

# M-EEM “Challenge-based Sustainability Case projects”: From PBL to CBL

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**Programme/Course characteristics**

- 30-40 students in whole programme
- Diverse cohort in terms of discipline, age, career, life experience, culture
- Choose specialisation including case project

**Evaluation questions**

- How does challenge-based learning **contribute** to the development, formulation and execution of profound, original, and integrated **sustainability research** in a student group setting?
- How does the use of a combined **self- and peer-assessment procedure** contribute to formative student learning about their personal development and group participation in a challenge-based learning setting?

**Evaluation methods**

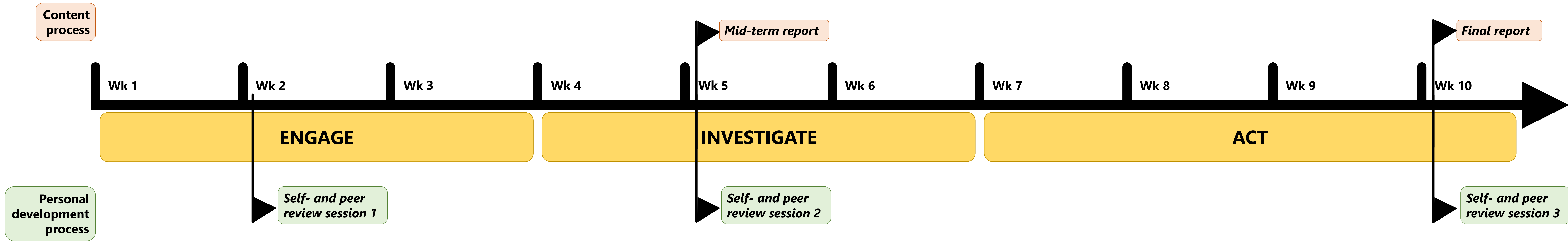
- Teacher reflections
- Self- and peer assessment forms
- Mid-term & final reports

**Preliminary evaluation outcomes**

- ‘Engage’ executed best → too much academic focus later on
- ‘Act’ requires more emphasis
- Self- and peer assessment welcome addition
- Students assessed their *critical thinking* and *communication* more than *creativity* and *collaboration*
- 3x self- and peer assessment does not show too much change in skills and adds to workload
- Students’ depth of reflection differed considerably

**Implications**

- Rubrics for report and for self-assessment were not aligned sufficiently with CBL
- Focus on 21<sup>st</sup>-century skills was appreciated by students
- 2 self- and peer assessment sessions may suffice to gauge personal development throughout the quartile
- Guidance on depth of reflection needs to be reviewed



| Common part                  |                                    | Specialisation part                |                    |
|------------------------------|------------------------------------|------------------------------------|--------------------|
| Quartile 1 (15)              | Quartile 2 (15)                    | Quartile 3 (15)                    | Quartile 4 (15)    |
| Sustainability & Law (3)     | Policy & Sustainability (3)        | Case study (10)                    | Master thesis (15) |
| Environmental management (4) | Rurban Commons (6)                 | Master thesis proposal (3)         |                    |
| Energy management (4)        | Academic research skills (4)       | Case study (10)                    | Master thesis (15) |
| Water management (4)         | Personal Development Electives (2) | Master thesis proposal (3)         |                    |
|                              |                                    | Case study (10)                    | Master thesis (15) |
|                              |                                    | Master thesis proposal (3)         |                    |
|                              |                                    | Personal Development Electives (2) |                    |

**Legend:**

- Common course work (Grey)
- Environmental specialisation (Green)
- Energy specialisation (Orange)
- Water specialisation (Blue)

**1 quartile:**  
15 EC, 1 EC = 28 hours;  
10 weeks, 8 teaching + 2 exam.

**Personal Development Electives:**

- Sustainability & Justice
- Digitalisation & Sustainability
- The Sustainability Game
- Critical Sustainable Futures
- Stakeholder and social network analysis in sustainability transitions

Figure Embedding of challenge-based sustainability case projects in M-EEM curriculum (Q3).

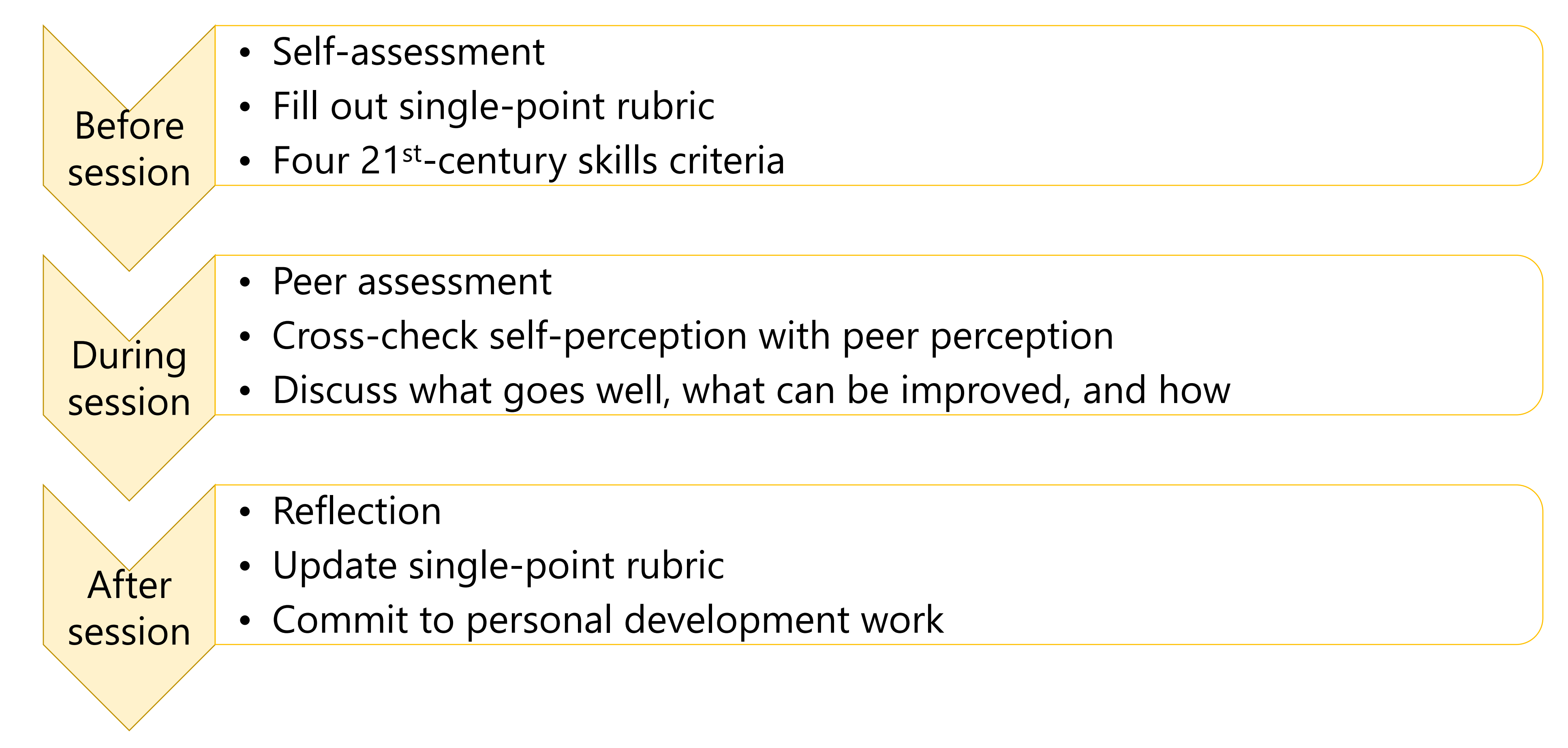


Figure Workflow of self- and peer assessment process per reflection session.