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# CREATIVE ENGAGEMENT IN ONLINE AND HYBRID TEACHERS' PROFESSIONAL DEVELOPMENT PROGRAMS

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## Introduction

This chapter briefly introduces a few critical aspects of online and hybrid Teachers' Professional Development (TPD) program design, based on our experiences concerning the facilitation of hybrid TPD programs for Southeast Asian mathematics teachers. These hybrid programs were provided locally in Indonesia and some parts of these programs were facilitated online from other countries, including Finland.

The COVID-19 pandemic affected all areas of education. Teachers' Professional Development programs needed to be transformed in several ways too. SEAMEO for QITEP in Mathematics or commonly abbreviated as SEAQiM (<https://www.qitepinmath.org/en/>) is an Indonesia-based regional organisation that focuses on providing various TPD programs for mathematics teachers in Southeast Asian countries. Often international facilitators contribute to these programs and the potential for working together with overseas specialists has been expanded in the pandemic era. Online and hybrid formats support the collaboration with remote contributors. However, one of the main challenges of the online and hybrid TPD programs has been how the technological environment can support creative engagement during training sessions.

## Creative engagement in online and hybrid mode

One of the keys to success for a training program is participant engagement. Engagement in learning is one of the important aspects of the quality of education and is an indication that the students or participants are actively involved in the learning process (Robinson, Huling, 2008). The learning engagement is recognisable when participants are making efforts to study a subject, practice, obtain feedback, analyse and solve problems (Samson, 2015). As the activities and modes of learning are fundamentally different, engaging and motivating training participants require different approaches and tools in a physical event and in an online or hybrid training format.

One of the TPD program designs introduced in this chapter is a STEM Camp, the first hybrid Camp conducted during the pandemic COVID-19, at the beginning of 2021 in Yogyakarta, Indonesia. This program was designed to explore the potentials of STEM education with the on-site participation of 30 in-service elementary school teachers. The other example is a similar Indonesian TPD program for special education teachers. It was a part of the International Symposium on Mathematics for Special Education which was conducted in hybrid mode by involving 50 on-site and 350 online participants in 2021 November. Both programs were planned and executed by the authors of this chapter.

There are several added values of face-to-face meetings in the context of the quality of TPD programs. Therefore, if the situation allows, hybrid formats are preferred, where at least some groups of the participants can meet on-site, discuss, and carry out various activities together. Otherwise, TPD programs in the pandemic era require a fully flexible design, open for any adjustments depending on the quickly changing local situation regarding the pandemic.

During both programs, all on-site participants came together in one place (in a hotel) for the duration of the training sessions. All participants and the local committee needed to take a COVID-19 test before entering the site and after leaving the area to ensure that they were healthy. All participants and on-site facilitators had to wear masks during the training sessions. The training programs combined on-site and online sessions. The participating teachers and on-site facilitators were placed in the same space, and the remote international facilitator conducted the session online from Finland.

## The online and hybrid learning environment

Designing the physical learning environment for the hybrid TPD programs was challenging. We needed to consider the pedagogical and didactical perspectives as well as COVID-19 regulations. Although Philipsen et. al (2019) has identified key components of implementing TPD programs in online and blended learning settings and these were used as starting points to create the hybrid design, the theoretical findings had yet to be tested in practice.

It was critical to check the room's capacity and related COVID-19 rules, the number of participants and local facilitators, and the distance between two persons in the indoors space. In this situation, good quality technology plays a vital role as a mediator for safe interactions between participants and online and on-site facilitators at the same time.

The hybrid setting required a remarkable investment regarding purchasing and installing devices and related technological equipment, including a solution for online streaming. A professional technical staff was working to install and operate the necessary equipment and devices during sessions.

To provide creative engagement in the hybrid setting, we invited all participants for fruitful interaction, various hands-on activities, and creative problem-solving. The classroom space needed to be designed (Rands, Gensemer-Topf, 2017) in line with the “hard” and “soft” technologies (Ethmer, Ottenbreit-Leftwich, 2013) used during training sessions.

We had the following hard technologies available in the room:

- Desktop computers;
- One large widescreen monitor;
- Two medium screen monitors;
- Sound systems including quality speakers installed in several locations in the physical space and four wireless microphones to ensure interactions;
- Various hands-on tools such as paper, sticks, colourful pipe cleaners, loops, etc.

Soft technologies used for various types of interactions:

- Learning apps,
- GeoGebra,
- Google forms,
- Google Classroom,
- Interactive quizzes, Mural application, etc.

The seating arrangements during the training session's individual and group activities were in traditional and group pod settings with a 1-metre distance between the participants (Figure 1).

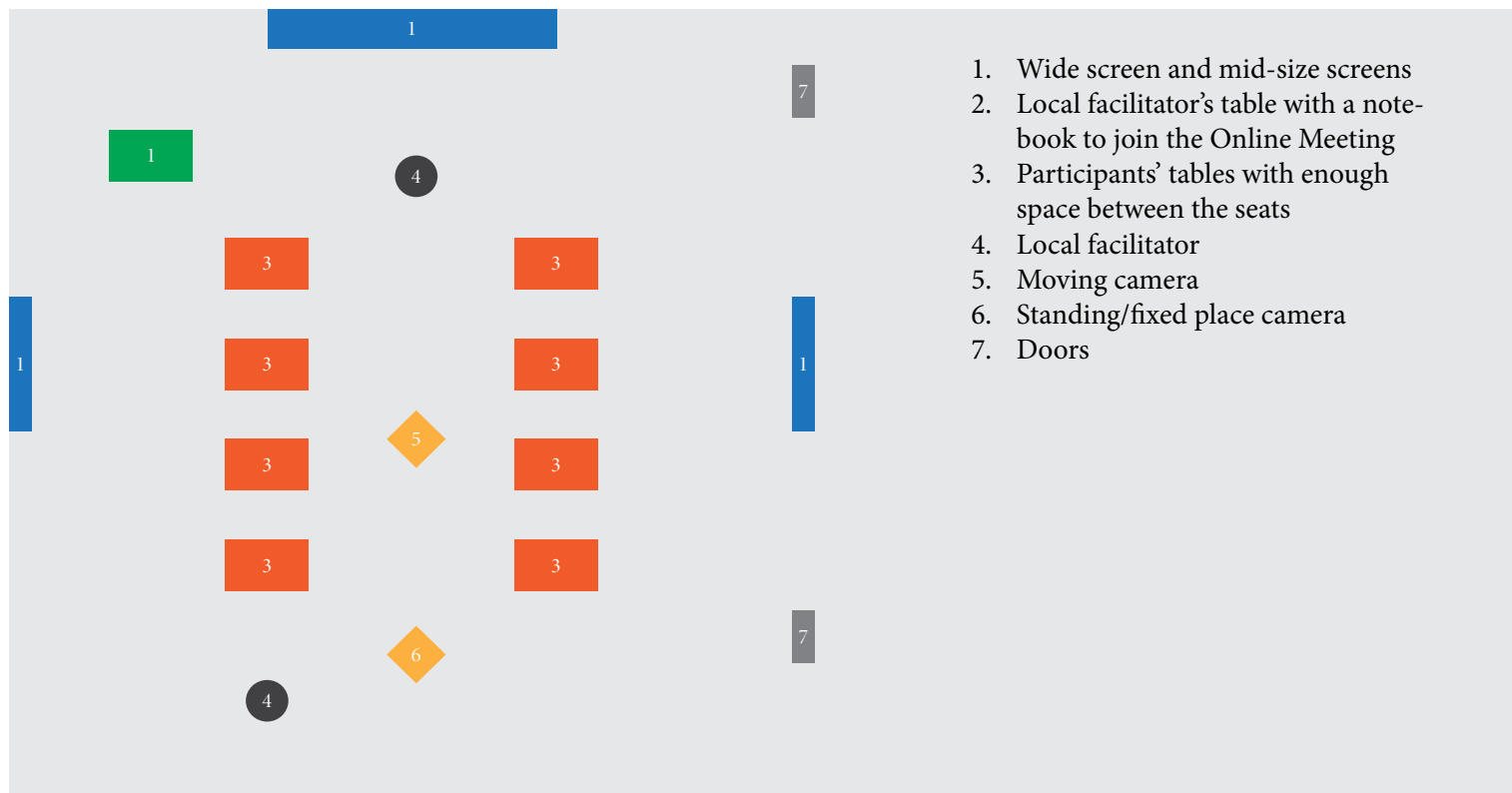


Figure 1: Physical arrangement of the learning space for hybrid Teachers' Professional Development program.

The widescreen was in the front section of the training room. Two smaller screens were located on the left and right sides of the classroom to support the participants sitting at the back of the classroom.

We worked together with on-site facilitators who mediated between the online facilitator and all participants on-site during the blended training session. The on-site facilitators ensured that the online facilitator could carry out the session online and on-site smoothly, and the participants could effectively achieve the training session's goals. The on-site facilitators also prepared and oversaw all tools used during the session. The on-site facilitators were also busy guiding and helping when participants needed to do

hands-on activities or collaborate to create a project with each other or with the online facilitator during the session. Depending on the characteristics of the workshop activities and the number of participants, our experience has shown that it is beneficial if in one session more than one on-site facilitators for one online facilitator can support the execution of the hybrid training program.

## Hybrid outcomes

The combination of the learning space design and pedagogical setting resulted in the creative engagement of the participants through various creative activities. For example, all participants collaborated in the online space to create a virtual display board and motivational poster using a Mural app representing their expectations and personal contributions to the program (Figure 2). In the physical space, the participants also designed a giant geodesic dome using paper and tape. The participants prepared for

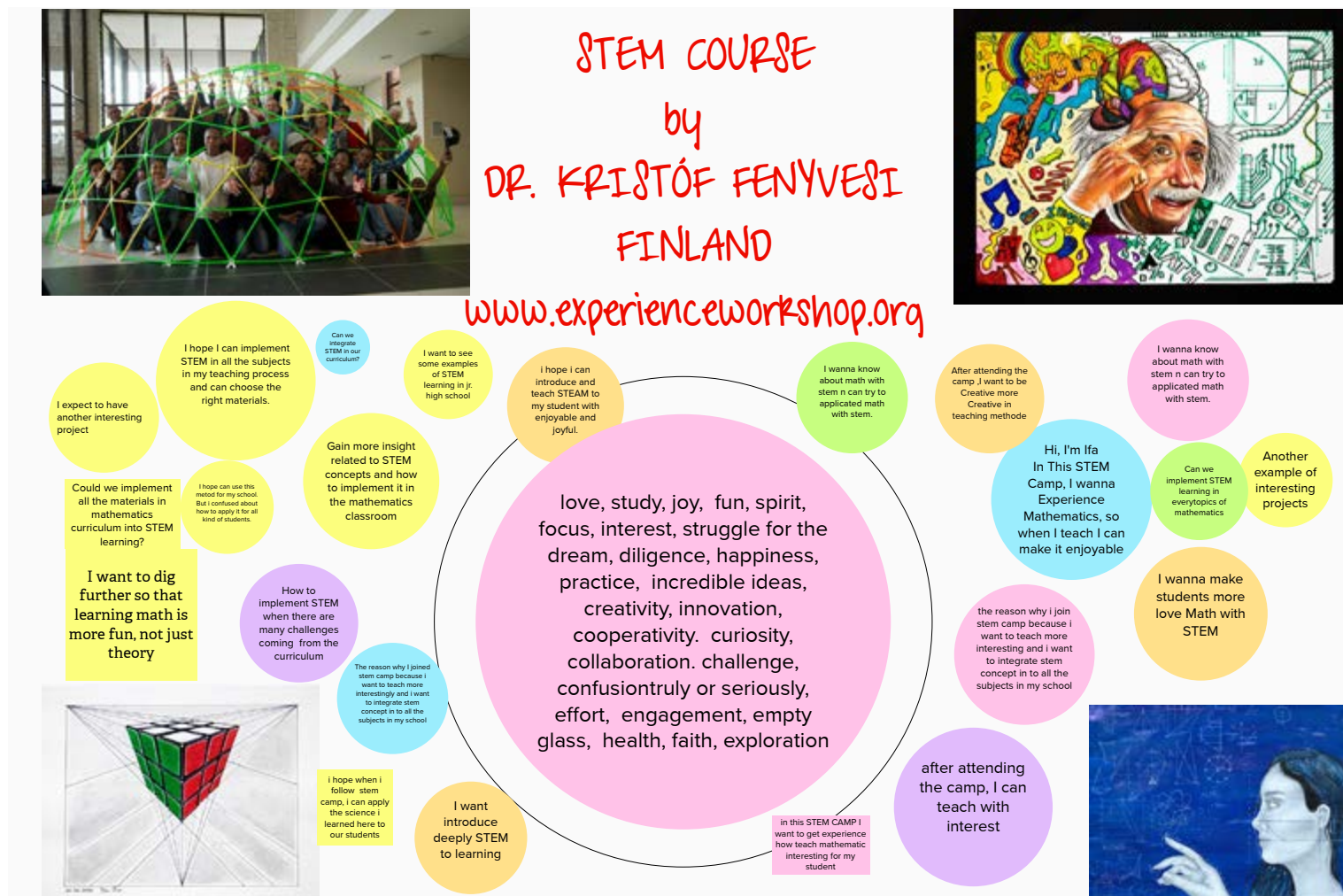


Figure 2: Motivational Poster representing participants' expectations and personal contributions created by the participants through online collaboration with Mural app.



this building process and discussed their collaborative work plan by studying digital GeoGebra models and 3-dimensional CAD images. The physical construction process took place in a hybrid manner, guided from Finland as part of the hybrid session of the STEM Camp (Figure 3).



Figure 3: Photos from SEAMEO for QITEP in Mathematics' Teachers' Professional Development program with Kristóf Fenyvesi.

At the TPD program for special educators, the participants and online facilitator could together build a variety of 3-dimensional constructions with the 4Dframe STEAM educational toolkit. The participants received the physical 4Dframe STEAM toolkit via post preceding the session. The collaborative problem-solving dimension in the hybrid setting required that the online facilitator also worked with multiple cameras during the physical construction process. One camera showed him and his presentation and another showed his desktop with his hands working on the 3-dimensional constructions (Figure 3).

Hybrid and online sessions with physical activities were implemented as part of the same programs when all participants and facil-



Figure 4: Zoom screen showing participants building 3-dimensional models with 4Dframe STEAM toolkit together with the online facilitator. On-site facilitators are supporting the process.

itators were online. This required careful planning of the physical activity. This was based on materials and opportunities provided for every participant or in other instances, logistic preparations were required to provide the activity materials and preparation opportunities for all online participants preceding the activity. With the help of VR, AR, and digital platforms for online collaboration, innovative opportunities are also available to combine physical and digital creative activities even with full online participation and facilitation.

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