Developing, implementing, and disseminating an adaptive clinical reasoning curriculum for healthcare students and educators

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D4.1 Curriculum outline and online course material

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Authors	MFUM, UAU
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1. Introduction

As part of deliverable 4.1. the DID-ACT partners and associate partners developed 25 learning units for undergraduate healthcare students on different clinical reasoning related topics. Target groups of these courses are students in the health professions on a novice (pre-clinical), intermediate, and advanced level. These learning units are designed to be implemented in a blended learning format and are aligned with the corresponding DID-ACT train-the-trainer courses. In the following sections we provide an overview about the conceptualization and development of the train-the-trainer learning units followed by descriptions of the student curriculum..

3. Quality criteria

The learning units developed for the student curriculum should be

- tailored and adaptable to the students' needs.
- easily accessible, applicable, and understandable.
- based on the DID-ACT curricular framework (D2.2).
- reviewed by all partners and additionally by associate partners.

4. Methods

The planning and development of the learning units of the student curriculum was closely aligned with the train-the-trainer courses (D3.1).

4.1 Development of the curricular blueprint

In the DID-ACT framework (D2.2) we had defined overarching themes and learning objectives for the student learning units. Based on this framework and the identified barriers [1] and solutions for implementing a clinical reasoning curriculum, we developed a curricular blueprint at the beginning of this deliverable (see figure 1). The blueprint was drafted by UAU and MFUM and discussed and agreed upon by all partners and associate partners as part of D3.1 and D4.1.

4.2. Development of the learning units

For developing these 25 learning units we split our consortium into small teams of 3-6 persons, each working on one learning unit. As far as possible we made sure that in each team we had representatives of different professions, partner and associate partner institutions, and levels of expertise (including students). This allowed us to include different perspectives on each topic. Each team organized itself and presented updates of their group work during our bi-weekly team meetings. After a team had completed a learning unit we organized a peer consulting process adapted to working remotely to receive feedback from the whole team and associate partners. Following the review process the learning units were revised by the development team and after final approval of the consortium implemented in our learning management system Moodle. After testing and a final quality check the learning unit was published.

Each learning unit was implemented to be used in a guided / structured way if the learner is part of a planned blended learning course. In addition, it is also accessible in a self-directed way. The second option required some adaptations of the learning unit, as for example sample solutions had to be provided as feedback for assignments instead of a follow-up discussion during a synchronous meeting.

For all planned synchronous meetings, we made sure that these can either be implemented face-to-face or virtually.

To support and structure the work of the development teams MFUM and UAU provided a template that we used to specify the outline and content of each learning unit based on instructional principles [2,3,4]. A similar template has been introduced for the curriculum development at the medical school in Augsburg, which we translated and adapted to our needs. This template is publicly available for download on our website and includes the following information about each learning unit:

- Specific learning objectives, target group(s), required prior knowledge
- Title, description, group size, estimated workload/duration
- Synchronous and asynchronous learning phases
- Details for each phase with instructional steps, including types of instruction, description, method of instruction, duration, material needed, and possible adaptations
- Suggestions for assessment
- Outline for learning resources such as virtual patients / cases if required for this learning unit

Each template also included space for the review comments and an overview about potential teaching and assessment methods.

5. Results

The results of this deliverable are the curricular blueprint and the implemented learning units. Both will be summarized below, and are publicly available in our learning platform Moodle.

5.1 Curricular blueprint

Figure 1 shows the curricular blueprint for the train-the-trainer (in blue) and the corresponding student (green, yellow, red) learning units. The colored dots in the left column indicate the themes a learning unit is covering. The white column on the right side stands for a collection of virtual patients with which students can deliberately deepen their clinical reasoning abilities. An interactive view and explanatory video is available on our website: [Curricular Blueprint]

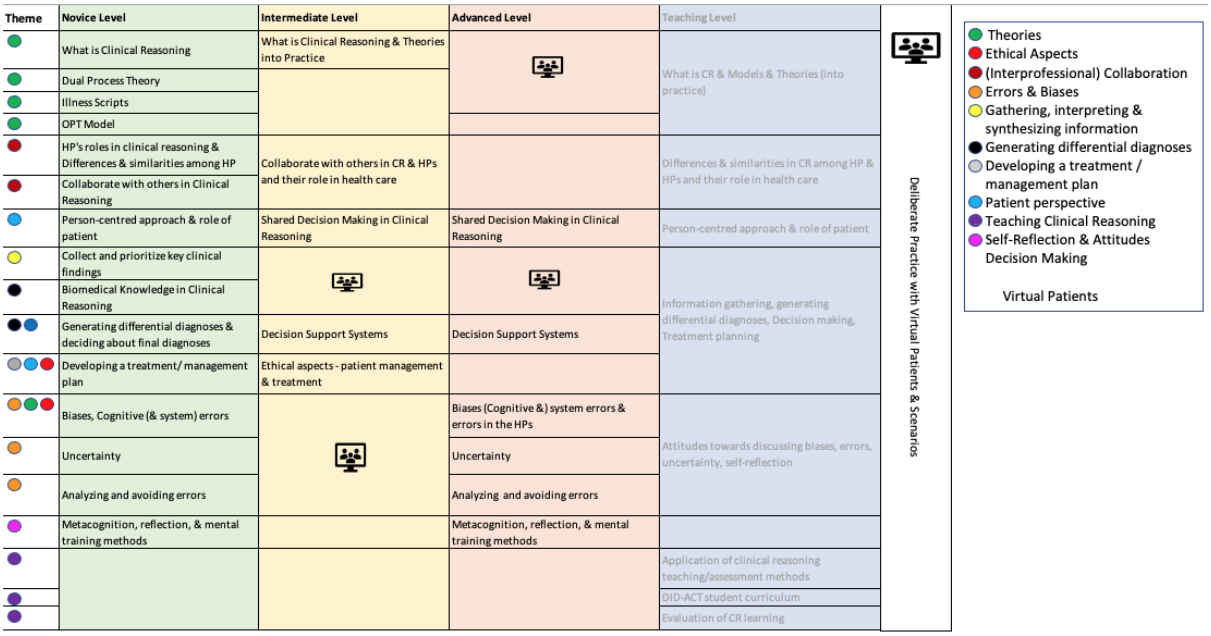

Figure 1: Curricular blueprint for the student curriculum on novice (green), intermediate (yellow), and advanced (red) and the train-the-trainer learning units (in gray).

5.2. Student learning units

The following figure shows the 15 learning units developed for the student curriculum on a novice level. The learning units can be accessed after registering for the moodle platform or login in with university credentials (EduGain). All course material is available in English, but if needed can also be translated in additional languages.

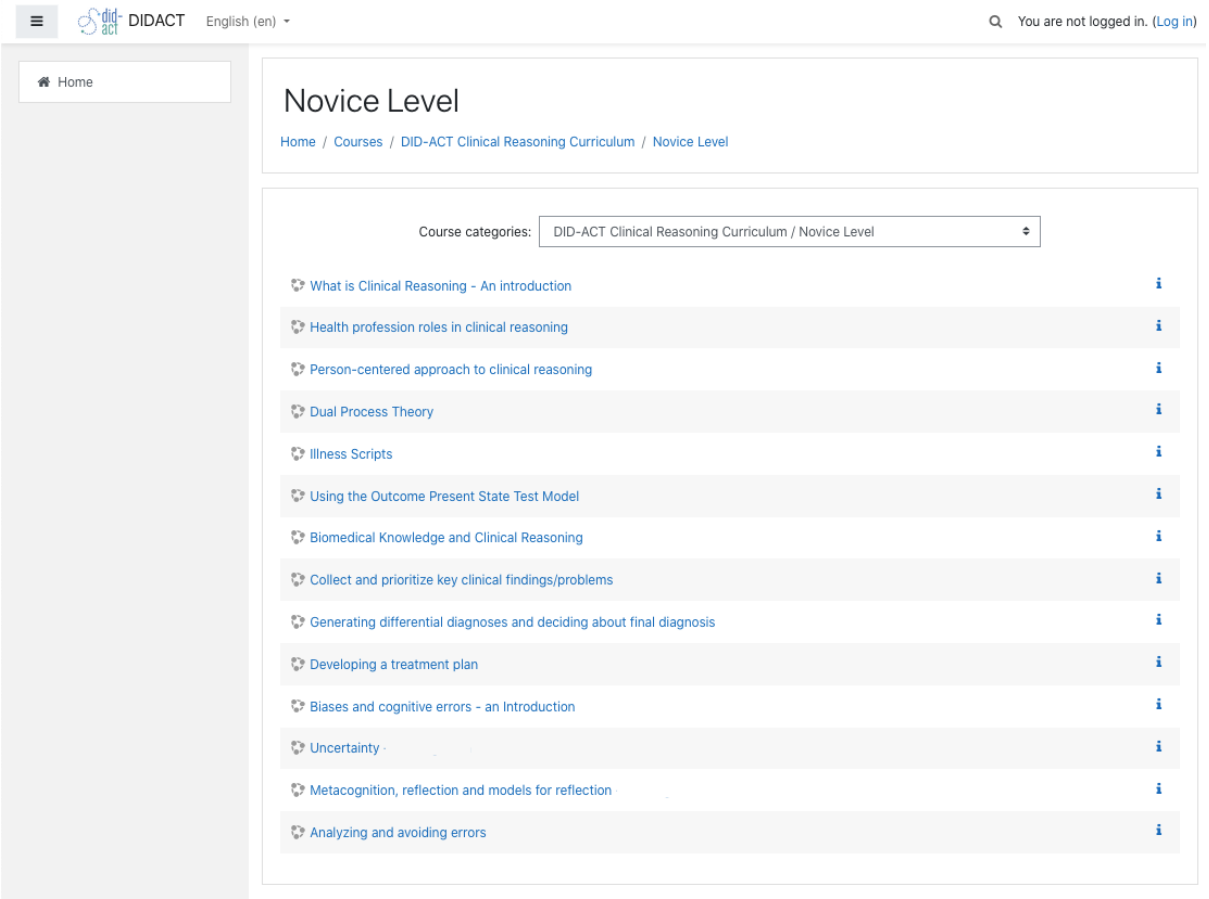

Figure 2: Overview of the student learning units on novice level in Moodle

The outline, description, and all required material for teaching these learning units is provided on the moodle platform in the course DID-ACT student curriculum.

5.3 Virtual patient collection

In addition to the structured learning units we integrated 75 virtual patients for self-study of the following topics:

- Illness Scripts
- Collecting and prioritizing key clinical findings
- Generating differential diagnoses and deciding about final diagnoses
- Developing a treatment / management plan

These virtual patients have not been developed as part of DID-ACT, but originate from a former Marie Curie fellowship and will be further developed and extended within the iCoViP Strategic partnership. These virtual patients are hosted by Instruct in the learning system CASUS and are linked from the DID-ACT moodle and are accessible via EduGain or self-registration. Figure 3 shows a screenshot of the course in CASUS, which covers a wide range of key symptoms and differential diagnoses.

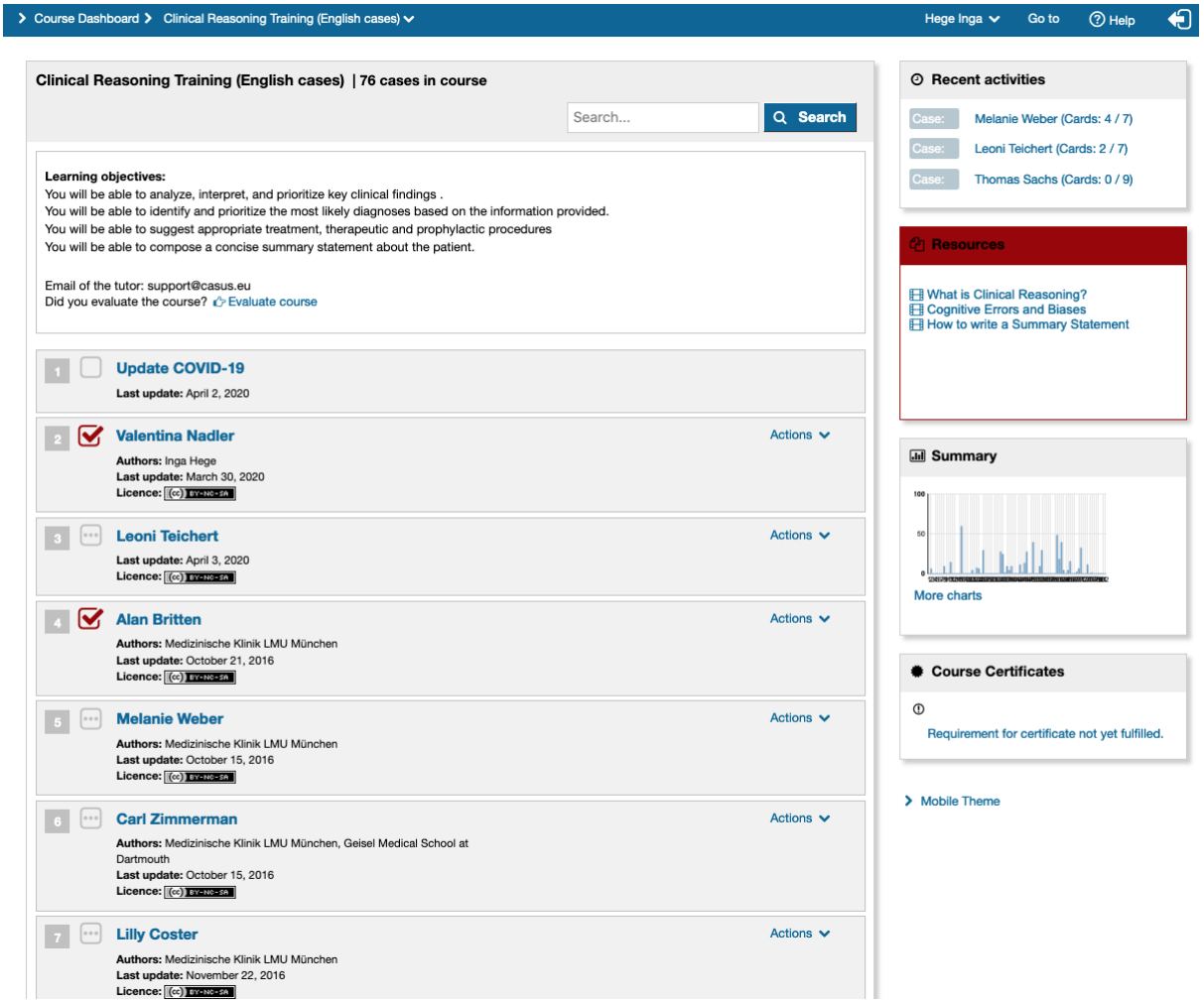

Figure 3: Screenshot of the course with virtual patients in CASUS.

6. Conclusions

Our previous work on the curricular framework and the identified barriers and solutions for providing a student curriculum was a valuable basis for this implementing the learning units. The described approach for developing the student learning units allowed us to include many different perspectives on clinical reasoning from partners and associate partners. Similar to the development of the train-the-trainer course, the development was challenging in terms of discussing and agreeing on aspects of the learning units, finding time-slots for virtual meetings, and merging the different perspectives and ideas. However, we believe that our approach led to richer learning units with a wide applicability in other schools.

7. References

1. Sudacka M, Adler M, Durning SJ, Edelbring S, Frankowska A, Hartmann D, u. a. Why is it so difficult to implement a longitudinal clinical reasoning curriculum? A multicenter interview study on the barriers perceived by European health professions educators. BMC Med Educ. 2021;21(1):575.

2. Städeli C. Die fünf Säulen der guten Unterrichtsvorbereitung. Folio Nr. 6/2010 (Full text in German)
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4. The ROPES model (Description, Video)