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

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D5.2 Evaluation and analysis of learner activities of the pilot implementations of the train-the-trainer courses

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1. Summary

After several months of production, the DID-ACT train-the-trainer courses for teachers of clinical reasoning (TTT) were ready for pilot testing at partner institutions. We prepared a questionnaire for both participants and facilitators of these courses based on an existing evaluation tool called ETELM. In addition, we monitored participant activity in our learning management system, Moodle, and virtual patient system, CASUS, where training materials for the courses were available. All six academic partner institutions took part in the evaluation. Nine pilot courses were organised across Europe. The courses covered five topics in clinical reasoning teaching. In total, about 100 teachers participated in these courses. Half of them returned their evaluation questionnaires. We also received 12

feedback forms from course facilitators. Several different factors related to the courses were evaluated.

Overall, when asked whether the courses would improve the teaching of clinical reasoning, the average score of responses was 5.8 where 1 means 'Definitely disagree' and 7 means 'Definitely agree'. Respondents liked the overall selection of topics, the small group discussions, the engaged and responsive session facilitators, and the interprofessional learning opportunities. For improvement, it was mentioned the technical navigation of the courses in the learning management system, assessment and feedback on progress, and better tailored content including more examples for health professions other than physicians. In some courses it was suggested that more time should be provided or that more interactivity is needed. When tracking participants' online activities, we noticed a high level of interest in live (synchronous) sessions, but little activity between them or as follow-up. Each course had its own special features that were most popular and included formative knowledge quizzes, links to review student clinical reasoning modules, moderator-led videos, virtual patient cases, role playing, file uploads and discussion boards. The DID-ACT project will prepare an improved version of the courses based on the feedback received.

2. Introduction

The purpose of this deliverable is to summarise the findings from the DID-ACT pilot evaluation of train-the-trainer (TTT) learning units.

3. Quality criteria

- Use of tested instruments for data collection.
- Use of electronic survey tools.
- Possibility for adaptations of the evaluation tools to the needs of partner institutions.
- Option for paper-based data collection.
- Evaluation data from all academic partner institutions.
- Collect a total of at least 25 surveys from participants of the TTT courses.
- Descriptive statistics grouped by learning unit; if there is enough data, subgroup analyses by profession, partner institution.
- Content analysis of free-text comments completed in pairs and reviewed by associated partners.
- Learning analytics based on at least 3 indicators (e.g. number of visitors, type of content, use in time) presented numerically (descriptive statistics) and visually.

4. Methods

4.1. Survey-based evaluation tools for pilot implementations

In deliverable <u>D5.1</u>, we reported the results of a literature review of evaluation tools to measure clinical reasoning outcomes in the student curricula and faculty development programmes. The question items identified formed an inventory to be used to create new evaluation tools. We also identified two validated evaluation instruments to capture the instructor's perspective - one for general faculty development outcomes (SFDP-26) and one for curriculum adoption (CBAM).

The identified evaluation items and instruments will become useful at advanced levels of curriculum implementation. The review of these tools was also helpful in developing learning units on assessment and evaluation of clinical reasoning. However, we noticed that for the purpose of the short-term pilot evaluation of individual learning units, a more flexible tool is needed. One that is capable of capturing participants' responses with a limited number of questions and allowing comparison of responses across different, short learning units of the DID-ACT curriculum.

In our literature search, we came across a tool called 'ETELM' (Evaluation of Technology-Enhanced Learning Materials) developed by David Cook and Rachel Ellaway [Cook15]. This tool comes in three variations: ETELM-LP, ETELM-LP-S, and ETELM-IP. They were developed to evaluate courses from the perspectives of learners in long and short courses, as well as the evaluation of instructors. The ETELM tool was designed based on a theoretical model developed by the authors and informed by analysis and reuse of items from several established evaluation tools [Cook15]. This instrument was validated on a sample of potential users, including both educators and students. The authors allow the tool to be adapted to context and specific situational needs [Cook15].

We initially excluded the ETELM instrument from our considerations due to its seemingly strong technology orientation. Yet, upon a closer examination, it became apparent that only a few items directly refer to technology. Moreover, partially due to natural development, partially due to the spread of the COVID-19 pandemic, the role of technology-mediation has increased. All DID-ACT learning units in the student curriculum and TTT courses are available in the project learning management system (LMS). As such, we chose the ETELM questionnaires as our standard evaluation tool in the learning unit template in the project's LMS.

The original ETELM instrument was adapted to the needs of the DID-ACT project during several rounds of online and offline discussions by project representatives. These rounds included a psychologist, as well as experienced educators and researchers. We decided to add some introductory demographic questions to the form. These included the name of the evaluated learning unit (automatically completed in the LMS), the institution, age, program of study, and gender of the respondent. We consistently changed the word "course" in the

questionnaires to the term "learning unit", which is uniformly used in the DID-ACT curriculum. Furthermore, the word "practice" was changed to "clinical reasoning" to clarify what type of practice is meant (e.g. "This learning unit will change my practice" -> "This learning unit will improve my clinical reasoning"). Open-ended (free-text) questions were preceded by an additional instruction, aimed at encouraging the respondents to answer in their native language if they felt more comfortable.

We took the shorter version of the ETELM-LP-S tool as the basis of the participant questionnaire to save time for the respondents. This also avoided overloading them with too many questions. The basic set of items was expanded by adding three items from the longer version of the tool (ETELM-LP) that we considered particularly relevant:

- (ETELM-LP.12). "Educational activities encouraged interaction and collaboration with other participants"
- (ETELM-LP.14). "The learning unit effectively blended online and face-to-face elements."
- (ETELM-LP.16). "Assessments (e.g. tests and self-assessments) were appropriate for the learning unit objectives, content, and activities."

We have added an additional item to the train-the-trainer version of ETELM-LP-S tool asking directly about perceived change in teaching practice:

• "This learning unit will improve my teaching of clinical reasoning."

At the special request of instructors from one of the partner institutions, we also prepared a translated version of the adapted ETELM-LP-S tool in Polish. We offered the possibility to create national language versions for other partners as well. The Polish version was validated by a group of five testers. Additional minor linguistic corrections were made until a consensus was reached regarding quality.

An additional Likert-scale question was added to the Polish version of the ETELM-LP-S questionnaire for the LU32 train-the-trainer course. This question explicitly asked about language preferences for the training materials:

• "The training materials presented in English in the learning unit made it difficult for me to understand the course content." (the item was available only in Polish)

In the instructor perspective questionnaire (ETELM-IP), we changed the age-related question in the added demographic section. Instead, we asked about the number of years of experience as a teacher in higher education. We slightly reordered the questions to match the themes: objectives, technology, learning activities, assessment/ feedback, follow-up and impact. We omitted questions related to the availability of technical tools because we felt they were not applicable to our situation.

The adapted evaluation tools were implemented in the LimeSurvey tool (ETELM-LP-S: Fig. 1, Fig. 2 and ETELM-IP: Fig. 3) and are available on-line:

- ETELM-LP-S (for participants in TTT courses) <u>https://survey.instruct.eu/index.php/588891?LU=40&newtest=Y&lang=en</u>
- ETELM-IP (for facilitators of TTT courses) https://survey.instruct.eu/index.php/471319?LU=40&newtest=Y&lang=en

The LU parameter in the URL allows the form to be pre-filled with the learning unit identifier. The term "LU40" stands for a test unit and these recordings are discarded from the analyses.

Load unfinished survey	Language: English 👻		Resume later 🛛 Language: English 👻
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This is an adapted version of the ETELM-LP-S evaluation tool by Cook DA, Ellaway RH. I	Med Teach. 2015;37(10).	Your answer must be between 18 and 100	
There are 13 questions in this survey.	Next		25

Fig. 1. Introductory screens of the ETELM-LP-S evaluation form implemented in LimeSurvey

In the context of which health profession study programme are you using the learning unit?

Č	LimeSurvey				nguage: English 👻					
			Ev	aluation	n 1/3		80%			
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	*Objectives							If you prefer you may answer free text questions in your native language.		
		7 (strongly agree)	6	5	4		2	1 (strongly disagree)	n/a	How could the quality of the learning unit be improved? What would you change, remove, or add? Please describe and explain.
	Instructions provided a good intro- duction to the learning unit (e.g., how to get started, where to find various learning units components, how to obtain technical support if needed, etc.).	structions provided a good intro- duction to the learning unit (e.g., how to get started, where to find urious learning units components, how to obtain technical support if needed, etc.).								

Fig. 2. Examples of Likert and open-ended questions in the ETELM-LP-S evaluation form.

	imeSurvey								
06	*Learning activities								
DID-ACT's instructor perceptions form		7 (strongly agree)	6	5	4	3	2	1 (strongly dis- agree)	n/a
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instructor in this learning unit an opportunity to evaluate its quality from the teacher's perspective. Please share your experience from this learning unit with us so that we may continue to improve. Select "ha' (not applicable) in case a question is not relevant in your context.	The educational activities promoted participants' achievement of the learning unit objectives.		٠						
This is an adapted version of the ETELM-IP evaluation tool by Cook DA, Ellaway RH. Med Teach. 2015;37(10).	I was able to contribute a personal presence / personal touch during the learning unit's development and/or delivery.		٠						
There are 15 questions in this survey.	Educational activities encouraged participants' interaction and collabo- ration.	۲							
Next	The learning unit effectively blended online and face-to-face elements.					٠			

Fig. 3. Example screens of the adapted ETELM-IP evaluation tool implemented in LimeSurvey.

To improve the accessibility of the evaluation form, we have included it as a standard element of the learning units in the learning management system Moodle (Fig. 4).

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Clinical reasoning and	Î	References	۲
Participants		Recommened Further Reading	
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I Grades			•
🗅 General		Q Your feedback about this learning unit	
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Fig. 4. Integration of the ETELM-LP-S survey with the TTT learning units in Moodle

Additionally, at the request of some partners who wanted to increase the response rate to the questionnaire, we prepared a paper version of the ETELM-LP-S questionnaire. This was done in English and Polish (Fig 5., available as appendix 1 and 2).

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Fig. 5. Paper version of the adapted ETELM-LP-S questionnaire.

4.2. DID-ACT learning analytics infrastructure

DID-ACT is a blended learning curriculum, with activities performed in a digital learning environment and offline face-to-face setting. Learning analytics methods are limited to the digital part of the curriculum.

The digital content of the DID-ACT curriculum is available on two learning platforms:

- Moodle (for storage of didactic materials, external references, videos and hosting learning activities like quizzes or discussion forums)
- CASUS (for storage of virtual patients).

In the learning management system "Moodle", learner activities are logged as events. Events are "atomic pieces of information describing something that happened in Moodle" [Moodle]. Each event is associated with a specific user and grouped by partner institutions. Events can be classified in several categories depending on the type of element of the platform in use. The categories can be divided into two types:

- Resources (System, Tour, File, Page, URL) which denotes learning methods like reading files or text documents available on the platform or following links to external resources. Tour events are generated by a tutorial introducing the user to the platform. System events are generated when the learner e.g. opens a course or marks parts as completed. If text or video is directly displayed in the main course window, it is impossible to capture whether the learner has read a section unless they mark a section explicitly as completed.
- Activities (Assignment, File submissions, Forum, Online text submissions, Quiz, User report, VP) - represent user actions like answering questions, uploading files or on-line discussion.

The list of recorded events can be filtered, summarised using basic analytic functionality, and downloaded for external analysis from a dashboard (Fig. 6).

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Fig. 6. Moodle dashboard for learning unit LU35 on the DID-ACT platform.

Learning analytics in CASUS are available through a learning analytics dashboard. It is possible to record time spent on the cases, completion status (how many cards were visited) and success rate in knowledge questions.

4.3. Analysis

4.3.1. Survey research

The data from ETELM questionnaires were analysed quantitatively using Microsoft Excel to calculate descriptive statistics.

For qualitative data from open ended responses we performed a content analysis. Opinions submitted in languages other than English were translated in the preprocessing stage. This was done in collaboration with project participants for whom said language is their mother tongue. We coded participant utterances with categories proposed in D3.2 (Didactical, Content, Technical, Interaction/ Collaboration, Implementation/ Time, Implementation /Facilitators) extended by adding three more categories (Content/Assessment, Overall and Others). For each statement we coded additionally the valence of the statement as positive, negative or neutral. All data was processed anonymously. The coding was double-checked by a second coder and disagreements were solved by consensus.

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3	2	LU32	P1	For me, the learning unit was very well designed at [+]Overall [-]Imp/Time		
4	3	LU32	P1	In the second part it was difficult to discuss in the <code>f[-]Inter/Collab = [-]Imp/Time = </code>		
5	4	LU32	P1	45min was too short for deep discussions during gr [-]Imp/Time 🔹 [-]Technical 🔹	[-]Content/As	
6	5	LU32	P1	Great learning unit [+]Overall 🔹		
7	6	LU32	P1	I would add more text material to expand on the ir [#]Content/Cc 🔻 💌		
8	7	LU32	P1	[Instructor] conducted the workshop in a very eng [+]Imp/Facilit 🔹 🔹		
9	8	LU32	P1	It was great :) [+]Overall 🔻		
10	9	LU32	P1	Everything is very interesting and opens new persp [+]Overall		
11	10	LU32	P1	I would not change anything [+]Overall		
12	11	LU32	P1	Clearer navigation in the online module [-]Technical		
13	12	LU32	P1	Make sure all platform features are well suited for [-]Technical		
14	13	LU32	P2	The comments from [Instructor] were very import [+]Imp/Facilit • [+]Inter/Collat •		
15	14	LU32	P2	For me, the alternation between short lectures and [+]Didactical 👻 [+]Inter/Collat 💌		\checkmark
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Fig. 7. Qualitative content analysis of open ended responses in ETELM-LP-S and ETELM-IP surveys.

4.3.2. Learning analytics

A system log of all events related to the piloted TTT learning units was exported from the Moodle dashboard. We have excluded all events generated by teachers and test users from the statistics. Next we analysed the data in Microsoft Excel using Pivot Table and visualised business graphics.

We have also summarised the number of visited virtual patient cases, completion status and time spent on learning from CASUS.

5. Results

5.1 Survey results

5.1.1 Pilot TTT implementations

The following TTT learning units (including identifiers) were pilot evaluated by the DID-ACT consortium in the time frame from September to October 2021:

• What is clinical reasoning & how to put theories into practice (LU32)

- Information gathering, generating differential diagnoses, decision making, and treatment planning (LU33)
- Person-centred approach and the role of the patient (LU34)
- Health Professionals' roles in clinical reasoning (LU35)

An additional TTT pilot evaluation was conducted on December 10, 2021 (because of logistical reasons) and was included in the report as well:

• Application of clinical reasoning teaching and assessment methods (LU37)

An overview of the TTT pilot implementations carried out is presented in Table 1. In total, this corresponded to 9 courses piloting 5 topics conducted at all 6 academic institutions of the DID-ACT project. There were 98 faculty members enrolled as participants of formal or informal continuing professional development in their skills as health professional teachers from 13 higher education institutions. This institutions included: Bildungszentrum Pflege Bern, Charite Berlin, EDU, Jagiellonian University, Karolinska Institutet, LMU München, Örebro University, Sophiahemmet University, University Mannheim, University of Augsburg, University of Bern, University of Frankfurt, University of Maribor.

The first reactions of the facilitators of those courses were presented in deliverable D3.2. This deliverable reported the impression of the participants and facilitators as stated in ETELM-LP-S and ETELM-IP surveys.

ID	Торіс	Pilot lead	Number of participants	Participant Institutions	Professions	Dates
32	What is clinical reasoning & how to put theories into practice	JU	11	Jagiellonian University	Medicine, Paramedics, Nursing	Oct 6th - Oct 13th
		UBERN	21	University of Bern, Master of Medical Education students	Medicine	Oct 10th - Oct 18th
33	Information gathering, generating differential diagnoses, decision making,	JU	7	Jagiellonian University	Medicine, Paramedics	Oct 28th - Nov 4th
	and treatment planning	UBERN	6	University of Bern	Medicine	Oct 19th - Oct 26th
		MFUM	6	University of Maribor	Medicine and preclinical educators	Oct 20th - Oct 27th
34	Person-centred approach and the role of the patient	EDU	7	EDU	Medicine	Sep 28th - Oct 5th
35	Health Professionals' roles in clinical reasoning	UAU	10	University of Augsburg University of Frankfurt University Mannheim Bildungszentrum Pflege Bern Charite Berlin LMU München	Medicine, Nursing, Medical Students	Oct 7th - Oct 21st
		ORU	8	Örebro University, Karolinska Institutet, Sophiahemmet University	Medicine, nursing physiotherapy, biomedical science	Oct 4th - Oct 13th
37	Application of clinical reasoning teaching and assessment methods	UBERN	22	University of Bern	Medicine	Dec 10th

Table 1. Overview about topics, participants, and dates of the conducted TTT pilots

5.1.2 Participants' perspective (ETELM-LP-S)

Overall statistics

We have collected in total 56 TTT participant ETELM-LP-S responses. Considering that the total registered participation in the pilots was 98 participants, it resulted in a 57% response rate. The average age of the respondent was 38.7 years (range [18-55], four answers not given). Most of the respondents were women (79%) and came from human medicine (75%). We have received in total 96 free text comments for three open-ended questions. Out of these open-ended questions, 16 were submitted in national languages other than English (i.e. German, Polish, Swedish) and were translated with the assistance of native speakers to English for a uniform analysis.

A summary of demographic data of responding TTT course participants is presented in Table 2.

Variable	Values	n						
Gender	Female	44						
	Male	11						
	Not disclosed, other	1						
Learning unit	What is clinical reasoning & how to put theories into practice (LU32)	15						
	Information gathering, generating differential diagnoses, decision making, and treatment planning (LU33)	8						
	rson-centred approach and the role of the patient (LU34)							
	Health Professionals' roles in clinical reasoning (LU35)	11						
	Application of clinical reasoning teaching and assessment methods (LU37)	16						
Institution	EDU	6						
	Jagiellonian University	13						
	University of Augsburg	3						
	University of Bern	24						
	University of Maribor	2						
	University of Örebro	4						
	Other	4						
Profession	Human medicine	42						
	Nursing	6						
	Other	8						

Table 2.	Summary	of demographic	data of responding	g TTT	courses	participants
	,			<i>_</i>		

Table 3 presents average ratings of all evaluated learning units. In general, the courses were rated highly with an average in particular aspects in the range from 5 to 6 out of 7 Likert-scale points. Learning unit LU34 was less favourably graded in the pilot.

Theme	Question	LU32	LU33	LU34	LU35	LU37	Total
	Responses:	n=15	n=8	n=6	n=11	n=16	n=56
	of enrolled:	32	19	7	18	22	98
	Response rate:	47%	42%	86%	61%	64%	57%
Objectives	Instructions provided a good introduction to the learning unit (e.g., how to get started, where to find various learning units components, how to obtain technical support if needed, etc.).	6.33	5.86	4.00	5.45	5.93	5.66
	Learning unit objectives, expectations, and policies were clearly stated.	6.27	6.50	4.17	5.73	6.00	5.91
	Learning unit objectives were relevant to my needs.	6.53	6.13	3.80	5.36	6.44	5.91
Technology	Navigation of the technology-based components of the learning unit was logical, consistent, and efficient	5.58	5.86	3.83	4.27	6.22	5.08
	The learning unit technologies and media supported the learning objectives.	6.00	5.86	4.83	4.64	6.44	5.48
	I had significant computer / technical problems during this learning unit. (negative answer is better; if agree, please explain at the end of the survey)	1.64	1.17	2.00	2.73	2.00	1.91
Learning	The educational activities encouraged engagement with learning unit materials / content.	6.33	6.14	3.80	5.90	6.38	5.95
activities	The educational activities promoted achievement of the learning unit objectives.	6.40	6.43	3.80	5.40	6.50	5.91
	Educational activities encouraged interaction and collaboration with other participants	6.21	6.71	3.00	6.00	6.56	6.00
	The learning unit effectively blended online and face-to-face elements.	6.25	6.50	2.75	5.89	6.30	5.70
Assessment/ Feedback	Assessments (e.g. tests and self-assessments) were appropriate for the learning unit objectives, content, and activities.	5.50	6.20	2.33	5.00	6.25	5.28
	I had sufficient opportunity to assess and reflect upon my learning progress.	5.20	5.50	3.20	5.22	6.20	5.12
	I received adequate feedback on my learning progress.	6.00	5.40	2.67	4.38	5.78	5.04
	I received adequate support for any questions or concerns I had about my learning.	6.47	6.67	3.75	6.00	6.38	6.13
Impact	This learning unit will improve my clinical reasoning.	6.21	5.43	3.80	5.78	5.88	5.63
	This learning unit will improve my teaching of clinical reasoning.	6.27	6.00	3.00	6.00	6.44	5.83
	The overall quality of this learning unit was excellent.	5.87	5.86	2.40	5.11	6.20	5.38
	The overall effectiveness of the instructor(s) was excellent.	6.53	6.29	2.75	5.67	6.20	5.93

Table 3. Ratings of the ETELM-LP-S questionnaire items in all evaluated learning units

The key message from the Likert scale items in the ETELM questionnaire is that in the perception of TTT course participants the learning units in fact improved their clinical reasoning teaching skills \bar{x} =5.8 of 7 (in 4 out of 5 learning units this item was rated ≥6) and overall quality \bar{x} =5.4. Most valued were adequate support for questions (\bar{x} =6.1), collaborative aspects and engagement of the content (\bar{x} =6.0) and effectiveness of instructors (\bar{x} =5.9). The most poorly graded, even though still positive, were technical aspects related to navigation in the modules (\bar{x} =5.1). Respondents sporadically reported technical problems (in inverted scale: \bar{x} =1.9), feedback on progress (\bar{x} =5.0) and opportunities for reflection (\bar{x} =5.1).

We also summarised quantitatively the valence of free text responses to open-ended questions from the content analysis (Fig. 8). The content analysis corroborates the opinion acquired with Likert-scale questions with an overall positive attitude to the courses. The special strengths were connected to collaborative aspects and facilitators. Negative with technical aspects. For some learning units, time and some course content & didactics related issues were highlighted. In the following sections we summarise the findings regarding individual learning units.

		LU32			LU33			LU34			LU35			LU37		
Code	+	#	-	+	#	-	+	#	-	+	#	-	+	#	-	
Didactical	2	0	1	2	0	0	0	0	0	1	0	3	5	0	2	
Content/Course	2	2	1	0	2	4	3	0	1	4	5	5	3	2	3	
Content/Assess	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	
Technical	0	0	3	0	1	0	0	0	2	0	0	5	1	0	0	
Inter/Collab	6	0	1	6	1	1	0	0	2	7	0	1	1	1	0	
Imp/Time	0	0	5	0	0	0	0	0	1	0	0	0	0	0	0	
Imp/Facilitators	4	0	0	1	0	0	0	0	0	2	0	0	0	0	0	
Overall	7	0	0	3	0	0	0	0	0	1	0	0	2	0	0	
Other	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
Total valence	25	2	12	12	4	5	3	1	6	15	5	15	12	3	5	

Fig. 8. Valence of free text comments by participants and facilitators across categories from the content analysis.

Legend. Inter/Collab - Interaction/Collaboration; Imp - Implementation. [+] positive; [#] neutral and [-] negative valence of the comments. LU32: What is clinical reasoning & how to put theories into practice. LU33:Information gathering, generating differential diagnoses, decision making, and treatment planning. LU34:Person-centred approach and the role of the patient. LU35: Health Professionals' roles in clinical reasoning. LU37: Application of clinical reasoning teaching and assessment methods.

What is clinical reasoning & how to put theories into practice (LU32)

This learning unit was evaluated at two institutions: Jagiellonian University (n=11 survey responses) and the University of Bern (n=4 responses). All except one respondent were from human medicine. The single exception was a nurse participating from Jagiellonian University. The detailed results of the ETELM-LP-S questionnaire are presented in Table A1. The element that was assessed as being the best was the overall effectiveness of the instructors. The poorest area was the opportunity to assess and reflect upon the learning progress.

For this learning unit an additional Likert scale question was proposed at Jagiellonian University asking the participants whether "The training materials presented in English in the learning unit made it difficult for me to understand the course content". This question was answered by n=11 participants. Eight strongly disagreed or disagreed with the statement, three strongly agreed or somewhat agreed (average 2.45). The conclusion is that the majority of participants work with English language literature very well. However, there is a small group of participants for whom foreign language might be a barrier in development of teaching skills.

The participants left 26 free text comments that were tagged with 35 codes. Most of them were positive opinions related to particular elements of the learning units (n=23), whereas 12 codes related to requested improvements.

Positive elements	Negatives and requests for extension						
 + Overall positive impression (n=7) + Engaged/skillful facilitators (n=4) + Possibility to collaborate/interact (n=4) 	 Not enough time (n=4) Technical challenges with the learning management system (confusing, difficult to navigate) (n=3) 						

Other comments included judging the quiz as "too easy" which was balanced with one positive statement praising its usefulness. One participant commented about insufficient preparation of fellow participants to classes.

Information gathering, generating differential diagnoses, decision making, and treatment planning (LU33)

This learning unit was evaluated at three institutions: University of Bern (n=4 responses), Jagiellonian University (n=2 responses), and the University of Maribor (n=2 responses). All respondents declared their background in human medicine (one answer not given). All except one were female. The detailed results of the ETELM-LP-S questionnaire are presented in Table A2. The learning unit was most popular because the educational activities encouraged interaction and collaboration and the participants felt they were adequately supported with answers to their questions. Relatively less favourably graded was the possibility for long term reflection and feedback.

There were only 7 free text responses by the participants to which we assigned 10 codes. The great majority of the comments were positive overall, with some emphasising the possibility to collaborate in small groups and good educational methods. There were two requests for improvements regarding the need for more homogenous groups in terms of level of knowledge and more medical discipline specific examples (e.g. internal medicine, surgery, etc). Both are difficult to implement in small groups of participants.

Positive elements	Negatives and requests for extension
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Person-centred approach and the role of the patient (LU34)

This learning unit was evaluated at EDU. Six questionnaires were returned. Three participants were female, two male, in one questionnaire the respondent decided not to answer. All represented human medicine. The detailed results of the ETELM-LP-S questionnaire are presented in Table A3. The best grade was regarding the motivational learning content. The respondents also suggested some overall problems with the learning unit which were in particular visible in questions related to feedback and assessment activities.

We received five open-ended comments to which we assigned 7 codes. Four of the comments were rather critical. One of the respondents claimed there were redundancies of the learning unit with the local curriculum that is implemented in PBL (problem-based learning) sessions. There were also requests for more interactivity and more time for technical orientation. The participants praised the role playing activity and interesting design of patient cases as positive aspects of the course.

Positive elements	Negatives and requests for extension						
 + Role playing activity (abilities exercise) (n=1) + Interesting design of patient cases (n=1) 	 More interactivity needed (n=2) Potential redundancies with the local curriculum (n=1) More time for technical orientation in the learning management system (n=1) 						

Health Professionals' roles in clinical reasoning (LU35)

This learning unit was evaluated at University of Örebro (n=4 respondents), University of Augsburg (n=3) and additionally, the pilot had participants coming from associated partner institutions in Germany, Sweden and Switzerland (n=4 responses: Karolinska Institutet, CSK, LMU Munich, BZ-Pflege Bern). The audience was interprofessional with six participants with medical background and five representing other professions (nursing, biomedical analysts, radiology). The majority of the respondents were female (n=9) with two male respondents. The detailed results of the ETELM-LP-S questionnaire are presented in Table A4. Similar to the learning unit on Information gathering, generating differential diagnoses, decision making, and treatment planning (LU33), the strength of the learning unit was engagement in collaboration with others and supported by good answers to the posed questions. A problem was the technical infrastructure and content/technical implementation that was not always aligned well with the learning objectives. The participants also lacked long term feedback on progress in learning.

The respondents submitted 18 free text comments. We assigned 12 positive codes, 9 negative and 5 neutral. Positives were mainly related to the possibilities of interprofessional learning, interesting content and engaged facilitators. The negative and neutral comments also related to the content. They were described as potentially missing content and sometimes also suggestions to decrease the amount of content. There were also technical challenges and negative sentiments towards the learning management system, Moodle.

Positive elements	Negatives and requests for extension						
 + Possibility of interprofessional collaboration (n=5) + Good learning content (n=4) + Engaged facilitators (n=2) 	 Content should be better adjusted to particular professions given (e.g. biomedical analyst) (n=3) Neutral suggestions to change the amount of content (increase/decrease) (n=5) Technical challenges with the learning management system (difficult to navigate, dislike) (n=3) 						

LU37. Application of clinical reasoning teaching and assessment methods

This learning unit was evaluated at University of Bern only with a total of n=16 feedback responses as part of the Masters of Medical Education programme. Nine respondents declared their background in human medicine. There were three nurses enrolled. The remaining participants selected background: three education and one chiropractic medicine. There were 13 female and three male participants. The detailed results of the ETELM-LP-S questionnaire are presented in Table A5. The learning unit was most popular because the educational activities encouraged interaction and collaboration and the participants felt the educational activities promoted achievement of the learning unit objectives. Relatively less favourably graded was the possibility to receive feedback.

There were eight free text responses by the participants to which we assigned 15 codes. The majority of the comments were positive, with many praising the importance of the topic and regarded the module as very interesting. It was suggested this learning unit should be a mandatory part of the MME program. The participants liked the role playing exercise and division in breakout rooms for discussion. There were individual requests for improvements regarding some adjustment in the presented cases, lower expectation from the learner in the beginning and suggestion for more summary materials as take-away.

Positive elements	Negatives and requests for extension						
 + Overall relevant content (n=6) + Role playing activities (n=3) + Breakout room discussion (n=1) 	 Adjustments in content (n=3) Didactical approach (n=2) 						

5.1.2 Instructors' perspective

We have collected in total 12 facilitator ETELM-IP questionnaires (Table 4 and 5). Most of the facilitators were in general satisfied with the quality of learning units (\bar{x} =5.6 out of 7). They were, at the same time, all very open to implementing participant feedback (\bar{x} =6.5). As in the participants' responses, facilitators noted some technical problems with the use of the learning management system, including difficult navigation (\bar{x} =4.75). Most of the respondents did not use assessment in their pilots. However, those who rated the assessment opportunities were satisfied.

We received 32 free text comments from course facilitators to three open-ended questions. In the following sections we summarise the findings regarding individual learning units.

What is clinical reasoning & how to put theories into practice (LU32)

Facilitator opinion matched that of the participants regarding the strongest points of the learning unit: small group activities. One of the facilitators supported the opinion of some of the respondents that availability of learning materials in the national language is helpful. There were also suggestions to add more clinical examples to the learning unit.

Information gathering, generating differential diagnoses, decision making, and treatment planning (LU33)

Interestingly, for this learning unit we have received more comments from the facilitators (n=11) than participants. The facilitators agreed that the presentation slides needed improvement, mainly to reduce the excessive amount of text. Facilitators, similar to the participants, enjoyed small group activities but in one case the number of participants was too small to stimulate meaningful discussion which reduced interactivity. We also noticed echoes of the participants' comments that the examples in this learning unit have to be very specific to be useful and the range of covered disciplines need to be broader.

Person-centred approach and the role of the patient (LU34)

The facilitator from EDU who filled in the questionnaire recognised similar strengths of the learning unit as the participants. These were: the role playing exercise and engaging patient cases. As the main point of improvement the facilitator recognised the need for better familiarisation of the participants with the software components of the curriculum: Moodle and CASUS.

Health professionals' roles in clinical reasoning (LU35)

We have received 9 comments from facilitators. The facilitators noted that international representation was one of the learning unit's strengths. Similar to the participants, they recognised the value of interprofessional discussions despite their pilot implementation having been stated by one participant as lacking nurses. In addition, it was expressed that

some of the content in a few learning materials could be improved for non-medical professions, and that the videos could be shortened. It was also suggested to provide a better introduction to the Moodle platform.

Application of clinical reasoning teaching and assessment methods (LU37)

The two facilitators from University Bern who filled in the questionnaire reported they adapted the learning unit substantially to the need of their setting and suggested that the modified learning unit could inform the refined version of the module. The strengths are the practical exercises including role playing. There is potential for some minor improvements in the used case examples to adjust them better to workplace-based education.

L	32		33				34	35			37		_	
Question	lestion Institution		JU	UBI			JU	EDU	UAU		ORU	UBERN		Avrg
Instructions provided a good introduction to tunit	the learning	n/a	7	n/a	n/a	5	5	6	6	4	4	7	6	5.56
Learning unit objectives were relevant to par needs.	rticipant	6	7	6	5	4	7	7	3	5	4	7	6	5.58
Navigation of the technology-based components of the learning unit was logical, consistent, and efficient			5	n/a	n/a	7	5	5	4	5	3	n/a	n/a	4.75
The learning unit technologies and media su learning objectives.	4	7	n/a	n/a	7	6	6	6	5	4	n/a	n/a	5.63	
The learning unit required that participants possess inappropriately high computer skills. (negative answer is better; if agree, please explain below)			2	n/a	n/a	2	1	3	1	2	3	n/a	n/a	2.25
The educational activities encouraged participants' engagement with learning unit materials / content.			7	6	5	5	4	6	3	5	5	7	7	5.50
The educational activities promoted participants' achievement of the learning unit objectives.			7	6	5	6	4	6	5	5	6	7	7	5.83
I was able to contribute a personal presence / personal touch during the learning unit's development and/or delivery.			7	6	6	7	6	7	n/a	5	6	7	7	6.36
Educational activities encouraged participants' interaction and collaboration.			7	6	6	6	5	6	5	6	6	7	7	6.08
The learning unit effectively blended online and face-to-face elements.			7	n/a	n/a	5	6	6	6	6	6	n/a	n/a	6.00

Table 4. Facilitator ratings of the pilot TTT learning units (Part 1/2)

L	32		33				34	35			37			
Question	Institution	UBER N	JU	UBERN MFUM JU		EDU	U	۹U	ORU	UBERN		Avrg		
Face-to-face activities contributed meaningfue achieving the learning unit objectives.	6	7	6	7	6	6	7	6	6	6	7	7	6.42	
Assessments (e.g. tests and self-assessmer appropriate for the learning unit objectives, o activities.	n/a	7	n/a	n/a	n/a	7	7	n/a	n/a	n/a	n/a	6	6.75	
Learner assessments and provision of feedback proceeded smoothly (i.e., no unforeseen problems).			7	6	n/a	n/a	5	5	n/a	n/a	n/a	7	6	6.00
I was able to provide adequate support to students for questions or concerns about their learning.			7	6	5	6	6	6	5	n/a	5	7	7	6.00
I plan to use learner feedback to improve the	e learning unit.	6	7	6	5	7	7	7	7	7	6	7	6	6.50
The learning unit will be easy to maintain and deliver again.			7	6	6	6	7	7	4	5	6	7	6	6.08
It will be easy to re-use of all or part of the learning unit materials in other, future courses.			7	6	6	6	7	6	6	6	5	5	6	6.00
The learning unit was a good use of time and resources.			7	6	5	5	7	7	6	6	6	7	6	6.17
The overall quality of this learning unit was e	xcellent.	6	7	5	4	5	6	7	5	5	5	6	6	5.58

Table 5. Facilitator ratings of the pilot TTT learning units (Part 2/2)

Legend. LU32: What is clinical reasoning & how to put theories into practice. LU33:Information gathering, generating differential diagnoses, decision making, and treatment planning. LU34:Person-centred approach and the role of the patient. LU35: Health Professionals' roles in clinical reasoning. LU37: Application of clinical reasoning teaching and assessment methods.

5.2 Learning analytics

5.2.1 Data collected

We have analysed events recorded in Moodle for five learning units. Excluded from learning analytics was one learning unit (LU37) that was conducted face-to-face only without taking advantage of the technical infrastructure of the DID-ACT project. The analysed timeframe was September 27th - November 30th, 2021, which corresponds to the planned dates of TTT pilots and three weeks' follow-up. The total number of user events in that time was 1864. The bulk of activities were recorded until November 10th. After that day and until the end of November, we recorded only 29 user events which demonstrated little interest in follow-up activities. The course that recorded the most user events was 'Health professionals' roles in clinical reasoning' (LU35) with 1370 and also had the most unique participants registered to the platform n=22. The lowest activity on Moodle was recorded in 'Information gathering, generating differential diagnoses, decision making, and treatment planning' (LU33) with 59 events and 5 enrolled participants.

5.2.2 Types of participants

We classified the on-line engagement of the TTT course participants into three groups:

- Bounced visitors who only briefly visited the learning unit on Moodle and then left performing in total less than 5 actions (events).
- Sporadic visitors who seemed to have completed the requested activities, but did not engage with the content for a longer time. We took as a cut-off value a threshold of less than 25 events that reflected natural clustering of values.
- Frequent visitors who appeared to be deeply engaged as revealed by generating at least 25 events in the learning management system.

The results are presented in Table 6 and Figure 9. The learning unit that managed to engage the participants the most in online activities in Moodle was clearly the course on 'Health professionals' roles in clinical reasoning' (LU35). Most of the participants in the rest of the TTT pilots engaged sporadically in the learning management system.

	Events	Number of visitors											
LU	Total	Total	Bounced	Sporadic	Frequent								
32	247	14	1	10	3								
33	59	5	1	4	0								
34	188	14	0	12	2								
35	1370	22	0	5	17								

Table 6. Types of participants in TTT on-line learning units

Visitors: bounced: events < 5; sporadic: $5 \le$ events < 25; frequent: events ≥ 25 . LU32: What is clinical reasoning & how to put theories into practice. LU33:Information gathering, generating differential diagnoses, decision making, and treatment planning. LU34:Person-centred approach and the role of the patient. LU35: Health Professionals' roles in clinical reasoning. LU37: Application of clinical reasoning teaching and assessment methods.



Fig. 9. Comparison of type of visitors across piloted TTT learning units

5.2.3 Elements in use

The next analysis focused on course elements that were most frequently used by the pilot participants (Table 7). The results showed an interesting distribution of usage patterns with each learning unit having its characteristic elements.

			R	esource	es	_	Activities								
LU	Total Events	System	Tour	File	Page	URL	Assign ment	File subm.	Forum	O. text subm.	Quiz	User report	VP		
32	247	36%	13%	8%	0%	11%	0%	0%	7%	0%	24%	0%	0%		
33	59	71%	17%	0%	2%	10%	0%	0%	0%	0%	0%	0%	0%		
34	188	47%	25%	0%	0%	18%	0%	0%	1%	0%	0%	0%	9%		
35	1370	40%	3%	3%	2%	2%	12%	2%	35%	2%	0%	0%	0%		

Table 7. Types of elements in use on the DID-ACT Moodle platform

subm. - submission; o. text - on-line text. LU32: What is clinical reasoning & how to put theories into practice. LU33:Information gathering, generating differential diagnoses, decision making, and treatment planning. LU34:Person-centred approach and the role of the patient. LU35: Health Professionals' roles in clinical reasoning. LU37: Application of clinical reasoning teaching and assessment methods.

For the learning unit on 'What is CR & Models & Theories' (LU32), a quarter of events were generated by a quiz functionality which enabled participants to test their knowledge after learning the theoretical content. It showed a clear need for formative testing which was

offered only by this TTT learning unit. The participants also took advantage of files which were shared by the instructors and followed links to other modules. This corresponds to the tasks given to the participants which involved reviewing learning units from the student curriculum in search for how theory was applied in practice of teaching. Consequently many participants left the module to explore content in different locations on Moodle which is not covered by the learning unit statistics and by that underestimates the on-line activity of the learners.

In the learning unit on "Information gathering, generating differential diagnoses, decision making, and treatment planning" (LU33), most events were recorded as system events. In a more thorough analysis, it became clear that this might reflect the way how the course was implemented on Moodle. The characteristic feature of this LU is a long page divided into sections illustrated with directly embedded videos developed by a DID-ACT instructor. The advantage of such a structure is that it enables a straight forward ebook-like view of the content. This has, however, the disadvantage for learning analytics purposes in that engaging with content like reading a text passage does not generate specific events in Moodle. This remains true for the playback of videos. If the videos are directly embedded in the main page, and not in subpages, they are not logged as separate learning events. Most of the recorded events are the opening and closing of the start page, which does not inform us what happened in the time between those events. This has likely led, similar as in "What is clinical reasoning & how to put theories into practice" (LU32), to an underestimation of participant activities for this unit.

The strength of the learning unit on "Person-centred approach and the role of the patient." (LU34), were the virtual patient cases, which were enabled for this learning unit in the pilots only. The participants were offered three virtual patients in the CASUS learning environment enabling practice of a person-centred approach in clinical reasoning. This was also the course which had the highest ratio of using external links. In total those two elements covered approximately one fourth of system events. In total, 12 CASUS virtual patient sessions were recorded. In nine sessions the virtual patient case was completed, in three the participant left the case before it was solved. Table 8 presents the average time on task of the participants and success rate in knowledge questions in the virtual patient sessions. On average, the participants that used virtual patients spent more than half an hour on solving the cases.

Case	Sessions	Time in (avg) [min]	Success rate (avg) [%]
Gerry Wild	4	17:44 ± 12:53	50%
Nils Ahlstrom	4	07:34 ± 01:31	50%
Sandra Guterres	4	16:32 ± 16:32	75%

Table 8. Virtual patient activities in learning unit "Person-centred approach and the role of the patient" (LU34)

Finally, the learning unit on "Health professionals' roles in clinical reasoning" showed a dominance of events that required participants to take an active role in the digital environment; they had to construct their responses directly in the learning management system. This included participation in conversations on discussion boards, submission of free text responses to assignments and uploading file reports. Engagement with static resources such as reading subpages, downloading files and following external links were recorded as well and covered 7% of events. They appear less important because of presenting values as percentage, but when converted to absolute numbers, they amount to approximately 100 events. This corresponds to 5 explored subpages, downloaded files or external links opened by each participant in this learning unit.

5.2.4 User activities distributed in time

We were also interested in looking at how the participants' activities were distributed in time. Figure 10 presents the frequencies of events for the piloted TTT courses.

For most of the learning units the events were accumulated in peaks of activities which correspond to the days of synchronous sessions as reported in table 1. Only the LU on "Health professionals' roles in clinical reasoning" (LU35) managed to retain substantial sustained activities in-between the learning sessions. It was typical for our pilots that once the last session is completed, the activities virtually ceased in the learning management system.

DID-ACT



Fig. 10 Time distribution activities of TTT course participants in DID-ACT's learning management system Moodle.

6. Discussion

In this deliverable, we reported the evaluation results of TTT pilot courses from the DID-ACT curriculum. Nearly 100 health professions teachers participated in courses organised by all academic partner institutions and supported by Instruct and our associate partners. Five topics were evaluated and in most cases the courses were conducted in more than one institution. The response from the audience was generally positive, indicating that the faculty development curriculum is useful. However, we also received some constructive comments that will help us improve the curriculum for the remaining year of the project. They will also ensure sustainability of the developed resources in the future.

We met and even exceeded our stated quality indicators, collecting 56 evaluation questionnaires out of the required 25. Evaluation data were provided by all partner institutions, but we had participants from seven further institutions outside the DID-ACT consortium. We collected evaluation data using a variety of tools (surveys, learning analytics) and from a variety of sources (participants, facilitators, learning management system usage patterns). The response rate was at a satisfactory level of more than 50%.

A key element of the evaluation was a survey based on the externally validated questionnaire ETELM and available in two variants: one for participants and one for course facilitators. The tool was adapted to the DID-ACT evaluation context in a collaborative process involving input and validation by project members and external testers. We took into account the needs of partner institutions by including additional questions, providing versions of the survey in national languages, and in both electronic and paper formats. A dynamic link to the survey was placed on the project's learning management platform Moodle. The data collected were both quantitative and qualitative, allowing for a mixed-method analysis.

As stated, we also made use of learning analytics, which enabled us to analyse the traces left by the course participants in the digital learning environment of the curriculum: Moodle and CASUS. This involved a variety of analyses focusing on different variables, such as clustering of users into groups according to the frequency of activity in the course, analysing the types of resources used and the distribution of activities over time.

All the data we collected triangulates well, revealing similar strengths but also weaknesses of the TTT courses developed so far and its implementation at project partner institutions.

One thing that has proved to be a strength in the curriculum thus far are synchronous activities led by engaged, knowledgeable facilitators involved in the DID-ACT project. This is evident in the Likert-scale questions of survey about effectiveness, free text comments praising the commitment and teaching skills of individual facilitators. This strength is also evident in the peaks of activity around synchronous sessions captured by learning analytics methods. How sustainable the curriculum will be when the courses are delivered by trainers who are not part of the DID-ACT consortium is an open question for evaluation.

Another strength of the curriculum, commonly praised across learning units, were the small group discussions. This was difficult to capture using learning analytics methods because most were conducted during the synchronous meetings. The only exception is the learning unit on "Health Professionals' roles in clinical reasoning" (LU35), where it was indeed possible to implement discussion in an online environment. That said, and based on anecdotal evidence and some free-text comments, the efficiency of digital discussion was not as good as face-to-face. It has been considered by the team that this will be far better for younger generations of participants in the student curriculum as currently the average age of TTT participants was close to 40. A better faring is also assumed for when other collaborative tools than Moodle are used. However, at the moment, the feeling is that for this part of the curriculum it is still worthwhile to have traditional face-to-face meetings, which are less flexible in terms of time and place.

Participants were also appreciative of having had the opportunity to experience the perspectives of other health professions. Unfortunately, as noted in the comments as well as based on the demographics of respondents - learning clinical reasoning is dominated by the perspective of medical doctors. This profession represented 80% of the participants. A potential point for improvement is to empower other health professions, such as nurses, physiotherapists or biomedical analysts, both in the content (e.g. relevant theories, recommended teaching methods, clinical examples given) and in implementation (bost TTT courses enrollment rates of other professions) in the curriculum.

The usability of the learning management system Moodle was a clear concern, as comments on this topic were unanimous across all pilots. As seen in the Likert scale questions and open-ended responses, users felt the platform was not intuitive to navigate and were surprised by some of the behaviour of the system. As the developers of the learning units, we had hoped to see more learning analytics events logged in the learning management system. Usability of Moodle may have impacted this. First improvements have already been implemented, such as a clearer dashboard structure or a short instructive how-to video that provides basic information on how to navigate in Moodle. To determine exactly where the problems lie, systematic usability studies with users external to the project are required. We plan to carry out such studies to inform course improvements in D3.3.

We observed relatively low use of virtual patients in the TTT curriculum. In part, this may be explained by the perception that participants at the faculty development level are less interested in improving their own clinical reasoning skills. It is here where virtual patients are mainly constructed, but rather expect higher level clinical reasoning teaching training. Teachers are referred to the student curriculum to see examples of the use of virtual patients (as in the learning units on "What is CR & Models & Theories" and "Info gathering, generating DDX, Decision making, Treatment planning" LU32 & LU33), which are not included in TTT course statistics. The virtual patient cases which were directly embedded in the TTT curriculum, as in "Person-centred approach, role of patient", were visited and commented on positively. Another explanation is that the technical infrastructure and methodology for teaching how to use virtual patients efficiently, despite attempts to improve its accessibility (e.g. [Kononowicz17]), is still a complex topic and exceeds the time

constraints that are given for general teaching techniques modules in the DID-ACT TTT curriculum. Such training would require separate learning units dedicated to specific teaching methods, such as virtual patients.

Time constraints were also an issue flagged by pilot course participants in other contexts. For example, several learners suggested that the time devoted to learning the theories underlying clinical reasoning was insufficient. Others expressed dismay at the inadequate preparation of peers for group work between the learning sessions. Such statements are evidenced by the low usage statistics of the platform in the time for asynchronous activities. This comes without much surprise, as faculty development time was identified as a major barrier in the project needs analysis [Sudacka21]. We tried to address this problem as best we could by organising short, condensed faculty developments sessions in the late afternoons to satisfy clinicians. However, this has its limitations in terms of content that can be covered. Another possible solution might be to add explicit goals for clinical reasoning teaching to faculty development curricula, as proposed by Parodis et al [Parodis21]. This would reserve more allotted time for those involved in teaching clinical reasoning. The planned CME certificate for the TTT curriculum is definitely part of the solution.

Another interesting topic for discussion, mentioned by Parodis et al in their report [Parodis21], is the issue of bilinguality of the curriculum. On the one hand, it is undoubtedly beneficial to refer to English terminology in the courses as this is the language where the most important research results in this area are published. On the other hand, many of the TTT synchronous sessions were taught in the participants' native language. In the same way students of trained teachers are taught. We received 20% of the free-text comments from teachers in languages other than English. Even though the majority of the participants was satisfied with materials in English in the courses (this statement is limited by the fact that it was evaluated just in one setting), it is likely that the clinical reasoning vocabulary in their native language is also important. This could be supported by including some learning resources translated into native language into the training materials on the DID-ACT platform or availability of multilingual clinical reasoning glossaries.

Finally, when judging the evaluation methodology, we see several advantages of using the ETELM tool going forward. It was quick to use, easy to understand, open for extensions, and allowed us to compare results across pilots. Thanks to learning analytics, we were able to follow the general trends in participants' activities in digital learning environments. The amount of data collected was not large enough to allow for more specific subgroup analysis, such as comparing the effectiveness of implementation of particular learning units across partner institutions or health professions. In the longer term, it would be useful to add evaluation tools that test individual intended learning objectives in more detail. In this scenario we would ideally combine it with objective measurement for skills transfer. Given the variety of topics, the complexity of content to be taught, and the barriers previously identified [Sudacka21], this is an ambitious goal that must be pursued over a long period of time with considerable effort.

7. Conclusions

The pilot evaluation of the DID-ACT TTT learning units by all academic partner institutions confirmed the utility of the TTT courses. Strengths of the curriculum included small group activities, the overall interesting content in terms of learning resources, engaged teachers, and opportunities for interprofessional education. Improvement requires the usability of the chosen learning management system, more emphasis on specific examples, and more involvement of health professions other than physicians. Some learning units require more time (or less content) and/or more interactive tasks.

8. References

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9. Appendix

9.1 Summary of ETELM-LP-S Likert-scale questions

Theme	Question	n	Avrg	SD	Rng	7	6	5	4	3	2	1	n/a
Objectives	Instructions provided a good introduction to the learning unit	15	6.33	0.82	[5-7]	8	4	3	0	0	0	0	0
	Learning unit objectives, expectations, and policies were clearly stated.	15	6.27	1.1	[4-7]	9	3	1	2	0	0	0	0
	Learning unit objectives were relevant to my needs.	15	6.53	0.83	[4-7]	10	4	0	1	0	0	0	0
Technology	Navigation of the technology-based components of the learning unit was logical,	12	5.58	1.51	[2-7]	4	3	3	1	0	1	0	3
	consistent, and efficient												
	The learning unit technologies and media supported the learning objectives.	13	6	0.91	[4-7]	4	6	2	1	0	0	0	2
	I had significant computer / technical problems during this learning unit. (negative answer	11	1.64	1.43	[1-5]	0	0	1	1	0	0	9	4
	is better; if agree, please explain at the end of the survey)												
Learning	The educational activities encouraged engagement with learning unit materials / content.	15	6.33	0.72	[5-7]	7	6	2	0	0	0	0	0
activities	The educational activities promoted achievement of the learning unit objectives.	15	6.4	0.63	[5-7]	7	7	1	0	0	0	0	0
	Educational activities encouraged interaction and collaboration with other participants	14	6.21	1.37	[2-7]	8	4	1	0	0	1	0	1
	The learning unit effectively blended online and face-to-face elements.	12	6.25	0.62	[5-7]	4	7	1	0	0	0	0	3
Assessment/	Assessments (e.g. tests and self-assessments) were appropriate for the learning unit	9	5.5	1.51	[3-7]	3	1	2	1	1	0	0	6
Feedback	objectives, content, and activities.												
	I had sufficient opportunity to assess and reflect upon my learning progress.	11	5.2	1.62	[3-7]	4	0	1	4	1	0	0	4
	I received adequate feedback on my learning progress.	7	6	1.15	[4-7]	3	2	1	1	0	0	0	8
	I received adequate support for any questions or concerns I had about my learning.	15	6.47	0.74	[5-7]	9	4	2	0	0	0	0	0
Impact	This learning unit will improve my clinical reasoning.	14	6.21	0.89	[4-7]	6	6	1	1	0	0	0	1
	This learning unit will improve my teaching of clinical reasoning.	15	6.27	0.8	[5-7]	7	5	3	0	0	0	0	0
	The overall quality of this learning unit was excellent.	15	5.87	1.13	[4-7]	6	3	4	2	0	0	0	0
	The overall effectiveness of the instructor(s) was excellent.	15	6.53	0.64	[5-7]	9	5	1	0	0	0	0	0

Table A.1 Summary of ETELM-LP-S survey responses in Learning unit: 32. What is clinical reasoning; Setting: JU (n=11), UBERN (n=4)

Theme	Question	n	Avrg	SD	Rng	7	6	5	4	3	2	1	n/a
Objectives	Instructions provided a good introduction to the learning unit	7	5.86	0.69	[5-7]	1	4	2	0	0	0	0	1
	Learning unit objectives, expectations, and policies were clearly stated.	8	6.5	0.53	[6-7]	4	4	0	0	0	0	0	0
	Learning unit objectives were relevant to my needs.	8	6.13	0.99	[5-7]	4	1	3	0	0	0	0	0
Technology	Navigation of the technology-based components of the learning unit was logical,	7	5.86	0.69	[5-7]	1	4	2	0	0	0	0	1
	consistent, and efficient												
	The learning unit technologies and media supported the learning objectives.	7	5.86	0.9	[5-7]	2	2	3	0	0	0	0	1
	I had significant computer / technical problems during this learning unit. (negative answer	6	1.17	0.41	[1-2]	0	0	0	0	0	1	5	2
	is better; if agree, please explain at the end of the survey)												
Learning	The educational activities encouraged engagement with learning unit materials / content.	7	6.14	0.69	[5-7]	2	4	1	0	0	0	0	0
activities	The educational activities promoted achievement of the learning unit objectives.	7	6.43	0.53	[6-7]	3	4	0	0	0	0	0	0
	Educational activities encouraged interaction and collaboration with other participants	7	6.71	0.49	[6-7]	5	2	0	0	0	0	0	0
	The learning unit effectively blended online and face-to-face elements.	6	6.5	0.84	[5-7]	4	1	1	0	0	0	0	1
Assessment/	Assessments (e.g. tests and self-assessments) were appropriate for the learning unit	5	6.2	0.84	[5-7]	2	2	1	0	0	0	0	2
Feedback	objectives, content, and activities.												
	I had sufficient opportunity to assess and reflect upon my learning progress.	6	5.5	1.64	[3-7]	2	2	0	1	1	0	0	1
	I received adequate feedback on my learning progress.	5	5.4	2.19	[3-7]	3	0	0	0	2	0	0	2
	I received adequate support for any questions or concerns I had about my learning.	6	6.67	0.52	[6-7]	4	2	0	0	0	0	0	1
Impact	This learning unit will improve my clinical reasoning.	7	5.43	1.27	[4-7]	2	1	2	2	0	0	0	0
	This learning unit will improve my teaching of clinical reasoning.	7	6	1.53	[3-7]	4	1	1	0	1	0	0	0
	The overall quality of this learning unit was excellent.	7	5.86	0.69	[5-7]	1	4	2	0	0	0	0	0
	The overall effectiveness of the instructor(s) was excellent.	7	6.29	0.76	[5-7]	3	3	1	0	0	0	0	0

Table A.2 Summary of ETELM-LP-S survey responses in Learning unit: 33. Information gathering Setting: UBERN (n=4), JU (n=2), MFUM (n=2)

Theme	Question	n	Avrg	SD	Rng	7	6	5	4	3	2	1	n/a
Objectives	Instructions provided a good introduction to the learning unit,	6	4	1.41	[2-6]	0	1	1	2	1	1	0	0
	Learning unit objectives, expectations, and policies were clearly stated.	6	4.17	1.72	[2-6]	0	1	3	0	0	2	0	0
	Learning unit objectives were relevant to my needs.	5	3.8	2.17	[1-6]	0	1	2	0	0	1	1	1
Technology	Navigation of the technology-based components of the learning unit was logical,	6	3.83	1.17	[2-5]	0	0	2	2	1	1	0	0
	consistent, and efficient												
	The learning unit technologies and media supported the learning objectives.	6	4.83	1.6	[2-6]	0	3	1	1	0	1	0	0
	I had significant computer / technical problems during this learning unit. (negative answer	4	2	1.41	[1-4]	0	0	0	1	0	1	2	2
	is better; if agree, please explain at the end of the survey)												
Learning	The educational activities encouraged engagement with learning unit materials / content.	5	3.8	2.39	[1-7]	1	0	1	1	0	1	1	0
activities	The educational activities promoted achievement of the learning unit objectives.	5	3.8	2.39	[1-7]	1	0	1	1	0	1	1	0
	Educational activities encouraged interaction and collaboration with other participants	4	3	1.83	[1-5]	0	0	1	1	0	1	1	1
	The learning unit effectively blended online and face-to-face elements.	4	2.75	1.5	[1-4]	0	0	0	2	0	1	1	1
Assessment/	Assessments (e.g. tests and self-assessments) were appropriate for the learning unit	3	2.33	1.53	[1-4]	0	0	0	1	0	1	1	2
Feedback	objectives, content, and activities.												
	I had sufficient opportunity to assess and reflect upon my learning progress.	5	3.2	1.3	[2-5]	0	0	1	1	1	2	0	0
	I received adequate feedback on my learning progress.	3	2.67	1.15	[2-4]	0	0	0	1	0	2	0	2
	I received adequate support for any questions or concerns I had about my learning.	4	3.75	1.71	[2-6]	0	1	0	1	1	1	0	1
Impact	This learning unit will improve my clinical reasoning.	5	3.8	2.28	[1-6]	0	2	0	1	0	1	1	0
	This learning unit will improve my teaching of clinical reasoning.	5	3	2.35	[1-6]	0	1	1	0	0	1	2	0
	The overall quality of this learning unit was excellent.	5	2.4	1.14	[1-4]	0	0	0	1	1	2	1	0
	The overall effectiveness of the instructor(s) was excellent.	4	2.75	1.5	[1-4]	0	0	0	2	0	1	1	1

Table A.3 Summary of ETELM-LP-S survey responses in Learning unit: 34. Person-centred approach Setting: EDU (n=6)

Theme	Question	n	Avrg	SD	Rng	7	6	5	4	3	2	1	n/a
Objectives	Instructions provided a good introduction to the learning unit.	11	5.45	1.21	[4-7]	3	2	3	3	0	0	0	0
	Learning unit objectives, expectations, and policies were clearly stated.	11	5.73	1.35	[3-7]	4	3	2	1	1	0	0	0
	Learning unit objectives were relevant to my needs.	11	5.36	1.8	[1-7]	4	1	4	1	0	0	1	0
Technology	Navigation of the technology-based components of the learning unit was logical,	11	4.27	1.85	[2-7]	2	1	2	1	3	2	0	0
	consistent, and efficient												
	The learning unit technologies and media supported the learning objectives.	11	4.64	1.57	[3-7]	2	1	3	1	4	0	0	0
	I had significant computer / technical problems during this learning unit. (negative answer	11	2.73	1.85	[1-6]	0	1	1	2	2	0	5	0
	is better; if agree, please explain at the end of the survey)												
Learning	The educational activities encouraged engagement with learning unit materials / content.	10	5.9	1.2	[4-7]	4	3	1	2	0	0	0	0
activities	The educational activities promoted achievement of the learning unit objectives.	10	5.4	1.58	[3-7]	3	3	1	1	2	0	0	0
	Educational activities encouraged interaction and collaboration with other participants	10	6	1.15	[4-7]	5	1	3	1	0	0	0	0
	The learning unit effectively blended online and face-to-face elements.	9	5.89	0.93	[5-7]	3	2	4	0	0	0	0	1
Assessment/	Assessments (e.g. tests and self-assessments) were appropriate for the learning unit	6	5	0.89	[4-6]	0	2	2	2	0	0	0	4
Feedback	objectives, content, and activities.												
	I had sufficient opportunity to assess and reflect upon my learning progress.	9	5.22	1.86	[1-7]	2	3	2	1	0	0	1	1
	I received adequate feedback on my learning progress.	8	4.38	2.45	[1-7]	2	1	2	0	1	0	2	2
	I received adequate support for any questions or concerns I had about my learning.	8	6	1.2	[4-7]	4	1	2	1	0	0	0	2
Impact	This learning unit will improve my clinical reasoning.	9	5.78	0.97	[5-7]	3	1	5	0	0	0	0	1
	This learning unit will improve my teaching of clinical reasoning.	9	6	1.32	[3-7]	4	3	1	0	1	0	0	0
	The overall quality of this learning unit was excellent.	9	5.11	1.62	[2-7]	2	2	2	2	0	1	0	1
	The overall effectiveness of the instructor(s) was excellent.	9	5.67	1.8	[3-7]	5	1	0	1	2	0	0	1

Table A.4 Summary of ETELM-LP-S survey responses in Learning unit: 35 Health Professionals' roles. Setting: ORU (n=4), UAU (n=3), Other (n=3)

Theme	Question	n	Avrg	SD	Rng	7	6	5	4	3	2	1	n/a
Objectives	Instructions provided a good introduction to the learning unit.	14	5.93	0.83	[5-7]	4	5	5	0	0	0	0	2
	Learning unit objectives, expectations, and policies were clearly stated.	16	6	0.82	[5-7]	5	6	5	0	0	0	0	0
	Learning unit objectives were relevant to my needs.	16	6.44	0.96	[4-7]	11	2	2	1	0	0	0	0
Technology	Navigation of the technology-based components of the learning unit was logical,	9	6.22	0.67	[5-7]	3	5	1	0	0	0	0	7
	consistent, and efficient												
	The learning unit technologies and media supported the learning objectives.	9	6.44	0.53	[6-7]	4	5	0	0	0	0	0	7
	I had significant computer / technical problems during this learning unit. (negative answer	6	2	2.45	[1-7]	1	0	0	0	0	0	5	10
	is better; if agree, please explain at the end of the survey)												
Learning	The educational activities encouraged engagement with learning unit materials / content.	16	6.38	0.72	[5-7]	8	6	2	0	0	0	0	0
activities	The educational activities promoted achievement of the learning unit objectives.	16	6.5	0.63	[5-7]	9	6	1	0	0	0	0	0
	Educational activities encouraged interaction and collaboration with other participants	16	6.56	0.63	[5-7]	10	5	1	0	0	0	0	0
	The learning unit effectively blended online and face-to-face elements.	10	6.3	0.95	[4-7]	5	4	0	1	0	0	0	6
Assessment/	Assessments (e.g. tests and self-assessments) were appropriate for the learning unit	8	6.25	0.89	[5-7]	4	2	2	0	0	0	0	8
Feedback	objectives, content, and activities.												
	I had sufficient opportunity to assess and reflect upon my learning progress.	10	6.2	1.14	[4-7]	6	1	2	1	0	0	0	6
	I received adequate feedback on my learning progress.	9	5.78	1.64	[2-7]	4	2	2	0	0	1	0	7
	I received adequate support for any questions or concerns I had about my learning.	13	6.38	0.65	[5-7]	6	6	1	0	0	0	0	3
Impact	This learning unit will improve my clinical reasoning.	16	5.88	1.26	[4-7]	8	1	4	3	0	0	0	0
	This learning unit will improve my teaching of clinical reasoning.	16	6.44	0.73	[5-7]	9	5	2	0	0	0	0	0
	The overall quality of this learning unit was excellent.	15	6.2	0.77	[5-7]	6	6	3	0	0	0	0	1
	The overall effectiveness of the instructor(s) was excellent.	15	6.2	0.94	[4-7]	7	5	2	1	0	0	0	1

Table A.5 Summary of ETELM-LP-S survey responses in Learning unit: 37. CR teaching and assessment methods Setting: UBERN (n=16)

9.2 Free text opinions of participants in the TTT courses (ETELM-LP-S)

How could the quality of the learning unit be improved? What would you change, remove, or add? Please describe and explain.

LU32

- 45 minutes is too short. I think at the end of a working day there should be a little bit more time. I liked the topic very much, but I think for so little time the lesson should be more guided and the task perhaps a little bit clearer.
- For me, the learning unit was very well designed and I was able to gain a lot from it.... I already had good prior knowledge of the different theories on CR. If someone comes with less prior knowledge, it may take a little more time to understand the different theories.
- In the second part it was difficult to discuss in the group because we aren't all equally prepared. The units of 45 min were very short. Half of the time, we discussed in our group and only about 20 minutes was about theory. We from the MME group had already a knowledge of the presented theory. But I think somebody else would have a bigger problem to understand all this in 20 minutes.
- 45min was too short for deep discussions during group work practicing th clinical reasoning teaching methods based on an example in practice during class (virtual) would have been valuable the moodle platform was a little bit confusing, the quizz after the video was too easy
- Great learning unit
- I would add more text material to expand on the information shown in the videos
- [Instructor] conducted the workshop in a very engaged manner
- It was great :)
- Everything is very interesting and opens new perspectives
- I would not change anything
- Clearer navigation in the online module
- Make sure all platform features are well suited for the learners.

- Maybe the learners could be divided into different groups based on prior knowledge.
- I would be better to use field specific examples for teachers internal medicine cases, surgical cases etc.
- At present I would rather not suggest any changes. The course has been very professionally prepared.
- I find the quality of the learning unit good.

LU34

- This entire approach is already in place in a PBL session as well as in a VC. Not also this, but PBL sessions incorporate CanMed questions about the topic. This will be a reiteration and, in my opinion, not the best way to use resources.
- Presentation might be more interactive with the students. The student/teacher needs a time to orient himself/herself in Moodle webpage. Students should be strongly encouraged to come prepared for having a nice discussion afterwards and for lesson to be more interactive. I like clinical cases with different approach and same medical condition.
- interactive

LU35

- Wished for further articles on how to stimulate the student/trainee to clinical reasoning. Are there validated methods?
- Perhaps should be more focused on how supervisors should help their students in clinical reasoning
- What could be improved is to adapt the cases and the learning template to different professional roles. For instance biomedical analysts do not have much use to teach their students what is expected from nurses and physicians, more analysis-method related cases would have been interesting for our part. It would also have been interesting if there was a video clip explaining clinical reasoning in the laboratory medicine clinic.
- I would add more details in the patient case such as, what assessments were made when the patient ended up in the emergency room, and the patient had high pain, I would remove the worksheet, and prefer a question to us (participants in the course) that how would we supervise a student when we have the patient in the clinic or in the ward or at testing or at rehabilitation etc, about how we would the clinical reasoning with the student about the patient case look like
- As one participant suggested, it would be interesting to have a video of a clinical case where you get to delve into the separate clinical reasoning of each profession. I felt that the videos for physiotherapists and occupational therapists were not tailored to these particular professions but could also be applied to doctors and nurses, for example. Furthermore, I found the moodle platform somewhat cluttered.
- less content. video (CR in nursing) shorter
- Clearly distinguish between subject-specific (clinical) level and didactic level. The learning unit should be designed with a more clear and purposeful didactic structure aligned with the intended learning outcomes. It would be helpful to ask here the question of what the teachers should be able to do at the end (performance) and how they achieve this.

- as we discussed already I found the content of the cases very good and useful, the only thing is that the learner should not know as much as you mentioned.
- Very good module, it would have been great to have had more like these.

- I am not sure if the cases presented are really well chosen and maybe you should separate the intro from the following informations. The student had right from the beginning all the relevant information, so it is hard to discuss which examination sets. should be done next (but maybe this was not planned with theses cases). The difference to the supervisor cases were only the diagnosis
- For the break-out rooms/group work: it was clear to me that we could change the cases, but I was not aware that it could make sense to provide the learner with less informations and give the other parts of information during the CR-exercise. Better but two observers in a group than no oberserver, because this role is very helpful to reflect on the performance of the preceptor. Unfortunately, I missed the second of the three units, and it is very possible that we talked about, but I think it could be helpful to provide a one-pager with do's and don'ts for preceptors (don't interrupt the learner, encourage him to think out loud, summarize what you heard from the learner, make eye-contact,...). This would be a good repetition and take-away from the course before the group work starts or after the group work session. And it could serve as support for the role of the observer.

Overall, what elements of this learning unit most contributed to your learning, excitement and engagement as a learner? Please describe and explain.

LU32

- The comments from [Instructor] were very important as well as the whole class discussion.
- For me, the alternation between short lectures and then discussion in the group was very enriching. In this way, I was able to exchange new information directly with peers.
- working in small groups, exchange of ideas, experiences from the colleagues applying the teaching methods discussions with [instructor]
- Interaction with the group
- Tests were helpful to reinforcing learning
- practical learning activities
- Teamwork skills, attention to the medical environment ... [illegible hand-writing]
- Practical classes the need for concrete, practical application of the acquired knowledge
- Video presented the theory in a clear and simple way referring to well-known characters.
- Very good preparation of [Instructor] for the meetings, presentation supported by examples from the teacher's life.

LU33

• Learning about the biggest mistakes students usually make in this process.

- Systematisation of existing knowledge and its transmission. A new look at "obvious content". Deepening of existing knowledge related to didactics, including the way of thinking and reasoning as well as the form and content of the information provided.
- What helped me the most in my learning was the instructor's great commitment and patience. The form of the classes partially independent work, then work in small groups, the opportunity to present the results of our work to a wider audience, was conducive to better understanding and consolidation of the material.

LU34

- See above.
- Clinical cases. As was mentioned in our online meeting (feedback part), the exercise
 "as a patient" with different symptoms was nice but needs to be well explained to
 students also with particular medical condition so they really put themselves in the
 shoes of the person. "How would it change the encounter with patient?" f.e. we might
 ask patient who is complaining of urinary incontinence if he/she is going outside or
 prefer to be isolated due to her symptom.

LU35

- Nice and interesting to discuss the issues with other health professionals
- Discussing with other professionals gave a lot
- I thought it was great that a lot of it was about "simple" questions that we could discuss with each other. The discussions provided a lot of interesting information as you learned how other professionals reason, some things you could take on board and perhaps use in practice in your own work. Short concrete videos explaining clinical reasoning (would have been good with more like the above).
- We were given good exercises on the first day to describe clinical reasoning in terms of my profession. It was interesting to hear how other professions think about clinical reasoning, how we collaborate with each other and all professions are needed to provide good and safe care to patients. Good seminar leaders. Good written explanations (Clinical reasoning cycle) and good film about it.
- What I found most interesting was the knowledge I acquired about different models of different reasoning and the interprofessional aspect of clinical reasoning - both similarities and differences. This is something that I will further explore and also take with me to my future students.
- case (virtual patient) Forum/submission could be used more effectively
- The theoretical resources have been very interesting and the implementation examples on Moodle.

- The techniques of different teaching styles
- The role play, especially the feedback from the observer The summary on CR theories and CR learning tools The schedule of the group work and how the alloction in the breakout room worked was impressive

Further comments

LU32

- Unfortunately, I was only able to attend the first meeting, as the busy working day changed my plans for the second meeting. I would have loved to have been there for the second time.....
- For my opinion the theory part was very fast and short for somebody without our MME knowledge
- Thank you for the course
- Very interesting topic of the learning unit, raises important issues from the point of view of the teacher how to teach the learner/student what they should expect from the teacher; how I want to be taught.

LU33

• Such courses are very much needed. They also provide an opportunity for analysis, reflection and some group thinking, as well as the opportunity to share experiences with each other.

LU34

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LU35

- The platform itself a bit unclear. After watching a video, you were taken to youtube, but not so easily back to the platform.
- Moodle is not a favourite. It is illogical, energy consuming and very difficult to understand for those who don't use it on a daily basis. Otherwise, everything was very interesting and rewarding! Thanks for the invitation! :D
- It has been two pleasant meetings with a very inclusive and nice group of teachers. I also learned a lot from the other participants in our group discussions. It was very nice that we all came from different professions. I am grateful that I was able to be part of this pilot course and feel that I am one experience richer.
- I noticed the different pedagogical/didactic prerequisites of the course participants. In the context of practice development theory, a value analysis could be interesting at the beginning.

- very important and nice topic! Should definitively included in the MME!
- I with you all the best in the further development for this course. CR is such an important skill in clinical practice. This course facilitates the preceptors in supporting this complex cognitive skill, it should be compulsory for all clinicians... Creating the

course in a blended learning mode is great in these times. Thank you very much for letting us be part and providing the materials. Kind regards, [name]

9.3 Free text opinions of facilitators in the TTT courses (ETELM-IP)

What could have been done to improve the local implementation of the learning unit?

LU 32

• Translation of the PP into Polish can be useful for some participants.

LU 33

- Direct links to resources of the modules (e.g. video) would have been helpful
- the learning unit is very focused on medical doctors
- I had too small group of participants to do the small group exercises, it was rather a lecture and conversation with them

LU 34

• Better familiarisation of the learners to moodle, CASUS.

LU35

- Participants for this interprofessional LU were not well-balanced as we had only one nurse and all others except one student were physicians. This made the discussions a bit unbalanced
- videos shorter (perhaps only a little text in 3-4 sentences instead of video?)
- to have a better introduction to Moodle. The face-to-face was on zoom.

LU37

- We adapted the LU completely to fit the needs/interest of the target group.
- We did substantially adapt the material to our needs.

How could the quality of the learning unit be improved? What would you change, remove, or add? Please describe and explain.

LU 32

• I would add more clinical examples of using each theory

LU 33

- We did improve the slides before using them and provided the used slides..
- more interprofessional aspects
- Slides of learning unit not optimal for a teaching session, fe too much text
- I would change PP presentations- too much text in them

• Initial familiarisation of learners to moodle and CASUS before the first LU pilot, by a video for example as is being discussed

LU35

- The videos are not totally suitable for the following discussions, especially the nursing video was hard to understand for the participants (and also for us facilitators). Additionally, it would be good to have sample solutions for us facilitators to help participants in the discussions and sometimes direct them a bit more and add aspects they have not yet mentioned. This is especially important if (as in our case) the facilitators are all from medicine.
- reduction of questions (one question in the asynchronous phase, complete the question in the synchronous phase) shorten the videos
- The case used has to be better adjusted to interprofessional learning.

LU37

• It could be improved by using our implementation as a suggestion for refinement. The used cases should a bit more adapted to the different workplace based learning methods to allow even better role play.

Overall, what elements of this learning unit do you perceive as most contributing to the learning, excitement and engagement of the students? Please describe and explain.

LU32

- Small group work
- group working on each theory and then presenting it to others.

LU33

- Small group work
- I find it was difficult to do the teaching outside of a focused profession. but everybody shared their experience and enabled engagement with this.
- Discussion in the group elements of management and remediation strategies
- Group working, discussions, good examples

LU34

• All elements had different contributions, but the abilities exercise had an interesting way of immersing the learner in person centeredness and the patient cases taught practical examples through engagement

LU35

- Discussions between participants especially as we had lots of external participants from different universities in Germany & Switzerland.
- inverted concept. activation by discussion own experiences
- To meet teachers from other health professions and to discuss their experiences. To discuss what they have in common and what difference.

- Practical exercises
- Role play of different methods.