Universität Potsdam

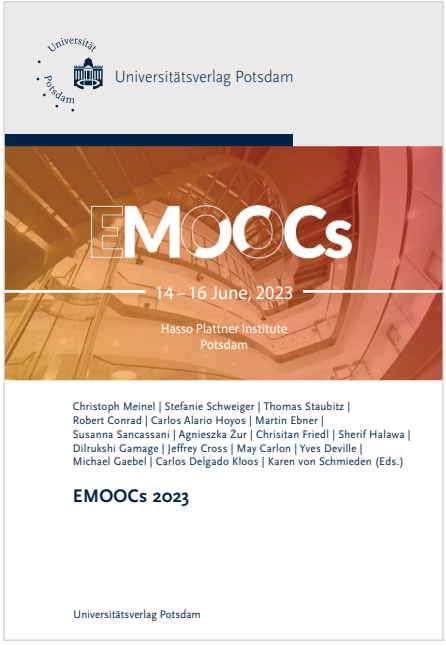
Universitätsverlag Potsdam

Article published in:

Christoph Meinel, Stefanie Schweiger, Thomas Staubitz, Robert Conrad, Carlos Alario Hoyos, Martin Ebner, Susanna Sancassani, Agnieszka Żur, Christian Friedl, Sherif Halawa, Dilrukshi Gamage, Jeffrey Cross, May Kristine Jonson Carlon, Yves Deville, Michael Gaebel, Carlos Delgado Kloos, Karen von Schmieden (Eds.)

EMOOCs 2023

2023 – vii, 350 p.
DOI https://doi.org/10.25932/publishup-57645



Suggested citation:
Ada Giannatelli; Alessandra Tomasini: Descriptors and EU Standards to support the recognition of MOOCs, In: Christoph Meinel, Stefanie Schweiger, Thomas Staubitz, Robert Conrad, Carlos Alario Hoyos, Martin Ebner, Susanna Sancassani, Agnieszka Żur, Christian Friedl, Sherif Halawa, Dilrukshi Gamage, Jeffrey Cross, May Kristine Jonson Carlon, Yves Deville, Michael Gaebel, Carlos Delgado Kloos, Karen von Schmieden (Eds.): EMOOCs 2023 : Post-Covid Prospects for Massive Open Online Courses - Boost or Backlash?, Potsdam, Universitätsverlag Potsdam, 2023, S. 133–146.
DOI https://doi.org/10.25932/publishup-62396

Descriptors and EU Standards to Support the Recognition of MOOCs

Ada Giannatelli and Alessandra Tomasini

Politecnico di Milano – METID
Piazza Leonardo da Vinci, 32 – Milano

Digital technologies have enabled a variety of learning offers that opened new challenges in terms of recognition of formal, informal and non-formal learning, such as MOOCs.

This paper focuses on how providing relevant data to describe a MOOC is conducive to increase the transparency of information and, ultimately, the flexibility of European higher education.

The EU-funded project ECCOE took up these challenges and developed a solution by identifying the most relevant descriptors of a learning opportunity with a view to supporting a European system for micro-credentials. Descriptors indicate the specific properties of a learning opportunity according to European standards. They can provide a recognition framework also for small volumes of learning (micro-credentials) to support the integration of non-formal learning (MOOCs) into formal learning (e.g. institutional university courses) and to tackle skills shortage, upskilling and reskilling by acquiring relevant competencies. The focus on learning outcomes can facilitate the recognition of skills and competences of students and enhance both virtual and physical mobility and employability.

This paper presents two contexts where ECCOE descriptors have been adopted: the Politecnico di Milano MOOC platform (Polimi Open Knowledge – POK), which is using these descriptors as the standard information to document the features of its learning opportunities, and the EU-funded Uforest project on urban forestry, which developed a blended training program for students of partner universities whose MOOCs used the ECCOE descriptors.

Practice with ECCOE descriptors shows how they can be used not only to detail MOOC features, but also as a compass to design the learning offer. In addition, some rules of thumb can be derived and applied when using specific descriptors.

1 Introduction

The online delivery of Higher Education (HE) was accelerated first by the emergence of open learning, and then by COVID-19 pandemic. As the digital transformation of HE gathers momentum, MOOCs cater for the needs of an increasingly diversified student population and open up opportunities to develop new competencies demanded by the labour market. MOOCs can be integrated into formal learning paths and can support transnational mobility (whether physical, virtual or a combination of the two) in both higher education and lifelong learning, but challenges arise in terms of recognition of learning.

Upon successful completion, a MOOC can issue a credential, which is, in its most essential form, a documented statement containing claims made about a person, such as a diploma or a certificate.

The recognition of MOOCs enables learners to transition from non-formal to formal education; a further advantage is that a credential can also count toward earning a further credential (stackability). Recognition has two meanings: the process of issuing a certificate, diploma or title which has formal value even if the learning has taken place non formally (credentialisation); the process of formally accepting a certificate, a diploma or title issued by a third party institution, which attests that a set of learning outcomes achieved by an individual has been assessed by a competent body against a predefined standard. A report from the EU Joint Research Centre (JRC) (2019) presents practical guidelines for the implementation of open education practices in HE and highlights the increasing importance of the recognition process [3].

Despite the fact that European Higher Education Institutions (HEIs) use the same reference standards and currency, i.e. ECTS credits, the recognition of sub-degree credentials earned online is still not common practice because there are no widely established practices to this end and HEIs are reluctant to trust the reputation of credential issuers they are not familiar with [5].

Making learning explicit through the codification of knowledge, skills and competences in qualifications is conducive to streamline recognition through an increased transparency of information. This is instrumental to foster the flexibility of European HE and to keep at pace with the constantly evolving needs of the labour market by documenting the achievement of the most sought-after skills.

In this context, the paper presents the synergy between two EU-funded projects:

- ECCOE project[1](2019–2022), which identified the most relevant descriptors with a view to supporting a European system for micro-credentials; the MOOC

[1]Available at https://eccoe.eu/

platform of Politecnico di Milano (POK) adopted these descriptors to present the information about its learning opportunities;

- Uforest project (2020–2023) on urban forestry[2], which developed a MOOC-based blended training program for students from partner universities and took up the ECCOE descriptors as a compass to design the learning offer and to streamline recognition of learning.

2 Describing Learning Opportunities

The EU-funded ECCOE project developed a system of tools to support the digitalisation and recognition of credentials by increasing trust in technology-enabled credentials among students, HEIs and employers and in particular:

- a comprehensive list (dataset) of credential descriptors, reviewed through extensive internal and external processes of feedback; the methodology is described in a specific paper [2];
- the learning opportunities catalogue, which provides examples of how to describe a learning opportunity[3].

If an organization issues a micro-credential for a MOOC and wants this credential to be easily recognizable by other HEIs, it is paramount to properly describe it, with the focus being set on the learning outcomes and resulting competencies. That is true especially if the credential is presented for recognition without any existing agreement between the issuing institution and the receiving institution.

Descriptors indicate the specific properties of a learning opportunity according to European standards: they can provide a recognition framework also for small volumes of learning (micro-credentials) to support the integration of non-formal learning (MOOCs) into formal learning (e.g. institutional university courses), to enhance both virtual and physical mobility and to tackle skills shortage, upskilling and reskilling by acquiring relevant competencies. Micro-credentials certify the learning outcomes of educational experiences that are shorter than traditional qualifications, for example a MOOC.

A micro-credential potentially ranges from a minimum of one ECTS credit with an upper limit of less than a full degree.

[2] Available at https://www.uforest.eu/

[3] Available at https://eccoe.eu/wp-content/uploads/sites/28/2022/09/ECCOE_O3_Learning-Opportunities-Catalogue_Public-Report.pdf

2.1 European standards

Micro-credentials cannot reach their full potential without common standards ensuring their quality, transparency, cross-border comparability, recognition and portability. The EU has developed the European Learning Model (ELM) to capture the results of any non-formal, informal and formal learning across Europe. It is designed to provide a single format to describe any kind of claims that are related to learning, from certificates of attendance, to degrees to diploma supplements. ECCOE credential descriptors, and the dataset of credential qualities, can complement the ELM database of descriptors: ECCOE partners first defined the main required descriptors with reference to the European Digital Credential Infrastructure (EDCI) data model for learning opportunities.

European Digital Credentials for Learning – EDC are a recently launched EU standard for issuing education credentials (e.g. diplomas, transcripts of records, etc.). In late 2022 a new version of the EDC infrastructure was released, which allows for issuing credentials potentially in 29 languages (multilingualism), and ELM v3 is being progressively released in 2023. As part of the ECCOE sustainability plan, experiments are being carried out to issue digital credentials through the EDC infrastructure such as in the case of the upcoming MOOC of the FemPower project[4]. For more in-depth information about issuing digital credentials, ECCOE developed the How-to guides [1].

EDCI can be potentially integrated into the online student services and MOOC delivery platforms of a university: in case two HEIs have integrated their respective student management systems with EDCI, a fully automated mutual recognition of credentials is possible. However, whether a HEI integrated the EDCI standards or not is only a small part of the question: technical interoperability only accelerates and simplifies the recognition procedure, it does not replace it. To solve this problem and support credential issuing institutions in automating the process, the ECCOE project developed a template for a Model Credit Recognition Agreement – MCRA [6], that can be used by those HEIs wishing to establish mutual agreements to recognise and validate each other courses.

Another key element within the European standard ecosystem for credentials is the reference to ESCO, which is the classification of European Skills, Competences, Qualifications and Occupations: in particular the ESCO skills and knowledge hierarchy[5] is a single all-embracing hierarchical framework containing four distinct sub-classifications:

[4]Available at https://www.pok.polimi.it/courses?search_query=CET101
[5]Available at https://esco.ec.europa.eu/en/classification/skill_main

- Knowledge
- Language skills and knowledge
- Skills
- Transversal skills and competences

The Learning Outcome of a MOOC can be linked to the appropriate ESCO skill(s) by using the respective URI(s), that is Unique Resource Identifier, a persistent and machine-readable string of characters, which identifies each ESCO skill (see an example in the table). It also points to suitable translations, as ESCO is multilingual. It is important to use verbs that indicate what the learner will be able to do by achieving a Learning Outcome.

To describe a MOOC its provider can search for a suitable match with each Learning Outcome of the MOOC by scrolling through the structure of the taxonomy and/or with a keywords search: it is worth noting that the new version of ESCO (1.1) improved the mapping of digital, green, transversal skills and skills for researchers. ESCO is aligned with DigComp framework, whose updated version DigComp 2.2 [7] provides new examples of knowledge, skills and attitudes and takes into account emerging technologies such as Artificial Intelligence, the Internet of Things and datafication or new phenomena such as the new teleworking conditions. The ESCO skills hierarchy, updated in early 2022, is in a continuous process of improvement.

Another aspect that needs to be pointed out is that ESCO skills and knowledge hierarchy can act as a lever for fine-tuning the learning outcomes of courses irrespective of their volume of learning, from whole study programs (such as bachelor's or master's degrees) to short courses and learning paths such as MOOCs.

3 Uforest case study and anatomy of descriptors

The Uforest project developed a training program to support students and practitioners in the implementation of innovative Urban Forestry projects and help them maximize the economic, environmental, and social benefits of nature-based solutions. It has been conceived as a blended path (Figure 1) made of an initial MOOC-based part, hosted on Polimi Open Knowledge (POK) platform, and a second in-person part, as intensive 14-days training for students of partner universities.

Figure 1: Uforest training innovation program

When partner universities (Politecnico di Milano, Transilvania University of Brasov, Trinity College Dublin, Universitat Autònoma de Barcelona) started the design process, they explored how they could offer ECTS credits recognition to learners from outside their respective HEIs. During this investigation process, it was decided to use the ECCOE descriptors to design the online learning opportunity. The aim was to ensure that it is aligned with micro-credential standards, if the Uforest universities should decide to create them.

Interestingly enough, the co-design process of the learning outcomes that learners are expected to achieve at the end of the Program was very challenging for partners. A survey was administered to university students, professionals and citizens from different Countries to identify training needs in the areas of innovation and entrepreneurship in urban forestry and Nature Based Solutions (NBS) [4]: its results in terms of demanded knowledge and skills fed into learning outcomes.

Currently just one university, the Trinity College Dublin, has moved in this direction by activating the micro-credential "Entrepreneurship for the Nature-based Enterprise", available upon selection to anyone interested, not only to its enrolled students[6]. At the time of writing, around 25 % of students of the micro-credential are coming from outside Trinity. This process has evolved according to internal rules of each university. The fact that the use of ECCOE descriptors has been agreed from the outset of the Uforest project has allowed the smooth integration of Trinity's new academic provision into the Uforest learning opportunity.

Table 1 shows some examples of how ECCOE descriptors have been applied to one of the Uforest MOOCs.

[6]Available at https://www.tcd.ie/courses/microcredentials/by-school/micro-credentials---business/entrepreneurship-for-the-nature-based-enterprise---micro-credential/)

Table 1: Descriptors

Criterion / Label	Definition	Descriptors in Uforest
Title	Title of Learning Opportunity	Nature in the city: turning knowledge into urban forestry practice
Description	A summary of the learning opportunity	This course focuses on introducing the concept of Urban Forestry (UF), exploring the different and closely interrelated topics that constitute the foundations of this field. The course is designed as a choral MOOC based on the valuable experiences of international experts. Real case studies offer a compelling picture of challenges and strengths that needs to be considered when designing a new initiative on Urban Forestry.
Learning Opportunity Type	e.g. course, module, MOOC (suggested standard vocabulary)	MOOC
Provided by	e.g. the institution responsible for offering the MOOC	Politecnico di Milano in collaboration with Ente Regionale per i Servizi all'Agricoltura e alle Foreste (ERSAF), Etifor | Valuing Nature, The European Forest Institute (EFI), The Universitat Autònoma de Barcelona (UAB), CREAF, AGRESTA Forest solution for the future, Transilvania University of Brașov (UNITBV), Forest Design, Trinity College Dublin, Nature Based Solutions Institute, Green City Watch
Hosted by	The name of the platform hosting a learning opportunity	Polimi Open Knowledge platform
Type of provider	e.g. HEI, Private business school etc.	HEI
Provided at	The location (physical and/or virtual) where the learning opportunity will take place	Polimi Open Knowledge platform www.pok.polimi.it
Language(s) of Instruction	e.g. English	English
Start Date / End Date	The date from which a person may follow the learning opportunity, or "any start date"	Classes Start Nov 21, 2022 Classes End May 21, 2023

Duration	The duration for which the learning opportunity will continue to run	expressed in months (in whole number) e.g. six months
Learning Schedule	Timetable	The course is structured in seven Weeks: Week 0 – Introduction to the course Week 1 – History of urban forestry Week 2 – Urban Forestry planning and design Week 3 – Urban forest ecology Week 4 – Socioeconomics – Governance and community engagement Week 5 – Entrepreneurship and innovation Week 6 – Final assessment Week 7 – Live events – Urban Forest Case Studies
Workload in Hours	The estimated number of hours the learner should spend to earn the award	50
Admissions Procedure	Specific information on how to apply for the course	You can access the course fully online. Course materials will remain available to all enrolled users after the end of the current edition, so they can return to content later. The current course edition will be followed by a new one just after its end.
Entry Requirements	The criteria the person should meet to start this learning opportunity	No prerequisite knowledge is required for this course.
Fees	Information about the pricing of the course	You can access the course entirely free of charge.
Mode of learning	online, blended etc.	Online
ECTS Credit Points	If the MOOC awards ECTS and, if it does, number of ECTS credits for the MOOC	The Certificate of Accomplishment in itself does not confer any academic credit, grade or degree, but learners who successfully complete passes this MOOC and the advanced online course of Uforest program titled “Greening your city: develop your urban forestry project” within the Uforest program, can be entitled to achieve 6 ECTS issues by Uforest partner universities.

Type of credential	A badge, a certificate of attendance, a paper diploma, a digital credential etc.	The Certificate of Accomplishment will be issued to anyone who successfully completed the course by achieving at least 60 % of the total score in the assessed quizzes. You will be able to download the Certificate of Accomplishment directly on the website.
Discipline / subject area (Thematic Area)	According to ISCED-F classification	0731 Architecture and town planning 0821 Forestry 0413 Management and administration 0521 Environmental sciences 0522 Natural environments and wildlife 0712 Environmental protection technology
European Qualifications Framework (EQF)	Level expressed in terms of EQF	Level 7
National QualificationeFramework Level		–
Description of learning outcomes	Description in terms of learning outcomes	By completing this course you will be able to:
Related ESCO Skill(s)	For each Learning Outcome, direct reference to the specific ESCO skill(s)	• explain and discuss the concept of urban forestry and its key characteristics and provide a broad yet comprehensive overview of key concepts in smart and sustainable city planning (ESCO – specialize in an area of history; ESCO – urban planning; ESCO – develop forestry strategies) • identify urban and peri-urban forestry categories and the main UPF design principles (ESCO – manage landscape design projectsESCO – urban planning;) • recognise ecosystem services provided by urban forests, differentiate between different ES (ESCO – sustainable forest management; ESCO – forest ecology)

		• understand the basic concepts of forest ecology and management, of a tree inventory, forest monitoring and how existing areas can be included in developing plans (ESCO – forest ecology; ESCO – analysing and evaluating information and data; ESCO – apply digital mapping; ESCO – manage forests) • recognize the complex nature of urban forest governance, the roles of different actors and stakeholders and how to engage them to be participative (ESCO – sustainable forest management; ESCO – engage with stakeholders; ESCO – work within communities) • understand and explain the concept and practice of entrepreneurship in urban forestry, relevant impact indicators and the dynamics underlying the formation and growth of entrepreneurial ventures (ESCO – show entrepreneurial spirit) • identify a range of different public and private ways to fund urban forestry initiatives and how to make them attractive for investment / grants (ESCO – Funding methods)
Activities	Activities which a person can perform to acquire the expected learning outcomes	Throughout the MOOC, over and above consulting the content, in the form of videos, additional web-based resources and webinars, you will, through the forum or other digital tools that support sharing and comparing ideas, work on reflecting on the contents and experiences brought by the MOOC experts and improving your own experience taking into consideration the inputs emerged from discussions with peers. To obtain the certificate, you should complete the whole MOOC, read the additional resources and reply to Weekly and Final quizzes. We strongly encourage you to take part in the activities and discussions that you find most useful and relevant for your own professional development. These activities guide you in:

		• focusing or reflecting on specific inputs individually; • interacting with the other learners during webinars and through external tool, like Padlet and Answer Garden; • sharing and discussing experiences, challenges, and solutions with the aim to help and support professional development.
Assessments	Assessments a person can undergo to prove the acquisition of the learning outcomes	The final grade for the course is based on your responses to the quizzes you will find at the end of each week (weekly quizzes), to the final quiz (Week 6), and to the two quizzes linked to case studies discussed during live events (in Week 7). Remember that questions refer to video lessons, live events, and additional resources. Questions are proposed randomly from a bulk. Scoring for the quizzes equals 1 point per question. Remember, the system will record the result of your final attempt, not the best of your attempts. The course is considered successfully completed if the participant reaches 60 % of the total score. Therefore, we strongly encourage you to take part in the activities and discussions. The course's total score will be calculated by summing the scores of all the assessed quizzes: weekly quizzes, final quiz, and live event's quizzes.

3.1 Practical takeaways from practice with descriptors

Adopting ECCOE descriptors in a variety of learning opportunities allowed to derive some rules of thumb that can be applied in using specific descriptors:

- **Related ESCO skills** – not any skill can be referenced to ESCO, but wherever possible it is recommended to associate 1 to 3 relevant ESCO skills to each Learning Outcome; in case of multidisciplinary learning outcomes, more than one ESCO skill can give an account of the multidisciplinary dimension. Operationally it means to add to the Learning Outcome a direct reference to the specific ESCO skill using the ESCO unique identifiers, that is the ESCO skill expressed in natural language + its URI (Uniform Resource Identifier). Mapping learning outcomes against ESCO taxonomy allows for cross-border comparability.

- **EQF level** – it is indicative and is defined on the basis of the EQF level description that matches all or at least the majority of MOOC learning outcomes[7]. For general guidance: a MOOC corresponding to a face-to-face curricular BSc or MSc module in the same HEI generally equals EQF level 6 and EQF level 7 respectively, but this hint needs to be verified in each case. It is worth noting that a MOOC can be described as corresponding to a EQF level (e.g. EQF level 5) but can be used/instantiated as a part / module of a program which has a different EQF level (e.g. EQF level 6). In addition to the European framework, a learning opportunity can be mapped against a National Qualification Framework as well, if relevant/applicable.

- **Discipline / subject area** – is defined according to ISCED-F taxonomy and the MOOC provider should choose the most appropriate level of detail among the three available in ISCED-F[8]:

  Level 1 – broad fields (two figures): e.g. 05 Natural Sciences, Mathematics and Statistics

  Level 2 – narrow fields: (three figures): e.g. 051 Biological and related sciences

  Level 3 – detailed fields (four figures): e.g. 0512 Biochemistry.

  If relevant, more than one ISCED-F field can be assigned to a single learning opportunity, e.g. in the case of multidisciplinary courses.

- **Workload in Hours** – as the ECTS credits are the currency within the European higher education, whenever possible it is advisable to design the MOOC so that its workload equals the number of hours required for 1 ECTS credit or multiples thereof in the Country of the issuing institution (e.g. 25 hours workload for one ECTS credit in Italy).

4 Conclusion

The existence of a political will in HEIs is crucial to accelerate and simplify the ECTS recognition procedure. In this direction, the comprehensive dataset of credential descriptors, tested, reviewed and implemented in ECCOE provides a sound basis for making the academic recognition process as agile as possible. The calibration with ELM-controlled vocabularies also supports the list of credential descriptors.

[7] Available at https://ec.europa.eu/ploteus/en/content/descriptors-page https://europa.eu/europass/en/description-eight-eqf-levels

[8] Available at https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-fields-of-education-and-training-2013-detailed-field-descriptions-2015-en.pdf

Properly describing a credential paves the way to unleash the potential of micro-credentials for university students' mobility, be that physical, virtual / online) (as in Uforest), or a combination of the two; it also creates visibility for a particular learning offer, opens up learning pathways, and provides flexible training opportunities for people with more disadvantaged socioeconomic status. Ultimately, providing relevant data to describe a MOOC is conducive to the flexibility of European higher education by increasing the transparency of information. The use of Learning Outcome descriptors referenced to ESCO works in the same direction and fosters transnational and virtual mobility by supporting cross-border interoperability of information and comparability of skills.

In the cases of Uforest project, detailing learning outcomes and resulting competences acted as an innovation lever at an early stage of design of the blended training program. In addition to that, it will facilitate partner universities to offer the Uforest training program or part of it (e.g. the MOOC) as a micro-credential.

The ability to calibrate learning outcomes to ESCO skills and competencies, and therefore the possibility to indicate them in the certificate in the future, makes them more relatable for the labour market.

References

[1] A. Antonaci et al. *The ECCOE Micro-Credentials Implementation Guidebook How to make Digital Credentials and Micro-Credentials work at your institution*. ECCOE Project Report on Intellectual Output 5. July 2022.

[2] D. Arnold et al. "The ECCOE approach to quality reviewing online descriptions of learning opportunities". In: *Enhancing the Human Experience of Learning with Technology: New challenges for research into digital, open, distance & networked education*. European Distance and E-Learning Network (EDEN). Lisbon, Oct. 2020. DOI: 10.38069/edenconf-2020-rw-0008.

[3] A. Inamorato dos Santos. *Practical guidelines on open education for academics: modernising higher education via open educational practices (based on the OpenEdu Framework)*. JRC115663. 2019. DOI: 10.2760/55923.

[4] C. O'Driscoll et al. *Uforest Training Needs' Assessment and Stakeholder Analysis Report. Uforest Project Deliverable 3.1. Ediz. Integrale*. Technical report. 2021.

[5] T. Read and D. Arnold. "ECCOE: toward a robust solution for the cross-institutional recognition and validation of prior learning". In: *Human and Artificial Intelligence for the Society of the Future*. European Distance and E-Learning Network (EDEN). Lisbon, Oct. 2020. DOI: 10.38069/edenconf-2020-ac0002.

[6] B. Sedano and T. Read. *O2: Model Credit Recognition Agreement. Public report*. 2022. URL: https://eccoe.eu/wp-content/uploads/sites/28/2022/09/ECCOE_O2_Model-Credit-Recognition-Agreement_Public-Report.pdf (last accessed 2023-05-08).

[7] R. Vuorikari, S. Kluzer, and Y. Punie. *DigComp 2.2: The Digital Competence Framework for Citizens – With new examples of knowledge, skills and attitudes*. JRC128415. Publications Office of the European Union, 2022. ISBN: 978-92-76-48882-8. DOI: 10.2760/115376.