Hybrid Learning Communities (HLC): Math Courses and Items

	Thematic course 1 Establishing Hybrid Learning Communities.	Thematic course 2 Volume & measurement A design course.	Monodisciplinary item 1 Describe a packaging item	Monodisciplinary item 2 Calculate the volume of a packaging item
Main theme/ name and Summary	We are establishing Hybrid Learning Communities amongst the students. It can be used in all subjects and is the foundation of HLC. In the material, there are examples of both literature and Math. Course 1 in overview padlet form.	Design a box and a swimming pool with a terrace. Course 2 in overview padlet form	This is designed as a running feature for the beginning of each math module throughout the school year. One student brings a secret container from home and describe to the rest of the class using only math attributes. The class then must guess which container.	Find different containers at home and calculate their volume. The students must work together on this in Teams. The students need to use modelling to calculate the volumes.
What is it we want our students to learn? *- key learning objectives or topics*	Create an online community in Microsoft Teams. Create channels for each group. Get them to collaborate hybridly. Key points: - Online communication - Symbols - Express yourself online Digital literacy: How should the students combine efforts in their HLC-team? Symbols, agreements, and rules.	Communicate and collaborate in and about math. Learn about volume and measurements. Make a concrete output. Design a product.	Practice communicating about and with math. Communicate and express yourself in front of others. Awareness of the presence of math in everyday life.	Communicate with others using M.S. Teams -> hybrid communication. Use formulas to calculate different volumes. Express yourself in front of others and use math language. Awareness of the presence of math in everyday life.

Resources *The time and resources needed. The local classroom (context)?*	P.C., tablet or phone 2-3 lessons in the classroom and online -> hybrid.	P.C., tablet or phone 5-6 lessons in the classroom and online -> hybrid.	P.C., tablet or phone 5-10 minutes. Planning, making a schedule. Students need to prepare at home. Time in class to introduce.	P.C., tablet or phone Access to Microsoft Teams Homework: Leave enough time for the students to collaborate on the task in Teams.
Notes on tasks and learning types	Small tasks showcase the different functions in Teams. Homework in the form of a math (or other) assignment where the students must use Teams to communicate to complete the task. The teacher gives feedback and feedforward in Teams and the students need to qualify the task based on the teachers' comments.	Discussion and collaboration. Teams to communicate. The teacher gives notes on the ideas. Tutorial and the small training exercises leading up to the solution.	Participate in the game with the teacher as the initiator. This serves as a model for how to do the presentation. Feedforward: brainstorm ideas for describe math attributes. Students can use these directly or for inspiration. Participate in the game with other students as the initiator. This serves as further modelling for the students and can be used to differentiate by letting the stronger students go first, giving the others more time to familiarize themselves with the game.	Discussion with other students Investigation: Calculate at home Communicate with others and explain your understanding
Student products	Community (HLC) in itself.	A physical object, digital object, sketch.	Oral presentation.	Pictures and calculations uploaded to teams. Oral presentations.

Pedagogy (teaching methods) and points of attention.	Collaboration: Small group project using hybrid learning forums. Building a joint digital output Learning by doing and reflecting together. Acquisition: The teacher tells them what to do and how to do it. Practice: The students practice using the different functions in Teams that support and expand their learning. Collaboration: When we assign homework, the students must communicate in teams to solve. Production(items): Make a video or photo, digital document, concrete output.	Acquisition: Teacher tells them what to do and how to do it. Investigation: Students must explore and compare the problem they are solving. Collaboration: Students practice using different functions in GeoGebra. Production (Items): Students make a prism grid in GeoGebra. After that they make an actual box. Then they make draft for swimming pool and a terrace.	Investigation: Students must figure out which measures can be attributed to their chosen container. Practice: The students practice speaking about math: converting "real life" into math. The students practice listening to math: Converting math into "real life Collaboration: The students must listen to each other and communicate with each other Learning by doing: The students are learning math by using math.	Investigation: Students must find out how to calculate the volume of their chosen containers. Practice: The students calculate different volumes. Collaboration: The students must work together to calculate the different volumes. Learning by doing: The students must do the measurements themselves, find the formulas themselves and calculate the results themselves.
How can we know if our students learn anything? *How do you support the academically weak and engage the strong?*	Peer assessment Concrete outcome Digital outcome Teacher looks for signs of learning: Activity in the teams. In a hybrid way.	Peer assessment Concrete outcome Digital outcome Teacher looks for signs of learning: Activity in the teams. In a hybrid way.	The teachers conduct a formative evaluation each time the game is played to assess the progression of the language the students are using and the level of student participation.	The teacher facilitates a presentation of the groups' results. The teacher conducts a formative evaluation during that presentation to make sure the groups and individual

	The teacher must create the groups in a way that will enable them to accommodate a diverse group of students. The teacher must then use scaffolding Students must continuously evaluate their groups based on self-reflection and per-response with feedback and feedforward. In addition, the groups get teacher responses during the process and after submission, with feedback and feedforward. 1) Where am I going? (What are the goals?) 2) How am I going? (What progress is being made toward the goal?) 3) Where to next? (What activities need to be undertaken to make better progress?) (Hattie)	Students must continuously evaluate their groups based on self-reflection and per-response with feedback and feedforward. In addition, the groups get teacher responses during the process and after submission, with feedback and feedforward. 1) Where am I going? (What are the goals?) 2) How am I going? (What progress is being made toward the goal?) 3) Where to next? (What activities need to be undertaken to make better progress?) (Hattie)		students have attained the target skills.

Teacher and student as didactic designers in 3 phases in Thematic course 1 "Establishing Hybrid Learning Communities in Microsoft Teams"

The teacher's process		The student's process	
BEFORE	Create an online community in M.S. Teams for the students. Make channels for each group. Get them to collaborate hybrid. Targets: • Students should become familiar with the technology and apply it in other situations. • Students learn the benefits of HLC. • Students gain insight into their learning process. Including gaining experience of entering a collaboration and its impact on their production/presentation and own learning process)		
DURING Practice	Small tasks showcase the different functions of Teams. Acquisition: The teacher tells them what to do and how to do it.	**BEFORE Introduction**	Microsoft Teams Online communication Symbols Express yourself online What does it mean? What do you write? Secure clear, decent, and kind communication.
	Building a joint digital output Collaboration: Small group project using hybrid learning forums.	**PRACTICE Production**	The students practice using the different functions in Teams that support and expand their learning. Learning by doing and reflecting together.

	Collaboration: When the teacher assigns homework, the students must communicate in teams to solve.		Homework in the form of a math assignment where the students must use Teams to communicate to complete the task. Digital literacy: How should we (the students) join forces in our team? Symbols and agreements. - Agree with the group on how you use symbols. Agree with the group on how you show if the group has seen a message. - Agree in the group on how often you should look at your team. - Ensures that we understand each other. - Avoid hurtful comments Always agree after each meeting (both physics and online) - Who does what? - When should it be finished? - When will you meet again? - Anything else that needs to be agreed upon? Write down your agreements in a document that you call Team Rules. The document is placed under files in the HCL-Team.
	HLC evaluation: - How is the student's online communication in there HLC? - How is there use of symbols? - Do the students express themselves clear, decent, and kind? - Do they use HLC synchron and asynchron?	**AFTER Publication**	Community (HLC) Evaluation in MS Forms with the students. Student evaluation - Do I enjoy group work? - I was involved in the decision making when we started our work. - I listen carefully to others. - I took an active part in the conversation.

	- Are they respondent to each other's messages? - Can they collaborate in a document?		- I did my job on the project. - Make them rate themselves and their work.
AFTER	Guidance assessment / Teachers' evaluation • Interest/activity ▫ How much is the communicating on MS Teams? • Independence ▫ Focused ▫ Do I job without any support? • Initiative ▫ Are ready to take on new tasks ▫ Wants to improve • Communication ▫ Polite ▫ Responsible ▫ Want to help others		

Teacher and student as didactic designers in 3 phases in Thematic course 2
Volume and measurement – A design course.

The teacher's process		The student's process	
BEFORE	**Make groups** Divide the class into your chosen groups and establish online communities for their group work. Get them to work hybrid. Introduce the storyline. **Starter event/Icebreaker** Show the students a familiar object/canister like a bin already in the classroom. Q: How much water do you think we can fit in this bin? And then have a class discussion. Q: How can we calculate the volume? Students must investigate to find out how to calculate the volume. Q: What do we need to measure to calculate the volume using the formula you found? A triggering event that leads to exploration leads to the integration of the explored, leading to a decision. The teachers must support the groups.		
DURING **Practice**	Support them with physical and online feedback (teams) and by using the ABC learning types.	**BEFORE** **Introduction**	Brainstorming: The students will brainstorm in groups and use Padlet.

	An ongoing formative evaluation of the process. Evaluation of students' professional learning outcomes. Evaluation of their collaborative process and collaboration. Evaluation of the use of the technology -> HLC. Share and reflect with the team (teachers). *Diffusion of innovation* How do I feel along the way? What's it like to be a teacher in the process? Precisely share the dilemmas/insecurities that may arise in a new approach and unfamiliar teaching situation.	**PRACTICE Production**	Students must continuously evaluate their groups based on self-reflection and per-response with feedback and feedforward. In addition, the groups get teacher responses during the process and after submission, with feedback and feedforward. 1. Where am I going? (What are the goals?) 2. How am I going? (What progress is being made toward the goal?) 3. Where to next? (What activities need to be undertaken to make better progress?)
		AFTER Publication	
AFTER			

Teacher and student as didactic designers in 3 phases in Item 1 "Describe an item"

The teacher's process		The student's process	
BEFORE	Make a schedule of when each student must do their presentation. Prepare a worksheet for the student to take home before their turn. Prepare your own presentation to demonstrate the game.		
DURING **Practice**	Showcase the game and as an introduction. Have a brainstorm in class where the students give ideas for descriptive sentences that can be used. Remind students when their turn is approaching and make sure that the worksheets are available. Be available for sparing and guidance.	**BEFORE** **Introduction**	The students try the game with the teacher as the lead. The students must think about what can be said to describe objects during the brainstorm. Then they participate in the game when their classmates are leading. When it is their turn, they are given a worksheet which explains the task.
	Initiate the game if necessary. Assist with keeping order during the game if necessary.	**PRACTICE** **Production**	At home: The student must find a container, decide how to describe it, and practice. The student can ask for help from the teacher in class.

	Be available for students who need help finding the right word etc.		
	Give and receive feedback and feedforward. If necessary, have a class evaluation. Remind and prepare the student who's up next.	**AFTER Publication**	The student brings the container to school and makes sure that it remains hidden from their classmates. The student stands in front of the classroom with their container hidden from view of the rest of the class. The student proceeds to describe one aspect of their container and let the class guess a few times. The student describes their container one aspect at a time, letting the class guess in between until the container is guessed. Feedback and evaluation as needed.
AFTER	Evaluate the process and your own level of guidance and involvement and adjust for next time.		

Teacher and student as didactic designers in 3 phases in Item 2
"Calculate the Volume"

The teacher's process		The student's process	
BEFORE	Prepare the worksheet for the task. The following preparations can be done through Course 1 "Establishing Hybrid Learning Communities in Microsoft Teams". Divide the students into groups of two-four. Introduce the groups to Microsoft Teams and create channels for the groups. Make sure that you have access to all group channels.		
DURING Practice	Introduce the assignment. Be available to assist the groups with the tasks they must complete in school.	**BEFORE Introduction**	Listen to the introduction. Read the worksheet and complete the tasks that need to be done in class. At home: Find a suitable container, take a picture and upload it to teams.
	Monitor the groups. Make sure that they have a meeting scheduled and monitor their online communication.	**PRACTICE Production**	Team-meeting: calculate the volumes of each container. Upload your calculations and prepare a presentation in class.

	Conduct the group presentations. Conduct an evaluation in class. Make a formative assessment of each students' participation, understanding and intellectual output of the assignment.	**AFTER Publication**	Present your containers and calculations in class. Give and receive feedback and feedforward. Evaluate.
AFTER	Evaluate		