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

612454-EPP-1-2019-1-DE-EPPKA2-KA

D3.3 Refinement of course based on pilot implementations

Deliverable number	D3.3
Delivery date	May 2022
Status	v1.0 draft | final
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Reviewed by	All partners

Co-funded by the Erasmus+ Programme of the European Union

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1. Summary

Based on our experience with the pilot implementations and feedback we received from course participants and facilitators we refined the train-the-trainer learning units. We identified specific improvement suggestions for learning units, such as the need for more or different videos, that the allocated time was not sufficient, or that the focus should be more on the teaching aspects. These suggestions were addressed by the original development teams and refinements were made in the course outlines and the courses in our learning management platform Moodle.

Moreover, we discovered general suggestions for improvement, such as difficulties in teaching interprofessional and heterogeneous groups of participants, technical problems, or the need for a better overview about the learning units of the DID-ACT curriculum. We addressed these more general aspects by either covering them in our integration guideline or adapting the available guiding resources for course facilitators. For example, we created a video explaining the concept of blended learning and a video introducing our learning management platform.

2. Introduction

During the preceding deliverables D3.2 (Pilot implementations of the train-the-trainer courses) and D5.2 (Evaluation of the pilot implementations), we collected feedback from participants and facilitators about their satisfaction and impressions of the learning units (LU)

they held or attended. We collected these data through online questionnaires and a feedback template completed by facilitators as a basis for the course refinements implemented and described in this deliverable D3.3.

3. Quality criteria

- Workshop on sharing experiences of pilots at the beginning of this deliverable
- Considering all issues identified in the pilot implementation
- In close cooperation with target group(s), partners, and associate partners and with repeated feedback rounds
- Discussed and agreed upon by all partners

4. Methods

Overview about identified shortcomings

At the beginning of this deliverable, we collected and summarized all issues identified during our pilot implementations and which we reported in our D5.2 and 3.2 reports (Table 1).

LU	**Category**	**Issue**
General	Content	Different experience and knowledge levels on clinical reasoning (not all were medical doctors)
LU32	Content	quiz “too easy”, vs quiz useful
LU32	Content	availability of learning materials in the national language would be helpful
LU33	Content	More medical discipline specific examples
LU34	Content	Teaching the topic vs teaching how to do the corresponding LU. Many tutors asked for an explanation on how LU6 is structured to teach.
LU35	Content	expectations of participants were quite heterogeneous, but more related to how to teach
LU35	Content	found the case is more suitable in a theoretical course at an earlier stage in the educational program
LU35	Content	Participants mentioned that the nursing video was difficult to grasp, videos could be shortened
LU37	Content	Adjustments in content
LU37	Content	minor improvements in the used case examples to adjust them better to workplace-based education
LU35	Content	Content should be better adjusted to particular professions given (e.g. biomedical analyst), a few learning materials could be improved for non-medical professions and also include preclinical teachers
LU33	Content	Currently it is very monoprofession (medical) focused and leaves out pre-clinical teachers

General	Interaction/ Collaboration	Unbalanced participants in terms of professions made discussions difficult and focused towards physicians
LU35	Content	Neutral suggestions to change the amount of content (increase/decrease)
General	Didactical	Participants did not access/complete the online part
Meeting		Participants (and facilitators?) not familiar with online teaching / learning
LU33	Didactical	Powerpoint presentation quite boring, too much text, it is difficult to have so much text in different language
LU34	Didactical	More interactivity needed, No interactivity in powerpoint presentation/lecture
LU32	Content	Slight adaptations of presentations and of info for participants needed
LU32	Implementation - Time	Not enough time, Overall are two 45 min sessions rather short
LU37	Didactical	Didactical approach
LU32	Implementation - Time	Participants asked me if we can do it as one meeting
LU33	Interaction/ Collaboration	division into more homogeneous groups
LU33	Interaction/ Collaboration	number of participants was too small to stimulate meaningful discussion which reduced interactivity
General	Technical	Unfamiliarity and difficulty with Moodle & Casus, Problems to access moodle
LU32	Technical	direct links to interesting self-study materials
LU34	All	significantly lower evaluation results in the participant questionnaire in all categories
LU34	Didactical	Potential redundancies with the local curriculum

Table 1: Table with identified issues as basis for discussions about refinements.

Refinement process

We arranged for a meeting in which representatives from all partners and associate partners discussed identified issues and potential refinements addressing these discovered shortcomings. In this meeting ten stakeholders from partner and associate partner participated and Instruct moderated the brainstorming session. Due to the ongoing pandemic situation the meeting was held via a zoom meeting. After the meeting all participants had time to refine their ideas and add any additional thoughts and ideas.
In a follow-up meeting we agreed on the identified refinements and distributed work among participants. We also presented this interim status to all partners and associate partners during our regular bi-weekly team meeting.

After that, the development teams of each of the TTT learning units started refining their LU and necessary changes were highlighted in the development template.
After having presented and agreed on these changes, they were finally implemented in the course outlines and the moodle courses.

5. Results

5.1 General changes to the learning units

In table 2 we summarize the course refinements we have agreed upon after our second team meeting in addition to the specific refinements identified for each LU. Some of the comments were not specific enough, therefore, we could not address them. Our main changes include:

- Putting together an optional course that teaches educators about basic concepts of clinical reasoning, so that the main LUs focus solely on teaching clinical reasoning.
- Extending the glossary of clinical reasoning - related terms.
- Introducing in more detail the blended learning format and instructions for facilitators to conduct the courses.
- Better describing and outlining the train-the-trainer courses in moodle and on our website.

For other comments we found that they could not be addressed with refinements to the courses, but needed to be covered in the integration guideline (D7.3) (Table 3).

Issue	**Discussed and implemented solutions**
Different experience and knowledge levels on clinical reasoning of participants; quizzes useful	Implementation of self-assessment quizzes at the beginning of each LU to assess prior knowledge and help participants to prepare for the synchronous phases.
Teaching the topic vs teaching how to do the corresponding LU. Tutors asked for an explanation on how the student LU is structured to teach.	see 5.1.1
Expectations of participants were quite heterogeneous, but more related to how to teach	
Difficulty of finding correct clinical reasoning related terms	We expanded the glossary available in Moodle to include relevant terms for clinical reasoning and its teaching and assessment. Currently, it contains 35 entries.
Content should be better adjusted to particular professions given, a few learning materials could be improved for non-medical professions and also include preclinical teachers	Each learning unit was once again checked by other professions and suggestions of adaptations were made and implemented.

Currently it is very monoprofession (medical) focused and leaves out pre-clinical teachers	
Participants did not access/complete the online part	We provide now a better introduction into blended learning and online approach including a new video integrated into the train-the-trainer courses.
Participants (and facilitators?) not familiar with online teaching / learning	
Powerpoint presentation quite boring, too much text, it is difficult to have so much text in different language	Small groups & direct contact much appreciated, check whether we can reduce the amount of presentations and instead have videos in asynchronous phases so to make room for more discussion during meeting
More interactivity needed (n=2), No interactivity in powerpoint presentation/lecture	
Not enough time, Overall are two 45 min sessions rather short	We adapted the template in terms of allocated time and clarified that times can be adapted
Unfamiliarity and difficulty with Moodle & Casus, Problems to access moodle	We restructured Moodle and added category and course descriptions, a more detailed introduction into Moodle is available including a video on how to navigate in Moodle.
An overview about curriculum and which TTT related to which student LUs would be helpful, making connections between TTT and student LUs more visible / explicit	We provide an overview about the courses and their alignment on our DID-ACT website.

Table 2: Identified issues and implemented refinements

5.1.1 Teaching focus

A major improvement participants suggested was that the learning units should focus more on how to teach clinical reasoning to students than knowledge about it. During the development of the LUs we already were discussing this aspect within our consortium, but felt at that time that our approach was a good compromise. Even after the pilots we still see the need to provide some basic theoretical knowledge as the target group of healthcare profession educators within and across institutions is quite heterogeneous in terms of prior knowledge.

However, to make the teaching focus more explicit we decided to restructure each LU in a way that the teaching is the main part and all learning activities designed to increase the knowledge about clinical reasoning of participants are grouped together into an optional part or course. So, facilitators can decide depending on the prior knowledge and experience of their participants whether they want to conduct the LU including or excluding this optional part. Also, participants have the possibility depending on their self-assessment in the introductory quiz to access this optional part to deepen or refresh their knowledge on a specific clinical reasoning related topic.

5.1.2 Aspects to be addressed in the integration guideline

In addition, we identified issues that we will address in the integration guideline (D7.3) to provide tips & tricks for facilitators on these topics.

Challenge	**Integration guideline**
Different experience and knowledge levels on clinical reasoning of participants	Suggestion to include tips on how to deal with heterogeneous groups of participants in terms of prior knowledge and experiences with teaching CR
Unbalanced participants in terms of professions made discussions difficult and focused towards physicians; Content should be better adjusted to particular professions	Point to resources on interprofessional teaching
Number of participants was too small to stimulate meaningful discussion which reduced interactivity	Point to resources on small group teaching techniques
Potential redundancies with the local curriculum	Point out the importance of learning objectives that are defined for each of our learning units and how based on these learning activities can be aligned and integrated into existing curricula.
Availability of learning materials in the national language would be helpful	Point out possibility to translate into national languages and upload back to DID-ACT team (part of license)
Participants worked better together when they knew each other -> importance of providing a good atmosphere	Include that participants should know each other, so an icebreaker event might be helpful before starting any of the learning units, provide some resources
Participants (and facilitators) not familiar with online teaching / learning	Include resources & tips for teaching and learning in a blended learning format

Table 3: Aspects to be included in the integration guideline (D7.3.)

5.2 Specific changes to the learning units

Each development team decided about refining their LU based on the suggestions from participants and facilitators. We summarize these changes in the following section:

LU32 - What is Clinical Reasoning and Models

In this 3-phase learning unit, we moved activities from phase 1 and 2 that focus primarily on teaching participants about theories into an optional phase. To better support self-directed learners and facilitators, we created two videos based on the presentations that are part of the synchronous phases. Additionally, we added content about situativity theory that was not yet covered in this learning unit and the corresponding student units.

LU33 - Information gathering, Generating differential diagnoses, Decision making, and Treatment planning

In this 3-phase LU we moved activities from phase 1 and 2 to an optional phase that focuses primarily on teaching participants about the topics covered in this LU. Thus, the LU now consists of an optional, an asynchronous and a synchronous phase. We also added an introductory quiz to support participants in self-assessing their prior knowledge and phase 2 was adapted to emphasize the teaching focus even more.

LU34 - Person-centered approach and the role of patients
This LU included a substantial amount of activities focusing on knowledge about person-centered-care, presumably leading to lower evaluation results in our pilots compared to other learning units. Therefore, we re-arranged all knowledge-related activities into two optional phases (asynchronous and synchronous) and re-focusing the remaining two phases more explicitly on teaching about person-centered care.

LU35 - Differences and similarities in clinical reasoning among health professions
This learning unit originally included 2 asynchronous and 2 synchronous phases with phase 1 and 2 focusing mainly on teaching participants about the roles of health professions in clinical reasoning. To make this learning unit more focused on teaching, we declared phase 1 and 2 as optional phases, which can be used by facilitators if the prior knowledge of participants is not sufficient. We also decided to replace one of the videos that was part of the asynchronous learning phase and participants had difficulties understanding, with a video created by our team. This will also affect the corresponding student learning unit, where the same video was used. We also added an introductory quiz at the beginning of the asynchronous phase, so that participants can self-assess their knowledge on clinical reasoning in the different health professions.

LU36 - Discussing and teaching about cognitive errors and biases
For the asynchronous phase and the following synchronous phase we changed the focus of the learning unit. Participants are now prompted to prepare and discuss teaching methods for the topic of biases and errors instead of elaborating on biases and errors. To give participants the possibility to self-assess the knowledge required for this learning unit, we implemented an introductory quiz at the beginning of phase 1.

The refined learning units are available in our learning management system Moodle.

6. Conclusions

Despite our best efforts in preparing the learning units, the piloting phase revealed some aspects for improvements concerning content, teaching format, didactics, and the technical implementation. We addressed these aspects with course refinements and considered some of the aspects for our integration guideline (D7.3). Additionally, we will continue the improvement of our learning units based on new evaluation results and feedback from participants and facilitators.