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R2.1. GUIDELINES FOR TEACHERS TO CREATE DIGITAL CONTENT FOR MOOC CONSIDERING MICRO-CREDENTIALS

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- University of Hradec Králové, Czechia
- Charles University, Czechia
- Jesús Usón Minimally Invasive Surgery Centre, Spain
- Vytautas Magnus University, Lithuania
- Turiba University, Latvia
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Summary

The aim of the “Guidelines for teachers to create digital content for MOOC considering micro-credentials” is to explore possible teaching and learning strategies while planning and developing each MOOC in the Miss4Health project. It includes recommendations for formulating learning outcomes, developing teaching and learning plans, and selecting assessment strategies and assignments. The elements indicated in the MOOC module description also mark the micro-credential elements, which, when indicated, contribute to the quality of micro-credentials.

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1. Digital credentials

Following the EU Council's Recommendation on a European approach to micro-credentials for lifelong learning and employability (2022, p.14), "Micro-credential means the record of the learning outcomes a learner has acquired following a small volume of learning. These learning outcomes will have been assessed against transparent and clearly defined criteria. Learning experiences leading to micro-credentials are designed to provide the learner with specific knowledge, skills and competencies that respond to societal, personal, cultural or labour market needs. Micro-credentials are owned by the learner, can be shared and are portable. They may be stand-alone or combined into larger credentials. They are underpinned by quality assurance following agreed standards in the relevant sector or area of activity".

Micro-credentials are considered to be a smaller segment of credentials which can then be aggregated to create a macro-credential or to be considered as a segment of a portfolio. Micro-credentials are often used for the purposes of recognition. They can be used to recognise competencies, both soft and hard skills, as well as to acknowledge knowledge and experience in certain and/or specific subject areas. Thus, micro-credentials are versatile, as they can be used in diverse subject areas to recognise a wide range of skills and competencies. However, micro-credentials are not yet commonly used for certification and/or assessment of learning. Educational institutions and employers still hesitate to accept the value of micro-credentials for certification.

The standard mandatory elements to describe a micro-credential according to Council Recommendation (2022) are:

- identification of the learner;
- title of the micro-credential;
- country(ies)/region(s) of the issuer;
- awarding body(ies);
- date of issuing;
- learning outcomes;
- notional workload needed to achieve the learning outcomes (in European Credit Transfer and Accumulation System – ECTS, wherever possible);
- level (and cycle, if applicable) of the learning experience leading to the micro-credential (European Qualifications Framework, Qualifications Frameworks in the European Higher Education Area), if applicable;
- type of assessment;
- form of participation in the learning activity;

- type of quality assurance used to underpin the micro-credential.

Well-designed micro-credentials can be used to support inclusion and accessibility to education and training for a wider range of learners, particularly for disadvantaged and vulnerable groups such as people with disabilities, the elderly, low-qualified/skilled people, minorities, people with a migrant background, refugees. Micro-credentials can also be used to help better orient students and, facilitate access and success in learning and training, and support the school-to-work transition.

Based on the EU Council Recommendation on a European approach to micro-credentials for lifelong learning and employability (2022), as well as the outcomes of OEPass and MicroHE, ECCOE projects, the "Guidelines for teachers to create digital content for MOOC considering micro-credentials in HE or VET" offer recommended descriptions of each MOOC for potential learners using criteria for course description.

2. Open online course description template

Descriptions of each course (MOOC) for potential learners leading to micro-credentials should comply with the criteria that are presented in Annex 1. The sections below, provide more coherent explanations of these criteria.

2.1. Learning outcomes

All programmes in tertiary-level institutions throughout the European Higher Education Area should be based on the concept of learning outcomes, and the curriculum should be redesigned according to the Bologna process.

Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate after completion of a process of learning. There are the most popular taxonomies used in education, including original Bloom's taxonomy, revised Bloom's taxonomy, Webb's depth of knowledge, SOLO taxonomy, Fink's taxonomy of significant learning, Shulman's tablemodule of learning, and Marzano's taxonomy, Miller's Pyramid/Prism of Clinical Competence and others. Most of them include knowledge, cognition, metacognition, and higher-order thinking skills.

When writing the learning outcomes, consider how you will know if the student has achieved these learning outcomes; how these outcomes will be assessed, i.e. if the learning outcomes are very broad, they may be challenging to assess effectively; if the learning outcomes are very narrow, the list of learning outcomes may be too long and detailed. It is also necessary to consider whether they focus on your student's abilities to demonstrate knowledge or behaviour and whether the conditions under which they perform such behaviour are indicated. It is likewise required to state the criteria for the acceptable performance. Additionally, it is crucial to check if the learning outcomes are

specific, measurable, attainable, related and time-bound (i.e. realistic to achieve within the time and resources available).

2.2. Assessment strategy

Assessment helps improve learning and set direction for the ongoing teaching and learning process. All assignments and tests must be linked to the intended course learning outcomes in a digital environment (using tests or assignment tools). In terms of the work that learners must produce, the learning outcomes must be clearly communicated to learners involved in the learning process.

Assessment tasks can take many forms. Some of the more common assessment tasks are exams, tests and essays; however, there is a wide variety of other types, both formal and informal. Some of them are:

- *Short-form and multiple-choice tests* – they do not usually test higher-order thinking skills. Short-form tests are also known as objective tests. They include multiple choice, completion (or close), true-false and matching types, of which multiple choice is the most used. A multiple-choice test item usually consists of a statement, called the stem, and several alternative statements, one of which is the correct answer, and the others are known as distracters. Few short-form tests assess higher-order thinking skills; although not impossible, constructing items to test higher-order thinking when the explanation of the correct answer is provided. This has additional educational value and contributes to a deeper understanding of the training material.
- *E-Portfolio* – a space where learners can collect various files and reflections to support their learning. These can be assessed differently, and the tutor may inform you about the requirements. In a portfolio, learners select the items of work that they wish to include to represent the learning. Portfolios promote reflection, self-evaluation, ongoing personal engagement, and demonstrating practical and creative abilities.
- *Quizzes* can consist of various types of questions, such as multiple-choice, multiple-answer, and short answer. These will be automatically marked in the environment/program and receive immediate feedback. Quizzes are often used to allow learners to check their learning progress.
- *Posters* - a poster is a visual representation of a topic or the outcomes of a learning activity. Posters can use different media, including learning technologies, and can be created individually or in groups.
- *Projects* can test higher-order thinking skills. They are an extended piece of work involving inquiry-based activities. Projects may be small or large, undertaken by individuals or in groups, and have outcomes such as a report, design, artwork, wiki, poster, or working product.

- *Essays can test higher*-order thinking skills. They require students to select, organise, and integrate material on a given topic. They also test writing skills and the ability to develop an argument and use evidence to support it.
- *Forum* – Also known as discussion boards. These may or may not be assessed. Assessment may be based on the quality of individual posts, your overall contribution, or your engagement with the discussion.
- *Assignment Submission* – Moodle and other learning management systems have tools which allow you to upload assignments. These assignments are written offline; when the learners log into Moodle, they can upload the file.
- *Online Text*– A short answer question - perhaps 1 or 2 paragraphs the learner writes and submits online. The teacher may mark mistakes and provide feedback.
- *Reflective Journals* are online spaces where you can record your learning reflections by writing or talking in a diary. The teacher may assess these directly, or the learner may be asked to write a commentary or report using the reflections as evidence or examples with practical exercises.

Moodle gives teachers much flexibility when creating assessment tasks: single-answer and multiple-answer questions, pictures, sound, or other media in the question and/or answer options (by inserting HTML) may be provided. Assessment may be done by grading or giving feedback on individual answers or assignments.

2.3. Pedagogical approach: learning and teaching strategies

Group or individual learning?

Many online learning options are available, including virtual classrooms and self-regulated learning. However, it is essential to remember that MOOC's design flexibility comes with new challenges. Succeeding in this new setting is more than just attending virtual classes or completing assignments online. It requires understanding how to effectively utilise both group and individual learning environments by creating engaging and successful educational experiences.

Group learning becomes quite essential. The main reason is that collaboration is vital in acquiring a deep understanding of a subject. When you work in a group, you're not just passively absorbing information; you're actively engaging with your peers, discussing ideas, debating, and explaining concepts. Online discussion forums, group projects, and even live video study sessions are examples of group learning. If there are no possibilities to organise group projects, at least asynchronous discussions may be created, creating an online community in the online course.

On the other hand, individual learning is a significant advantage of online education. You no longer need to rush to keep up with others or get bored waiting for your peers to

catch up. You can select your schedule, choose your learning setting, and customise your learning experience according to your needs and preferences.

Online learning benefits from collaboration tools like discussion boards, video conferencing, and shared documents. These encourage students to connect and share ideas effortlessly with each other, making the learning experience more engaging. Additionally, they mirror the teamwork required in real-world work environments. Through collaboration, students learn effective communication, role negotiation, and respect for diverse perspectives, which are crucial skills in every workplace.

Which learning approach?

Self-regulated learning. Self-regulated learning is when students actively control and regulate their learning using cognitive and metacognitive strategies. It involves setting learning goals, selecting strategies, monitoring progress, and adjusting when necessary. Autonomy support, such as encouragement of independent functioning and freedom of choice, is crucial in promoting self-regulated learning.

Problem-based approach. Project-based learning is a teaching method in which students acquire and apply skills through long-term project development: they conduct in-depth research on a specific topic or issue and prepare a presentation.

Inquiry-based learning is a form of active learning in which a topic is introduced by posing questions, problems or creating scenarios rather than simply presenting findings or indicating a fluid way of acquiring knowledge.

Problem-based learning is a student-centred approach where students learn a subject by working in groups and solving open-ended problems.

Problem-based, experiential, project-based, and project-oriented approaches suit stationary and distance learning. Problem-based, experiential, project-based, and project-oriented learning and critical thinking are all about the learner's own agency. Choice, but not imposition, is a strong incentive to learn, to have confidence, and to achieve.

In modern education, providing knowledge and teaching memorisation or repetition is not enough. Students must be encouraged to consider different assumptions, analyse various points of view, make reasoned decisions, and base their opinions on facts. Evidence-based learning through hands-on experience motivates students to be more interested, explore, apply, and create.

The *case method* is a participatory, discussion-based learning method that helps students develop skills in critical thinking, communication, and group dynamics. It is a type of problem-based learning.

Role play is a didactic activity that allows students to empathise with a simulated, realistic situation: they interact with other students in the same or opposite role by playing a pre-assigned role. Depending on the objective of the role-play, the pupil may be given different roles. It should be noted that this didactic activity can be applied using modern technology. Cameras, voice recorders, mobile phones or tablet computers can be used to record the image and sound of the role-play. The recordings can then be watched or listened to as part of the game analysis. By watching the recordings, students can assess their behaviour, body language and the strength of the arguments presented in the simulated debates from the side. Modern technology in role-playing games can go beyond the recording of the game and the viewing or listening to it.

Online discussion forums are very suitable for role-playing games. Such role-playing helps to learn to accept different points of view. In a discussion, one student posts his argument on the forum, another posts his own, then the first student argues again, then the second student argues again, and so on. This is convenient for two reasons:

1. students can role-play whenever it is convenient for them, and not even necessarily at the same time as their coursemates;
2. after reading the opponent's arguments, students have time to think about the text and to make a coherent argument.

Applying concept and mind maps. Concept and mind maps illustrate the relationships between concepts or terms covered in the material under analysis. Learners construct concept/idea maps by connecting individual terms with lines indicating the relationships between groups of related terms. Multiple relationships may link many terms in a concept map. When creating a concept or mind map, learners identify key terms, organise them schematically, and create meaningful links between individual pieces of information. The virtual space provides open tools for its creation, which can be used for learning. The following are recommended as the best concept and mind mapping platforms for 2020, which are well suited to contextualising information using colour, text and images: MindMeister, Ayoa, Milanote, Miro, or Microsoft Visio.

Creating interactive learning objects. Interactive learning objects can be created by the teacher or by assigning the task to students or groups of students. Recommended tools include H5P, Eclipse Crossword (instructions for making a crossword are here), LearningApps or similar.

Discussions. Discussions occur when a group comes together to interact with each other - to talk and listen to each other about a topic or event that interests all. For example, students are invited to discuss healthy eating. Video conferencing tools can be used for the discussions if it is foreseen that students will join in at a specific time. Asynchronous discussions can be held in forums.

Gamification is the process of incorporating game elements into learning activities to increase engagement and motivation. This can involve using game-based learning platforms, creating online quizzes with points and badges, or incorporating game mechanics into other online activities. It makes learning fun and interactive.

Repetition and consolidation. This can be organised in a distance learning environment, with students completing practical tasks and self-tests; self-tests or review tests can be given at set times (either in the Moodle VLE or via videoconferencing room).

If possible, it is recommended to choose a variety of teaching and learning strategies when developing MOOCs. The purpose of using teaching and learning strategies can be different. If several teachers teach the course, the aim may be to identify the best strategy for organising learning. In contrast, if only one teacher has taught the course, the importance of these strategies for student learning may be identified.

2.4. Assignments

Assignments are valuable educational tools that raise students' consciousness and help them achieve learning outcomes. They require the effort, time, and dedication of students and teachers. Thus, it is clear that assignments are practical tools to develop skills and provide learning experiences in order to achieve the needed behaviour change. Thus, the purpose of this paper is to examine the views of state primary school students on the assignments given by their teachers.

Assignments and assessments are much the same thing: an instructor is unlikely to give students an assignment that does not receive some sort of assessment, whether formal or informal, formative or summative, and an assessment must be assigned, whether it is an essay, case study, or final exam. When the two terms are distinguished, "assignment" tends to refer to a learning activity that is primarily intended to foster or consolidate learning, while "assessment" tends to refer to an activity that is primarily intended to measure how well a student has learned.

Assignment description requires several additional efforts by course authors, namely:

- Assignments presented require practical application of theoretical knowledge;
- Course learning outcomes /competencies are linked with assignments;
- Assessment methods are indicated in the assignment;
- The prepared assignments foster exploration, information gathering, analysis, development of creativity and critical thinking;
- The assignment description contains information on how it has to be submitted.

For more on the presentation of assignments, see in the teaching and learning plan below.

3. Teaching and learning plan (for self-regulated learning)

When teaching and learning of each online learning course run, each module is recommended to have a specific teaching and learning plan, which is provided for learners before the learning starts and which may be adapted using the dates of each module run. If the modules are prepared for self-learning, the Teaching and learning plan may be adapted for student guidance, indicating the suggested timeframe but not specific dates.

When learning, each learner can ask for an agreed number of contact hours (such as 2 ac. hours) with the tutor or consultant *(further module-leading teacher).* These synchronous online meetings with the module-leading teacher should be planned using videoconferencing tools.

Module teachers should assign synchronous and asynchronous contact hours and indicate them in the online learning environment (link to virtual learning environment) after the learner (link to the request form) indicates the preferred time for the synchronous meeting.

The module topics, schedule and assignments that are recommended be included in the Teaching and learning plan (see **¡Error! No se encuentra el origen de la referencia.** as an example).

Table 1. Module topics, schedule and assignments of table

Topic	Learning week	Contact hours for synchronous meetings	Assignment for individual learning
Topic 1	1		-
Topic 2	2-3		Practical assignment 1. (individually). Concept map Assignment 2. Test
Topic 3	4-5		
Final assignment	6-8	Time agreed with the course teacher	Project presentation
Exam	9-10	Date (tbd)	

Assessment in a fully online learning context requires adequate planning and may involve diverse learning activities.

Table 2. Assessment strategy example

Activity	Grade	Percent value	Total percent value
Assignment 1. Concept map		10%	20 %
Assignment 2. Test		10%	
Project presentation		50 %	70 %
Exam		30 %	100 %
Total value	100 %		

4. Further readings

- Bates., T., (2022) Teaching in a Digital Age: Guidelines for designing teaching and learning – 3th Edition, University of British Columbia. https://www.tonybates.ca/teaching-in-a-digital-age/
- Council Recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability 2022/C 243/02. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022H0627(02)
- Exploring Group And Individual Learning In Online Environments.
- Law, P. (2015). Digital badging at The Open University: Recognition for informal learning. Open Learning: The Journal of Open, Distance and e-Learning, 30(3), 221–234. https://doi.org/10.1080/02680513.2015.11045 00.
- Mammadov, S., Schroeder,K., (2023). A meta-analytic review of the relationships between autonomy support and positive learning outcomes, Contemporary Educational Psychology, Volume 75. 102235. ISSN 0361-476X,https://doi.org/10.1016/j.cedpsych.2023.102235.
- Trepulė, Elena; Volungevičienė, Airina; Teresevičienė, Margarita; Daukšienė, Estela; Greenspon, Rasa; Tamoliūnė, Giedrė; Šadauskas, Marius; Vaitonytė, Gintarė. Guidelines for Open and Online Learning Assessment and Recognition with Reference to the National and European Qualification Framework: Micro-credentials as a Proposal for Tuning and Transparency. 2021. ISBN 978-609-467-479-2
- Zucker, L., & Hicks, T. (2019). Alternative assessments, unintended consequences: The promise and peril of digital badges. Transformations: The Journal of Inclusive Scholarship and Pedagogy, 29(1), 113-123. https://doi.org/10.5325/trajincschped.29.1.0113

Annex 1. Course description template

Criteria are displayed in a digital micro-credential and should be uploaded to Moodle by teachers

Criteria	*Description*
Course title	*Public speaking and intercultural communication*
Abstract or short description	*Add a short description of the course*
Field of studies	*Humanities*
Education institution/ department, faculty	*include all partners institutions*
Author Teacher	*The name, title, field of expertise and affiliation of author*
Short bio of the teacher/author	N/A
Photo (attached by separate file)	N/A
The scope of the learning (ECTS)	*ECTS*
Volume of learning (hours)	*Duration of learning and scope e.g. 1 ECTS or 26,67 academic hours, which includes 10 ac. hours group learning and rest 16,67 is self learning*
Start Date/Free choice of start date	*Indicate a specific start date for the subject/programme or indicate that the subject/programme is open for enrolment at any time.*
End Date	*What is the likely end of the course/programme*
The aim of the course	
Target group	
Entry requirements	
Course language	
Training material level	*Describe entry requirements based on EQF (8 levels)or NQF levels*
Formal entry requirements	
Mode of study	*Online, face to face, blended, etc.*
Form of study	*Part time, full time, non-formal*

<table>
<tr><td>Estimated duration</td><td>Months/ weeks</td></tr>
<tr><td>Workload</td><td></td></tr>
<tr><td>Keywords/tags</td><td></td></tr>
<tr><td>Price (if applicable)</td><td></td></tr>
<tr><td>Competences/ learning outcomes</td><td>Choose appropriate learning outcomes (e.g. from formal curriculum in relation with competences), having in mind target group need analyses and expected scope of non-formal learning program.</td></tr>
<tr><td>Pedagogical approach and structure/interactivity</td><td>Describe main learning activities (Case study, Problem-based, Project-based, Concept map, Scenario comparison, Summary,...) and how technologies will support learning: theory, group work, learning by doing, independent work.</td></tr>
<tr><td>Main topics (content)</td><td></td></tr>
<tr><td>Course delivery</td><td>Mentored and/ or self-learning</td></tr>
<tr><td>Distribution of learning hours</td><td>
<table>
<tr><th>Learning implemented</th><th>Synchronous/ contact hours</th><th>self - learning hours</th></tr>
<tr><td>Lectures</td><td></td><td></td></tr>
<tr><td>Consultations</td><td></td><td></td></tr>
<tr><td>Creative tasks</td><td></td><td></td></tr>
<tr><td>Assignments</td><td></td><td></td></tr>
<tr><td>...</td><td></td><td></td></tr>
<tr><td>.....</td><td></td><td></td></tr>
<tr><td>Total</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Assessment method</td><td>
<table>
<tr><th>Activity</th><th>Grade</th><th>Percent value</th><th>Total percent value</th></tr>
<tr><td>1 assignment</td><td>10</td><td>10%</td><td rowspan="3">30 %</td></tr>
<tr><td>2 assignment</td><td>10</td><td>10%</td></tr>
<tr><td>3 assignment</td><td>10</td><td>10%</td></tr>
<tr><td>Colloquium</td><td>10</td><td>20 %</td><td>20 %</td></tr>
<tr><td>Exam</td><td>10</td><td>50 %</td><td>50 %</td></tr>
</table>
</td></tr>
</table>

	Total value: 100 %
Assessment strategy	*How you assess student performance (knowledge, skills, competences). What are the requirements? Describe a formative and summative approach during learning. Decide on number and type of assignments. Choose appropriate criteria for different types of assignments.*
Assessed by	
Procedural requirements for learner authentication and ID verification	*No verification of a learner, online assessment without ID verification of a learner with secure login into LMS, etc.*
Certification/ Micro-Credential	*Requirements for general certification in case of completion of a learning program. Is there any (e.g. 80% of assigned activities could be performed?)*
Credentialization	*Credentials that will be issued*
Link of the course with the formal curricula	
Type of Creative Commons license for the course	*If applicable*
Learning opportunity type	*Learning opportunity Type Suggested standard vocabulary to use: https://op.europa.eu/en/web/eu-vocabularies/concept-scheme/-/resource?uri=http://data.europa.eu/snb/learning-opportunity/25831c2*
Industry Support	*The assurance that micro-credentials meet an industry need and reflect skills sought by employers. For example, a statement of support from industry.*
Stackability	*Any other micro-credentials that a micro-credential combines with (stacking) that lead to an overall certification being awarded upon completion, or entry into a further course.*