



Digital Support for Teachers'  
Collaborative Reflection on  
Mathematics Classroom Situations

Vignettes

in pre-service teacher education and  
in-service teacher professional development

## **A Course Concept for**

Implementing Vignette-based Learning

in Mathematics Teacher Education



## A Course Concept for

# Implementing Vignette-based Learning in Mathematics Teacher Education

What is the **target group** of the course?

Academic mathematics teacher educators as well as practitioners in mathematics teacher education at international, national, and local levels

What are the **aims** and the **learning goals** related to the course?

The course aims at informing mathematics teacher educators and practitioners in mathematics teacher education about vignettes as effective opportunities for student teachers' professional learning and about ways of implementing vignette-based working formats in mathematics teacher education.

In detail, the course outlined in this course concept targets the following learning goals:

- gaining an informative overview on the opportunities and benefits that vignette-based learning can provide at different stages and in different contexts of mathematics teacher education
- learning about vignette examples and vignette-based course concepts as well as good-practice examples of implementing them into mathematics teacher education
- becoming informed about the DIVER tool, which facilitates developing and implementing vignette-based learning opportunities in mathematics teacher education
- connecting the proposed approach to the individual context, goals, and demands of the specific participants
- reflecting possible obstacles of implementing and using vignettes in different contexts of mathematics teacher education
- sharing experience related to vignette-based learning in mathematics teacher education with colleagues

## What is the **related theory**?

Connecting theoretical considerations with the actual requirements of particular classroom situations is a key challenge in mathematics teacher education and professional development. Vignettes, considered as *representations of practice* (Buchbinder & Kuntze, 2018), have shown to be an effective way of representing and eliciting key aspects of professional requirement contexts. In particular, vignettes can be used in order to represent classroom situations and the requirements teachers have to deal with in specific situations, but also further aspects, such as beliefs or understandings about various aspects related to the teaching and learning of mathematics, can be represented (ibid.; Kuntze & Friesen, 2020; Skilling & Stylianides, 2019). Besides their function of representing practice, vignettes also function as a *representation of theory* (Kuntze & Friesen, 2020): vignettes can be designed based on theoretical considerations, so that such theoretical considerations become situated in a particular requirement context (ibid.).

Numerous vignette examples developed in the project coReflect@maths are available at the project website ([www.coreflect.eu](http://www.coreflect.eu)) and will also be available at <https://erasmus-plus.ec.europa.eu/projects>.

Due to this *double representational function* (ibid.), vignettes are regarded as an effective stimulus for reflecting and discussing professional requirement contexts in teacher education and professional development, but also in mathematics educational research: in this context, vignettes can be used, for instance, to elicit teachers' responses to certain scenarios, which can be analysed against the background of aspects such as participants' knowledge, beliefs, emotions, judgements, attitudes, or values regarding specific aspects represented by means of carefully designed vignettes. Such vignette-based research has focused, for instance, on developing trainee teachers' mathematical knowledge (Samková, 2018); improving pre-

service teachers' noticing using learning trajectories (Ivars et al., 2020); developing knowledge about teaching mathematics that respects student diversity (Healy & Fereirra dos Santos, 2014); eliciting teachers' value-laden beliefs (Skilling & Stylianides, 2019), or using different vignette formats to assess teacher competence (Friesen & Kuntze, 2018).

Vignettes can be implemented in different ways, and in particular in different formats: formats frequently applied are videos (e.g. Muñiz-Rodríguez et al., 2018), animations (e.g. Herbst & Kosko, 2014), texts (e.g. Healy & Fereirra dos Santos, 2014), or cartoons (e.g. Samková, 2018). The formats provide different advantages and disadvantages respectively (e.g. Herbst & Kosko, 2014; Friesen & Kuntze, 2018), so that the choice of a format needs to be reflected carefully when designing professional learning opportunities for mathematics teacher education and research.

What does the **course format** look like?

The course is designed as a series of 2 to 4 sessions (compact or extended version). Each session has a duration of 2x90 minutes, which can be adapted flexibly to the specific conditions of a possible implementation of this course concept. An extended version of this course is intended to contain an extensive focus on hands-on work with vignette-based activities in order to gain more intense vignette-based experience as well as to stimulate more detailed reflection on the participants' work with vignettes and related peer networking during the course.

The course sessions can be held in the format of on-site events, but can also be adapted flexibly to online or hybrid, e.g. blended learning working formats. It is recommended to implement phases between the sessions in which the participants can collect practical experience in applying new ideas, contents, and approaches in their own courses. Such phases can be complemented by e-learning support, e.g. via an e-learning platform, where the participants can upload questions and receive feedback but also can upload own material, comment and discuss

contributions from other participants and share ideas and concerns with colleagues.

**What participant-centred activities** are part of the course?

The working formats are chosen in order to maximise the active involvement of the participants. As shown below, each of the four parts of the course includes several participant-centered activities, in particular the exploration of vignette examples and vignette-based activities, several phases for discussion, and hands-on activities with the DIVER tool. These activities are complemented by relatively short input phases, which are intended for presenting key ideas of the theoretical framework and ideas behind vignettes and vignette-based learning activities.

What opportunities can the participants use to make **connections** between their prior experience and their further vignette-based work?

The course provides frequent opportunities for connecting new ideas related to vignette-based work to the participants' prior experiences, in particular in Part II, III, and IV of the course as shown below. The hands-on activities, for instance, are intended to engage the participants to work on the activities against the background of their own research questions and/or professional development aims. In Part IV of the course, the participants analyse example course concepts against their individual professional background and their specific demands. Like this, they are encouraged to connect vignette-based work to their individual frameworks and demands.

How is the course **structured**?

The course is structured into four parts of 2x90min each. However, the structural elements provided in the following are intended to be arranged flexibly according to the target groups' background and professional experience regarding vignette-based learning as well as the individual context of the implementation (e.g. a series of events over a certain period, daylong single event, activity as part of a seminar or a conference, etc.).



## Part I

### **Vignette-based learning and its potential for teacher education**

- Introduction of vignettes and vignette-based learning
- Different formats of vignettes and their specific advantages and disadvantages
- Vignette showcase (different examples)
- Individual exploration/analysis of example vignette-activities and small group discussion
- Whole group discussion about the potential of using the example vignettes in mathematics teacher education, about possible advantages, and potential obstacles

## Part II

### **Digital development of vignette-based learning activities with the DIVER tool**

- Introduction of the DIVER tool
- Discussion on the possibilities the tool provides for vignette-based teaching and learning in mathematics teacher education and research
- Individual and/or small-group hands-on activities with vignettes using the DIVER tool: (further) developing vignettes for specific educational purposes
- Whole group discussion about potential use of the DIVER tool, about its possible advantages as well as potential obstacles regarding the implementation against the specific individual background of the participants

## Part III

### **Developing vignette-based learning activities for a variety of purposes**

- Individual and/or small-group hands-on activities with the DIVER tool: creating vignettes for specific educational and/or research purposes (based on the participants' interests)
- Whole group reflective discussion on the activities
- Sharing prior experience with vignette-based or vignette-related contexts and tools

## Part IV

Is there **complementing material** for the course participants?

### Implementation of vignette-based learning

- Introduction of the vignette-based course concepts developed in the project coReflect@maths
- Overview and course concepts showcase (presentation of different examples and related key-ideas)
- Individual exploration/analysis of example course concepts and small group reflection, in particular regarding the implementation as a university course and against the individual backgrounds of the participants
- Whole group discussion about the potential use of the course concepts in mathematics teacher education, about possible advantages, and about possible challenges related to the implementation against the individual background of the participants

This course concept is complemented by a **material book**, providing in-depth theoretical and practical information on the development and implementation of vignette-based professional learning activities for pre-service and in-service mathematics teachers, as well as several examples of vignettes and related activities. The book can be downloaded from [www.co-reflect.eu](http://www.co-reflect.eu) and will also be available via <https://erasmus-plus.ec.europa.eu/projects>.

Reference:

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