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## Assessment and learning engagement in massive open online courses

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# Appendices



## Appendix A. References of studies included in the systematic literature review

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## Appendix B. Overview of measurement instruments adopted in the study presented in Chapter 3

Table B.1.

Overview of measurement instruments adopted in the study presented in Chapter 3.

Variable	Item
Perceived learning support	
Course design	<p>Please indicate your perceptions toward the MOOC you attended in the following aspects (1 - <i>Strongly disagree</i> to 6 - <i>Strongly agree</i>):</p> <ol style="list-style-type: none"> <li>1. The course and learning materials are coherently organized and well structured.</li> <li>2. The platform is user friendly.</li> <li>3. The required effort and learning outcomes were well-matched in this MOOC.</li> </ol>
Interaction with instructors	<p>Please indicate your perceptions toward the MOOC you attended in the following aspects (1 - <i>Strongly disagree</i> to 6 - <i>Strongly agree</i>):</p> <ol style="list-style-type: none"> <li>1. The instructor gave me feedback in the course of learning.</li> <li>2. The instructor counseled and supported me in the course of learning.</li> <li>3. When I needed help in the course of learning, I could get in personal contact with the instructor.</li> <li>4. The instructor interact with students in the discussion forums.</li> </ol>
Interaction with peer students	<p>Please indicate your perceptions toward the MOOC you attended in the following aspects (1 - <i>Strongly disagree</i> to 6 - <i>Strongly agree</i>):</p> <ol style="list-style-type: none"> <li>1. I could exchange information and knowledge easily and quickly with peer students.</li> <li>2. The communication in the discussion forums facilitated exchange of information with peer students.</li> <li>3. Learning in groups and cooperation with other learners were supported in the courses (e.g., discussion forums and peer-review).</li> <li>4. There were ample opportunities in the course to establish personal contact with peer students (e.g., discussion forums, peer-review, and group work).</li> </ol>

Learner autonomy	<p>Please indicate your perceptions toward the MOOC you attended in the following aspects (1 - <i>Strongly disagree</i> to 6 - <i>Strongly agree</i>):</p> <ol style="list-style-type: none"> <li>1. I could individually decide what times and where I am learning this MOOC.</li> <li>2. I could individually decide the use of learning strategies and the pace of learning.</li> <li>3. This MOOC offers opportunities for self-paced chapter exercises and the application of one's knowledge.</li> <li>4. This MOOC offers opportunities to control my learning outcomes (e.g. by self-tests).</li> </ol>
Learning engagement	<p>Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - <i>Never</i> to 5 - <i>Very often</i>):</p> <ol style="list-style-type: none"> <li>1. I watched video lectures to master the subject matter in this MOOC.</li> <li>2. I read course materials to enhance the understanding of the subject matter in this MOOC.</li> <li>3. I completed the assignments before the deadline.</li> <li>4. I submitted the assignments before the deadline.</li> <li>5. I participated in the course assessments to exam what I learned in this MOOC (e.g., tests, quizzes, and exams).</li> <li>6. I posted my views on the topics in discussion forums.</li> <li>7. I replied to others' comments in discussion forums.</li> <li>8. I commented on others' posts in discussion forums.</li> <li>9. I provided feedback to other course participants in peer-review.</li> <li>10. I reflected on the peer feedback to improve coursework in peer-review.</li> </ol>
Self-regulated learning strategies	
Elaboration	<p>Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - <i>Very untrue of me</i> to 6 - <i>Very true of me</i>):</p> <ol style="list-style-type: none"> <li>1. When I become confused about something, I return to the video lectures and course materials and try to figure it out.</li> <li>2. I try to relate ideas in this subject to those in other courses whenever possible.</li> <li>3. When watching video lectures and reading course materials for this MOOC, I try to relate the content to what I already know.</li> </ol>

4. I try to understand the video lectures and course materials taught in this MOOC by making connections between the content and the concepts I can find in and outside this MOOC.
5. When studying video lectures and course materials for this MOOC I try to determine which concepts I don't understand well.
6. I try to apply ideas from video lectures and course materials in other course activities such as discussion forums.

Critical thinking

Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 – *Very untrue of me* to 6 – *Very true of me*):

1. I often find myself questioning things I hear or read in this MOOC to decide if I find them convincing.
2. When a theory, interpretation, or conclusion is presented in the video lectures, course materials, or discussion forums, I try to decide if there is good supporting evidence.
3. I treat the video lecture and course materials as a starting point and try to develop my own ideas about it.
4. I try to play around with ideas of my own related to what I am learning in this MOOC.
5. Whenever I read an assertion or conclusion in this MOOC, I think about possible alternatives.

Metacognitive  
self-regulation

Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 – *Very untrue of me* to 6 – *Very true of me*):

1. When watching video lectures and reading course materials for this MOOC, I make up questions to help focus my watch and reading.
2. If video lectures and course materials are difficult to understand, I change the way I watch the lectures and read the material.
3. Before I study new video lectures and course materials thoroughly, I often skim it to see how they are organized.
4. I ask myself questions to make sure I understand the video lectures and course materials taught in this MOOC.
5. I try to change the way I study in order to fit the course requirements and the instructional methods used in this MOOC.
6. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this MOOC.
7. When I study for this MOOC, I write brief summaries of the main ideas from the video lectures, course materials.

8. When I study for this MOOC, I set goals for myself in order to direct my activities in each session.

Time and environment management

Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 – *Very untrue of me* to 6 – *Very true of me*):

1. I usually study in a place where I can concentrate on my course work.
2. I make good use of my study time for this MOOC.
3. I find it hard to stick to a study schedule in this MOOC.
4. I have a regular place set aside for studying this MOOC.
5. I make sure that I keep up with the weekly sessions and assignments for this MOOC.
6. I often find that I don't spend very much time on this MOOC because of other activities.
7. I rarely find time to review my notes, video lectures, or course materials.

Perceived learning outcomes

Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - *Strongly disagree* to 6 - *Strongly agree*):

1. I have understood the video lectures and course materials taught in this MOOC.
2. I have learned the knowledge taught in the subject matter.
3. This MOOC expands my knowledge and skills of the subject.
4. I have developed skills on how to apply the knowledge in this MOOC.
5. I have developed the skills of communication and cooperation in this MOOC.
6. I have developed the skills of self-regulated learning in this MOOC.
7. I am pleased with what I learned in this MOOC.
8. I am appreciated the interaction with the instructor in this MOOC.
9. I am appreciated the interaction with peer students in this MOOC.

## Appendix C. Overview of measurement instruments adopted in the study presented in Chapter 4

Table C.1.

Overview of measurement instruments adopted in the study presented in Chapter 4.

Variable	Item
Attitudes	<p>Please indicate your perceptions toward learning in MOOCs in the following aspects (1 - <i>Completely inapplicable</i> to 5 - <i>Completely Applicable</i>):</p> <ol style="list-style-type: none"> <li>1. Learning in MOOCs makes my study more satisfying.</li> <li>2. I like learning in MOOCs.</li> <li>3. I feel more motivated when I am learning in MOOCs.</li> <li>4. Because of learning in MOOCs, my study becomes more efficient.</li> <li>5. Learning in MOOCs in an effective way enhances my learning productivity.</li> <li>6. Learning in MOOCs improves my academic performance.</li> </ol>
Self-efficacy	<p>Please indicate your perceptions toward learning in MOOCs in the following aspects (1 - <i>Very untrue of me</i> to 5 - <i>Very true of me</i>):</p> <ol style="list-style-type: none"> <li>1. I believe I can learn a lot in MOOCs.</li> <li>2. I am certain I can understand the most difficult material presented in MOOCs.</li> <li>3. I am confident I can learn the basic concepts taught in MOOCs.</li> <li>4. I am confident I can understand the most complex material presented in MOOCs.</li> <li>5. I am confident I can do an excellent job in MOOCs.</li> <li>6. I expect to do well in MOOCs.</li> <li>7. I am certain I can master the skills being taught in MOOCs.</li> <li>8. Concerning the difficulty of MOOCs and my skills, I think I can do well in MOOCs.</li> </ol>
Task value	
Intrinsic value	<p>Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - <i>Strongly Disagree</i> to 5 - <i>Strongly Agree</i>):</p> <ol style="list-style-type: none"> <li>1. This MOOC is interesting to me.</li> <li>2. I find studying for this MOOC is interesting.</li> </ol>

3. Compared to other courses, I like this MOOC very much.
4. I am fascinated by this MOOC.
5. I enjoy this MOOC.
6. This MOOC is exciting to me.
7. I like this MOOC.

## Attainment value

Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - *Strongly Disagree* to 5 - *Strongly Agree*):

1. Being good at solving problems in this MOOC is important to me.
2. Compared to other courses, doing well in this MOOC is important to me.
3. Being someone who does well at this MOOC is important to me.
4. Doing well at this MOOC is an important part of who I am.

## Utility value

Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - *Strongly Disagree* to 5 - *Strongly Agree*):

1. This MOOC is useful for what I want to do after I graduate.
2. This MOOC will be important when I get a job or go to graduate school.
3. This MOOC will be useful for me later in life.
4. What I am learning in this MOOC is useful because they will help me in the future.

## Perceived cost

## Task effort cost

Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - *Strongly Disagree* to 5 - *Strongly Agree*):

1. This MOOC demands too much of my time.
2. I have to put too much energy into this MOOC.
3. This MOOC takes up too much time.
4. This MOOC is too much work.
5. This MOOC requires too much effort.

## Loss of valued alternatives

Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - *Strongly Disagree* to 5 - *Strongly Agree*):

1. I have to sacrifice too much to be in this MOOC.

2. This MOOC requires me to give up too many other activities I value.
3. Taking this MOOC causes me to miss out on too many other things I care about.
4. I can't spend as much time doing the other things that I would like because I am taking this MOOC.
5. I pay attention to this MOOC.

Emotional cost

Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - *Strongly Disagree* to 5 - *Strongly Agree*):

1. I worry too much about this MOOC.
2. This MOOC is too exhausting.
3. MOOC is emotionally draining.
4. This MOOC is too frustrating.
5. This MOOC is too stressful.
6. This MOOC makes me feel too anxious.

Learning engagement

Cognitive Engagement

Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - *Strongly Disagree* to 5 - *Strongly Agree*):

1. When doing coursework in this MOOC, I try to relate what I'm learning to what I already know.
2. I study this MOOC, I try to connect what I am learning with my own experiences.
3. I try to make all the different ideas fit together and make sense when I study this MOOC.
4. I make up my own examples to help me understand the important concepts I study in this MOOC.
5. Before I begin to study this MOOC, I think about what I want to get done.
6. When I'm working on my coursework in this MOOC, I stop once in a while and go over what I have been doing.
7. As I study this MOOC, I keep track of how much I understand, not just if I am getting the right answers.
8. If what I am learning in this MOOC is difficult to understand, I change the way I learn the material.

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Behavioral Engagement	<p>Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - <i>Strongly Disagree</i> to 5 - <i>Strongly Agree</i>):</p> <ol style="list-style-type: none"><li>1. I study this MOOC carefully.</li><li>2. I try hard to do well in this MOOC.</li><li>3. When I start a new topic in this MOOC, I learn it very carefully.</li><li>4. I work hard when I start something new in this MOOC.</li><li>5. I pay attention to this MOOC.</li></ol>
Emotional Engagement	<p>Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - <i>Strongly Disagree</i> to 5 - <i>Strongly Agree</i>):</p> <ol style="list-style-type: none"><li>1. I enjoy learning new things in this MOOC.</li><li>2. When I work on something in this MOOC, I feel interested.</li><li>3. When I study this MOOC, I feel curious about what I am learning.</li><li>4. This MOOC is fun.</li><li>5. When I work on something in this MOOC, I get involved.</li></ol>
Perceived learning outcomes	<p>Please indicate how you feel about learning in the MOOC you attended in the following aspects (1 - <i>Strongly Disagree</i> to 5 - <i>Strongly Agree</i>):</p> <ol style="list-style-type: none"><li>1. I have understood the content and concepts in the subject matter of this MOOC.</li><li>2. I have learned the knowledge taught in the subject matter of this MOOC.</li><li>3. This MOOC expands my knowledge of the subject.</li><li>4. I have developed skills on how to apply the knowledge in this MOOC.</li><li>5. I have developed the skills of communication and cooperation in this MOOC.</li><li>6. I have developed the skills of self-regulated learning in this MOOC.</li><li>7. I am pleased with what I learned in this MOOC.</li><li>8. I am appreciated the interaction with the instructor in this MOOC.</li><li>9. I am appreciated the interaction with peer students in this MOOC.</li></ol>

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