

## DEVELOPING QUALITY CRITERIA FOR CREATING AND CHOOSING MATHEMATICS LEARNING VIDEOS

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### Short description of the Workshop Groups: organizers, aims and underlying ideas

*In this workshop, we have the pleasure of sharing the results of a joint project between two universities in Germany and Italy. The aim of the project is to develop quality criteria to create or to choose mathematical learning videos. Two postdoctoral researchers (the first two authors) work on this project under the guidance of the third and fourth authors. There are many mathematics learning videos freely available on the internet and daily many videos are uploading on various platforms. However, there are many important factors that need to be considered in creating and choosing a learning video. Thus, in our project, we suggest some quality criteria that are crucial to accomplish the intention expressed above. We started with a catalogue developed under the CAKE project conducted by a research group representing four departments of the Technical University of Darmstadt (Feldt-Caesar & Bruder, 2018). This catalogue was a general one including quality criteria for digital learning environments. Following this, the current project was designed to develop quality criteria for learning videos from a mathematical perspective (Ratnayake, Bruder, Mammana, & Taranto, 2020). We identified three important aspects that need to be considered when working with learning videos for mathematics teaching/learning processes. They are goals, learning situations and linking from prior knowledge to expected knowledge. The result of our collaboration has therefore generated two catalogues: (i) quality criteria for creators and (ii) quality criteria for users (teachers). In particular, our catalogues paid attention to learning situations, expected prior knowledge, accuracy of the content, learner's expectations, pedagogical consideration and design and technical consideration. During the workshop, we would like to share the two catalogues that we developed to stimulate discussion with colleagues in the mathematics education research community about ways in which they might be refined and extended and contribute to building a shared understanding of creation and the use of high-quality mathematics learning videos.*

### Planned structure:

Insert the planned structure of the workshop in the table below. You can insert rows if needed.

Planned timeline	Planned activity	Working format /Responsible person
20 minutes	Watch learning videos and choose your favourite for your teaching intention- depending on a specific goal	The organizers show some videos (chosen from YouTube) created to accomplish some mathematical teaching intention. The participants choose the best one that they would like to use in their teaching while noting down the reason/s for their choice.

10 minutes	Presentation and use of the catalogue “ <i>Quality Criteria for Teachers as Users</i> ”	The organizers provide a link to the <i>catalogue for users</i> to the participants. The participants, individually, evaluate each video that they have watched using the catalogue which includes a 4-point Likert-style scale. They then, will share the evaluations in a Padlet and will start a discussion to choose the best one according to the results of the evaluations in small groups (depends on the number of participants).
15 minutes	Group work and participants’ feedback to the catalogue for users	Based on this experience the groups will then write down some suggestions in a Padlet, and/or critique, if any, about the catalogue for future use. They will write down these suggestions and will present at the main room discussion. Finally, the organizers conduct a discussion based on these suggestions.
20 minutes	Watch learning videos from the designer’s point of view	The organizers show to the participants two videos created by teacher-students of each of the organizers’ Universities.
10 minutes	Presentation and the use of the catalogue “ <i>Quality Criteria for Video Creators</i> ”	The organizers provide a link to the <i>catalogue for creators</i> . The participants, individually, evaluate each video they watched using the catalogue which includes a 4-point Likert-style scale.
15 minutes	Group work and participants’ feedback to the catalogue for creators	The organizers direct the participants to share their evaluations in a Padlet in groups. They will then discuss on participants’ suggestions, and/or critique, if any, about the videos and/or the catalogue in groups in breakout rooms. Finally, the organisers will conduct a discussion on these suggestions.

**Venue requirement:**

*We will conduct this as an online workshop. We would appreciate the facilities to create breakout rooms on zoom.*

**References**

Feldt-Caesar, N. & Bruder, R. (2018). Qualitätssicherung digitaler Lernangebote am Beispiel von mathematischen Videos zum (Nach-) Lernen in einführenden Ingenieursveranstaltungen. In: Festschrift Jörg Lange (Festschrift anlässlich des 60. Geburtstages von Herrn Prof. Dr.-Ing. Jörg Lange), TU Darmstadt, Institut für Stahlbau und Werkstoffmechanik, pp. 163-168.

Ratnayake, I., Bruder, R., Mammana, M. F. & Taranto, E. (2020). Supporting teachers in choosing mathematics learning videos. *Proceedings of EDULEARN20 Conference*, pp. 3022-3031.