Finding valuable direction for teaching and learning in campus-integrated Medical Massive Open Online Courses

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SUPPLEMENTS

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Appendix A: MOOC Teaching Modes Tool

Massive Open Online Course Teaching Modes Tool

This tool was assembled to study the instructional design (teaching modes) of MOOCs. It has been updated to include teaching modes we have found available. The tool consists of sections A and B. Original categorization was first published by Toven-Lindsey, Rhoads and Lozano in 2014 in their research paper: Virtually unlimited classrooms; pedagogical practices in Massive Open Online Courses. Journal: Internet and Higher Education.

A - Course info

B - Presence of
1. instruction modes
2. interaction modes
3. assessment modes

(Assembled in 2017 by RA Hendriks, Center for Innovation in Medical Education, Leiden University Medical Center, The Netherlands)

A0 Initials of researcher:

A1 Course name:

A2 Course startdate/Self-paced:

A3 Date of analysis:

B1a. Modes of instruction / resources in the course:

	Number:		Number:
Text/digital textbook		Audio or podcasts	
Illustrations; simulations (a)		Flashcards	
White board voiceover (b)		Thought trees or word clouds	
Power point presentation			
PPT with voiceover (c)			
Instructor talking to camera (d)			
Recorded traditional lecture (e)			
Links to external resources			
Prompts to use external resource for activity			
Interactive online labs			
Virtual patient cases			
Games			
Animation (f)			

B1b. Did you encounter any other mode of instruction/resources in the course? Specify type and number.

Notes:
(a) Category includes static digital images and interactive digital images. Both were used to help further explain concepts in the curriculum.

(b) Category includes digital whiteboard image with instructor drawing text and images while talking to the student. Instructor's face is generally not visible.

(c) Category includes video capture of PowerPoint slides with voice over from instructor to help explain concepts.

(d) Category includes video capture of course instructor talking directly into the camera. Often coupled with PowerPoint slides, whiteboard, images etc.

(e) Category includes video capture of classroom with instructor lecturing to a room of students. Often includes chalkboard, whiteboard, or other tools.

(f) Category includes use of avatar as instructor, with recorded voiceover, or use of animation or animated figures to teach course concepts.

B2a. Mode of interaction among peers:

	Y or N:
Asynchronous: Discussion board for Q&A available (a)	
Asynchronous: Discussion board for discussing course content available (b)	
Asynchronous: Discussion board prompt for introducing oneself	
Asynchronous: Discussion board prompt for answering course questions	
Asynchronous: Discussion board prompt for responding to peers on specific topics	
Synchronous: Chat/Study groups (c)	

B2b. Mode of interaction with the instructor:

	Y or N:
Asynchronous: active on discussion board for Q&A (a)	
Asynchronous: active on discussion board for dialogue (b)	
Asynchronous: active on discussion board for introducing oneself	
Synchronous: "live" event (d)	

Notes:
(a) Discussion board serves as a platform for question and answer sessions as opposed to discussion/dialogue among participants.

(b) Discussion board serves as a platform for threaded, back-and-forth dialogue among participants.

(c) Category includes platforms for chat or study groups, student-led study groups, etc.

(d) Category includes synchronous or "live" sessions hosted by instructor/TA such as virtual office hours, webcasts, and Skype chats with select students broadcast for full class.

B3a. Mode of assessment — assignments, exams and quizzes

	Number:
Multiple choice questions (a)	
Open ended short / fill in the blanks (b)	
Open ended long (c)	
Open ended long - peer assessed (d)	

B3b. If formal assessment was present, what parts were included in the formal assessment?

B3c. Mode of formal assessment

	Y or N:
Multiple attempts allowed	
Certificate of completion (e)	
Optional exam for credit (f)	

Notes:
(a) Category includes multiple choice questions that offered either computer -generated response or static answer key.

(b) Category includes short-response formats, typically students received computer-generated stock answer to compare, answer key or where students were required to offer a numerical response, often to an equation..

(c) Category includes long-response formats, typically essays or reflections.

(d) Category includes long-response formats, typically essays or reflections that are peer assessed.

(e) Course provider would generate a certificate stating that the study completed the course with a particular grade or percentage, sometimes for a fee.

(f) Category includes courses linked to institutions of higher education with option to enroll for credit; option to sign up for specific exams to earn credit.

B4. Have you encountered any activities that were not part of instruction or assessment but part of processing information or practicing skills? Please list type and number of these activities.

Appendix B: List of investigated MOOCs

#	Massive Open Online Course Title	Platform	Offered by
1	Introduction to the Science of Cancer	Canvas Network	The Ohio State University
2	Understanding Common Diseases	OpenEdXstudy	University of Wollongong
3	The Social Context of Mental Health and Illness	Coursera	University of Toronto
4	Managing Addiction: A Framework for Successful Treatment	EdX	University of Adelaide
5	Introduction to Cataract Surgery	Coursera	University of Michigan
6	Histology: Using Microscopy to Study Anatomy and Identify Disease	Futurelearn	The Open University
7	Talking About Cancer: Reducing Risk, Early Detection, and Mythbusting	Futurelearn	Cancer Research UK
8	Genomic Medicine: Transforming Patient Care in Diabetes	Futurelearn	University of Exeter
9	The Many Faces of Dementia	Futurelearn	University College London
10	Clinical Kidney, Pancreas and Islet Transplantation	Coursera	Leiden University Medical Center
11	Diabetes - A Global Challenge	Coursera	University of Copenhagen
12	Diabetes - The Essential Facts	Coursera	University of Copenhagen
13	Well and Able: Improving the Physical Health of People with Intellectual Disability	Coursera	University of Queensland
14	Epidemics: the dynamics of Infectious Diseases	Coursera	The Pennsylvania State University
15	ADHD: Everyday Strategies for Elementary Students	Coursera	The State University of New York, University at Buffalo
16	AIDS: Hope and Fear	Coursera	University of Michigan
17	In the Footsteps of ZIKA: Approaching the Unknown	EdX	Université de Genève, Institut Pasteur, Université Paris Descartes and Centre Virchow-Villermé
18	Ebola Virus Disease: An Evolving Epidemic	Coursera	Emory University
19	Preventing the ZIKA virus: Understanding and controlling the Aedes Mosquito	Futurelearn	London School of Hygiene and Tropical Medicine and the Arthropod Control Product
20	Easing the burden of obesity and cadiovascular disease	Coursera	The University of Sydney
21	Organ donation: from death to life	Coursera	University of Cape Town
22	Introduction to breast cancer	Coursera	Yale University
23	Tropical parasitology, protozoans, worms, vectors ans human diseases	Coursera	Duke University and Kilimanjaro and Christian Medical University College
24	Bacteria and chronic infections	Coursera	University of Copenhagen
25	Good brain, bad brain, Parkinson's disease	Futurelearn	University of Birmingham
26	Understanding Alzheimer's disease: A molecular and genetic approach	EdX	The University of Texas at San Antonio
27	MalariaX: Defeating malaria/ from the genes to the globe	EdX	Harvard University
28	Better conversations with aphasia	UCLeXtend	University College London
29	Clinical management of HIV	Iversity	European AIDS Clinical Society
30	Congenital hypothyroidism, what every primary care provider needs to know	Stanford Online	Stanford Medicine
31	Prescription drug misuse ans addiction: compassionate care for a complex problem	Stanford Online	Stanford Medicine
32	Perspectives on disability	Open Education by Blackboard	Northern Illinois University
33	Understanding dementia	desireEdXlearn	The University of Tasmania

Appendix C: MOOC Instructional Design Tool

MOOC Instructional Design Quality Tool
- CourseScan extended with Goal-Setting Items -

This tool was assembled to study the instructional design quality of MOOCs, based on a 10 principle framework named CourseScan by Margaryan, Bianco and Littlejohn (2015), published in *Computers & Education.* Goal-setting was added as 11th principle. In addition information about course presentation and organization can be gathered with the tool.
The tool consists of 3 sections:

A - Researcher information and course information that can be gathered on the course information page

B - Course information that can be gathered once one is enrolled in the course

C - Instructional design principles: goal-setting, problem-centeredness, authentic resources, activation, application, integration, differentiation, demonstration, collective knowledge, feedback and collaboration

(Assembled by Renée Hendriks, Center for Innovation in Medical Education, Leiden University Medical Center, The Netherlands, 2019)

SECTION A

This section concerns the information page of the course

A1 Initials of researcher:

A2 Course name:

A3 Course startdate/Self-paced:

A4 Date of analysis:

A5 Course website:

A6 Course platform:

- Coursera
- EdX
- Iversity
- Futurelearn
- Canvas Network
- Independent
- OpenEx
- Open2study
- Open Education by Blackboard
- Other:

A7 Does the course information page specify the learner population that will engage in the course?

- Yes
- No

MOOC Instructional Design Quality Tool - page 1 of 7

A8 Does the course information page specify the change that needs to be promoted in the skill set of the learner population?

- ○ Yes
- ○ No

A9 Are distal goals described on the course information page (at the end of this course...)?

- ○ No
- ○ Yes, namely:

A10 Are the course enrollment requirements clearly outlined on the course information page?

- ○ Yes
- ○ No

A11 Are the course completion requirements clearly outlined on the course information page?

- ○ Yes
- ○ No

A12 Is the course description on the course information page clear?

- ○ Yes
- ○ No

Please enter the course for the following sections

SECTION B

Likert-scale items scoring system for section B and C:

- **None.** The course does not reflect a given principle at all.
- **To some extent.** Serious gaps were found, the course reflects a given principle in less than 50% of the included teaching modes.
- **To large extent.** The course reflects a given principle mostly sufficient, in 51% to 80% of included teaching modes.
- **To very large extent.** The course reflects a given principle to complete satisfaction, in 81% to 100% of included teaching modes.
- **Not applicable.** An item is absent, for example when group work is absent in a course, all questions regarding the composition of the group are not applicable.
- **No information.** No information is available to determine if a given principle is reflected in the course.

B1 Is the course description clear?

- Yes
- No

B2 Does the course specify the learner population that will engage in the course?

- Yes
- No

B3 Does the course specify the change that needs to be promoted in the skill set of the learner population?

- Yes
- No

B4 To what extent are the course materials well organised?

- None
- To some extent
- To large extent
- To very large extent
- Not applicable
- No information

B5 Are the course enrollment requirements clearly outlined?

- Yes
- No

B6 Are the course completion requirements clearly outlined?

- Yes
- No

SECTION C

Goal setting

C1 Are distal goals described (at the end of this course...)?

- No
- Yes, namely:

C2 Are proximal goals described (per week or per activity)?

- No
- Yes, namely:

C3 To what extent are the course objectives measurable?

- None
- To some extent
- To large extent
- To very large extent
- Not applicable
- No information

C4 Are students encouraged to make a commitment statement about learning goals or a change in their knowledge, skill set or attitude?

- Yes
- No

C5 Are students invited to construct or set their own goals?

- Yes
- No

C6 Are students encouraged to think about possible obstacles that might impede their development in the course?

- Yes
- No

Problem-centeredness

C7 To what extent do the activities build upon each other?

- None
- To some extent
- To large extent
- To very large extent
- No information

C8 To what extent are the course objectives relevant to real-world problems?

- None
- To some extent
- To large extent
- To very large extent
- Not applicable
- No information

C9 To what extent are the problems in the course typical of those learners will encounter in the real world?

- None
- To some extent
- To large extent
- To very large extent
- Not applicable
- No information

C10 To what extent do the activities in the course relate to the participants' real workplace problems?

- None
- To some extent
- To large extent
- To very large extent
- Not applicable
- No information

C11 To what extent are the problems ill-structured – ie have more than one correct solution?

- None
- To some extent
- To large extent
- To very large extent
- Not applicable
- No information

C12 To what extent are the problems divergent from one another?

- None
- To some extent
- To large extent
- To very large extent
- Not applicable
- No information

Authentic resources

C13 To what extent are the resources reused from real-world settings?

- None
- To some extent
- To large extent
- To very large extent
- No information

Activation

C14 To what extent do the activities attempt to activate learners' relevant prior knowledge or experience?

- None
- To some extent
- To large extent
- To very large extent
- No information

Application

C15 To what extent do the activities require learners to apply their newly acquired knowledge or skill?

- None
- To some extent
- To large extent
- To very large extent
- No information

Integration

C16 To what extent do the activities require learners to integrate the new knowledge or skill into their everyday life or work?

- None
- To some extent
- To large extent
- To very large extent
- No information

Differentiation

C17 To what extent are there activity options for participants with various learning needs?

- None
- To some extent
- To large extent
- To very large extent
- No information

Demonstration

C18 Are there examples of problem solutions?

- Yes
- No
- Not applicable

C19 If there are examples of solutions, to what extent do these solutions represent a range of quality from excellent examples to poor examples?

- None
- To some extent
- To large extent
- To very large extent
- Not applicable
- No information

Collective knowledge

C20 To what extent do the activities require participants to learn from each other?

- None
- To some extent
- To large extent
- To very large extent
- No information

C21 To what extent do the activities require learners to build on other participants' submissions?

- None
- To some extent
- To large extent
- To very large extent
- No information

C22 To what extent do the activities require participants to contribute to the collective knowledge, rather than merely consume knowledge?

- None
- To some extent
- To large extent
- To very large extent
- Not applicable
- No information

Feedback

C23 Is there feedback on activities by the instructor(s) in this course?

- Yes
- No

C24 If there is feedback, is the way feedback will be provided clearly explained to the participants?

- Yes
- No
- Not applicable

Collaboration

C25 To what extent do the activities require participants to collaborate with other course participants?

- None
- To some extent
- To large extent
- To very large extent
- No information

C26 To what extent do the activities require participants to collaborate with others outside the course?

- None
- To some extent
- To large extent
- To very large extent
- No information

C27 To what extent do the activities require that the peer-interaction groups be comprised of individuals with different backgrounds, opinions, and skills?

- None
- To some extent
- To large extent
- To very large extent
- Not applicable
- No information

C28 To what extent can the individual contribution of each learner in the group be clearly identified?

- None
- To some extent
- To large extent
- To very large extent
- Not applicable
- No information

C29 Are the peer-interaction groups given specific directions for interaction?

- Yes
- No
- Not applicable

C30 Does each member of a peer-interaction group have a specific role to play?

- Yes
- No
- Not applicable

Appendix D: Extended results table for Instructional Design

MOOC number*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	Present in (n)	Present in (%)	Sum of scores	Mean score of represented
Organisation																																					
The course materials are well organised	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	3	3	3	3	3	3	3	2	2	3	3	3	2	3	33	100%	93	2,82
The course description is clear	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	33	100%	33	1
The learner population that will engage in the course is specified	1	1	0	1	1	1	1	1	1	1	0	1	1	0	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	26	79%	26	1
The course completion requirements are outlined clearly	0	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	0	1	1	0	1	1	1	1	1	24	73%	24	1
The course enrolment requirements are outlined clearly	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1	1	1	0	0	0	1	12	36%	12	1
The change that needs to be promoted in the skill set of the learner population is specified	0	1	0	1	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	1	1	1	0	0	0	0	11	33%	11	1
Problem-centered																																					
The activities build upon each other	2	2	2	3	3	3	1	2	2	3	2	2	1	3	2	1	1	2	1	2	2	3	2	3	2	3	3	2	2	2	3	3	3	33	100%	73	2,21
The activities in the course relate to the participants' real workplace problems	0	0	0	3	3	3	1	0	0	2	0	0	2	0	2	0	1	0	1	2	2	1	2	0	0	1	3	2	3	3	3	0	2	20	61%	42	2,10
The course objectives are relevant to real-world problems	0	0	0	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	2	3	3	3	0	3	11	33%	32	2,91
The problems in the course are typical of those learners will encounter in the real world	0	0	0	3	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	2	2	1	1	0	2	11	33%	21	1,91
The problems are ill-structured – have more than one correct solution	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	2	0	0	0	0	5	15%	7	1,40
The problems are divergent from one another	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	4	12%	5	1,25
Activation																																					
The activities attempt to activate learners' relevant prior knowledge or experience	0	3	2	2	0	1	1	0	1	3	0	0	0	1	0	0	0	0	0	1	0	2	0	0	1	0	1	0	0	1	1	1	3	16	48%	25	1,56
Demonstration																																					
There are examples of problem solutions	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1	0	1	11	33%	11	1,00
Solutions represent a range of quality from excellent examples to poor examples	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	3	9%	3	1,00
Application																																					
The activities require learners to apply their newly acquired knowledge or skill	1	1	1	1	1	2	1	1	1	2	1	2	1	1	1	1	2	1	1	1	1	2	1	0	1	1	2	2	2	1	1	1	2	32	97%	41	1,28
Integration																																					
The activities require learners to integrate the new knowledge or skill into their everyday work	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2	6%	2	1,00
Collective knowledge																																					
The activities require contributing to the collective knowledge, rather than merely consuming	0	0	1	1	0	0	1	1	0	1	0	1	0	1	0	1	1	0	1	1	0	0	1	0	0	1	0	0	0	0	0	1	1	15	45%	15	1,00
The activities require learners to build on other participants' submissions	0	1	1	1	1	0	0	1	0	1	1	1	0	0	0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	13	39%	13	1,00
The activities require participants to learn from each other	0	0	1	0	0	1	0	0	0	1	1	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	9	27%	9	1,00
Collaboration																																					
Activities require participants to collaborate with other course participants	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0	-
Activities require participants to collaborate with others outside the course	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	3%	1	1,00
Activities require peer-interaction groups with individuals with different backgrounds, opinions, and skills	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0	-
The individual contribution of each learner in the group can be clearly identified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0	-
Peer-interaction groups are given specific directions for interaction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0	-
Each member of a peer-interaction group has a specific role to play	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0	-
Differentiation																																					
There are activity options for participants with various learning needs	0	0	0	0	0	0	0	1	1	3	1	1	1	0	0	1	0	1	0	1	1	0	0	0	0	0	0	3	1	0	0	1	0	13	39%	17	1,31
Athentic resources																																					
The resources are reused from real-world settings	1	0	1	1	1	1	1	2	1	3	1	1	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	32	97%	39	1,22
Feedback																																					
There is feedback on activities by the instructor(s) in this course	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	32	97%	32	1,00
If there is feedback, the way feedback will be provided, is clearly explained to the participants	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	6	18%	6	1,00
Goal-setting																																					
Goals are measurable	3	1	3	3	3	3	2	0	2	3	0	3	0	0	3	3	2	2	2	2	3	0	0	0	3	2	0	3	3	3	3	3	3	25	76%	66	2,64
Course contains distal goals	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	0	20	61%	20	1,00
Course contains proximal goals	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	1	0	1	1	1	1	0	0	0	0	1	0	1	1	0	0	1	1	14	42%	14	1,00
Personal goals are incorporated	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	8	24%	8	1,00
Obstacles to attain goals are considered	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3%	1	1,00
Commitment statement about goals is required	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0	-

*the matching titles can be found in appendix A.

Appendix E: Interview protocol Dutch version

Interview protocol

Naam student:
Identificatienummer:

1) Voorstellen
Mijn naam is Renée Hendriks en ik ben promovenda bij het Onderwijs Expertise Centrum (OEC) van het LUMC. Hier doe ik in het kader van mijn promotietraject onderzoek binnen de medische opleidingen. Ik zal het interview vandaag met je afnemen.

2) Achtergrond
Bij het Onderwijs Expertise Centrum is drie jaar geleden een onderzoeksgroep gestart. Eén van de onderzoekslijnen richt zich op Technology Enhanced Learning. In dat kader onderzoeken we, onder andere middels deze interviewstudie, hoe medische MOOCs optimaal geïntegreerd kunnen worden in het campus onderwijs.

3) Doelen van het interview
Dit interview heeft twee hoofddoelen: 1) inzicht krijgen in hoe studenten werken met toegewezen leerdoelen in een online omgeving, en 2) achterhalen of en welke problemen studenten ondervinden in het werken met deze doelen. Het interview is in 3 thema's onderverdeeld.

- Starten met een MOOC
- Leerdoelen accepteren of niet
- Mogelijke problemen met toegewezen leerdoelen

4) Rapportage van het interview
De geluidsopnames van dit interview en de transcripties van die opnames zullen we beveiligd opslaan. Weet je wat een transcriptie is? (*Indien ja*: verder gaan met de volgende zin / *Indien nee*: uitleggen wat een transcriptie is). Alleen ikzelf en de databasebeheerder van het onderzoek zullen er toegang tot hebben. De resultaten van dit interview zullen samen met de andere interviews geanalyseerd worden en gerapporteerd worden in de vorm van een wetenschappelijk artikel. In dit artikel worden je antwoorden uiteraard anoniem verwerkt.

5) Duur van het interview
Het interview zal ongeveer 60-75 minuten duren.

6) Afspraken

- Geef je toestemming dat de resultaten vanuit de interviews in een weten-schappelijk artikel verwerkt worden?
- Geef je toestemming voor een geluidsopname?
- Geef je toestemming dat ik je mag benaderen voor een vervolginterview?
- Als ik een quote uit je interview wil gebruiken vraag ik je daarvoor om toestemming.
- Je mag te allen tijde je toestemming intrekken zonder opgaaf van redenen.
- Heb je nog andere vragen of opmerkingen?

Start interview

Thema 1: Starten met een MOOC

1. Wanneer heb je voor het laatst in een MOOC geleerd voor je studie? Was dit de eerste keer?
2. Wat doe als eerste als je begint met een MOOC voor je studie?
3. Wat doe je daarna?

Thema 2: Leerdoelen accepteren of niet

1. Doe je iets met de cursusinformatie, syllabus of leerdoelen in de MOOC?

   Ja: - Weet je nog wat de leerdoelen zijn/waren?
   - Wat doe je ermee?
   - Waarom?
   - Wat vind je ervan dat deze informatie en doelen worden gegeven?
   - Zit er een volgorde in die activiteiten?

   Nee: - Wat vind je ervan dat deze informatie en doelen worden gegeven?
   - Is er een reden dat je niets doet met deze informatie?
   - Hoe bepaal je of je iets doet met de leerdoelen?
   - Wat is het eerstvolgende dat je doet na (antw. vraag 3 van thema 1)?

2. Stel je eigen doelen op voor het leren in de MOOC?

   Ja: - Kun je een voorbeeld geven van zo'n doel?
   - Hoe ga je te werk als je doelen opstelt?
   - Waarom doe je dit zo?

   Nee: - Wat vind je van het opstellen van doelen?
   - Stel je wel eens doelen in andere contexten?
   - Is er denk je een reden dat je geen doelen stelt voor het leren in de MOOC?

Thema 3: Mogelijke problemen met toegewezen leerdoelen

1. Vindt je het prettig om op deze manier met/zonder toegewezen leerdoelen te werken?

   Ja: - Wat vind je er prettig aan?
   - Waarom?

   Nee: - Wat vind je er niet prettig aan?
   - Waarom?

Appendix F: Interview protocol English version

Interview protocol (English)

Student name:
Identification number:

1) Introductions
My name is Renée Hendriks and I am a PhD candidate at the Center for Innovation in Medical Education (OEC) at the Leiden University Medical Center. As part of my PhD trajectory, I am doing research within the medical courses here. I'll be doing the interview with you today.

2) Background
A research group was started three years ago at the Center for Innovation in Medical Education. One of the research focuses is on Technology Enhanced Learning. In this context we are investigating, through this interview study, how medical MOOCs can be optimally integrated into campus education.

3) Objectives of the interview
This interview has two main goals: 1) gain insight into how students work or do not work with assigned learning goals in an online environment, and 2) find out if and what problems students experience working with these goals. The interview is subdivided into 3 themes.

- Starting with a MOOC
- Accepting learning objectives or not
- Possible problems with assigned learning objectives

4) Reporting the interview
We will store the audio recordings of this interview and the transcriptions of those recordings securely. Do you know what a transcription is? (If yes: continue with the following sentence / If no: explain what a transcription is). Only myself and the database administrator of the study will have access to it. The results of this interview will be analyzed together with the other interviews and reported in the form of a scientific article. In this article your answers will of course be processed anonymously.

5) Duration of the interview
The interview will last approximately 30-60 minutes.

6) Agreements

- Do you give permission for the results from the interviews to be processed in a scientific article?
- Do you give permission for a sound recording?
- Do you allow me to approach you for a follow-up interview?
- If I want to use a quote from your interview, I will ask you for permission.
- You may withdraw your consent at any time without giving reasons.
- Do you have any other questions or comments?

Start interview

Theme 1: Starting with a MOOC

1. When did you last learn in a MOOC for your studies? Was this the first time?
2. What do you do first when you start a MOOC for your studies?
3. What do you do next?

Theme 2: Accepting learning objectives or not

1. Do you do something with the course information, syllabus or learning objectives in the MOOC?

   Yes: - Do you remember the objectives?
   - What do you do with it?
   - Why?
   - What do you think about this information and goals being given?
   - Is there a sequence in those activities?

   No: - What do you think about this information and goals being given?
   - Is there a reason that you do not do anything with this information?
   - How do you determine whether you do something with the learning objectives?
   - What is the next thing you do after .... (answer to question 3 of theme 1)?

2. Do you set your own goals for learning in the MOOC?

   Yes: - Can you give an example of such a goal?
   - How do you proceed when you set goals?
   - Why are you doing this?

   No: - What do you think about setting goals?
   - Do you ever set goals in other contexts?
   - Is there a reason why you don't set goals for learning in the MOOC?

Theme 3: Possible problems with assigned learning objectives

1. Do you like working in this way with / without assigned learning goals?

   Yes: - What do you like about it?
   - Why?

   No: - What do you dislike about it?
   - Why?

Appendix G: Information letter and informed consent form for quantitative data collection

'Motivation and self-regulated learning skills in integrated medical mooc learning'

Dear student,
We want to ask you to participate in this educational study. In this study we investigate motivation and independent (or self-regulated) online learning skills of students that learn in Massive Open Online Courses (MOOCs) for their medical studies. We ask all medical students of the Leiden University Medical Center (LUMC) that have enrolled in one of the following courses to participate in this research: *Mechanisms of Disease (MOD), Leiden Oxford Transplantation Summer school (LOTS), and students that participate in in the Virtual Exchange or Honors program (Hons)*. Your participation will have no consequences for your study progress and results will only be used for research purposes. We would ask you to read the following points carefully and if you agree to participate in the study, provide the consent form with a date and your confirmed consent.

Purpose of the investigation
The purpose of this research is to 1) compare motivation between different courses that use the MOOC, and 2) see how motivation and independent learning are related when learning in a MOOC. Results will inform future MOOC use in the LUMC and other universities.

Conducting the investigation
Participation consists of filling in two questionnaires (Q1 and Q2), one before starting the MOOC and one after you have finished learning in the MOOC. Each will take approximately 15-20 minutes. A small number of the participants will be asked to also partake in an interview to deepen understanding of the results. Students that are approached for the interview study will receive additional information after results of the questionnaires have been analyzed. You will receive Q1 via email, and Q2 will be distributed after a lecture (LOTS), before a workgroup, or after an exam (MOD), and via email (Hons, and all previously unreached students of LOTS and MOD).

What is expected of you?
If you participate in the study, you do not have to make specific preparations.

Advantages and disadvantages and possible risks
Your participation is entirely voluntary. If you decide not to participate or withdraw at any time during the study, you do not have to give a reason. If you withdraw, we will not include the collected data in our investigation and destroy it. Participating or not participating in the study will in no way affect your further study progress negatively. If you decide to participate,

it is greatly appreciated by us as it will provide useful information for future use of MOOCs in medical education. Your participation in this research can offer you new insights into your motivation and self-regulated learning skills if you wish to see your analyzed results, which can ultimately benefit your academic performance and enjoyment of learning. There are no risks associated with participating in this study. Confidentiality and privacy are guaranteed.

What happens with your data?
The data will be stored encrypted and stored in a protected folder on a protected LUMC server. Coded means that it cannot be directly traced back to you. Only the principal investigator Renée Hendriks (PhD candidate) or her possible successor, have access to the directly traceable data. The other researchers involved only have access to the coded data. You have the right to see the way in which your data is stored.

Review committee
Approval for this research has been obtained from the Educational Research Review Board (ERRB) of the LUMC.

Contact information
If you have any questions about the research or your participation, you can contact the principal investigator.

Renée Hendriks

Center for Innovation in Medical Education (OEC),
LUMC, Postbus 9600, 2300RC Leiden

r.a.hendriks@lumc.nl
Many thanks in advance, on behalf of the research team,

drs. Renée Hendriks, PhD candidate, LUMC
dr. ir. Peter de Jong, Assistant Professor of Technology Enhanced Learning, LUMC
prof. dr. Wilfried Admiraal, Professor of Educational Sciences, Leiden University
prof. dr. Marlies Reinders, Professor of Internal Medicine, LUMC

CONSENT

Please select your choice below. You may print or request a copy of this consent form for your records. Selecting the “Agree” button indicates that:

- You have read the above information
- You voluntarily agree to participate
- You give permission to use your data for the purposes stated in the information letter

☐ Agree
☐ Disagree

Name: _____ Date: __ /__ /__

To be completed by researcher:

I hereby declare that I have sufficiently informed this participant about the aforementioned study. If information becomes known during the investigation that could influence the consent of the participant, I will inform him / her in a timely manner in a manner that ensures that the information has reached the participant.

Researcher’s name: Renée Hendriks

Signature: Date: __ / __ / __

Appendix H: Information letter for qualitative data collection

'Motivation and self-regulated learning skills in integrated medical mooc learning'

Dear student,
We want to ask you to participate in the interview part of the 'motivation and self-regulated learning in medical MOOCs' study. In this interview study we investigate the processes involved in accepting or rejecting course learning goals, and problems students might encounter when working with these goals. We ask students that have participated in the previous part of the study and that have specific combinations of motivation and self-regulated learning skills. Your participation will have no consequences for your study progress and results will only be used for research purposes. We would ask you to read the following points carefully. If you agree to participate in the study, the consent form for using the interview data will be provided afterwards as you will then know what was discussed and what you agree on sharing with the researchers.

Purpose of the investigation
The purpose of this research is to 1) gain insight into how students work or do not work with assigned learning goals in an online environment, and 2) find out if and what problems students experience working with these goals.

Conducting the investigation
Participation consists of answering questions regarding course goals and personal goals in an interview. If you decide to participate in the study, the researcher will schedule an appointment with you. To relieve you of any traveling time, the interview will take place in the educational building of the LUMC if you are a student in Leiden. If you study elsewhere, the researcher will arrange a meeting closer to you or via skype. The investigation will take approximately 30-60 minutes. In case of a face-to-face meeting, drinks and snacks will be available during the interview.

What is expected of you?
If you participate in the study, you do not have to make specific preparations.

Advantages and disadvantages and possible risks
Your participation is entirely voluntary. If you decide not to participate or withdraw at any time during the study, you do not have to give a reason. If you withdraw, we will not include the collected data in our investigation and destroy it. Participating or not participating in the study will in no way affect your further study progress negatively. If you decide to participate, it is greatly appreciated by us as it will provide useful information for future use of learning goals in MOOCs in medical education. Your participation in this research can offer you new

insights into your motivation and self-regulated learning skills, which can ultimately benefit your academic performance and enjoyment of learning. There are no risks associated with participating in this study. Confidentiality and privacy are guaranteed.

What happens with your data?
A sound recording is made of the interview. This recording will be deleted from the recording device after transcribing the data. The data will also be stored encrypted and stored in a protected folder on a protected LUMC server. Coded means that it cannot be directly traced back to you. Only the principal investigator Renée Hendriks (PhD candidate) or her possible successor, and the person who will transcribe the data, have access to the directly traceable data. The other researchers involved only have access to the coded data. You have the right to see the way in which your data is stored.

Review committee
Approval has been obtained for this research from the Educational Research Review Board (ERRB) of the LUMC.

Contact information
If you have any questions about the research or your participation, you can contact the principal investigator.

Renée Hendriks

Center for Innovation in Medical Education (OEC), LUMC, Postbus 9600, 2300RC Leiden

r.a.hendriks@lumc.nl

Many thanks in advance, on behalf of the research team,

drs. Renée Hendriks, PhD candidate, LUMC
dr. ir. Peter de Jong, Assistant Professor of Technology Enhanced Learning, LUMC
prof. dr. Wilfried Admiraal, Professor of Educational Sciences, Leiden University
prof. dr. Marlies Reinders, Professor of Internal Medicine, LUMC

Appendix I: Informed consent form for qualitative data collection

INFORMED CONSENT

To be filled in by participant:

Previous to the interview, I have read the information and was able to ask additional questions. I had enough time to decide if I would like to participate. I know that participating is entirely voluntary and I am aware that I can decide at any time to withdraw. I don't have to give reasons for that. I know that researcher Renée Hendriks can view my data. I myself have the right to see how my data is stored.

I give permission to use my data for the purposes stated in the information letter. If there is reason to use the data for another research purpose, permission will be requested again from me.

I also give permission to retain data for a further 10 years after the end of this study for further analysis in the context of this study (if applicable). I know that if the researchers want to use specific quotes, I will be asked for consent for each quote.

Name contestant:

Signature: Date: __ / __ / __

To be completed by researcher:

I hereby declare that I have sufficiently informed this participant about the aforementioned study.

If information becomes known during the investigation that could influence the consent of the participant, I will inform him / her in a timely manner in a manner that ensures that the information has reached the participant.

Researcher's name:

Signature: *Date: __ / __ / __*

Appendix J. Factor loadings of three types of motivation for all items.

	Component			*N = 265, sample size threshold for loading significance =.35*
	Autonomous motivation	**Instructor trusting motivation**	**Positive image motivation**	
Item #	*1*	*2*	*3*	*Item*
T2AQ9	0,859			The reason that I worked to expand my knowledge of transplantation in the MOOC is: 9. Because it is interesting to learn more about the nature of transplantation medicine.
T2AQ4	0,835			I have participated actively in the MOOC: 4. Because a solid understanding of transplantation medicine is important to my intellectual growth.
T2AQ1	0,816			I have participated actively in the MOOC: 1. Because I feel like it is a good way to improve my understanding of the material.
T2AQ10	0,806			The reason that I worked to expand my knowledge of transplantation in the MOOC is: 10. Because it is a challenge to really understand how to solve transplantation problems.
T2AQ3	0,580			I have participated actively in the MOOC: 3. Because I would feel proud of myself if I did well in the course.
T2AQ7		0,819		I have followed the instructor's suggestions for studying transplantation medicine online: 7. Because it is easier to follow his/her suggestions than come up with my own study strategies.
T2AQ8		0,781		I have followed the instructor's suggestions for studying transplantation medicine online: 8. Because he/she seems to have insight about how best to learn the material.
T2AQ6		0,668		I have followed the instructor's suggestions for studying transplantation medicine online: 6. Because I am worried that I am not going to perform well in the course.
T2AQ5		0,595		I have followed the instructor's suggestions for studying transplantation medicine online: 5. Because I would get a bad grade if I didn't do what he/she suggests.
T2AQ11			0,768	The reason that I worked to expand my knowledge of transplantation in the MOOC is: 11. Because a good grade in the MOOC will look positive on my record.
T2AQ12			0,768	The reason that I worked to expand my knowledge of transplantation in the MOOC is: 12. Because I want others to see that I am intelligent.
T2AQ2			0,640	I have participated actively in the MOOC: 2. Because others might think badly of me if I didn't.

Appendix K. Factor loadings of three and two subscales of psychological need satisfaction and frustration for all items.

	Component			*N = 259, sample size threshold for loading significance = .35*
	Relatedness-autonomy satisfaction	**Competence satisfaction**	**Autonomy satisfaction**	
Item #	*1*	*2*	*3*	*Item*
T2CQ15	0,898			I feel close and connected with other people in the MOOC who are important to me.
T2CQ9	0,767			I feel connected with people in the MOOC who care for me, and for whom I care.
T2CQ21	0,760			I experience a warm feeling with the people I spend time with in the MOOC.
T2CQ3	0,667			I feel that the people in the MOOC I care about also care about me.
T2CQ13	0,589			I feel my choices in the MOOC express who I really am.
T2CQ7	0,576			I feel that my decisions in the MOOC reflect what I really want.
T2CQ5		0,851		I feel confident that I can do things well in the MOOC.
T2CQ17		0,783		I feel competent to achieve my goals in the MOOC.
T2CQ11		0,773		I feel capable at what I do in the MOOC.
T2CQ23		0,698		I feel I can successfully complete difficult tasks in the MOOC.
T2CQ1			0,871	I feel a sense of choice and freedom in the things I undertake in the MOOC.
T2CQ19			0,489	I feel I have been doing what really interests me in the MOOC.

	Component		*N = 262, sample size threshold for loading significance = .35*
	Relatedness-competence frustration	**Autonomy frustration**	
Item #	*1*	*2*	*Item*
T2CQ24	0,796		I feel like a failure because of the mistakes I make in the MOOC.
T2CQ18	0,743		I feel insecure about my abilities in the MOOC.
T2CQ10	0,711		I feel that people who are important to me in the MOOC are cold and distant towards me.
T2CQ12	0,705		I feel disappointed with many of my performances in the MOOC.
T2CQ16	0,697		I have the impression that people I spend time with in the MOOC dislike me.
T2CQ4	0,613		I feel excluded from the group I want to belong to in the MOOC.
T2CQ6	0,608		I have serious doubts about whether I can do things well in the MOOC.
T2CQ2		0,826	Most of the things I do in the MOOC feel like “I have to”.
T2CQ8		0,787	I feel forced to do many things in the MOOC I wouldn’t choose to do.
T2CQ14		0,770	I feel pressured to do too many things in the MOOC.
T2CQ20		0,735	My daily activities in the MOOC feel like a chain of obligations.

Appendix L. Variation Ration Criterion calculation results, showing an optimal combination of parsimony, a high VRC score and a low (negative) Omega score for the cluster solution when 6 clusters are formed.

	SSB10	SSW10	SSB9	SSW9	SSB8	SSW8	SSB7	SSW7	SSB6	SSW6	SSB5	SSW5	SSB4	SSW4	SSB3	SSW3	SSB2	SSW2
Auto-nomous	168,644	70,388	164,852	74,18	161,363	77,669	141,122	97,911	117,723	121,31	104,429	134,604	99,826	139,206	40,946	198,086	30,282	208,75
Teacher trusting	236,37	92,939	222,214	107,095	220,66	108,649	217,517	111,793	212,74	116,57	203,206	126,104	154,709	174,6	147,067	182,242	50,473	278,836
Positive image	255,314	69,036	253,531	70,819	238,563	85,788	233,298	91,053	226,066	98,285	200,55	123,801	195,646	128,704	195,386	128,964	193,553	130,798
Total	660,328	232,363	640,597	252,094	620,586	272,106	591,937	300,757	556,529	336,165	508,185	384,509	450,181	442,51	383,399	509,292	274,308	618,384
N	263		263		263		263		263		263		263		263		263	
K	10		9		8		7		**6**		5		4		3		2	
SSB/K-1	73,36977778		80,074625		88,65514286		98,65616667		111,3058		127,04625		150,0603333		191,6995		274,308	
SSw/N-K	0,91843083		0,992496063		1,067082353		1,174832031		1,308035019		1,490344961		1,708532819		1,958815385		2,369287356	
VRC	79,8860136		80,68004296		83,08181896		83,9746994		**85,09389913**		85,2462036		87,82993906		97,86501653		115,7765854	
Difference a	-		-0,794029362		-2,401775995		-0,892880442		-1,11919973		-0,152304473		-2,58373546		-10,03507747		-17,91156889	
Difference b	-0,794029362		-2,401775995		-0,892880442		-1,11919973		-0,152304473		-2,58373546		-10,03507747		-17,91156889		-	
omega	-		1,607746633		-1,508895552		0,226319287		**-0,966895257**		2,431430987		7,451342013		7,876491417		-	

Appendix M. Explained variance of cluster solution by constituting dimensions.

Constituting dimension	F(5, 263)	η2
Instructor trusting motivation	109,72***	0,68
Positive image motivation	111,45***	0,68
Quantity of motivation	149,057***	0,74
Quality of motivation A	56,05***	0,52
Quality of motivation B	102,15***	0,67

Note. Quality of motivation A is calculated as Autonomous motivation and Instructor trusting motivation combined minus Positive image motivation. Quality of motivation B is calculated as Autonomous motivation minus Instructor trusting motivation and Positive image motivation. As Instructor trusting motivation can consist of both autonomous and controlled forms of regulation, two types of quality of motivation we calculated.

***p<.001.

APPENDIX N: Chronological sequence of analysis approach

Step	Activity	Researcher(s)	Program(s)	Corresponding memo's*
1	Write reflexivity memo	RH and PJ	Microsoft Word	Reflexivity memo's
2	Conduct interview 1 to 4	RH	Microsoft Teams	
3	Open coding interview 1 and 2	RH and PJ	Atlas.ti	
4	Discussion on open codes	RH and PJ	Microsoft Teams	Analysis memo 1
5	Conduct interview 5	RH	Microsoft Teams	
6	Open coding interview 3	RH and PJ	Atlas.ti	
7	Conduct interview 6	RH	Microsoft Teams	
8	Follow-up open coding interview 3	RH and PJ	Atlas.ti	
9	Discussion on open codes	RH and PJ	Microsoft Teams	Analysis memo 2
10	Create Word files with tables	RH and PJ	Microsoft Word	
11	Discussion on axial codes	RH and PJ	Microsoft Word	Analysis memo 3
12	Create more Word files with tables	RH and PJ	Microsoft Word	
13	Discussion on axial codes	RH and PJ	Microsoft Teams	Analysis memo 4
14	Open coding interview 4 to 6	RH and PJ	Atlas.ti	
15	Discussion on axial codes	RH and PJ	Microsoft Teams	Analysis memo 5
16	Conducting interview 7	RH	Microsoft Teams	
17	Discussion on axial codes	RH and PJ	Microsoft Teams	Analysis memo 6 to 8
18	Reconsider names of open codes	RH	Microsoft word	Analysis memo 9
19	Conduct interviews 8 and 9	RH	Microsoft Teams	
20	Changing codes in Atlas for int 1-6	RH	Atlas.ti	Analysis memo 10
21	Discussion on axial codes	RH and PJ	Microsoft Word	Analysis memo 11 to 15
22	Logical ordering of axial codes	RH and PJ	Microsoft Word	Analysis memo 16
23	Conduct interview 10 to 12	RH	Microsoft Teams	
24	Open coding interview 8 to 10	RH and PJ	Atlas.ti	Analysis memo 17 and 18
25	Conduct interview 13	RH	Microsoft Teams	
26	Open coding interview 11 to 12	RH and PJ	Atlas.ti	Analysis memo 19 to 21
27	Axial coding	RH and PJ	Microsoft Word	Analysis memo 21 to 27
28	Selective coding	RH and PJ	Microsoft Word, diagrams.net	Analysis memo 26 to 28
29	Traceability check	WA	All produced Word and Atlas.ti files	
30	Final discussion on results	All authors	Microsoft Teams	

*can be shared upon request

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LIST OF SCIENTIFIC CONTRIBUTIONS

Scientific publications

van Klaveren, C.W., de Jong, P.G.M., **Hendriks, R.A.**, Luk, F., de Vries, A.P., van der Boog P.J., & Reinders, M.E.J. (2022). Didactical characteristics of Dutch websites about kidney transplantation targeted for kidney patients and living donors: An exploratory study. *PEC Innovation*, 100026.

Bakker, C.R. den, **Hendriks, R.A.**, Houtlosser, M., Dekker, F.W. & Norbart, A.F. (2021). Twelve tips for fostering the next generation of medical teachers. *Medical Teacher*. DOI:10.1080/0142159X.2021.1912311.

de Jong, P.G.M., **Hendriks**, **R.A.**, Luk, F., Dos Santos Jr., A.C.S. & Reinders, M.E.J (2021). Development and application of a massive open online course to deliver innovative transplant education *Transplant Immunology.*, 66 (2021), p. 101339.

Hendriks, R.A., de Jong, P.G.M., Admiraal, W.F., & Reinders, M.E.J. (2020). Instructional design quality in medical massive open online courses for integration into campus education. *Medical teacher*, 42(2), 156-163.

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Versteeg, M., **Hendriks, R.A**., Thomas, A., Ommering, B.W.C., & Steendijk, P. (2020). Conceptualising spaced learning in health professions education: A scoping review. *Medical Education*, 54(3), 205-216.

van Klaveren, C.W., de Jong, P.G.M., **Hendriks, R.A**., Luk, F., de Vries, A.P.J., van der Boog, P.J.M., & Reinders, M.E.J. (2020). Topics, Delivery Modes, and Social-Epistemological Dimensions of Web-Based Information for Patients Undergoing Renal Transplant and Living Donors during the COVID-19 Pandemic: Content Analysis. *Journal of Medical Internet Research.* 22, e22068. doi:10.2196/22068

Hendriks, R.A., de Jong, P.G.M., Admiraal, W.F., & Reinders, M.E.J. (2019). Teaching modes and social-epistemological dimensions in medical Massive Open Online Courses: Lessons for integration in campus education. *Medical Teacher*, 1-10. https://doi.org/10.1080/0142159x.2019.1592140

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Manuscripts under review

Hendriks, R.A., de Jong, P.G.M., Admiraal, W.F., & Reinders, M.E.J. (*Submitted*). Students learning in different MOOC integration designs are self-determined learners, grade hunters and teacher trusters.

Hendriks, R.A., de Jong, P.G.M., Admiraal, W.F., & Reinders, M.E.J. (*Submitted*). Assigned Learning Goal Acceptance Theory: a model to understand learning goal acceptance processes of undergraduate students.

Manuscripts in preparation

Hendriks, R.A., van Blankenstein, F., Ommering, B.W.C., & de Jong, P.G.M. (*In preparation*). On the relation between autonomous motivation to learn and Self-Regulated Learning in secondary and higher education: A scoping review.

Reviewed for

NVMO conference
Medical Education Online
BMJ Open
Advances in Medical Education and Practice
Journal of Workplace Learning

Awarded grants

NRO overzichtsstudie: De eigen wil in zelfstandig leren (2021).

Paper presentations

New opportunities to teach on-campus by using massive open online courses (MOOCs)	de Jong PGM, Hendriks RA, Reinders MEJ	2017	IAMSE
Framework for integrating Massive Open Online Courses into classroom teaching	de Jong PGM, Hendriks RA, Reinders MEJ	2018	APMEC
Enrolment intentions of learners for open online courses in different educational settings	de Jong PGM, Hendriks RA, Reinders MEJ	2018	IAMSE
Integration of a Massive Open Online Course on clinical kidney, pancreas and islet transplantation into a regular medical science curriculum	Reinders MEJ, Hendriks RA, Luk F, de Jong PGM	2018	International Congress of The Transplantation Society
Teaching modes and social-epistemological dimensions in Medical Massive Open Online Courses	de Jong PGM, Hendriks RA, Reinders MEJ	2018	AMEE
Instructional Quality of Medical Massive Open Online Courses	Hendriks RA, de Jong PGM, Reinders MEJ	2018	EARLI SIG 6&7
De kwaliteit van het instructie-ontwerp van medische Massive Open Online Courses	Hendriks RA, de Jong PGM, Reinders MEJ	2018	NVMO
Onderwijsvormen en sociaal-epistemolische dimensies in medische Massive Online Courses	Hendriks RA, de Jong PGM, Reinders MEJ	2018	NVMO
Identifying Instructional Design Principles in MOOCs to Inform Integration	Hendriks RA, de Jong PGM , Admiraal WF, Reinders MEJ	2019	AMEE
Spaced learning in het medisch onderwijs. Een scoping review.	Versteeg M, Hendriks RA, Thomas A, Ommering BWC, Steendijk P	2019	NVMO
Research findings for using medical MOOCs in campus education	de Jong PGM, Hendriks RA	2019	Symposium Best of Both Worlds
Motivation profiles and psychological need satisfaction and frustration in medical MOOC integration designs	Hendriks RA, de Jong PGM , Admiraal WF, Reinders MEJ	2020	EARLI SIG 8
Psychological need satisfaction and frustration of medical students that learn in different MOOC integration settings	Hendriks RA, de Jong PGM , Admiraal WF, Reinders MEJ	2020	AMEE
Vervulling van psychologische behoeften van medische studenten die leren in verschillende MOOC-integratie ontwerpen	Hendriks RA, de Jong PGM , Admiraal WF, Reinders MEJ	2020	NVMO
Inzicht in medisch onderwijskundig onderzoek	Hendriks RA	2021	Invited lecture Honours College Medicine

Poster presentations

Scenario's voor het integreren van een Massive Open Online Course in regulier onderwijs.	de Jong PGM, Hendriks RA, Reinders MEJ	2017	NVMO
Different ways to blend a Massive Open Online Course (MOOC) into medical teaching	de Jong PGM, Hendriks RA, Reinders MEJ	2017	AMEE
Application of an integration framework for using a Massive Open Online Course in undergraduate classroom teaching	de Jong PGM, Hendriks RA, Reinders MEJ	2018	AMEE
Facilitation of Self-Regulated Online Learning: Goal Setting in Medical Massive Open Online Courses	de Jong PGM, Hendriks RA, Reinders MEJ	2018	EARLI SIG 8
Spaced learning in het medisch onderwijs: Is het tijd voor een instructionele revolutie?	Versteeg M, Hendriks RA, Timmer MCJ, Steendijk P	2018	NVMO
Spaced learning in medical education: Is it time for an instructional revolution?	Timmer MCJ, Versteeg M, Hendriks RA, Thomas A, Steendijk P	2019	AMEE
Using a Massive Open Online Course on Clinical Kidney, Pancreas and Islet Transplantation in different settings of transplant education	de Jong PGM, Luk F, Hendriks RA, Reinders MEJ	2019	Bootcongres - Nederlandse Transplantatie Vereniging
Use of a Massive Open Online Course on clinical kidney, pancreas and islet transplantation in campus education and an international course exchange program	Reinders MEJ, Hendriks RA, Luk F, de Jong PGM	2019	Coursera Partners Conference
Using a Massive Open Online Course on Clinical Kidney, Prancreas and Islet Transplantion in Different Settings of Transplant Education	de Jong PGM, Hendriks RA, Luk F, Reinders MEJ	2019	American Transplant Congress (ATC)

Workshops/round tables

Welke obstakels voor engagement ervaren studenten bij het volgen van online leeractiviteiten? (round table)	de Jong PGM, Hendriks RA, Reinders MEJ	2017	NVMO
Using open online course materials to innovate face to face teaching (round table)	de Jong PGM, Hendriks RA, Reinders MEJ	2017	The Generalists in Medical Education
Leren voor de toets? Zo 20ste eeuw! Inzetten op motivatie: hoe we het 'moeten' wat makkelijker kunnen maken (workshop)	Dubois E, Ommering BWC, Hendriks RA, van der Hoeven I, Bosman L	2018	LUMC onderwijs conferentie
Integratie van MOOCs in campusonderwijs (workshop)	Hendriks RA, de Jong PGM, Broersen P	2019	LUMC onderwijs conferentie
12 stappen voor de integratie van MOOCs in campusonderwijs (workshop)	de Jong PGM, Hendriks RA, Broersen PJA, Reinders MEJ	2019	NVMO
Obstakels bij gebruik van online leerdoelen door geneeskunde studenten (workshop)	Hendriks, RA	2019	NVMO promovendidag
Paradigma Workshop promovendi en begeleiders (workshop)	Hendriks RA, den Bakker CR	2020	NVMO promovendi estafette
Welcome to Medical Education (workshop)	Lupascu A, den Bakker CR, Firman D, van Wijk E, Disser J, Hendriks RA	2022	LUMC onderwijs conferentie
Self-regulated learning: van Buzzword naar Begrip (keynote paneldiscussie)	Hendriks RA, Norbart A, Pranger A, Roemer J	2022	LUMC onderwijs conferentie

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CURRICULUM VITAE

Renée Anne Hendriks was born on the 26th of April in 1990 in Amersfoort, the Netherlands. Together with her parents and sister she moved to Deventer, where she completed her secondary education at the Etty Hillesum Lyceum in 2008.

In 2013 she received her bachelor's degree in *Life Sciences and Technology* with a minor in *Psychology* and Major in *Biomedical Sciences* at the University of Groningen. During her years in university she tutored secondary education students in mathematics, chemistry, physics, biology and English, and assisted in teaching Biomedical Research skills to university students. During these teaching and training activities Renée was inspired by what motivates people to persevere and enjoy learning.

As a part of her Master in *Science Education and Communication* she developed a cross-curricular learning application for a local high school. Its goal was to explicitly connect subject content of various disciplines and simultaneously provide students with insight into their learning progress. As her graduation assignment, she designed and piloted an instructional design tool for primary school teachers that supported learning motivation, constructive alignment and use of Open Educational Resources. Renée graduated university in 2016, after which she moved to Leiden to start her PhD research in Technology Enhanced Learning at the Center for Innovation in Medical Education at Leiden University Medical Center. Under supervision of prof.dr. Marlies Reinders, prof.dr. Wilfried Admiraal and dr.ir. Peter de Jong she investigated the added value of integration of medical Massive Open Online Courses into the undergraduate campus curriculum. She presented her research at national and international conferences, and published articles together with fellow PhD students in addition to her own work.

During her time as PhD researcher, Renée joined the half minor Medical Education teaching team. From 2018 on she taught, coordinated and partly redesigned the research module of this course. In addition she wrote a grant proposal for a review study, advised in evaluations of educational innovations in the hospital, and joined in establishing the social activities committee of the Center for Innovation in Medical Education. After finishing her PhD in 2022 Renée continued to work at Leiden University Medical Center as an educational advisor, as well as working on the half minor Medical Education teaching team, the granted review study and new grant proposals.