

TIIM Implementation Scenarios

WP2 D6. A procedure that supports deliberate practice in individual skillstraining in the skillslab and workplace setting

Date: January 10, 2025

Authors: Friedrich Pawelka (University of Münster), Elvis Vrolijk and Teodora Spirova (University of Twente)



Co-funded by
the European Union

Structure

- Background
- TIIM Overview
- Workflow
- Overview / general discussion about scenarios
- Scenario 1-3: Description, Technical Remarks, Pros / Cons
- Proposal from technical team
- Change requests for proposed scenario

Background

- During the [EU-Project ACTIVATE](#) one objective is to adapt and implement software to support the deliberate practice (DP) process/workflow in medical education (see [PACT scenario](#))
- The application „Twente Intervention and Interaction Machine“ (TIIM, see TIIM Introduction) is chosen to be used for the collection of feedback during the process.
- After an initial [workshop in Twente](#) on the December 3, 2024 possible scenarios were developed of how to use this app during DP.
- Depending on the selected scenario further adjustments on TIIM and at the implementing institution are needed.

TIIM Overview

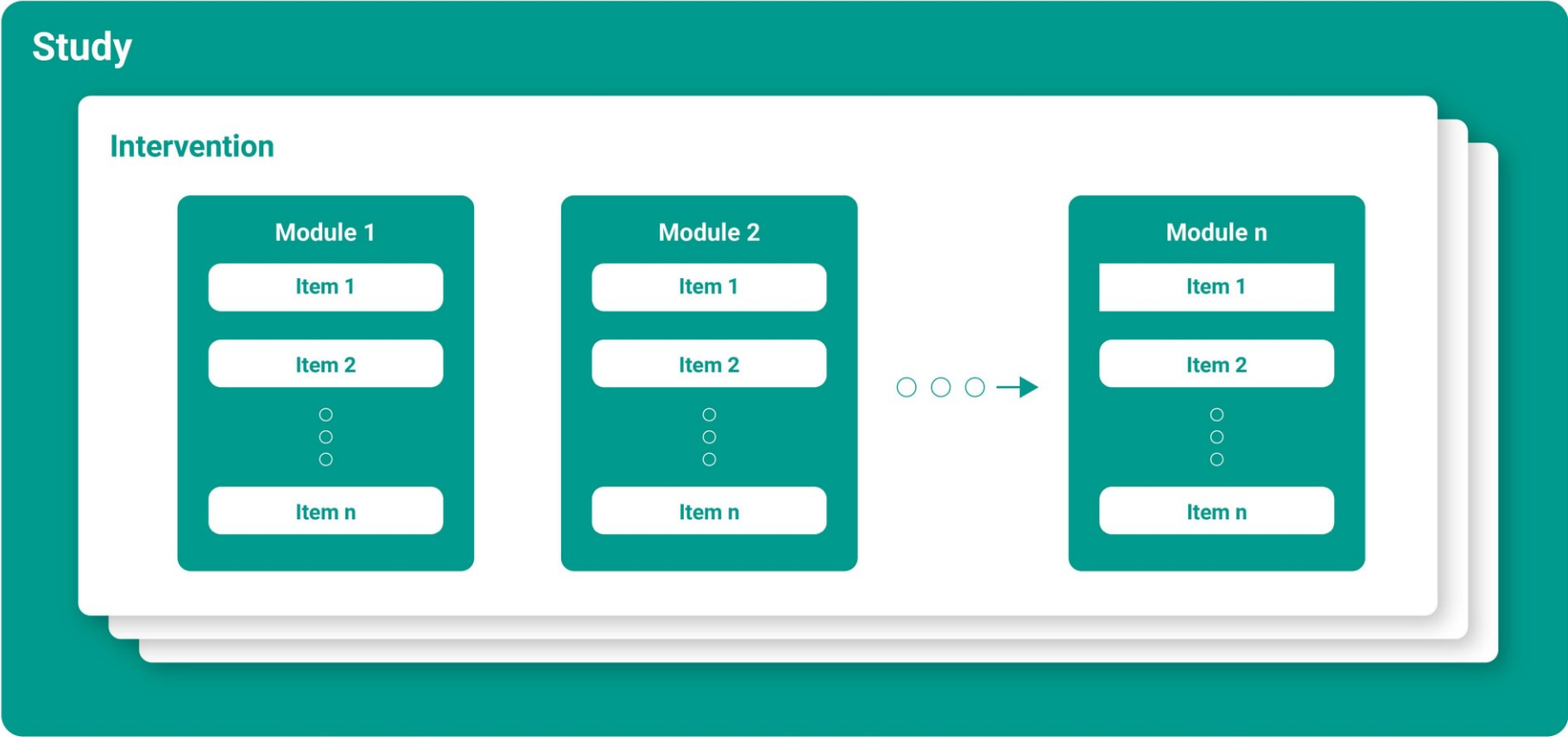
Structure and components

TIIM Structure - Description

- **Item:** The *questions and messages tutors* (researchers) prepare and send out.
- **Module:** A *collection of items* which a student (participant) receives according to pre-determined schedule (questionnaire).
- **Intervention:** The *complete collection of all the content sent to the student (participant)* (in modules).
 - You can have multiple interventions in a single **study**.
 - Students (participants) can be assigned to only one intervention.

Remark on vocabulary: TIIM was originally developed for research studies where often different interventions are compared in one study (e.g. control vs treatment).

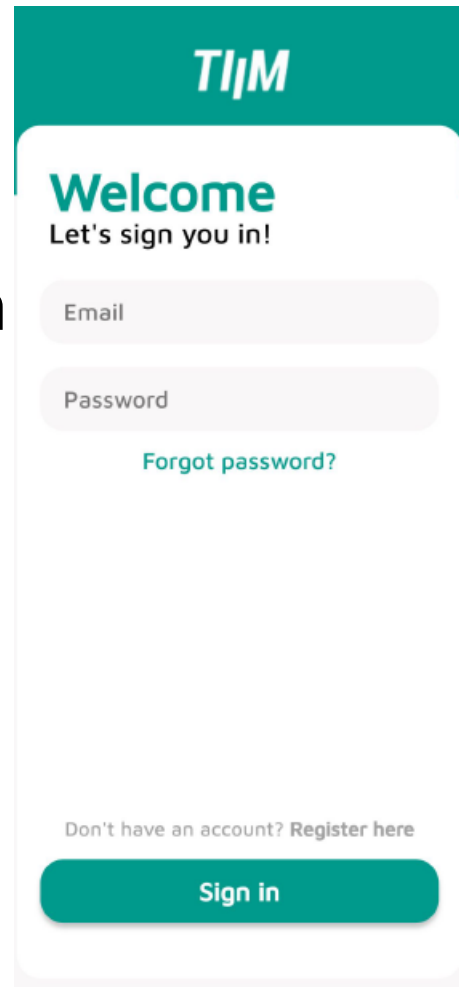
TIIM Structure - visualisation



TIIM Components

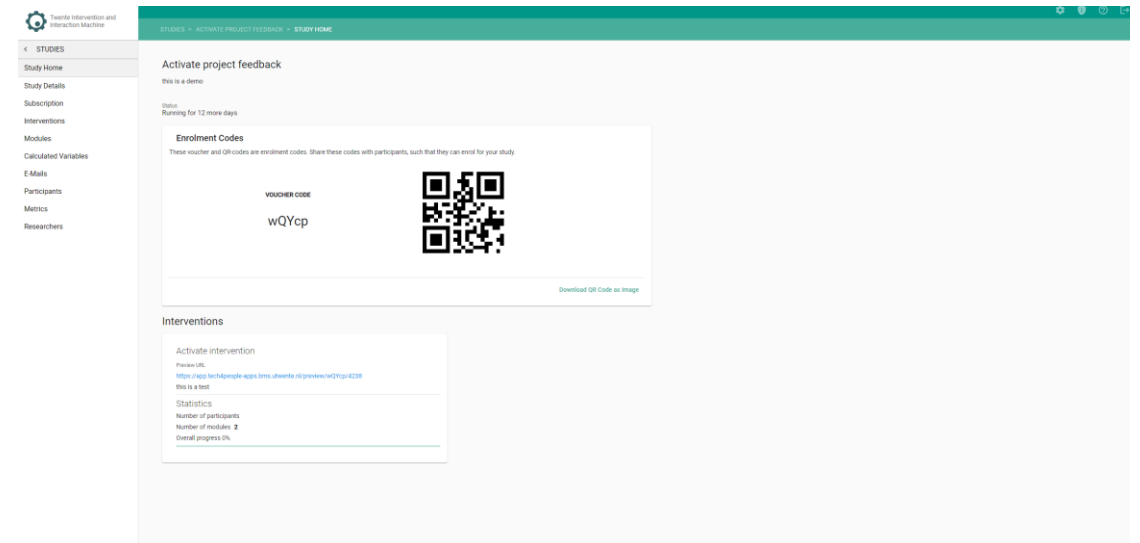
TIIM App

- App for data gathering from students (participants)



TIIM Dashboard

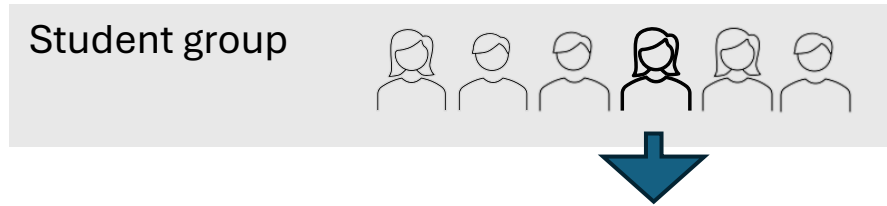
- Dashboard for organization / data retrieving / overview



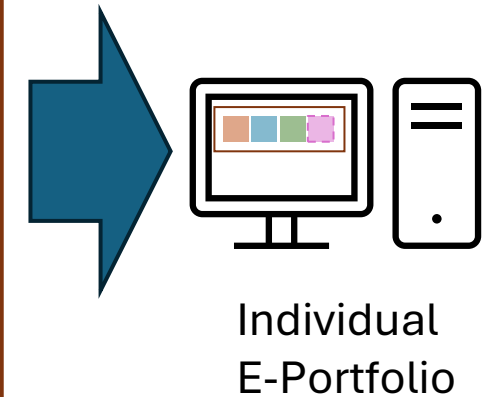
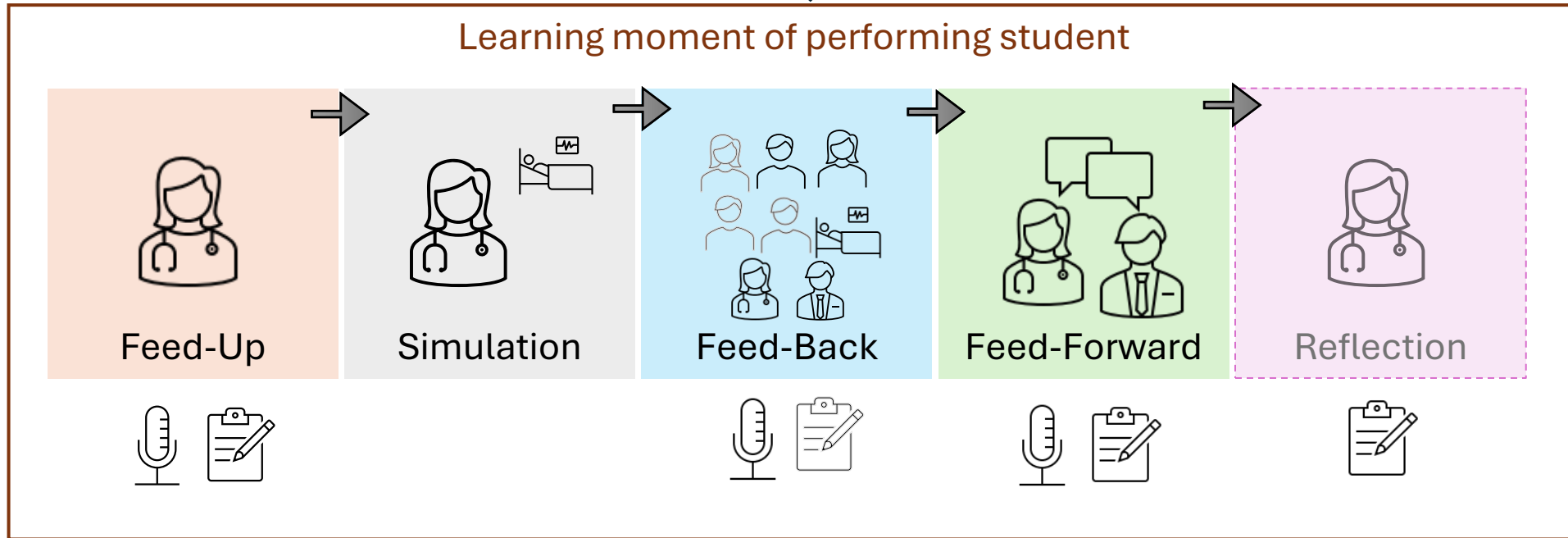
Workflow


Visualisation of the simulation process


Workflow zoomed in for one student





Learning moment of performing student



 Narrative feedback

 Items / Freetext

 Student and tutor **simultaneously** assess the performance of the student as foundation for the following „talk about trust“

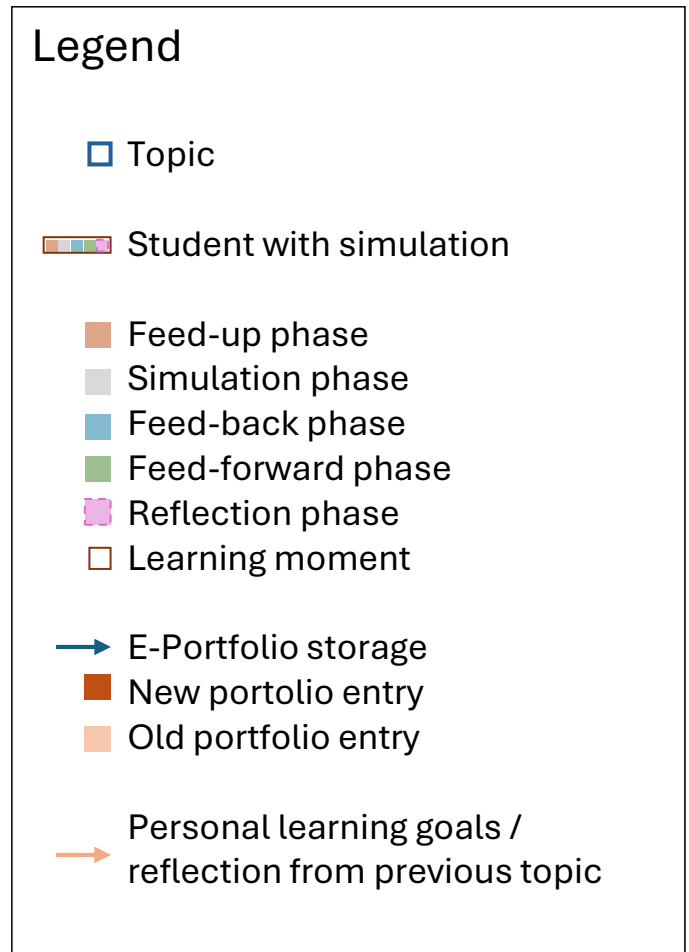
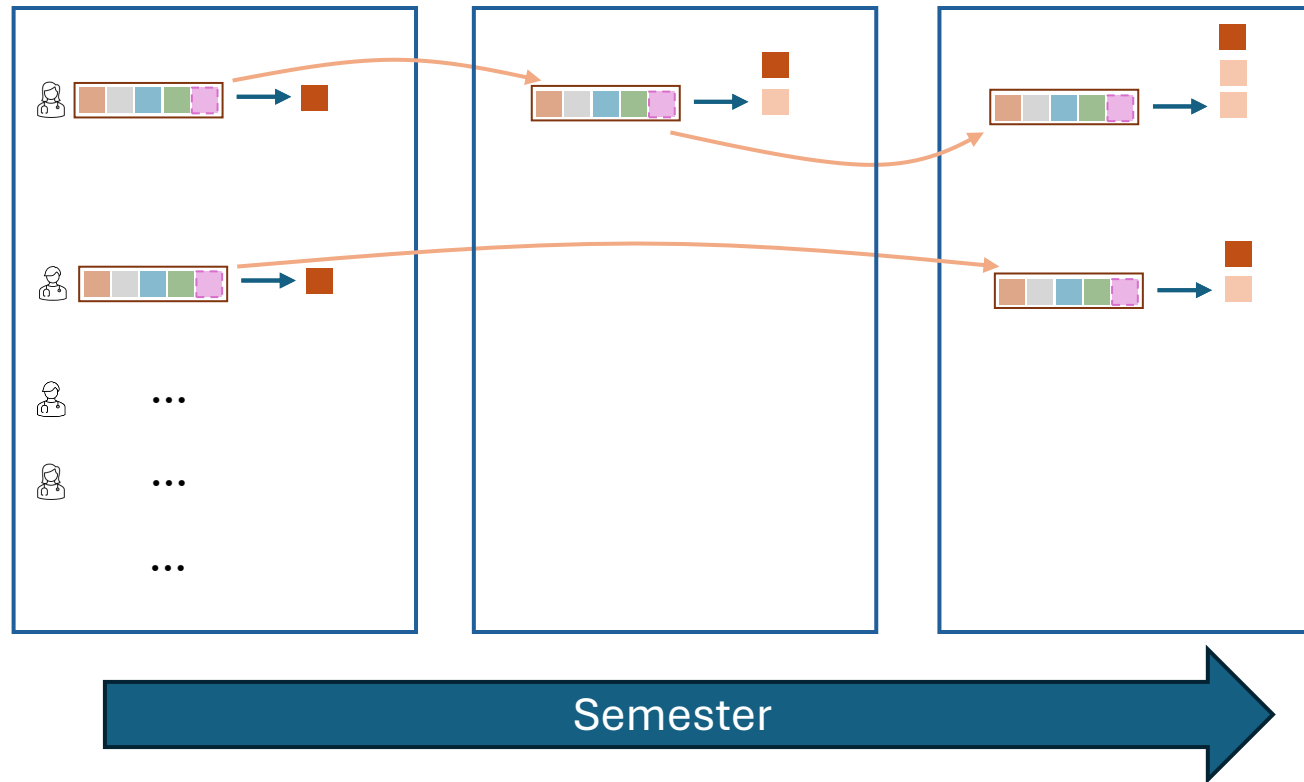
 Students

 Performing student

 Simulation patient

 Teacher

Zoomed out for more than one simulation / more than one student



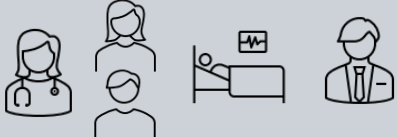
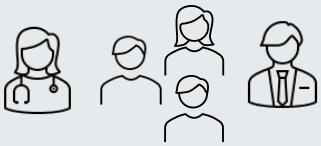

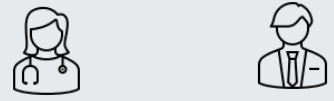


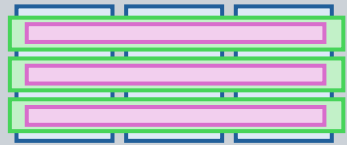
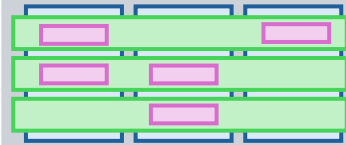
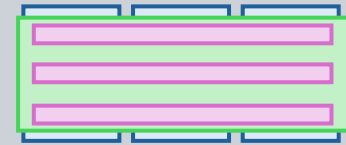








TIIM implementation scenarios

Discussion of different scenarios for using TIIM for the described workflow

Scenarios developed during workshop

- Scenario 1 (Lucy/Hendrik)
 - One study / one intervention per student per topic
- Scenario 2a (Elvis/Bas)
 - One study / one intervention per student for multiple topics
- Scenario 2b (Friedrich)
 - Without separate peer feedback and one intervention per simulation topic
- Scenario 3 (Jan Willem)
 - One study for whole semester
 - Student uses only app
 - Only students who receive feedback use the app
 - Feedback that s/he receives needs to be gathered by her-/himself


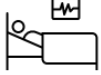

Visual Overview

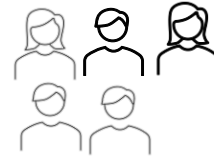
| Dimensions* | Scenario 1 | Scenario 2a | Scenario 2b | Scenario 3 | Proposal |
|-------------------------------|--|--|--|---|--------------|
| Who gives feedback? | | |  | | |
| Who uses app? |  |  |  |  | |
| TIIM implementation structure |  |  |  |  | See slide 23 |
| Tools used by student? |  |  |  |  | |
| Access to data (= portfolio) |  complex |  no good structure |  no good structure |  only via app | |

* Description of dimensions on following slides

Dimension „Who gives feedback“

For all scenarios the following persons of the group give feedback:

- Performing student 
- 2 of the 5 observing peer students 
- Simulation patient 
- Teacher



Dimension „Who uses app“

This dimension describes what persons use a **seperate** device with their TIIM account logged in to enter feedback (verbal or by typing) for the performing student.

Dimension „TIIM implementation structure“

This dimension describes how we use the TIIM elements „study“ (green) and „intervention“ (purple) to collect feedback for multiple topics (blue/columns) and students (rows).

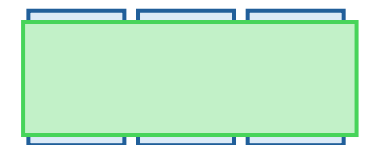
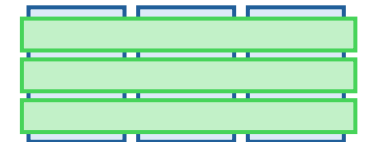
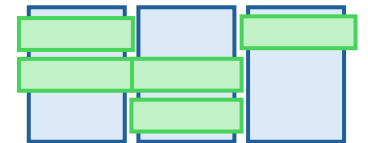


Different combinations affect which components are used and how (easily) students can access feedback data.

The next two slides discuss the different combinations.

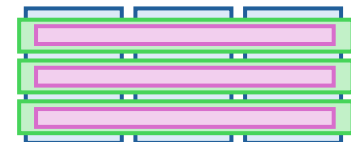
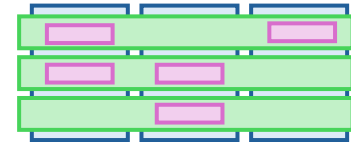
TIIM implementation structure - study

- One study per student per topic
 - For every simulation the students has to go through the process to take part in the study (privacy policy, ...)
 - Overview in TIIM dashboard is difficult as we only see metrics per study
 - Requires automation (creating studies and interventions for every simulation and every student)
- One study per student per semester
 - Better overview in study (depending on intervention structure), because we see all data in one study
 - Automation would be nice (creating interventions start of semester)
- One study for all students
 - Only possible if student isn't using the TIIM dashboard
 - Automation would be nice (creating interventions with students start of semester)







TIIM implementation structure - intervention

- One intervention per student per topic
 - Better structure in current TIIM dashboard
 - Better grouping of already answered questions (e.g. for calculated answers)
 - Currently not possible to show answers from previous modules or to have a student in more than one intervention
- One intervention per semester
 - Possibility to show answers from previous module (e.g. learning goals from feed-forward in next feed-up phase)
 - Currently no good overview of data in dashboard (grouping by time or answer to a question is missing)



Dimension „Tools used by student“

This dimension describes what TIIM components the performing student uses:

- Student uses only app 
 - Lack of visibility of feedback data
 - Would need external dashboard
- Student uses **both** app and TIIM dashboard   
 - Additional login necessary
 - „Easy“ access to own learning moments (= Portfolio) via dashboard
 - How easy depends on structure (see next slide)
 - Only possible, if each student has an own study

Dimension „Access to data“

Describes if and how access to **all** feedback data is possible for the performing student.

- Student uses TIIM dashboard
 - Multiple studies per student: complex overview
 - One study / one intervention: unstructured overview
 - One study / multiple interventions: structured overview
- Student uses only app
 - Difficult to present all data inside the app
 - At the moment only the last answers of each module are shown

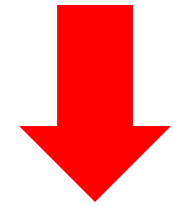
Technical remarks for all scenarios

- There has to be an **administrative user** who creates studies and interventions and adds students (if necessary)
- **Connection to Scribe** needed to present transcription in TIIM app or TIIM dashboard

Proposal

From the technical team, with consideration of the need for software customisation

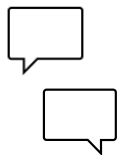
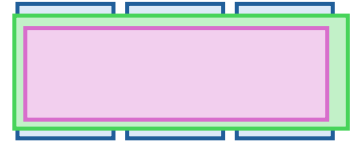
Proposal from technical team



| Dimensions | Scenario 1 | Scenario 2a | Scenario 2b | Scenario 3 | Proposal |
|-------------------------------|-------------|-----------------------|-------------|------------------|--------------------------|
| Who gives feedback? | | | | | |
| Who uses app? | | | | | |
| TIIM implementation structure | | | | | |
| Tools used by student? | | | | | |
| Access to data (= portfolio) | complex | no good structure | | only via app | via custom dashboard |

Reasoning for proposed scenario

- **Only performing student** uses app (on own or provided device)
 - To minimize the „screen time“ of the whole group
- **Only one intervention and one study**
 - The two current technical limitations are too hard to solve and not relevant for other TIIM projects
 - Limitation 1: User can only participate in one intervention at a time
 - Limitation 2: Only answers from same intervention can be used in other questions
 - Only needs to be created (automatically) once per semester
- Performing student uses **only app**
 - No additional login requirement for TIIM dashboard
 - No need for an overly complex dashboard to access only your own data
- Access to data via **custom** dashboard
 - No additional login needed, easy access through the app
- Sequential action from student and teacher (instead of simultaneously on two different devices)
 - Hard to solve technical limitation: showing answers of other participant (teacher) in a question
 - Alternative: Student and teacher enters their answer after each other in the same device
 - If they only have to enter one number, it will not take much extra time
 - Only one device (from student) is needed



Change requests for proposed scenario

- Epic 1: Handling audio files
 - Replay recorded audio files inside app
 - Request and show transcript of recorded audio files inside app
- Epic 2: Recall answers
 - Possibility to use previous Audio/Text answers (only latest one) in following module items
 - Improve UI/UX for large texts (e.g. transcripts) inside app
- Epic 3: Loop mechanism
 - Either repeating one module or a set of modules endlessly
- Epic 4: E-Portfolio
 - View all module answers for student in custom dashboard (webpage, not mobile optimized)
 - Ability to get and share access to this custom dashboard from app
 - Idea: send link with temporary token via email, token will expire after 7 days and can be revoked manually, everyone that has access to the token can view the e-portfolio of the student
- Epic 5: App performance
 - Make sure to handle larger studies/interventions without slowing down TIIM app