data and the HLC-project activities uncovered differences between the schools and the teachers in terms of their development in digitization. The same with teachers' knowledge of and attitude toward digital technologies. These differences are essential to discuss in the collaboration's start-up, as they impact the teacher's opportunities to enter collaboration in a hybrid space. On this basis, design principles were developed, which must apply to, e.g., designing for a “shared space,” organizational communication, and the participating teachers' collaboration (See frameworks in the appendix).

Technology's role in learning

There are many reasons teachers' professional digital competencies should be developed: Technology is increasingly driving societal development and changing how we live.

Thus, teachers must have opportunities and abilities to reflect together on technology development to learn and further develop new learning paradigms and contribute to the development of constructing and shaping communication technologies within teachers' practice (rather than simply applying technologies in the ways that the technologies afford). This occurs far too rarely (Harasim, 2017).

Learning theories help us understand how people learn. But theories also shape how we see the world and thereby shape it (Harasim, 2017). Collective learning for a group of teachers is in focus when we deal with developing hybrid learning communities. When we develop learning communities in a hybrid framework, we should apply a learning theory that can help to mutually understand how learning processes take place and can be framed in the virtual space.

Linda Harasim (2017) described the theory of “Online Collaborative Learning” (OCL) as one of the essential perspectives on learning in the 21st century. In OCL, digital technology constitutes the "learning space" where the interaction between the learners (and their teacher) takes place. While physical learning spaces have different properties and affordances, the same applies to OCL environments. In OCL, the discussion forum is highlighted with important characteristics attributed to learning; The various forms of online discourse that enable asynchronous communication and, thus, cooperation and social construction independent of time and space. Hence, the focus is on the participating teachers' learning to collaborate online.

Important caveats

To implement principles of hybrid learning communities in a local school, the principles can also be applied to, e.g., departments at the individual school. However, precautions are essential here. Knowledge created during the HLC project primarily concerns groups of teachers' collaboration and their learning using, among other things, virtual

collaboration in an IT platform. The organization of an entire educational institution's collaboration in an IT platform is a very complex challenge.

In the HLC project, participants from different countries and school cultures collaborated within a minimal and straightforward hierarchy with one type of staff - teachers. This could be equated to a "department" with 20 teachers. However, the HLC project has not dealt with essential tasks such as uniform user-friendly naming of (Microsoft Teams) sites, data synchronization, data security, IT support, and many other extensive and complex tasks that would follow from implementing common principles of hybrid collaboration in an entire organization.

Considerations on common pedagogy and didactics

What teaching approaches should be used?

The learning processes have alternated between planned webinars, transnational training/learning activities, and tasks to solve, exercise, and execute between the scheduled activities. The activities developing the teacher's competencies were primarily based on their learning by doing and reflections on their practical learning: The teachers developed Hybrid Learning Communities through their collaborative production of learning materials and thematic courses targeting their students in 4 different schools.

Professionals learning - Online Collaborative Learning (OCL)

The OCL approach (Harasim, 2017) to digital didactics was recommended for - first - the activities that are targeted at the professional participants in the project, especially the activities before, during, and after the project's webinars and meetings (both online and locally – JST 1 & 2). It was the intention that the teachers learn through interaction with each other in the project's shared space in Microsoft Teams. After, when teachers themselves experienced collaboration based on OCL, they should be able to apply the principles of OCL in their didactic designs and teaching.

According to evolutionary anthropology, intentional participation in "collaboration" is essential and unique to humans. According to Harasim, the collaborative approach to learning can link education with modern technology.

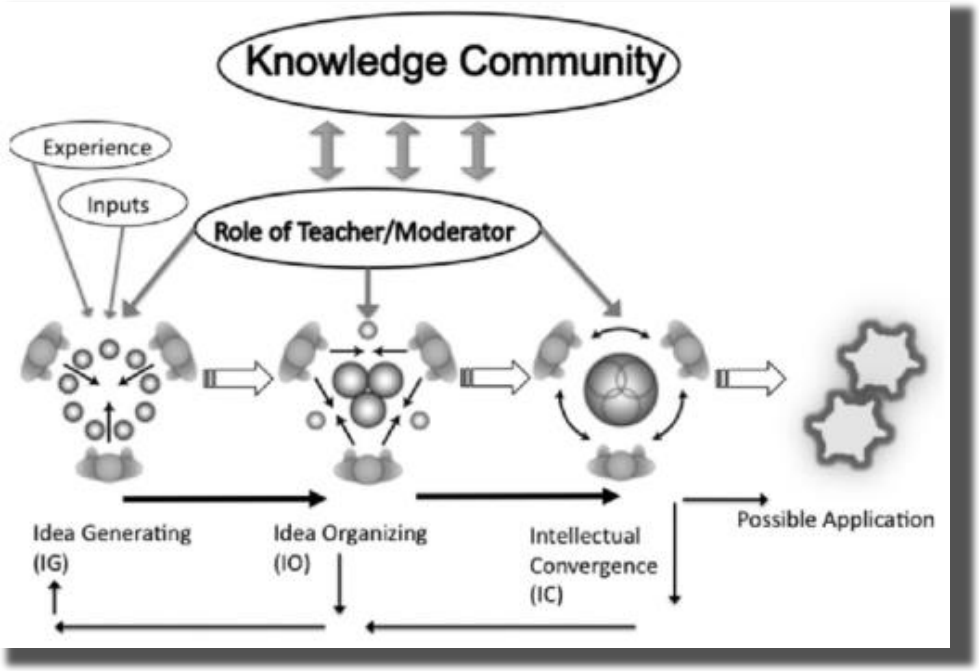
"OCL builds on and integrates theories of cognitive development that focus on conversational learning (Pask, 1975), conditions for deep learning (Marton and Saljø, 1997; Entwistle, 2000), development of academic knowledge (Laurillard, 2001), and knowledge construction (Scardamalia and Bereiter, 2006)." (Bates, 2019, p. 170)

Core design principles of OCL

The core design principles of OCL and the role of the teacher in this, according to Bates (2019):

"Harasim emphasizes the importance of three key phases of knowledge construction through discourse:

1. *Idea generating: this is literally brainstorming to collect the divergent thinking within a group;*
2. *idea organizing: this is where learners compare, analyze and categorize the different ideas previously generated, again through discussion and argument;*
3. *intellectual convergence: the aim here is to reach a level of intellectual synthesis, understanding, and consensus (including agreeing to disagree), usually through the joint construction of some artefact or work, such as an essay or assignment.*



[…] for a learner, once started, the process of generating, organizing, and converging on ideas continues at an ever deeper or more advanced level. The role of the teacher or instructor in this process is seen as critical, not only in facilitating the process and providing appropriate resources and learner activities that encourage this kind of learning, but also, as a representative of a knowledge community or subject domain, in ensuring that the core concepts, practices, standards, and principles of the subject domain are fully integrated into the learning cycle." (Bates, 2019)

Another important factor in the OCL model is the considerations concerning the discussion forums. These forums are the core teaching component where the participant's knowledge is constructed. Texts and other resources should support learning through discussion, not the other way around. This is a key design principle and part of the reason why the competencies of participating in OCL processes correspond so well to the HLC-participating learners in different parts of DigCompEdu areas, e.g., Area 1: Professional Engagement, Area 3: Teaching and Learning and area 6: Facilitating Learners' Digital Competence; Digital communication and collaboration.

Figure: Harasim's pedagogy of group discussion (from Harasim, 2017, p. 9

Professionals' didactic designs - Common approaches

References to research in the following section are based on Levinsen & Sørensen (2014)

The network society replaces the industrial community and requires that students develop additional competencies in school/ education besides basic competencies: reading, writing, and math. The fundamental competencies are supplemented by 3 new competencies

1. "Digital competencies": Information, media, and IT competencies.
2. Digital education - to be able to function and act in the 21st century "Digital Literacy" ("21st century skills")
3. The competence to take control in own competence development.

These competencies correspond to parts of DigCompEdu area 6.1: Facilitating Learners' Digital Competence; Information and media literacy. The student's development of these competencies (and other skills) is framed by the teacher's didactic design. So, what is didactic design?

Didactic design - a definition:

"The process where, based on theories and about practice in a specific context, goals, and content are determined, where plans, programs, concepts, organization and the arena for teaching and learning are designed, and where choices are made about modalities, media, learning resources, product form, presentation, and evaluation." (Levinsen & Sørensen, 2014 – own translation)

The realization of this is often a lot more complicated than the intention. Design is not just pre-planning and post-evaluation. The design process takes place in the learning process as an ongoing reflective interaction with the students in practice.

The idea that didactic design precedes students' learning processes in teaching is based on a (German-Nordic) understanding of didactics, where the doctrine of teaching AND learning is seen as a concept that deals with both PROCESS and a learner ACTING in the process. The didactic design thus contains intentionality:

- The teacher WANTS SOMETHING with the student's learning and their teaching.
- The student WANTS SOMETHING with their learning.

Research shows traditional didactic approaches are not immediately useful in an IT-integrating practice. This entails an increased need for teachers to learn new approaches to didactic design. Significant points of attention in this could be:

- Affordance concept: Affordance is the properties and functionalities of, e.g., technological objects that intuitively invite a particular action/ use. For example, a computer mouse demands (invites) that it be moved and that buttons are pressed. It is essential to explore the "affordances" associated with digital technologies.
- Web 3.0: Allows for new positions for student action. This ought to be a central focus for the school! Everyone can be senders, recipients, producers, participants, or partners.

The challenge: Teachers must collaborate to identify the properties/ functionalities of digital technologies in new ways. Teachers cannot "just" assimilate digital technologies into the school's usual teaching as

before. This link between the possibilities of digital technology and teachers' practice in education has been the biggest challenge in education in recent years. Faster mobile internet and all that it entails of opportunities for communication and information retrieval are ubiquitous in everyone's lives in terms of smartphone technologies. Still, much practice in school and the role of the teacher is characterized by "printed media technologies" (the book) and the teacher as an expert who (cognitively) “transfers” knowledge to the learner. This "downloading strategy" focused on using and repeating experiences is the didactic of the past.

Digital media, unlike books/ writing, is multimodal: One can communicate using audio, text, photo, video, and link to other content on the web. It requires a new strategy, as well as giving up habits. The focus on the use of digital technologies in education has thus shifted:

Before	Now
Technology can increase student motivation, independence, knowledge sharing, collaboration, differentiation, and new teacher-student relationships.	*How can digital technologies facilitate learning processes and qualify learning outcomes in academic and interdisciplinary teaching?*

This focus appears different in the school's subjects. Subjects may use the same technologies differently, and different technologies are helpful in different subjects, examples:

- In project work, digital technology is an essential part of the student's *work*: The search for information, communication, collaboration, and presentation are increasingly IT-based.

Subjects and digital challenges:

- Language: Media and the expanded concept of text take up more and more space in teaching. Could online gaming be a new media genre? Social Media provides good opportunities to work with the language, e.g., through communication in other languages.
- Science and Mathematics: What might the content of these subjects be in the future when apps/programs today make(?) the learning of some skills needless in some students' mathematics practice?
- Music and creative subjects: Programs/apps provide new possibilities for recording, composition, and production. Focus on production instead of reproduction.

The didactics must allow the students to take control of their development (e.g., set goals for their learning).

The teachers must establish a framework that allows the students to take on new tasks and train themselves to collaborate. When the students recognize something new, they need to learn to honor goals for the learning processes. This is not a new way of acting for students - it works as in play processes. The challenge lies with the teacher to think this approach into the didactics/ framework design:

Develop IT-integrative designs that relate to how people play and relate to each other in a digitalized network society: Participation, sociality, networking, collaboration, production, publishing, multimodality, and globalization.

These competencies correspond to parts of DigCompEdu area 5: Empowering learners; Actively engaging learners.

Teacher and the student as didactic designers and learning through digital production (see the model in the appendix)

Danish research shows that students' digital production is a way of learning that qualifies the academic learning results when production is based on a teacher-made didactic framework design with clear goals and evaluations. Clear framing creates space for a process that supports students to organize and reorganize processes and negotiate meaning in a mutually exploratory dialogue and reflection that facilitates their learning.

These competencies correspond to parts of DigCompEdu area 6.3: Facilitating Learners' Digital Competence; Digital content creation.

When this happens, students produce to learn for themselves and for their productions to be used by other students to understand. This becomes a meaningful and engaging activity for the student. Thereby, it is not only the teachers who are didactic designers; the students also become didactic designers for their learning.

Basic design principles

- When the students “design,” they work with: Choice of sub-goals, academic content, working methods, presentation, dissemination, and evaluation.
- The student MUST acquire project work as a form of work. Then the teacher can show confidence that the student can act based on the stipulated provisions.
- ALWAYS focus on evaluation competence; be able to give and receive criticism.
- Micro-management is meaningless in this approach to learning.
- REQUIREMENTS for students: They must WORK in a defined organizational framework.
- The main question the teacher must ask himself in the planning is: How do I set up a didactic framework design that allows students to develop their skills as didactic designers?

Results and methods for verification of participant's learning:

What will the learners do to prove their learning?

The learning processes are seen as hybrid in that they have taken place both in the individual teacher individually, socially through (online and offline) collaboration in the mediated shared space on the online platform, and not least through practice in the individual teacher's classroom. These collaborative (HLC) activities (webinars, Learning/Teaching/Training, and work in local and transnational Hybrid Learning Communities) are the primary indicators for the teachers' developed digital competencies.

Through the project's activities, the participating teachers collaborated on ideas for generating, developing, planning, and producing educational materials. Each of the project's 4 teacher learning communities collaboratively produced teaching materials: 2 "courses" and 2 "items." The designed learning materials focused on 4 common subjects/ teaching domains OR interdisciplinary projects between these subjects:

- Language
- Science
- Practical/ Musical subjects
- Society/ citizenship/ technology.

The work in designing these activities should develop both the teachers:

1. Competencies for online collaboration/ communication *and*
2. Understanding and competencies to use the pedagogical/didactic options and possibilities for the technical, electronic, and digital tools in the classroom.

The materials and the teachers' statements about their own learning experiences are thus part of verifying the participating teachers' learning through the project activities.

How do we know that the teaching is effective?

General indicators of HLC-participants (the teachers) learning are:

- The participant's activities of virtual collaboration in their Microsoft Teams sites. From an OCL point of view, one would be able to observe indicators of learning in the activities in the online forum (The shared space):
    - Quantitative indicators: Observing increasing numbers of messages/replies and references to previous answers.
    - Qualitative indicators: Declaration of agreement/disagreement among participants. Improved in personal understanding. Shared understanding. Merging key ideas.
- Evaluation data: At the end of Joint staff training 2 (September 16th, 2022), an anonymous online evaluation was conducted. The 20 participants answered questions about their own experiences of learning. (Data available: "STJST2, Qualitative evaluation survey; participants' perceived learning in project activities").

Regarding the students' learning: The developed learning materials will be tested after completion of this curriculum, and the students will subsequently participate in the evaluation. Here, their perceived learning outcomes will be uncovered.

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Appendixes – HLC frameworks for exploration, didactic designs and collaborative learning

Framework 1A: Basic framework for preparing activities and developing HLC didactic design principle

Header, e.g., didactic design principles for Joint staff training 1 - day 1 Summary and properties of the activities.	
Target group Characteristics of the learners? The learner's experience Needs of the schools and the learners.	IO1
Model/principle: The principle relates to… Key learning objectives Topics Difficulty level	IO2
Resources The time and resources needed The local classroom (context)	IO3
When and how is the principle applied? *Pedagogy (teaching methods).* *Tasks: Type of tasks, (teaching-) techniques that support the tasks, tools/resources, interaction/ roles of those involved, etc.*	IO3
How does the principal work best? Didactic structure: What to do before, during, and after the activities.	IO3 + IO4

Framework 1B: Basic didactic design principle: The common design of learning activities in the HLC project

Basic didactic design principle: The common design of learning activities in the HLC project Learning activities (during webinars and Joint Staff training) that are carried out to develop the competencies of the participating teachers must live up to the following requirements ...	
Target group Characteristics of the learners? The learner's experience Needs of the schools and the learners.	All participants. The participating teachers have extensive experience, with 69% having more than ten years of experience working with learning. Most teachers teach more than one subject.
Model/principle: The principle relates to… Key learning objectives Topics Difficulty level Key learning objectives	Collaborative activities where teachers design teaching materials in a hybrid community will develop 1) the teacher's competencies for online collaboration/ communication AND 2) understanding and competencies to use the pedagogical/didactic options and possibilities of the technical, electronic, and digital tools in the classroom. A strengthening of teachers' digital competencies to collaborate and share knowledge outside of teaching is a prerequisite for the teachers' development of didactic competencies to use digital technology to promote students' learning in the classroom. Thus, the project's learning activities focus first on developing the teachers' competence for digital collaboration. The HLC project key learning objectives for teachers (DigCompEdu) focus on the following areas described in the curriculum: **Area 1: Professional Engagement, Area 2: Digital Resources, Area 3: Teaching and Learning.** **Learning related to school subjects:** Teachers' collaborative design activities should focus on common subjects/ teaching domains OR designing for interdisciplinary projects between these subjects. In the HLC project, the communities form around 1) Language, 2) Science & Math, 3) Practical/ Musical subjects, and 4) Society/ citizenship/ technology. The use of digital technologies is an essential part of the student's way of working. **Learning related to digital competencies:** The primary focus of learning activities designed by the participating teachers for their students are following areas (described in the curriculum): **Area 5: Empowering Learners, Area 6: Facilitating Learners' Digital Competence.**

Resources The time and resources needed The local classroom (context)	Learning activities should be developed and organized so that the teachers collaborate for joint preparation and development of helpful teaching courses. Sufficient time must be used to support the development of teachers' competencies to collaborate. The teachers, however, work collaboratively to learn synchronously and asynchronously – thereby, the individual teachers organize parts of their learning. The context of learning is hybrid: The teachers thus learn in several contexts in parallel with each other - continuous individual reflection, their classroom, collaboration with colleagues in everyday life, and online collaboration with their learning community (synchronously and asynchronously).
When and how is the principle applied? *Pedagogy (teaching methods).* *Tasks: Type of tasks, (teaching-) techniques that support the tasks, tools/resources, interaction/ roles of those involved, etc.*	This principle should be implemented in all the project's learning activities. The section "Framework for common pedagogy and didactics" explains basic pedagogical and didactic theories that can be applied in the learning activities for students and participating professionals. Core design principles of OCL (Bates, 2019): The participants learning activities in the hybrid learning community (especially the webinars and asynchronous activities) could be designed using three key phases of knowledge construction through discourse: 1. Idea generating: To collect the divergent thinking within a group. (starts at the webinars) 2. idea organizing: To compare, analyze and categorize the different ideas generated through discussion and argument. 3. intellectual convergence: To reach a level of intellectual synthesis, understanding, and consensus (including agreeing to disagree) through the joint construction of educational materials. (Joint staff training)
How does the principal work best? Didactic structure: Most significant challenges and their solutions (Evaluation knowledge)	What to do before, during, and after the activities. The common structures (frameworks) for the didactic design of teaching materials and building a common culture in a digital space can be found in the appendix. It was a challenge to get all participants to understand the purpose, their roles, and their tasks. The participants worked with very complex tasks and knowledge with people they did not know. They had cultural differences in the group work, which had to be understood and solved in a second language using digital communication. Thus several teachers had difficulty understanding how to contribute in the beginning. -Cultural communication - misunderstandings can happen. -Differences in engagement and community work.

	-The differences in the participant's digital competencies challenge the communication/understanding and what can be expected from each other. However, the challenges are overcome for most teachers when meeting face-to-face in group work on the didactic design. Most of the teachers found this very engaging and memorable. Then realizing that the group had their ideas united and their ideas were growing, the different group members could relate, participate and add new perspectives and ideas for teaching that they individually would have never thought of. The community work was seen as very rewarding. An important note is that the teachers had their collaboration structured by the common frameworks of the project. The joint cooperation structures played a cameo role, which the teachers themselves also pointed out. Even then, teachers express a need for leadership in the individual communities – a supervisor or the like.

Framework 1C: Basic principle for digital technology as a shared space: Collaborative learning in HLC using Microsoft Teams

The basic principle for digital technology as a shared space in an organization: Collaborative learning in HLC using Microsoft Teams The participants' virtual/ hybrid collaboration and knowledge sharing should occur in one "shared space" (the fewest possible common digital technologies). In the HLC project, the space for collaboration was a Microsoft Teams site organized with a space/ "channel" for each subject-specific community.	
Target group:	All participants in the HLC project are divided into smaller "learning communities" based on their teaching subjects. They are invited to the online platform, where each community is assigned a "shared space" (an online channel) for communication and collaboration.
Model/principle: The principle relates to…	Most teachers find it challenging to meet with their team through face-to-face collaboration. Face-to-face collaboration is perceived as essential, but virtual collaboration has the potential to mediate parts of the team collaboration regardless of time and place. Telephone calls, SMS, and emails/ file sharing are typically used to a great extent in teacher collaboration. However, these digital technologies cannot adequately mediate a "shared space" to support the teacher's common online learning processes; Ongoing discourses are not maintained in a common space. Research and experience indicate that part of the solution is to use a few common technologies in teacher collaboration. • Participants should use one digital technology for collaboration and professional knowledge sharing – Microsoft Teams. • All joint project activities are carried out within the framework of the joint Microsoft Teams site. • Participants apply the features of Microsoft Teams in their practice for professional communication and collaboration, video meetings, chat, file sharing, and joint construction to prepare, design / develop teaching courses.
Properties:	Microsoft Teams is a central and common tool licensed by all participants. The common project site is hosted by one partner (SOSU) with the participating teachers as "guests" (fewer user rights).
When and how is the principle applied?	These are guidelines that apply to the above target group: • When the common technology's functions and possibilities are used, the accessibility to each other is increased, and opportunities are created for digitally supported knowledge sharing and collaboration.
How does the principal work most effectively?	• Requirement rather than choice: It is considered a requirement that teachers use the functions of Microsoft Teams for their digital communication and storage of shared files rather than choosing external/ individual digital technological solutions. • Clear assignment of responsibility for functionality and support: When the school's IT staff (or super users) stay informed about possible errors in the technology, new opportunities in the technology, and new effective ways to use it.

Framework 1D: Didactic design principle: Basic organizational communication and collaboration using Microsoft Teams

Didactic design principle: Basic organizational communication and collaboration using Microsoft Teams Microsoft Teams is a central and common tool that all employees are licensed to get to know and use. All participants must learn to use the various interactivity options to support synchronous and asynchronous collaboration in Microsoft Teams.	
Target group Characteristics of the learners? The learner's experience Needs of the schools and the learners.	All participants in the HLC project. The participants are the teachers from each partner school. The target group of the curriculum is experienced and highly motivated teachers who teach students around the age of 8th-9th grade. The teachers are characterized by interest and readiness to use new digital technologies in the classroom with the potential to use digital technology innovatively. Most teachers find it challenging to meet and agree on the importance of collaboration in carrying out their teaching. Learning to take advantage of collaborative opportunities in technology like Microsoft Teams is relevant. Teachers at Kópavogsbær use Google Workspace daily. Esbjerg, SOSU, and Olge Meglic were more familiar with using MS Teams in organizational communication and teacher collaboration. This allowed sharing of experiences and knowledge in the three schools' use of Microsoft Teams.
Model/principle: The principle relates to… Key learning objectives Topics Difficulty level	Learning related to digital competencies: The primary objectives of learning activities are described (DigCompEdu) earlier: Area 1: Professional Engagement: Using digital technologies for communication, collaboration, and professional development. 1.1 Organizational communication: To use digital technologies to enhance organizational communication with learners, parents, and third parties. To contribute to collaboratively developing and improving organizational communication strategies. 1.2 Professional collaboration: To use digital technologies to engage in collaboration with other educators, sharing and exchanging knowledge and experiences and collaboratively innovating pedagogic practices. 1.3 Reflective practice: To reflect individually and collectively, critically assess and actively develop one’s digital pedagogical approach and that of one’s educational community. The participants learning in these areas should evolve from “Explorer” (A2) toward “Integrator” (B1).
Resources The time and resources needed	Each partner school must prioritize time (and space) to support the development of the target group's basic competencies using Microsoft Teams.

The local classroom (context)	The participating teacher's basic competencies can be taught face-to-face training/ exercises. These processes can be supported by the many videos and materials provided by Microsoft: https://education.microsoft.com/en-us/learningPath/7795c940

When and how is the principle applied?
 	
Pedagogy (teaching methods).
 	
Tasks: Type of tasks, (teaching-) techniques that support the tasks, tools/resources, interaction/ roles of those involved, etc.
	• Early access and learning by doing: Before starting common learning activities, all participants should have Microsoft Teams installed on their digital devices. That way, participants can explore the platform and, at the same time, experience "learning by doing" while supporting future cooperation and communication.
	• Before they participate in the project's activities, the individual participants must develop basic skills in the common technology Microsoft Teams and have this installed on their device. Participants' learning can be organized in many ways. One can manage the knowledge individually using Microsoft's learning path, but many participants will be motivated by learning together through a joint introduction.
	• They should know of and be able to at least:
	  ○ 1) Setup/installation: Support in getting the program installed on different devices - iPad and laptop as well as learning how to access it.
	  ○ 2) Know the program's basic functions and dashboard, For example, chat, video meetings, notifications, and file-sharing structures.
	  ○ 3) Online socialization: Learn to use basic tools in "chat" and for collaboration on files in common documents, e.g., Navigate between feeds in different channels, "post" messages that can contain files, and use "@ mentions," e.g., to contact other participants.
	• Focus on both functions/ skills and virtual community culture: While getting introduced to the functions and possibilities of digital technology, it is vital to simultaneously facilitate that the participants learn/ agree on common uses/ concepts to collaboration/ communication, developing toward best practice/ common culture in the online community.
	• Both culture building and collaborative learning should be supported by common structures (e.g., common documents, models, or templates for tasks) built for and learned by the community; Shared structures (See frameworks) for collaboration can potentially achieve a function as emergent management; Promoting a common direction, shared purpose and content in common tasks.

How does the principal work best? Didactic structure:	• Media ideologies matter: It is an essential aspect of establishing the collaboration to recognize teachers' different competencies, understandings, and approaches to using digital technology in collaboration. • Building learning communities: The teachers learn in their social interaction (both when they are together and online synchronously and asynchronously) by preparing and developing teaching together - the epitome of being a hybrid learning community.

What to do before, during, and after the activities.	• Start together face to face: Groups of participants/ teams develop common culture better by learning together. It is most effective to start up as a group together, e.g., learning common theories and methods in didactics/educational design; Participants find the common learning activities face to face and the dialogue in the group work most educational: By organizing and combining ideas for teaching courses by using the common structures/ forms for collaboration (online and face to face). • Early support to novices: When collaborating with external organizations from different countries, challenges can arise in collaboration on a platform such as Microsoft Teams. This is especially the case when the technology is new to participants who only have user rights as "guests," and you cannot be present to support those who are novices with no skills in using the technology. Frustrations in these cases highlight that one cannot rely solely on leaving the individual participant's development to their own "learning by doing." o Participants must first learn the use of functions that support the opportunities for digital communication and mobility in Microsoft Teams to expand the target group's reach concerning communication, collaboration, and knowledge sharing. o At first: focus on the simple functions and then on the more complex ones in the learning process. Also, focusing on the feature immediately interested the teachers after the introduction. Ensure that teachers understand when and how the program's features contribute positively to their collaboration. Be careful to ensure that teachers understand in which situations the program does not provide the best framework for contributing positively to their collaboration; Features for common construction in Office 365 (synchronous and asynchronous) are best supported on the teachers' laptops, as they have all the program's options available. Tablets/ mobile devices do not support all application capabilities. However, mobile devices support the team's professional communication by increasing the range and mobility synchronously and asynchronously. • Targeted competence development is necessary to develop basic competencies for the new technology. When considering this in an organizational framework, this (a focus on agreements on the culture of the shared space and competence development) should be included in the organizational management documents and development plans. • It is crucial to help participants to be able to control the technology's notifications so that participants are not unnecessarily disturbed by communications that do not concern them.

Framework 1E: Basic didactic design principles for the development of common teaching materials

Basic didactic design principles for the development of common teaching materials The teaching courses that are developed for students in this project should be based on and follow this principle:	
Target group Characteristics of the learners? The learner's experience Needs of the schools and the learners.	All participating teachers must adopt these principles in their didactic designs. Most students are in the 8th-9th grade. Most students across all schools believe in the potential of using digital technology in learning processes. The students perceive themselves competent at using digital technology in their private communication.
Model/principle: The principle relates to…	The participating teachers will develop, plan, and produce educational material and thematic courses. This should create a better understanding and use of the pedagogical/didactic options and possibilities for the technical, electronic, and digital tools. The work through all work phases (webinars, Learning/Teaching/Training, and work in local and transnational Hybrid Learning Communities) will lead to materials and courses: 1) 2 x 4 items in 4 different subjects for students to be used and tested in all 4 partner organizations. 2) 2 x 4 thematic educational courses for students to be used and tested in all 4 partner organizations.
Resources The time and resources needed The local classroom (context)	Regarding digital resources – There are significant differences in digital technologies available to students in different countries. If digital technologies are required to participate, students must be able to participate using their smartphone and/or Ipad / tablet computer.
When and how is the principle applied? *Pedagogy (teaching methods).* *Tasks: Type of tasks, (teaching-) techniques that support the tasks,*	**Basic design principles when working with student's digital competencies and/ or embedding digital technologies in teaching:** • Embed digital technologies to facilitate learning processes and qualify learning outcomes in academic and interdisciplinary teaching. Develop IT-integrative designs that relate to how people play and relate to each other in a digitalized network society: Participation, sociality, networking, collaboration, production, publishing, multimodality, and globalization.

tools/resources, interaction/ roles of those involved, etc.	• Students' digital production qualifies the academic learning results when the production is based on a teacher-made didactic framework design with clear goals and evaluations. Students should produce to learn for themselves and for their productions to be used by other students to learn. • The main question the teacher must ask herself in the planning is: How do I set up a didactic framework design that allows students to develop their skills as didactic designers? When the students "design," they work with: Choice of sub-goals, academic content, working methods, presentation, dissemination and evaluation. Micro-management is meaningless in this approach to learning. • When learning in project-oriented teaching: The student MUST acquire the understanding and skills of project work as a form of work before the teacher can show confidence that the student can act based on the stipulated provisions. • ALWAYS focus on evaluation competence; be able to give/receive constructive criticism. • REQUIREMENTS for students: They must WORK in a defined organizational framework.
How does the principal work best?	Teachers should incorporate digital technologies into the student's learning processes. Teaching: Design the teaching so that it demands the students to use digital technology to produce videos, presentations, photos, documents, etc. The students are motivated by using digital technology, and it makes sense for them. There is a potential in building on build on top of students' experience and digital skills; They use digital technologies for collaboration and communication for both schoolwork/ learning activities and private socializing with friends and family.

Framework 1F: Questions for online survey (autumn 2021) - Uncovering the contexts of the participants

The qualitative data was shared with the participants in a report available on request.

Inquiry in Microsoft Forms.

Questions 1-2 focus on the participant's experience and their teaching subjects.

- How long have the participant been working with teaching/learning?
- What subjects do the participant teach?

Questions 3-4 focus on the participant's digital skills.

- Microsoft Teams Collaboration: Participants mark statements corresponding to what they know and can use now.
- Digital technologies in the classroom: What digital technologies are used with students in the classroom?

Questions 5-10 focus on the participant's collaboration with colleagues.

- What technologies are used in communication and collaboration with closest colleagues?
- Ranking technologies according to which ones are most important in daily communication and collaboration with colleagues.
- The common use of technologies: To what extent do the participants find that they and their colleagues use the same programs/technologies in collaboration?
- Elaboration: What impact does it have on their collaboration with colleagues that use the same OR different digital technologies?
- The importance of team collaboration: To what extent does the participant prioritize team collaboration with other teachers in solving their learning tasks?
- Team collaboration option: To what extent can it be difficult for the participant to meet with the team/colleagues for various reasons?

Questions 11-13 focus on the evaluation of learning during the project.

- Evaluation - Collaboration in Microsoft Teams. Marking the statements that correspond to what they know and can use now.
- You and "digital literacy." Participants marked the statements corresponding to what they know and can use now.
- Readiness for digital technology: To what extent do the participant find it interesting to test new digital technologies in your classroom?

Framework 1G: Questions for online survey (Sept. 2022) – Collecting qualitative evaluation data on learning experiences.

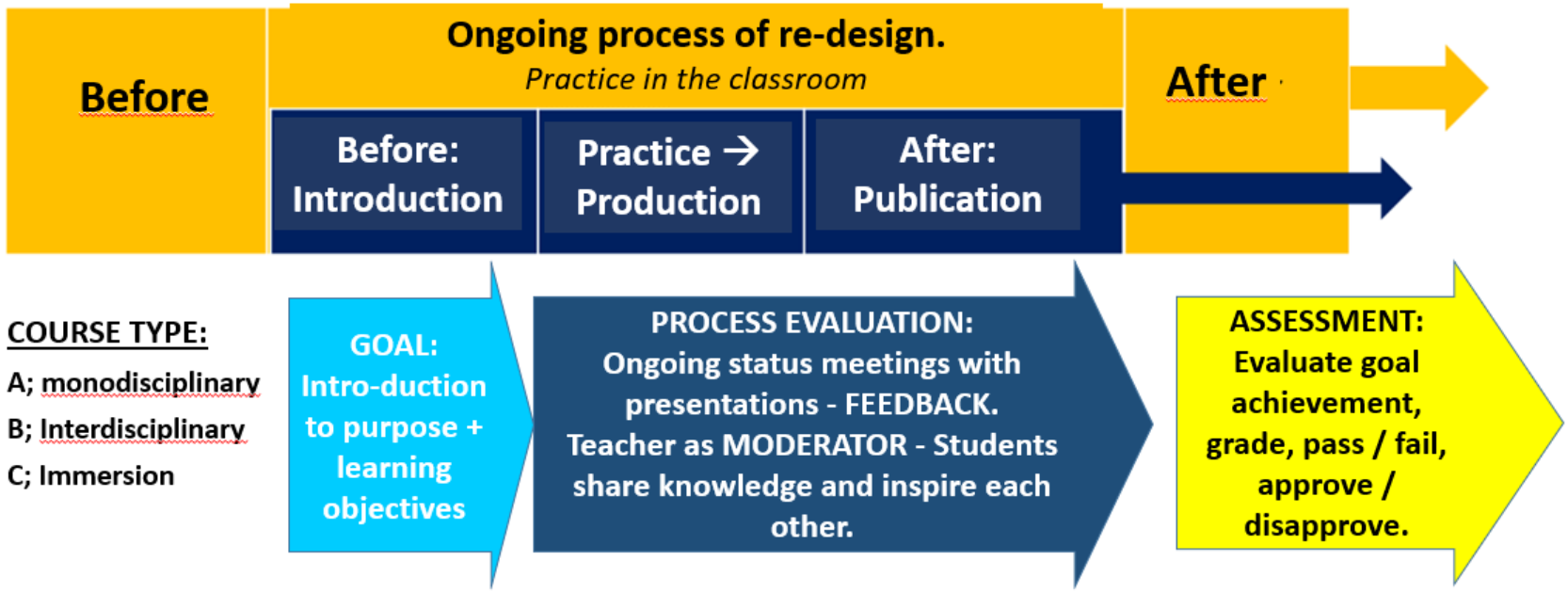
STJST2, Qualitative evaluation survey on participants' perceived learning in project activities.
The purpose of the survey was to collect data on the participants' learning through the project. Participants had 45 minutes to complete the survey. Before the survey, the questions and their purpose were presented/introduced to the participants by Erik Leschly.
The qualitative data in their original wording and entirety was shared with the participants in a report available on request.

Inquiry/survey done in Microsoft Forms.

1. Thinking back on the HLC-project learning activities (from the beginning) - What was the most challenging for you? Why?
2. Thinking back on the HLC-project learning activities (from the beginning) - What was most memorable for you?
3. Thinking back on the HLC-project learning activities (from the beginning) – What was the most educational activity for you? Why?
4. Ideas for change: What do you think has been missing from the project's learning activities?
5. Learning professional collaboration: To what extent did your participation in the HLC-project activities change/ have an impact on your use of digital technologies to engage in collaboration with other educators, E.g., for sharing and exchanging knowledge and experiences and collaborative practices?
6. Learning organizational communication: To what extent did your participation in the HLC-project activities change/impact your use of digital technologies in professional communication? (With learners, parents, and colleagues).
7. Your teaching: To what extent has your learning from the HLC project influenced your teaching? (e.g., your didactics or the use of digital technologies in the classroom)
8. Sharing knowledge: To what extent do you want to share your experiences and knowledge from the HLC-learning activities (webinars, community work, JST1, and JST2)
9. How could you share some of your experiences and learning from the HLC project with your colleagues?

Framework 2: Theoretical model - Teacher and the student as didactic designers and learning through digital production

Teacher and students as didactic designers in 3 phases: BEFORE, PRACTICE, AFTER.
The teacher sets up a didactic framework - The students work independently in the framework.

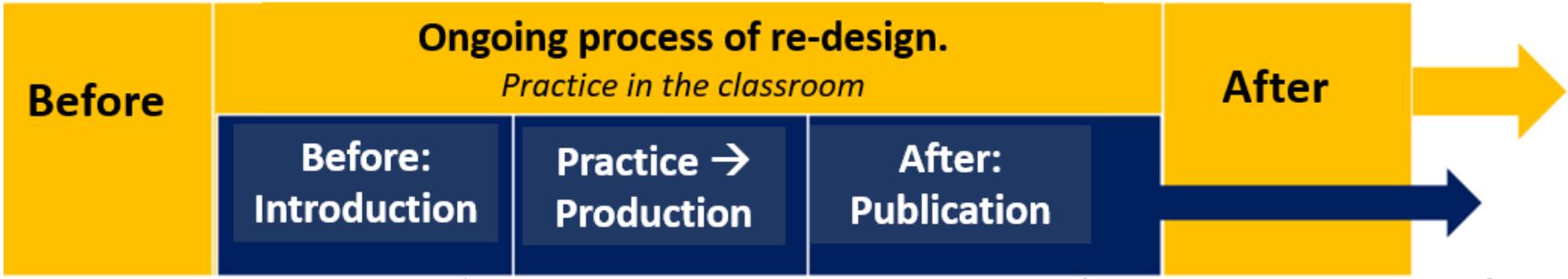


Models from: Levinsen & Sørensen (2014) - Edited by Leschly & Kjelgaard.

Framework 3: Framework for teacher's collaborative didactic design in HCL

Teacher and student as didactic designers in 3 phases.

The figure illustrates the temporal connection between the teacher's and the student's work as didactic designers;
The teacher sets up a didactic framework - The students work independently in the framework.



Model from: Levinsen & Sørensen (2014, p. 33) - Edited by Leschly & Kjelgaard

The relationship between the teacher and the student as a didactic designer

(Edited extract from Levinsen & Sørensen (2014))

When the students, based on the teacher's didactic framework design, make choices of goals, content, organization, and use of technology, the teacher's position is changed to be a leader who facilitates, supports, and challenges the students based on a theoretically grounded reflection in action.

When teachers and students are didactic designers, one can divide the process into three phases with focus. For the teacher, the three phases are:

1. **Before:** *Preparation.*
2. **During:** *Practice in class*
3. **After:** *Evaluation*

For the students' work, three similar phases are seen, which are embedded in the teacher's practice in the class:

1. **Before:** *Introduction and planning*
2. **Practice/production**
3. **After:** *Product/presentation.*

The teacher's frame of design also enables the students to sometimes have both preparation that lies before the work in the class and after the work in class with further work with their productions at home or in an after-school program.

Proposed framework for teacher's collaborative didactic design in HCL

(Explanations in the model are own edited translations from the description of the model in Levinsen & Sørensen (2014))

The teacher's process		The student's process	
BEFORE	Here, the teacher plans the didactic framework design for the student's overall work and the teacher's role and activity in the practice phase. In this phase, the teacher also works with the practical preparation of physical or digital spaces and any physical or digital materials that must be available to the students.		
DURING PRACTICE	In the students' pre-phase, the students are introduced to and involved in the purpose via learning goals.	**BEFORE**	The teacher introduces the students. Maybe students have prepared via homework.
	When the teacher reflects on his practice while the students work, it creates the opportunity for the teacher to modify his original design in the course itself and differentiate feedforward and feedback continuously, depending on the students' level. The didactic framework design is thus dynamic, although it can generally be divided into phases delimited by deadlines. Both teachers and students, therefore, have the opportunity to re-design in the middle practice-oriented phase, where they can repeatedly and reflectively utilize experiences, qualified feedforward, and learning to change and modify their knowledge and choices.	**PRACTICE/ PRODUCTION**	
	In the students' after-phase, the teacher and student (s) make status and produce new agreements for student focus. The teacher thus sets the framework for his practice in the class and the overall course that the students must complete. The students 'overall course is embedded in the phase that, for the teacher, constitutes practice in the class, where the teacher acts as process leader and general project manager, and facilitator for the students' general course.	**AFTER**	
AFTER	In the "after-phase," the teacher evaluates and shares knowledge with colleagues for didactic development and design of future courses.		

Teacher and student as didactic designers in 3 phases…			
The teacher's process		**The student's process**	
BEFORE			
DURING Practice		**BEFORE Introduction**	
		PRACTICE Production	
		AFTER Publication	
AFTER			

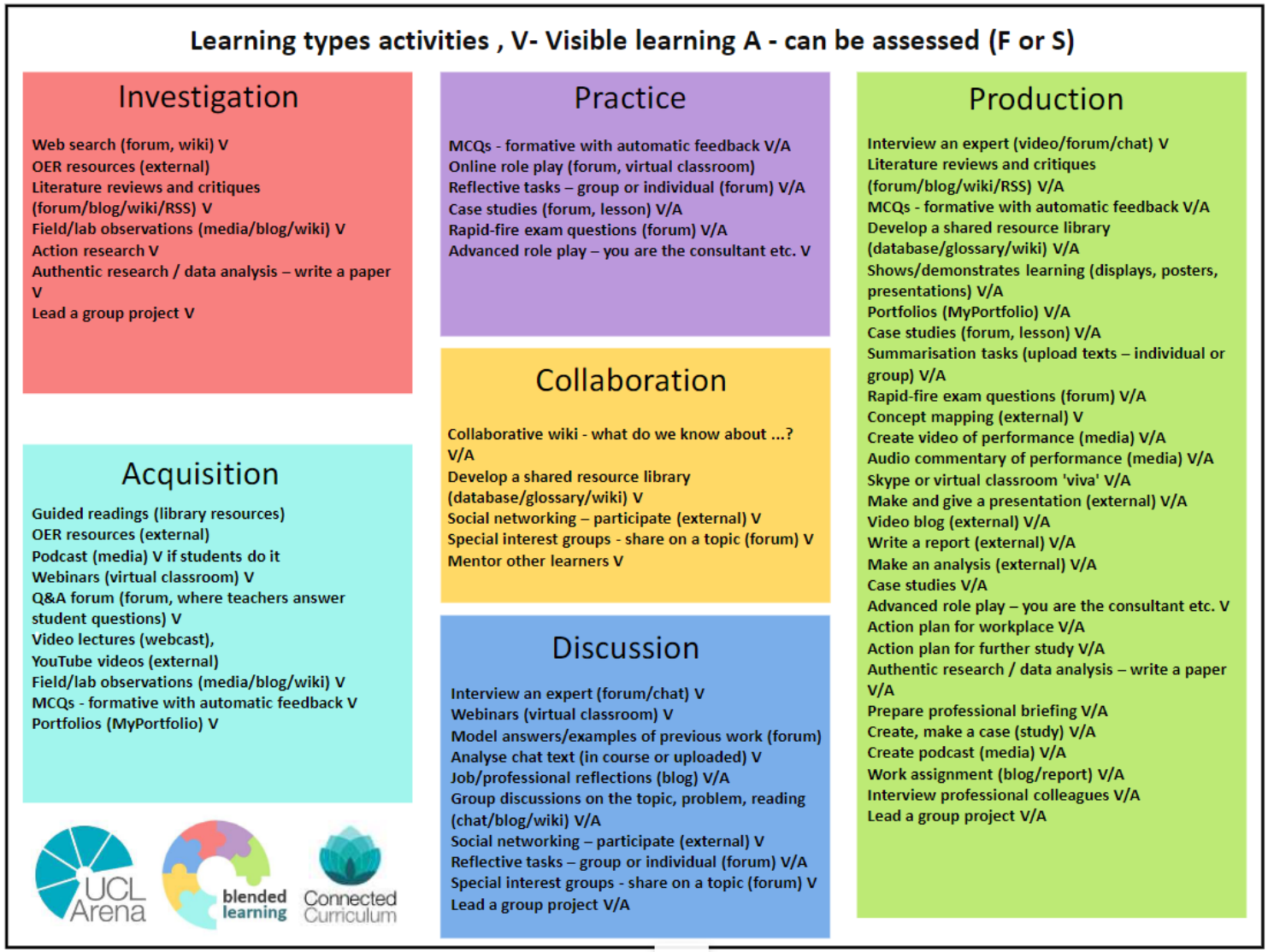
Framework 4: Organizing ideas for the courses/ materials the community will create together

	Thematic course 1	Thematic course 2	"Monodisciplinary" item 1	"Monodisciplinary" item 2
Primary theme/name + Summary *("tweet size" 140 characters)*				
What is it we want our students to learn? *- key learning objectives or topics*				
Resources *The time and resources are needed?* *The local classroom (context)?*				
Notes on tasks and learning types				
Student products				
Pedagogy (teaching methods) and points of attention.				
How can we know if our students learn anything? *How to support the academically weak and engage the strong?*				

Framework 5: Template for HLC- groupwork - Establishing a common culture for virtual cooperation in the HLC's shared space

	Questions for clarification/agreements	*Principles (Decisions/points of attention/notes)*
Goals & Tasks:	What do you need to do as individuals before you meet to continue your collaboration as a group?	• Common objectives/ Goals? • Individual tasks and responsibilities for the members?
Next meeting in your group:	1. Date and time - When is the group's next meeting? 2. How do we start the meeting/ who is responsible? 3. What is the key point(s) on the agenda?	**1. ..** **2. ..** **3. ..**
Realtime communication (video meetings in Microsoft Teams)	Future cooperation: For which processes do we use real-time communication (video), and how?How can we make our meetings via video as engaging and productive as possible? What do we do when we have technical difficulties?	*"Turn on your camera when we meet."* *"Sit in a quiet area, mute your sound if…."* *"Do not interrupt."* *…*
File sharing (Cloud)	Do we all agree on what materials/ files we should share and how we should organize our file sharing? How can we create joint working documents where everyone can contribute without becoming unmanageable? Should we establish any after today – e.g., The agenda for the next meeting?	• *Developing and organizing a common file-sharing structure in the channel + Naming (of folders) is a common concern…* • *Create common documents for the content of your meeting early and link to them in the feed to gather the team's input for meeting points.* • *Save documents from meetings in a common place.*
Asynchronous communication (Chat room/discussion forum)	Which symbols/emojis do we use - for what? How long post? How often? How can we have engaging online discussions without constantly disturbing each other with notifications? What tasks can we require that we complete learning processes in the team? Discuss your group's expectations for: - Response times? -Tone/attitude in the communication? -Activity level at different times of the day and weekdays?	Advice: • *Use channels/threads to cover different topics so that not everything is discussed in one long thread.* • *Start discussions/discussions of topics on the meeting agenda in the discussion forum in advance of the meeting to have plenty of time for important discussions and experience sharing/idea exchange/data collection.* • *Support for setting notifications according to needs and agreements.*
Organizing	How does it support maintaining appointments and follow-ups?	
Creative/visual production (online)	What does the group need? What common technologies could support this?	

Framework 6: The 6 learning types of Arena Based Curriculum Design



Source: University College London (2017): ABC (Arena Blended Connected) curriculum design (Web page with workshop materials). University College London; Digital Education Team Blog: https://blogs.ucl.ac.uk/digital-education/2015/04/09/abc-arena-blended-connected-curriculum-design/