DigiTeL Pro

Professional development in digital teaching and learning

IO 2 Course on Synchronous Hybrid Teaching and Learning

Teacher manual for the course on Synchronous Hybrid Teaching and Learning as part of the final CPD program for digital education

Document details

Document title	Teacher manual for the course on Synchronous Hybrid Teaching and Learning as part of the final CPD program for digital education
WP (if applicable)	
Document version	2
Lead author	Marieke Pieters
Other authors	Annelies Raes – Frederik Van de plas
Dissemination level	PU
Confidentiality Status	Public
Date	February 2023
CC License	

Versioning and Contribution History

Revision	Date	Author	Organisation	Description
Version 2	February 2023	Marieke Pieters Annelies Raes Frederik Van de plas	KU Leuven	Revised based on review of Advisory Board
Version 1	December 2022	Marieke Pieters Annelies Raes Frederik Van de plas	KU Leuven	

Co-funded by the Erasmus+ Programme of the European Union

Table of contents

Introduction

The target audience of this report is anyone involved in digital course and curriculum development and in addition leaders steering this process. More specifically, this report targets stakeholders involved in the transition to hybrid learning and teaching experiences who want to organize Continuous Professional Development (CPS) within their institution. Synchronous hybrid learning is a complex learning setting of online and in-person instruction that utilizes real-time virtual communication to connect students on site and remote and teachers. (More information about what we mean by hybrid education and what has been studied so for on this type of education can be found in deliverable IO2-A1 (An open access report on the state of art research, innovation and good practices of synchronous hybrid learning and conclusions related to the COVID 19 context)).

This report is set up as a **teacher manual** guiding you through the objectives of the course and the design of the course. The manual described in a detailed way all the course materials and worksheets which can be used for CPS on synchronous which have been made available as a result of the Digitel Pro project. It will provide you with a plan of action or roadmap to teach the course yourself within your institution. Of course, you can adapt the program to what your students or colleagues need or to the needs of your institution.

The DigiTEL Pro Strategic Partnership

This teacher manual is the result of **DigiTel Pro project** which aimed to reinforce the ability of educational institutions to provide high quality, inclusive digital education, responding to the needs of universities during the Corona crisis and beyond. Within the partnership three CPD courses were firstly designed, developed and implemented and secondly shared for re-use/re-run. This manual can be used to organize the re-run of one of the three courses, namely the one focusing on synchronous hybrid education.

If you want to know more about the design and development of the course and about the evaluation of the implementation of the first run, you can have a look at IO2-A3 for the design & development of the course and IO2-A5 respectively.

General approach of the course

Overall objective of the course

This course will provide participants with an understanding of the principles and practices of synchronous hybrid learning and teaching, including the use of technology and instructional strategies to enhance student engagement and learning outcomes. Whether you are a teacher, an instructional designer, or board member in your institution, this course will equip you with the knowledge and skills to effectively participate in and make decisions on synchronous hybrid learning environments.

Overall structure including different modules

The course created within IO2 on hybrid education is part of the overall, joint DigiTel Pro CPD programme for digital teaching. The total workload of the programme is 100 hrs (all three scenarios together). The workload of this course is about 30 hrs.

The course consists of six modules and follow a certain learning line including cross references. Although the modules can be used separately, it is recommend to follow the suggested order and to follow them all to have a complete understanding.

Modules

1. Conceptual challenges
2. Pedagogical challenges
3. The complexity of hybrid learning environments
4. Technological challenges
5. Effective scenario's in a synchronous hybrid setting
6. Do it yourself - Synchronous hybrid teaching

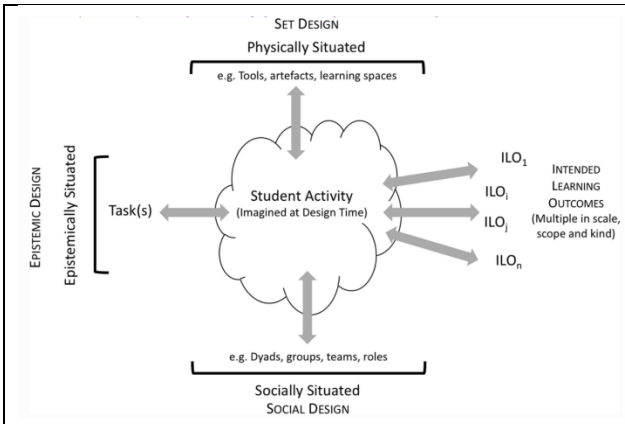
ACAD as guiding framework within the course

Activity-Centered Analysis and Design (ACAD) (Carvalho and Goodyear 2014; Goodyear, Carvalho, & Yeoman, 2021) is a human-centered approach to designing and analyzing systems and processes. It is based on the idea that any system or process should be designed with the end-users in mind. The focus is on understanding the activities that students undertake to reach their goals, and the contexts in which they perform those activities.

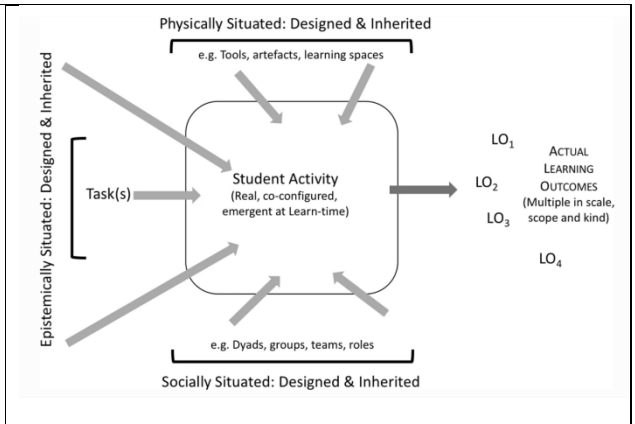
In our course, ACAD was not only informative for the design of our own course, it is also used as a guiding framework to help teachers understand the importance of designing learning activities, building social relationships with and between student and all this taking into account the possibilities of the learning space, learning time and available technology.

As further described in more detail, the ACAD framework is used already in the first module to situate the relationship between the different modules. Another reason why ACAD has been used in our course, is because the ACAD framework has been used in several research studies on synchronous hybrid education (cfr. Raes, 2021 and Bülow, 2022).

The ACAD framework acknowledges the physical, epistemic, and social situatedness of learning and conceptualizes this as set, epistemic, and social design. Set design includes the specific tools, artefacts and learning space used to support learning and teaching. Epistemic design is related to the tasks or activities students are asked to do in service of learning, and social design is related to how students are grouped or how networks or communities are built. ACAD has previously been used to analyse emergent learning activity in both online and place-based spaces for networked learning. In the study of Raes (2021), it was used to describe the design of two synchronous hybrid learning practices and to analyse the results for students outcomes within these new settings. Next, Bülow (2022) published a chapter on "Designing Synchronous Hybrid Learning Spaces: Challenges and Opportunities" in the eBook on Hybrid Learning Spaces. Understanding Teaching-Learning Practice edited by Gil, E., Mor, Y., Dimitriadis, Y., Köppe, C. (https://doi.org/10.1007/978-3-030-88520-5_9). His chapter builds on the review conducted at KU Leuven in late 2019 (Raes et al., 2020) and uncovers the challenges and opportunities associated with this specific hybrid learning space design. By reviewing previous studies in the field and introducing an analytical approach based on the design concepts presented by Goodyear and Carvalho in their ACAD framework, the chapter contributes to the formulation of principles for supporting activity-centred learning design principles and guidelines for network learning in a post-pandemic future.



ACAD at design-time: conceptualising the design problem space



ACAD at learn-time: the architecture of situated learning

Goodyear, P., Carvalho, L. & Yeoman, P. Activity-Centred Analysis and Design (ACAD): Core purposes, distinctive qualities and current developments. Education Tech Research Dev 69, 445–464 (2021).

Afterwards you test the design and analyse the actual student activity and the actual learning outcomes. Possibly you return and apply changes. No ground shaking ideas here, but the interplay of different design perspectives might be new and matter a great deal as we will gradually discover throughout the course.

One of its other affordances is that in describing the design perspectives not all agency is with the teacher.

"As well as providing some ideas that can help teachers, design teams and others discuss and agree on their working methods, ACAD has implications for some broader issues in educational technology research and development. It questions some deep assumptions about the framing of research and design thinking, in the hope that fresh ideas may be useful to people involved in leadership and advocacy roles in the field." (Goodyear, Carvalho & Yeoman, 2021, p445)

Delivery modes of the course

Each module is structured in the same way. You start with a preparatory task (estimated time approx. 1.5h), followed by a synchronous hybrid session (2h). In addition, the content is also provided by means of an online learning path. The learning path is for those participants who cannot follow synchronously during the session..

By using the different delivery modes we create sufficient interactivity within the course both student-to-content by means of the preparatory tasks and during the asynchronous learning path or student-to-student and student-teacher during the synchronous sessions. This interaction is crucial to encourage active engagement and enable students to test their knowledge, understanding and skills.

Timing of the course

The initial run of the course was spread over a semester, but you can also organize the sessions as a crash course and organize sessions weekly, this is up to you.

Keep in mind that with each module there is a preparatory task for the participants. If the modules follow each other too quickly, this can put time pressure on the participants to complete these tasks properly.

On the other hand, a close succession of sessions can cause participants to become completely immersed in the material.

The choice you make will depend on the profile and needs of the participants and your institution.

We envisioned one module every 2 weeks as the ideal timing, even though we had to adjust this intention to vacation periods and exam schedules at our institution.

Needed infrastructure for the course

Specific to this course is the synchronous hybrid teaching. It is the subject of the course so it is also obvious that the sessions will be offered synchronously hybrid.

For that, there are specific requirements for the classroom. Remote participants must be able to follow the class, which means that they hear and see the instructor and see the content.

In addition, participants must be able to be present in the classroom.

To enable the necessary interaction, it is strongly recommended that on site and remote participants can also hear and see each other.

Breakout spaces both digital and onsite are needed for group tasks during class.

Below is the a picture of the space we used for 4 of our sessions. For 2 sessions, we also used a team class setup.

Building a community

Next to the modules including the main learning content related to synchronous hybrid teaching and learning, the objective of the course was also to build a learning community as we believe that within CPD peer learning activities and discussion among peers are crucial to learn from each other and to be informed about what is happening in other institutions. As the course is on synchronous hybrid learning and as all synchronous sessions will be accessible on campus and remotely, there is a chance that participants will not meet in real life. To make it possible for participants to get to know each other and to make it possible to exchange experiences and ideas during and after this course we suggest starting a community on a social media platform. We chose for this course for a group on LinkedIn (see https://www.linkedin.com/groups/9089974/). Feel free to make other choices that fit your institution and/or group of participants.

Recommendations at institutional level

Underneath are some broader recommendations should one opt to install a similar course. These aim to inform Learning & teaching Centres and IT/AV-departments who provide support. The course can be informative for all staff (teachers not to say the least), but it functions best when embedded in the institution's context. As a result, these recommendations focus on possible policy measures.

The first advice would be to define a vision on synchronous hybrid education in the longer run and also to define the steps towards it. Can you describe your institution's level of maturity/consolidation on these topics: exploring/innovative, emerging, implemented at scale. KU Leuven, for instance, has been working on the guidance of an institution wide policy (Going Digital. Staying Human) for several years now. The *European maturity model for blended education framework* (EMBED[1]) helped us to make informed choices on the design at institutional level (and course level, or program level).

The Covid-19 pandemic has accelerated the use of educational technology at this university. From these lessons learned, it now wants to establish a smart combination of physical and digital education, using technology in a targeted way.

Such policy backing creates a fruitful context for experiments at course level, but especially for decisions at program level. With most institutions representing numerous faculties and programs, its respective leadership can play a vital role in shaping synchronous hybrid education (e.g. specific added value in (inter)national collaboration in education). Added value can be found in the disciplinary (future) self which underpins the programs. How do students see themselves evolve in a program? What do they aspire or expect? Ideally, this is combined with the expertise of staff and reflected in the makeup of the program.

Synchronous hybrid education can furthermore provide flexibility in mode of attendance and participation. Synchronous hybrid possibilities do however demand a strong motivation, especially on the part of the remote students. Student readiness becomes a feature to ascertain when implementing hybrid contexts. Students need to understand their motivation and should have the necessary e-skills. Even more

[1] https://embed.eadtu.eu/

so, opting to design synchronous hybrid courses should not unwillingly create thresholds for students from varying backgrounds and varying possibilities to partake in education.

This of course also applies to teaching staff. Experience and research (see IO2-A1 and A2) shows the need for support staff who can help them with infrastructure use and training. Such support staff display a sound but also practical understanding of pedagogical and didactical needs, but also know of technical evolutions inside and outside the institution. Have a closer look at KU Leuven's Learning Lab to find out more on support.

Lastly, synchronous hybrid education calls for a joint enterprise of technical services (AV, IT), support staff (educational technologists) and resilient teachers. This starts with the vision mentioned above, which enables people to bridge existing services and departments. A complex task as synchronous hybrid education provides the opportunity to reflect on existing practices and to redefine methods of collaboration.

Recommendations for the teacher

Teaching requires a solid and thorough prior knowledge. We are confident that you have it. Nevertheless, we recommend that you update your knowledge using our deliverable summarizing the literature pre and post covid. You can find the report here https://digitelpro.eadtu.eu/images/IO2_A1_DigiTeL_Pro__V3.pdf

For each module, we provide you with a reading list of articles that were specifically used to compile that module.

The reading list for the first module is very extensive. Do not worry, you will also find some of these references in other modules, we do not give you that much reading each time.

How to use this guide

In this guide, you will find for each module (1) the learning goals, (2) the instruction for the preparatory tasks, (3) the learning materials to set up the synchronous session including tips and tricks, (4) the link to WISE learning path for asynchronous participation and (5) the reading materials for you as a teacher of this course.

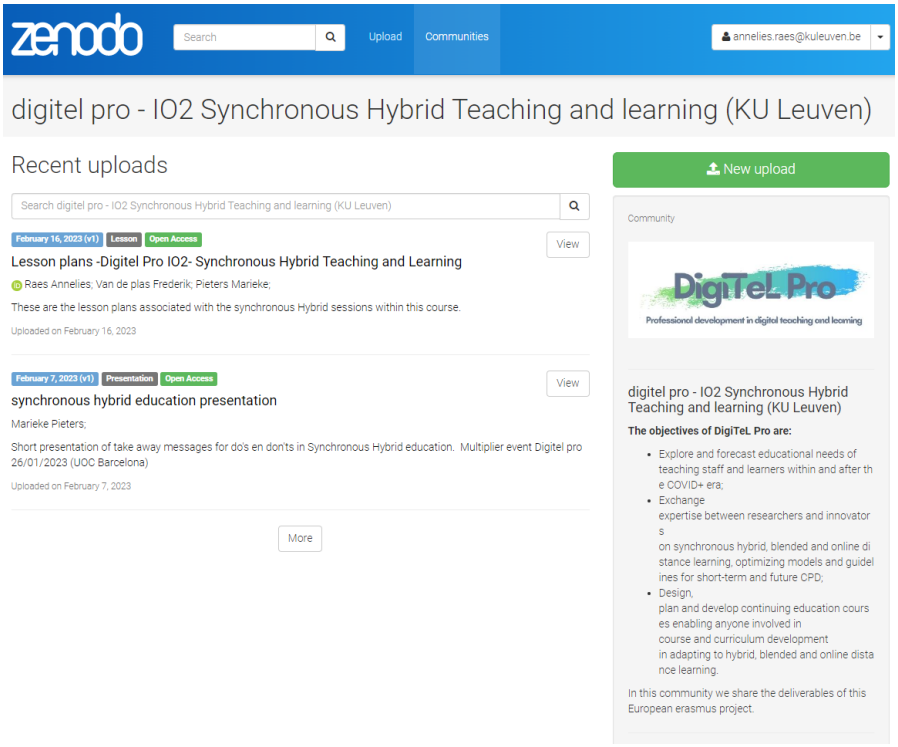
The learning materials include:

- tools or worksheets to support the preparatory tasks
- the presentations connected to each synchronous hybrid session within the six modules
- an excel sheet made by KU Leuven learning Lab[2] based on the ABC curriculum design framework[3] which stands for Arena Blended Connected Curriculum Design. ABD design is developed by the team of Prof. Diana Laurillard (University College London), as described in her book Teaching as a design science (2012). The excel sheets developed by KU Leuven Lab provides a detailed timetable and description of the learning activities during the session. This document also sets out the relationship between learning outcomes, learning activities and assessment

[2] https://www.kuleuven.be/english/education/leuvenlearninglab/leuven-learning-lab

[3] See https://www.youtube.com/watch?v=3C1gTHApg8A&t=1s for a short introduction on the ABC curriculum design

All materials can be found in the Zenodo community (See visualization below), which can be opened through the following link. https://zenodo.org/communities/digitelpro/



Module 1: Conceptual Challenges

1. Learning goals

After completing this module, participants....

1. can define synchronous hybrid education
2. can reflect on recent systematic studies
3. can describe synchronous hybrid education
4. know differences between a traditional F2F setting and synchronous hybrid education
5. know the ACAD-framework

2. Preparatory task for participants

Participants have to read the article " Theorising hybrid lifelong learning" (Nørgård, R. T. (2021))

> Nørgård, R. T. (2021). Theorising hybrid lifelong learning. British Journal of Educational Technology, 52, 1709– 1723. https://doi-org/10.1111/bjet.1312

In our first run, we asked participants to carefully read the article and summarize it personally. During the first run of the course, however, we noticed that few participants had pre-class activity which is a common problem in flipped classroom scenarios, described in the literature[4] . We would recommend adding a small task to the reading activity. For example, you can ask participants to write down three main thoughts in a wiki environment or in a shared Miro board[5] or Padlet[6]. During the session, you can refer to preparation of the participants which will improve motivation.

3. Synchronous session

The excel sheet based on ABC curriculum design will guide you through the activities foreseen in the session on conceptual challenges. You can download the lesson plan using the following link: https://zenodo.org/record/7645983#.Y-9BbnbMKUk

[4] https://www.sciencedirect.com/science/article/abs/pii/S0360131519300405#preview-section-references
[5] https://miro.com/
[6] https://padlet.com/

Session	Learning Goals
Conceptual challenges	define synchronous hybrid education

Parameters	Session of 2 hours group size? The number of online participants? The number of on-campus participants?

Timing	3'	4'	4'	3'
Activity	Opening slide/ technical check	Q&A: poll	Presentation: feedback group activity	Q&A: poll
		inquiry	acquisition	inquiry
Description	Waiting for participants, technical check, Welcome! Make good appointments, and start recording.	*Who are you? What are you working on?* It is important to know who the participants are. So you can adjust learning activities and examples given during this session to the public	*How to create a community?* During a course, it is important to create a learning community with all participants. We chose LinkedIn but there are other options. Take a moment to	What is in a name? "word cloud" question. All participants brainstorm about the word "hybrid"
Supportive actions	Technical check	Poll start/stop	Share Screen	Poll start/stop
Slides	1&2	3	8	14
Timing	6'	3'	5'	3'
Activity	Presentation: feedback group activity	Presentation: lecture, demo, example/case,...	Q&A: poll	Presentation: feedback group activity
	acquisition	acquisition	inquiry	acquisition
Description	Talk about all examples conclusion: Hybrid is something new based on 2 forms	Space and place. You can be in the same learning space without being in the same place or without following the learning	What is the most important feature of a learning space for you? ranking poll	Hybrid learning environments draw people, contexts, and places, together to form a holistic
Supportive actions	Share Screen	Share Screen	Poll start/stop	Share Screen
slides	15-19	20	21	23

Preview of lesson plan (For the full and editable document see link above.)

4. Learning path for asynchronous participation

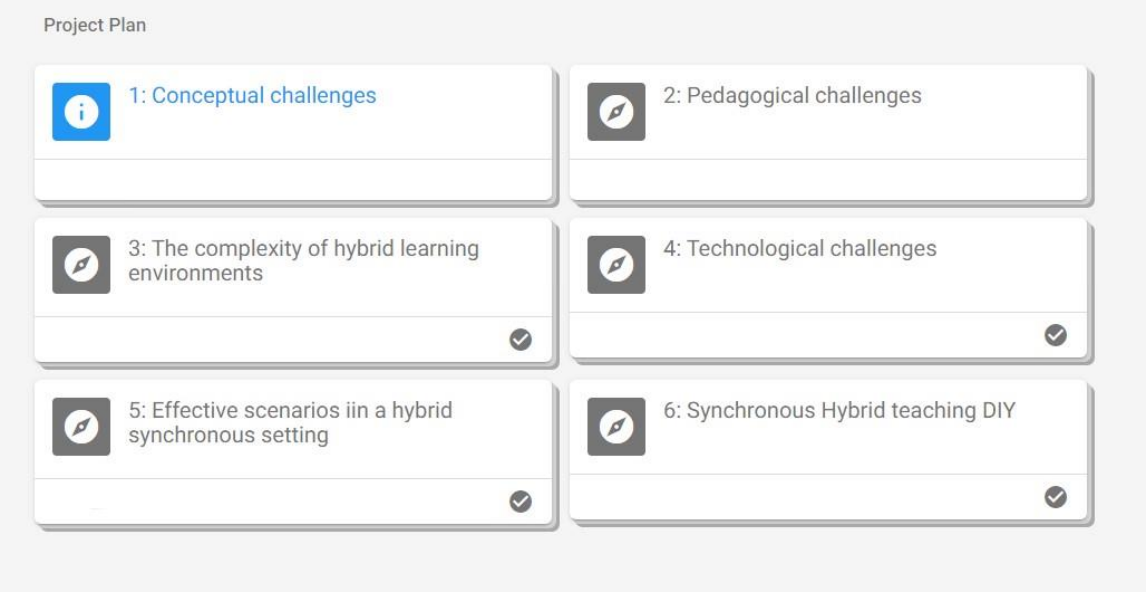
During the first run of this course, we used our own learning management system to create the learning path for asynchronous participation (see detailed description in IO2-A3). To facilitate the rerun of this course, the learning path has been redesigned in WISE, the web-based inquiry science environment[7].

WISE is an open source learning environment that enables online synchronous and asynchronous collaboration, developed at the University of Berkeley, California.

The link to the learning path: https://wise.berkeley.edu/preview/unit/39446/node1

This link is view only. In wise it is possible to share the exercises with other teacher accounts. If you want to use this exercise with your students, make an account and ask for sharing the exercise by sending an email to Marieke.pieters@kuleuven.be .

[7] https://wise-research.berkeley.edu/



Preview of structure of learning path (Wise)

5. Sources and reading material for teacher preparation

Beatty, B. J. (2019). Supporting Hybrid-Flexible Courses and Programs. Hybrid-Flexible Course Design. Beginnings - Hybrid-Flexible Course Design (edtechbooks.org)

Bülow, M.W. (2022). Designing Synchronous Hybrid Learning Spaces: Challenges and Opportunities. In: Gil, E., Mor, Y., Dimitriadis, Y., Köppe, C. (eds) Hybrid Learning Spaces. Understanding Teaching-Learning Practice. Springer, Cham. https://doi.org/10.1007/978-3-030-88520-5_9

Eyal, L., Gil, E. (2022). Hybrid Learning Spaces — A Three-Fold Evolving Perspective. In: Gil, E., Mor, Y., Dimitriadis, Y., Köppe, C. (eds) Hybrid Learning Spaces. Understanding Teaching-Learning Practice. Springer, Cham. https://doi.org/10.1007/978-3-030-88520-5_2

Goodyear, P., Carvalho, L. & Yeoman, P. Activity-Centred Analysis and Design (ACAD): Core purposes, distinctive qualities, and current developments. Education Tech Research Dev 69, 445–464 (2021). https://doi.org/10.1007/s11423-020-09926-7

Hilli, C., Nørgård, R. T., & Aaen, J. H. (2019). Designing Hybrid Learning Spaces in Higher Education. Dansk Universitetspædagogisk Tidsskrift, 14(27), 66–82. https://doi.org/10.7146/dut.v14i27.112644

O'Byrne, W.I. & Pytash, K.E. (2015). Hybrid and Blended Learning. Journal of Adolescent & Adult Literacy, 59(2), 137–140. doi: 10.1002/jaal.463

Nørgård, R. T. (2021). Theorising hybrid lifelong learning. British Journal of Educational Technology, 52, 1709– 1723. https://doi-org/10.1111/bjet.1312

Raes, A., Detienne, L., Windey, I. et al. A systematic literature review on synchronous hybrid learning: gaps identified. Learning Environ Res 23, 269–290 (2020). https://doi.org/10.1007/s10984-019-09303-z

Module 2: Pedagogical Challenges

1. Learning goals

After completing this module, participants…

6. know KU Leuven's policy that drives research in synchronous hybrid education
7. know the current research KU Leuven has undertaken in Synchronous hybrid education
8. know the concepts of engagement and flow, Technology Acceptance Model, Self Determination Theory and Community of Inquiry.
9. discuss the role of engagement in the development of learning settings using Itec's research findings

2. Preparatory task for the participants

Ask your participants to watch the video with the presentation of the EUNIS award 2020 (virtual congress 2020).

In this video, participants will learn about the important relation between learning objectives, learning activities and the design of the learning space.

Three specific and very different learning spaces are presented here

- AV enabled classroom space: KU Leuven – Hybrid classroom
- AV enabled lab or maker educational space: Indiana University – Idea Garden
- AV enabled multifunction educational space: Amsterdam UMC – Multi-functional active learning space.

Link to the video	https://kuleuven.mediaspace.kaltura.com/media/EUNIS+2020+Awards+for+AV-enabled+Education+Space/1_6upel3lq

In KU Leuven's video platform (Kaltura), quizzes can be integrated into videos to improve engagement. More specifically, participants were given a question after each presentation. We could then also incorporate the answers to those questions into the synchronous session. We advise you to incorporate the same or similar questions in the video. There are a lot of tools for making video interactive. One free tool that allows adding questions to video is edpuzzle[8].

Question 1 : What do you think is the biggest pedagogical challenge in the synchronous hybrid setting?

Question 2: One of the biggest challenges in synchronous hybrid learning is group work. Can we require students to come to campus for some of the classes we deem necessary?

Question 3: You have seen three learning spaces in the video series of the EUNIS award 2020. Which of the three learning spaces would you like most to use in your teaching practice? Which one fits best with your teaching method or your approach on learning?

[8] https://edpuzzle.com/

In the first run, we identified that this task was maybe too non-committal and not challenging enough. Depending on the participants it is recommended to make the task more demanding. To do so we would recommend asking the participants to take a picture of an AV-enabled classroom that they think has extra value. On the picture, the participants must mention what the function is and what the extra value is of the features and the class setup.

A good tool for this task is 'thinglink' (thinglink.com) or the more traditional software 'powerpoint'.

3. Synchronous session

The excel sheet based on ABC curriculum design will guide you through the activities foreseen in the session on conceptual challenges. You can download the lesson plan using the following link: https://zenodo.org/record/7645983#.Y-9BbnbMKUk

Session Pedagogical Challenges	**Learning Goals** know KU Leuven's policy that drives research in synchronous hybrid education know the current research KU Leuven has undertaken in Synchronous hybrid education

Parameters	What's the expected group size; expected online group, expected on campus group? What is the period? Which interaction do you want to

Timing	3'	4'	15'	4'
Activity	Opening slide/ technical check	Check-in/out	Q&A: poll	Presentation: lecture, demo, example/case,...
		inquiry	inquiry	acquisition
Description	Waiting for participants, technical check, Welcome! Make good appointments, start recording.	Start with a picture of the learning space where you are now. Ask about strengths and weaknesses. (We then return to these answers at the end of the session. This way you can	Based on our research we know that it is very important to launch quizzes and polls frequently, at least every 15 minutes. Start showing what platform you will use during	What is engagement? (refer in this context to the learning community you started for this course)
Supportive actions	Technical check	Share Screen	Poll start/stop	External tool
Slide	1-2	3	4-23	

Timing	4'	3'	8'	5'
Activity	Q&A: verbal	Q&A: poll	Presentation: feedback group activity	Presentation: lecture, demo, example/case,...
	discussion	inquiry	acquisition	acquisition
Description	What are indicators for engagement? Can we see engagement?	How long do you stay attentive during a webinar?	Divide the indicators that were given into 3 categories (social, epistemic, sett). Refer to the ACAD framework (session 1)	On the importance of engagement (literature review)
Supportive actions	Share Screen	Poll start/stop	Share Screen	Share Screen
Slide	28	30	31-32	33

Preview of lesson plan (For the full and editable document see link above.)

Group activity during session

As you will notice in the lesson plan provided on Zenodo, a breakout session is organized.

These breakouts are intended to get participants thinking about their own teaching practices and how they can adapt or align them to the synchronous hybrid setting. During each session/module we focus on 1 aspect of the pedagogical approach.

In this session we focus on the didactic format and learning goals.

During the breakout- group activity, participants discuss in small groups (4 to 6 participants) about the ideal didactic format to obtain the learning goals.

Participants have to make choices between different learning goals based on Bloom's Taxonomy[9] and combine them with different didactic formats.

The learning goals which were mentioned:

- **Create**
  creating something new or thinking of alternative solutions
- **Analyse**
  Analyzing and examining information
- **Understand and apply**
  Understanding information by consulting sources. Applying what is learned in a new situation
- **Acquiring and remembering**
  Memorizing facts, acquiring knowledge

The didactic formats which were mentioned:

- Collaborative problem solving
- Direct instruction
- Making a mind map
- Jigsaw (divide the content, students all study one part and explain it to each other)

This learning goals and didactic formats were based on the card game " The classroom as instrument" (Original title: "Het lokaal als Instrument" designed by Lotte van Egmond[10]).

Participants within the different groups are asked to share their work in an online whiteboard. We used Miro (www.miro.com), but padlet (www.padlet.com) or other tools can also be used for this activity. You can even use a shared document (e.g. google docs).

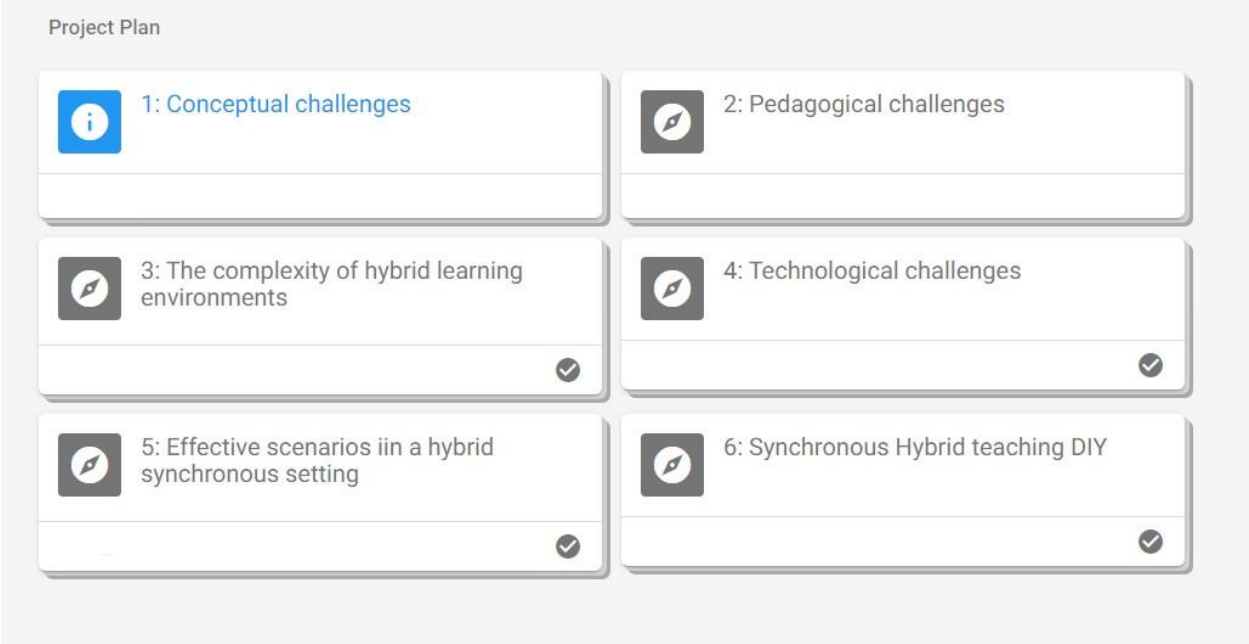
4. Learning path for asynchronous participation

As explained above, you will find the learning path for asynchronous participation here:

https://wise.berkeley.edu/preview/unit/39446/node1

This link is view only. In wise it is possible to share the exercises with other teacher accounts. If you want to use this exercise with your students, make an account and ask for sharing the exercise by sending an email to Marieke.pieters@kuleuven.be .

[9] https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/
[10] https://lottolearn.nl/



Preview of structure of learning path (Wise)

5. Sources and reading material for teacher preparation

Deci, E. L., & Ryan, R. M. (1985). Intrinsic Motivation and Self-Determination in Human Behavior. Berlin: Springer Science & Business Media. https://doi.org/10.1007/978-1-4899-2271-7

Dobbins, C., Denton, P. MyWallMate: An Investigation into the use of Mobile Technology in Enhancing Student Engagement. TechTrends 61, 541–549 (2017). https://doi.org/10.1007/s11528-017-0188-y

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education model. *The Internet and Higher Education*, 2(2-3), 87-105.

Raes, A., Detienne, L., Windey, I., & Depaepe, F. (2020). A systematic literature review on synchronous hybrid learning: gaps identified. Learning Environments Research, 23(3), 269-290.

Raes, A., Vanneste, P., Pieters, M., Windey, I., Van Den Noortgate, W., & Depaepe, F. (2020). Learning and instruction in the hybrid virtual classroom: An investigation of students' engagement and the effect of quizzes. Computers & Education, 143, 103682.

Shernoff, D.J., Csikszentmihalyi, M., Schneider, B., Shernoff, E.S. (2014). Student Engagement in High School Classrooms from the Perspective of Flow Theory. In: Applications of Flow in Human Development and Education. Springer, Dordrecht. https://doi.org/10.1007/978-94-017-9094-9_24

Subramainan, L., & Mahmoud, M. A. (2020). A systematic review on students' engagement in classroom: Indicators, challenges, and computational techniques. International Journal of Advanced Computer Science and Applications, 11(1).

Vanneste, P.; Oramas, J.; Verelst, T.; Tuytelaars, T.; Raes, A.; Depaepe, F.; Van den Noortgate, W. Computer Vision and Human Behaviour, Emotion and Cognition Detection: A Use Case on Student Engagement. Mathematics 2021, 9, 287. https://doi.org/10.3390/math 9030287

Yorke, L., Rose, P., Bayley, S., Wole, D. and Ramchandani, P. 2021. The Importance of Students' Socio-Emotional Learning, Mental Health, and Wellbeing in the time of COVID-19. 2021/025. https://doi. org/10.35489/BSG-RISE-RI_2021/025

Module 3: The complexity of hybrid learning environments

1. Learning Goals

After completing this module, participants…

10. know the concept 'orchestration graph' to describe pedagogical diversity in learning and teaching
11. know the levels or social planes learning activities can be situated in, starting at the individual level over the group level and the classroom level and having effect in a community level
12. can apply these levels to their respective contexts
13. share experiences and discuss the difficulties and policies around camera use
14. discuss the findings of current research in personal preferences in a synchronous hybrid setting and its possible relation to study success

2. Preparatory task

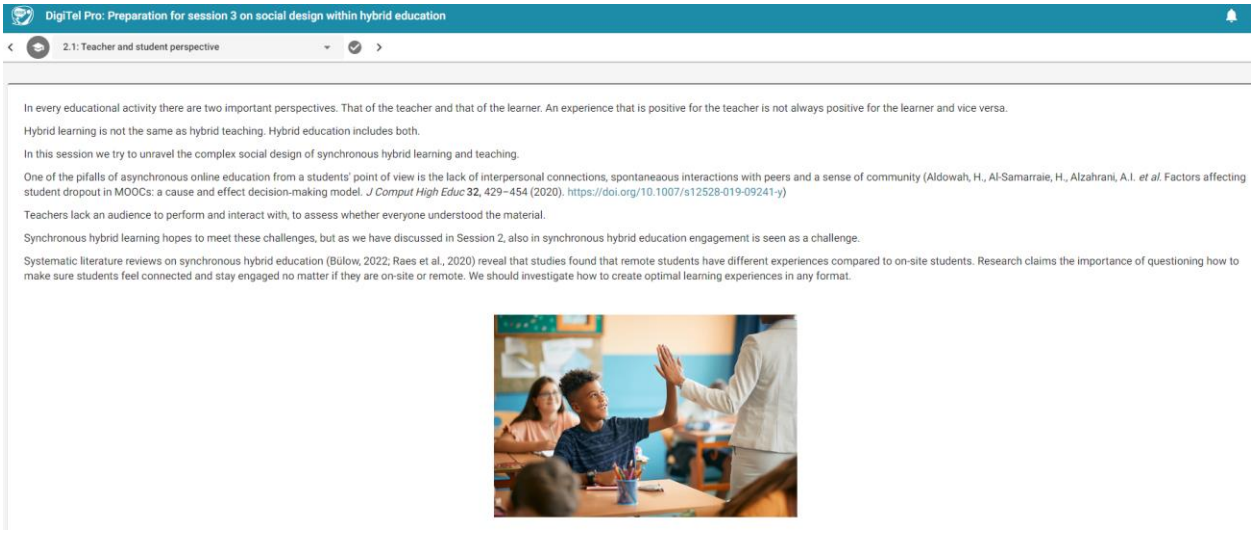
We asked the participants to complete an online learning path on the conditions for good group work. We worked with WISE, the web-based inquiry science environment (see https://wise-research.berkeley.edu/)

This is a free tool that enables online synchronous and asynchronous collaboration, developed at the University of Berkeley, California. The added value of working with WISE was that participation in the preparatory task could be monitored from the teacher dashboard. Almost all participants of this session completed the task. The answers of the participants could be used in the synchronous session. It made the session itself more interactive because we could elaborate on earlier answers given by the participants, based on the didactic format of 'productive failure'[11].

Here you can find the link to the exercise. https://wise.berkeley.edu/preview/unit/37584/node1

This link is view only. In wise it is possible to share the exercises with other teacher accounts. If you want to use this exercise with your students, make an account and ask for to share the exercise by sending an email to Marieke.pieters@kuleuven.be .

[11] For more info about the didactic format of productive failure, see: https://www.emerald.com/insight/content/doi/10.1108/S2055-364120220000045002/full/html



Preview of preparatory learning path (Wise)

3. Synchronous session

The excel sheet based on ABC curriculum design will guide you through the activities foreseen in the session on conceptual challenges. You can download the lesson plan using the following link: https://zenodo.org/record/7645983#.Y-9BbnbMKUk

Session Understanding the complexity of hybrid learning environments	**Learning Goals** know the concept 'orchestration graph' to describe pedagogical diversity in learning and teaching

Parameters	What's the expected group size; expected online group, expected on-campus group? What is the time span? Which interaction do you want

Timing	3'	5'	8'	4'
Activity	Opening slide/ technical check	Q&A: verbal	Presentation: lecture, demo, example/case,...	Q&A: verbal
		discussion	acquisition	discussion
Description	Waiting for participants, technical check, Welcome! Make good appointments, and start recording.	"How do you learn best? We see that different people have different learning styles. In most cases, there is interaction with others during the learning process. This interaction can	active learning in the history of pedagogical research. Learning and teaching is an interplay between individual activities and group/social activities in interaction with	reflection on this course so far. What activities and interactions did we have. Where and how is our (digital and physical) learning environment?
Supportive actions	Technical check	Share Screen	Share Screen	Share Screen
Slide	1	2 3	4 6	7 10

Timing	3'	3'	2'	5'
Activity	Presentation: lecture, demo, example/case,...	Q&A: poll	Presentation: lecture, demo, example/case,...	Presentation: feedback group activity
	acquisition	inquiry	acquisition	acquisition
Description	understanding the importance of community building in online and hybrid courses	"What suggestions (e.g. tools/platform or activities) do you have for effective community building?"	focus on the **classroom level**. The advantage of synchronous lessons is that for the time of the session, there can be oral	Feedback and discussion on the answers given in the preparatory task on the use of camera's
Supportive actions	Share Screen	Poll start/stop		
Slide	11	12 13		

Preview of lesson plan (For the full and editable document see link above.)

Group activity during session

As you will notice in the lesson plan provided on Zenodo, a breakout session is organized.

In this session we focus on groupwork.

During the breakout- group activity, participants discuss in small groups (4 to 6 participants) about the ideal group composition.

Participants can elaborate on the results of their task in module 2 where they discussed learning objectives and didactic formats.

Now they need to add to them what an ideal group composition would be when integrating group work into their session.

In doing so, they must make considerations about group size and group composition. Do they choose composition...

- by random chance
- on the basis of equal previous knowledge
- on the basis of unequal prior knowledge
- by students' own choice

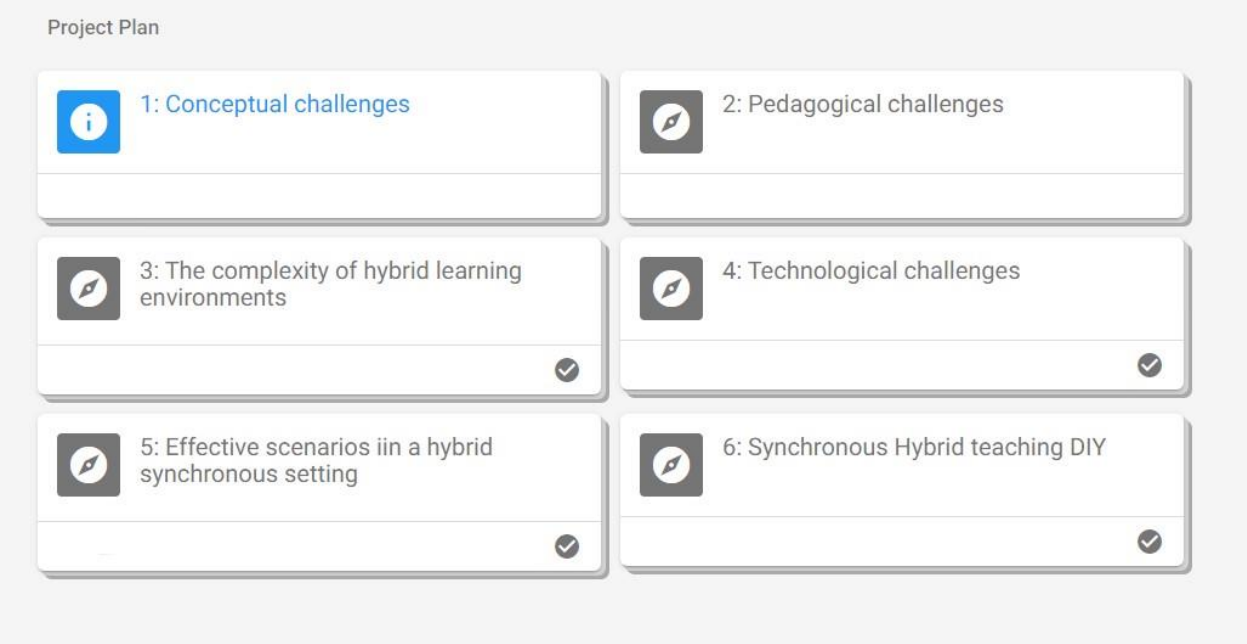
Participants within the different groups are asked to share their work in the same online whiteboard as in session 2. We used Miro (www.miro.com), but padlet (www.padlet.com) or other tools can also be used for this activity. You can even use a shared document (e.g. google docs).

4. Learning path for asynchronous participation

As explained above, you have find the learning path for asynchronous participation here:

https://wise.berkeley.edu/preview/unit/39446/node1

This link is view only. In wise it is possible to share the exercises with other teacher accounts. If you want to use this exercise with your students, make an account and ask for sharing the exercise by sending an email to Marieke.pieters@kuleuven.be .



Preview of structure of learning path (Wise)

5. Sources and reading material for teacher preparation

Perry J. Samson (2020) Student behaviors in a blended synchronous course, Journal of Geoscience Education, 68:4, 324-333, https://doi.org/10.1080/10899995.2020.1768002

Stahl, G., Koschmann, T., & Suthers, D. (2006). Computer-Supported Collaborative Learning: An Historical Perspective. In Cambridge Handbook of the Learning Sciences (pp. 409-426).

Module 4: Technological challenges

1. Learning goals

After completing this module, participants…

15. can situate formal learning spaces in the learning spaces framework by Ellis & Goodyear.
16. know the terms: formal learning spaces, choice architecture, visitors & residents
17. can discuss the importance of scaling & support as necessary procedures at an institution level
18. can discuss their institution's position to the implementation of synchronous hybrid rooms

2. Preparatory task

We asked participants to read Predictions for the future of hybrid learning space as an introduction to the topic, but also to spike conversation.

Mor, Yishay & Gil, Einat & Dimitriadis, Yannis & Köppe, Christian. (2021). Forward Looking: Predictions for the Future of Hybrid Learning Spaces. 10.1007/978-3-030-88520-5_17. (Preprint)

Participants read the article and prepare ideas on whether these predictions will become true in the context of their institution. Their opinions are charted in the session and discussed while indicating their

ideas on the whiteboard tool. The text is also used in the learning path in a similar but the discussion is done asynchronously.

3. Synchronous session

The excel sheet based on ABC curriculum design will guide you through the activities foreseen in the session on conceptual challenges. You can download the lesson plan using the following link: https://zenodo.org/record/7645983#.Y-9BbnbMKUk

Session Technological Challenges	**Learning Goals** situate formal learning spaces in the learning spaces framework by Ellis & Goodyear. know the terms: formal learning spaces, choice architecture, visitors & residents
Parameters	What's the expected group size; expected online group, expected on campus group? What is the time span? Which interaction do you want

Timing	3'	8'	10'	7'
Activity	Opening slide/ technical check	Presentation: lecture, demo, example/case,...	Group Activity:artefact	Presentation: feedback group activity
		acquisition	practice	acquisition
Description	Welcome	Intro: discuss Angelone, L., Warner, Z., & Zydney, J.M. (2020) as an example of how to look at technical problems	Share slide 6 in a whiteboard tool (Miro) and have participants add post-it concerning their institution's or their own position	Feedback on the speaker's experience (here KU Leuven). The reference to the acad-framework
Supportive actions	Technical check	Share Screen	External tool	Share Screen
Slide	1	2, 3,4	5 6	7 8 9
Timing	10	12	8	12
Activity	Presentation: lecture, demo, example/case,...	Q&A: verbal	Presentation: lecture, demo, example/case,...	Group Activity:artefact
	acquisition	discussion	acquisition	practice
Description	Figure Ellis, R.A. and Goodyear, P. (2016) Ref. to the article on formal spaces (Leijon, M., Nordmo, I., Tieva,	Use the pictures of emerging classrooms to discuss knowlegde and use of them	Present the findings of Warburton, S. and Perry M. (2022) concerning safety in online settings Present hte	Share slide 25 in a whiteboard tool (Miro) and have participants add post-ita about which type of activities they
Supportive actions	Share Screen	Share Screen	Share Screen	External tool
Slide	10 11 12 13 14 15	16 17 18 19 20	21 22 23 24	25

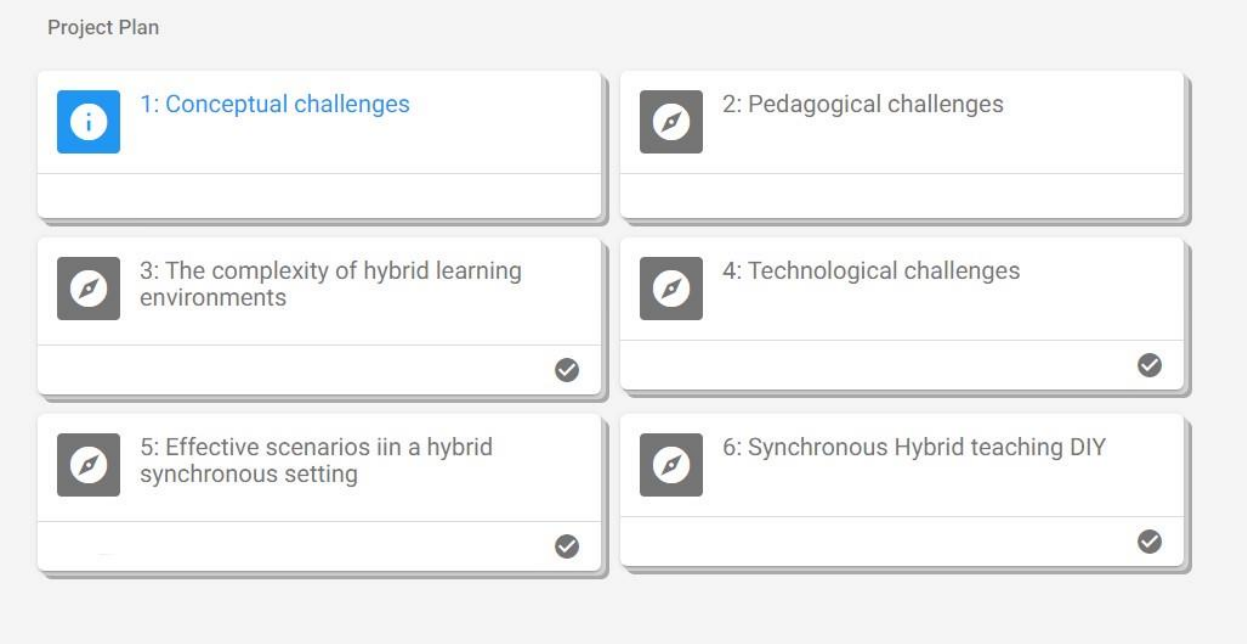
Preview of lesson plan (For the full and editable document see link above.)

4. Learning path for asynchronous participation

As explained above, you have find the learning path for asynchronous participation here:

https://wise.berkeley.edu/preview/unit/39446/node1

This link is view only. In wise it is possible to share the exercises with other teacher accounts. If you want to use this exercise with your students, make an account and ask for sharing the exercise by sending an email to Marieke.pieters@kuleuven.be .



Preview of structure of learning path (Wise)

5. Sources and reading material for teacher preparation

Angelone, L., Warner, Z., & Zydney, J.M. (2020). Optimizing the technological design of a blended synchronous learning environment. Online Learning, 24(3), 222-240. https://doi.org/10.24059/olj.v24i3.2180

Ellis, R.A. and Goodyear, P. (2016), Models of learning space: integrating research on space, place and learning in higher education. Rev Educ, 4: 149-191. https://doi.org/10.1002/rev3.3056

Leonard, T.C. Richard H. Thaler, Cass R. Sunstein, Nudge: Improving decisions about health, wealth, and happiness. *Const Polit Econ* **19,** 356–360 (2008). https://doi.org/10.1007/s10602-008-9056-2

Marie Leijon, Ivar Nordmo, Åse Tieva & Rie Troelsen (2022) Formal learning spaces in Higher Education – a systematic review, Teaching in Higher Education, DOI: 10.1080/13562517.2022.2066469

Warburton, S., Perry, M. (2022). Design for Balance: Addressing Challenges of Safety, Privacy and Identity Management in Online and Hybridised Learning and Teaching Spaces. In: Gil, E., Mor, Y., Dimitriadis, Y., Köppe, C. (eds) Hybrid Learning Spaces. Understanding Teaching-Learning Practice. Springer, Cham. https://doi.org/10.1007/978-3-030-88520-5_16

Module 5: Effective scenarios in a hybrid synchronous setting

1. Learning goals

After completing this module participants ….

19. can assess their own blended course that includes synchronous hybrid sessions
20. understand the effect of the sequence of instruction and problem solving on learning processes
21. discuss some successful scenarios for synchronous hybrid teaching and learning

2. Preparatory task

We have been discussing synchronous hybrid education. This can be a default mode of delivery for an entire course, but it can also be a step in a sequence of learning activities with differing modes of delivery. In that case, a blend creates a tension in the course (or even program). The *European maturity model for blended education framework* (EMBED) can help us make informed choices on the design at institutional level, course level, or program level.

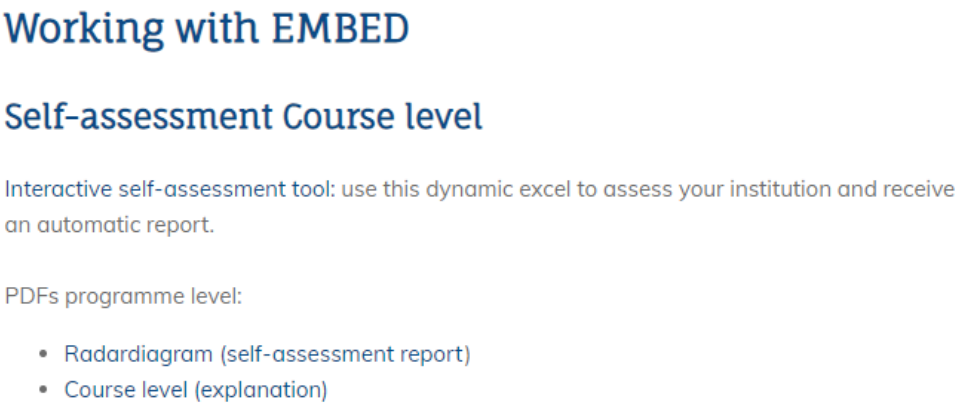
EMBED was a result of a European partnership between several universities and institutions. It has been the forerunner to this digitel pro project. This subsequent tool provides us a maturity check. It is all about the optimization of design. A maturity model is a way of reflecting on one's practice and therefore isn't a tick box for any quality assurance procedure. However, it can be instrumental in a culture of quality in any institution.

As a preparatory task ask the participants to take a closer look at their institution, program, or course with the help of EMBED's self-assessment tool.

As a result of this tool, participants will receive a report on their course

https://embed.eadtu.eu/

https://embed.eadtu.eu/working-with-embed



When participants access the site they click on "interactive self-assessment tool". Then an excel file opens in which they can evaluate their own practice. As a final result, they receive a radar diagram that visually shows how well their blended learning is integrated and where they could possibly improve or change.

3. Synchronous session

The excel sheet based on ABC curriculum design will guide you through the activities foreseen in the session on conceptual challenges. You can download the lesson plan using the following link: https://zenodo.org/record/7645983#.Y-9BbnbMKUk

Session effective scenarios for Synchronous Hybrid Teaching		**Learning Goals** assess their own blended course that includes synchronous hybrid sessions understand the effect of the sequence of instruction and problem solving on learning processes		
Parameters	What's the expected group size; expected online group, expected on campus group? What is the time span? Which interaction do you want			
Timing	3'	8'	15'	7'
Activity	Opening slide/ technical check	Presentation: feedback group activity	Group Activity: pair work, group work	Presentation: feedback group activity
		acquisition	collaboration	acquisition
Description	Welcome	situate the "embed" project in the Erasmus projects, it was the predecessor of digitel pro. The main objective is to see the course as a whole and not as a sequence of sessions and	compare reports of the preparatory task and make an orchestration graph together. Share the template in ppt with the participants	compare and discuss
Supportive actions	Technical check	Share Screen	Breakout groups start/stop	External tool
Slide		4 5		
Timing	7'	3'	10'	15'
Activity	Presentation: lecture, demo, example/case,...	Q&A: poll	Presentation: lecture, demo, example/case,...	Other
	acquisition	inquiry	acquisition	
Description	explain the difference between TTPS & TTFPS	"What sequence is in your opinion most effective?"	explain the research design and results of TTPS &TFPS. Link with the ACAD framework	break
Supportive actions	Share Screen	Poll start/stop	Share Screen	
Slide	8 12	13	14 26	27

Preview of lesson plan (For the full and editable document see link above.)

For this session, we made 2 clips. One in which we let teachers talk about their lessons in this setting and one in which a coordinator of courses within the lifelong learning program talks about her experiences on an organizational level.

The link to these videos is in the lesson plan but can also be found here.

https://youtu.be/iNX6h0CPxGQ video on successful scenarios- let the teachers tell

https://youtu.be/E1r8BKJrTSU video on the influence of Synchronous hybrid learning on lifelonglearning

Group activity during session

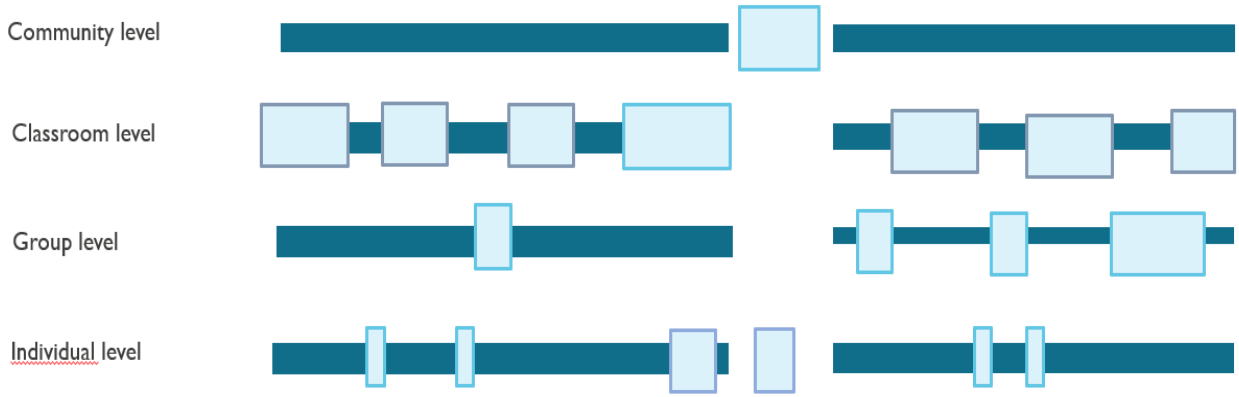
During this module and the previous ones (especially module 2) we learned that interaction at different levels is very important. For that reason it is also essential to focus on different learning activities at each level. As a teacher, you must constantly ask yourself the question: which learning activity are the students conducting and for what purpose. Another important question is whether they do the activity alone, with the whole class or in smaller groups.

In this module, we focus on the latter during the group activity. Based on the orchestration graph of by Dillenbourg (2016), we ask participants to create an orchestration graph for their lesson.

To do so, we provide them with a draft figure of the orchestration graph. They will work with this in group.

For this, we worked with a shared powerpoint presentation in which each group worked on 1 slide with the figure. That way we could easily make the slides available afterwards and show them to all participants for a follow-up discussion.

An example of that figure can be found below. The editable ppt can be found on zenodo https://zenodo.org/communities/digitelpro/?page=1&size=20 .



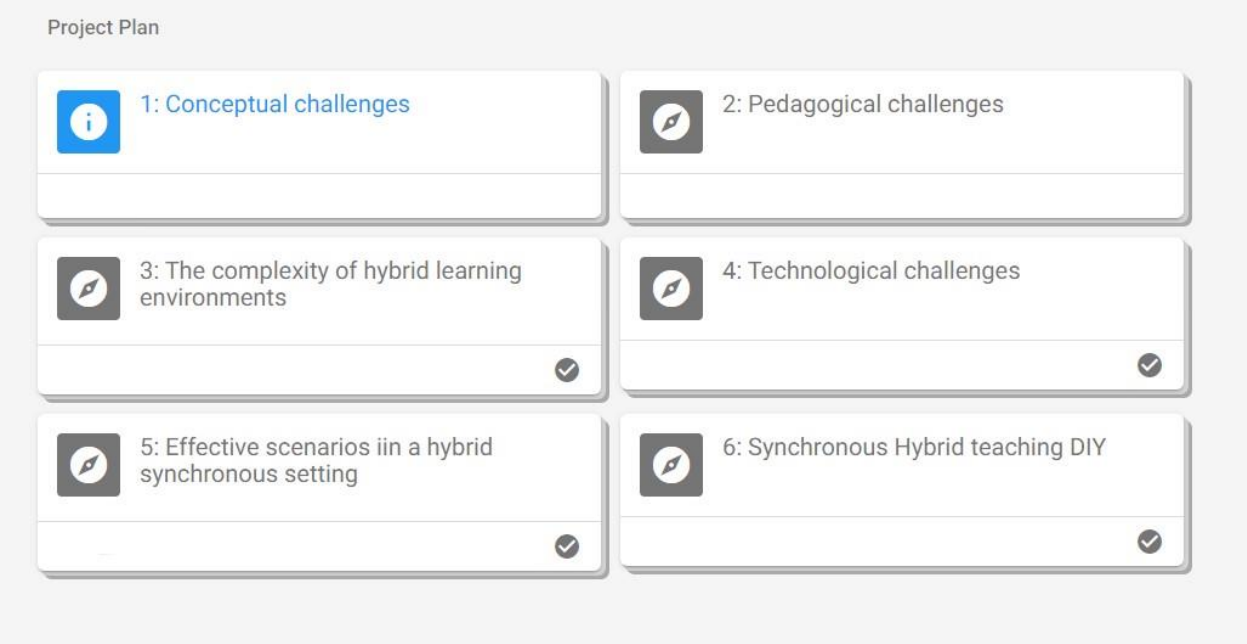
"Orchestration graph" (Dillenbourg, 2016)

4. Learning path for asynchronous participation

As explained above, you have find the learning path for asynchronous participation here:

https://wise.berkeley.edu/preview/unit/39446/node1

This link is view only. In wise it is possible to share the exercises with other teacher accounts. If you want to use this exercise with your students, make an account and ask for sharing the exercise by sending an email to Marieke.pieters@kuleuven.be .



Preview of structure of learning path (Wise)

5. Sources and reading material for teacher preparation

Kuepper-Tetzel, C. and Nordmann, E. (2021) "Watch party lectures: synchronous delivery of asynchronous material", Journal of Learning Development in Higher Education, (22). doi: 10.47408/jldhe.vi22.696.

Kirschner, P. A., Sweller, J., Kirschner, F., & Zambrano, J. R. (2018). From Cognitive Load Theory to Collaborative Cognitive Load Theory. International Journal of Computer-Supported Collaborative Learning, 13(2), 213–233. https://doi.org/10.1007/s11412-018- 9277-y

Loibl, K., & Rummel, N. (2014). Knowing what you don't know makes failure productive. Learning and Instruction, 34, 74– 85. https://doi.org/10.1016/j.learninstruc.2014.08.004

Sinha, T., & Kapur, M. (2021). When Problem Solving Followed by Instruction Works: Evidence for Productive Failure. Review of Educational Research, 91(5), 761–798. https://doi.org/10.3102/00346543211019105

Module 6: Synchronous Hybrid teaching: DIY

1. Learning Goals

After completing this module, participants…

22. can describe and reflect on their own blended approach or considerations that incorporate synchronous hybrid education.
23. can use the ACAD Framework's design dimensions in relation to the intended learning outcomes.
24. can offer peer feedback on products/presentations other participants provide.

In this last module, the approach is completely different from the previous sessions. Here we expect all input from the participants. This session is conceived as an evaluative session. the goal is to provide the participants with the necessary constructive feedback and, if necessary, an assessment can also be linked to this.

The preparatory task is to work out a Synchronous Hybrid session. In doing so, they should take into account what they have learned in the past modules.

Evaluation is done based on a number of rubrics or criteria. In doing so, not only the teachers will evaluate but the participants will also evaluate themselves.

This works best in smaller groups of about 6 to 8 participants. It is recommended that if necessary, multiple sessions be organized for smaller subgroups.

It is important to create a safe learning environment. This way participants feel comfortable presenting their work and exposing themselves to feedback. It is also only in such a safe environment that fellow participants will feel safe to give critical thoughtful and constructive feedback.

2. Preparatory task

Make a presentation of **about 8 min.**

- Introduce your institution and your role within the institution
- Situate the role of the synchronous hybrid session in your entire course/program. Is it part of a blended course? Is it more of a traditional course where you teach all classes Synchronous hybrid?
- Explain how your ideal lesson (think of a session of about 2 hours) would look like in a hybrid setting. Use the **ACAD framework** and pay specific attention to SET, EPISTEMIC and SOCIAL design.

To help you get started, we offer you a template in which you can embed your lesson and the different learning activities.

If you are taking this course together with someone from your institution, you may do this task together.

3. Synchronous session

We strongly recommend to take the time to provide oral feedback to all participants. The feedback from you as an instructor is important but also the feedback from fellow participants is important.

Oral feedback provides participants with specific and immediate information on what they are doing well and what they need to improve, which can help to facilitate their learning. Besides that it encourages participants to actively participate in class and to express their thoughts and ideas.

To help them provide feedback and to list the important points of interest, you can share the evaluation chart below with them. This chart is also available in excel in the documents. https://zenodo.org/record/7645983#.Y-9BbnbMKUk

Evaluation Form		score 1 to 5 (1= strongly insufficient, 2 insufficient, 3 sufficient, 4 good, excellent)
Set design	Tools provided are useful and easy to use	
	The set design allowed everyone from a different place to still be involved in the same learning	
Epistemic design	The learning activities are aligned with the learning goals	
	There is an adequate variety of learning tasks	
	There is sufficient interaction with all participants	
	The epistemic design stimulates an increased involvement of participants	
Social design	There is an alternation between activities at different levels (individual, small group, class group)	
	The participants can each participate in the learning activities in their personal way	
	There is a possibility for interaction and building a learning community participants can also interact outside of class time	

4. Learning path for asynchronous participation

As the final session is designed as a DIY workshop, no learning patch is provided connected to module 6.

5. Sources and reading material for teacher preparation

As the final session is designed as a DIY workshop, no reading material is provided to be prepared as a teacher for this session.

Conclusion

We hope you have the tools to share this course with others. Don't be afraid to step outside this structure and start teaching your way. Your unique perspective and passion for this subject will inspire your participants.

We strongly recommend you to work together with colleagues. Cooperation allows sharing of expertise and experiences, balancing workload, diverse perspectives to course design. Through collaboration, teachers can create courses that are well-designed and tailored to the needs of the students the approach of other courses and your institution.

If you have any comments or additions, don't hesitate to contact us. (learninglab@kuleuven.be)

Picture by Ian Schneider on Unsplash