

Documentation of PLATINUM teaching and learning units

Each PLATINUM unit is built around a mathematics topic, is designed for student inquiry, and is used in HE classroom practice. PLATINUM units serve as exemplary materials for mathematics lecturers and instructors in professionalisation programmes to experience inquiry based mathematics education (IBME) at university level and to inspire further development of IBME.

Documentation of a PLATINUM unit consists of

- A. Information for lecturers
- B. information about the learning activities
- C. the worksheets and files used in the classroom, plus supplementary material

A. Information for lecturers

Information about a PLATINUM unit for lecturers consists of short accounts of

- *unit description*
a short description of the unit about its subject matter and organisation, the student level, expected prior knowledge, the significant concepts and essential questions addressed, the course and context in which it has been used in HE practice, and the estimated duration.
- *learning objectives* of the unit
- *IBME character of the unit*
what *kind of student inquiry* is applied (e.g. interactive demonstration, lecturer & student discussion, confirmation inquiry, structured inquiry, guided inquiry, open inquiry, ...) and *what inquiry abilities* (i.e. engagement, exploration, explanation, elaboration, extension, evaluation; one may refer to an inquiry learning model) are students expected to develop through the unit activities?
- *mathematical content*
what mathematical concepts and ideas are introduced?
- *technological pedagogical content knowledge*
what common students' difficulties and alternative conceptions have been identified by mathematics education research and/or lecturers practice in higher education and what role does ICT play in the unit?
- *learning path*, in case the unit consists of subunits or multiple activities
describe way(s) in which subunits and/or student learning activities are connect to each other; a short list of activities and possible arrangement of these activities suffices, and each item consists of activity name, inquiry type, specific inquiry abilities
- *lecturers' experiences in HE classroom practice*
a short reflection about its use within HE classroom practice (which expectation were met or not, challenges and/or obstacles encountered in the implementation, students' reactions, ...)
- aspects of using the unit by *students with special needs*
- *assessment*, in case one has items or suggests for student assessment related to the unit
- (in case of modelling unit, developed in IO5) *relevance of/to the real word* (including industry)

B. Student learning activities

A description of each learning activity within the unit consists of an activity title and short descriptions of

- *learning goals*
- *significant concepts and essential questions* addressed

- *inquiry types* and emphasis on *inquiry abilities* (if not already discussed in the section Information for lecturers)
- *envisioned student engagement / involvement* in construction conceptual understanding
- *tool use* (including mentioning of materials like whiteboard, data projector, real object, ...) and *supporting materials* (e.g. links to websites or other sources of information)
- *time needed* for the student activity
- *suggestions for use*
how to carry out the activity? how to use materials? How to make it more inquiry-based?
exemplary questions that a lecturer could raise)

C. Worksheet, files, and supplementary material

A PLATINUM unit contains

- *student tasks and worksheets*
 - in source format (Word, LaTeX, ...)
 - in PDF format
- *auxiliary files*
data files, software-specific files, simulation files, assessment sheet, reference materials, ...
- *supplementary files*
more detailed notes about the design of the unit and the activities, classroom experiences, related narratives, ...