CREATING MATURE BLENDED COURSES: THE EUROPEAN MATURITY MODEL GUIDELINES

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Abstract

The pandemic has urged European universities and other institutions of higher education to switch in a very limited time from on-campus to remote teaching or to teaching modes that combine online and face-to-face activities. Instructors, as well as other course designers and support service staff are in search of evidence-based frameworks that show how to incorporate proven blended scenarios, adapted to their context. Between 2017 and 2020 seven European project partners collaborated in order to establish a conceptual and operational framework for blended education and teaching, labelled as the *European Maturity Model for Blended Education.* Its aim is to map blended learning practices, conditions, strategies and policies in a systematic manner and to empower higher education institutions to achieve up-scaled blended courses. In this contribution, we focus on what has been developed with regard to the course level. First, we describe the dimensions and indicators of the model, next we indicate blended courses might be altered in terms of their level of maturity using a series of guidelines and open-source tools and materials. We conclude by proposing how to employ the guidelines in a workshop setting.

Introduction

The Covid-19 crisis, as well as other societal demands change the formats and contexts for teaching and learning in higher education institutions (HEIs). In Europe, there is a prominent call for adopting "purposeful digital and innovative education practices" (European Commission, 2018) and to develop a "high-performing digital education ecosystem" (European Commission, 2020). In this regard, *blended* or *hybrid* educational approaches have been repeatedly pinpointed as drivers of personalized, flexible, inclusive, self-directed and effective student learning (e.g., Peterson, 2016; Thai, de Wever, & Valcke, 2017). While there is still ambiguity about the scope and core conceptions (Smith & Hill, 2019), in this study, *blended learning* is defined as "learning as a result of a deliberate, integrated combination of online and face-to-face learning activities". *Blended teaching* is

described as "designing and facilitating blended learning activities". While *deliberate* refers to the explicit role of a design which specifies the proportion and sequencing of in a blended course, *integrated combination* designates the logic for using a particular blend of virtual and physical learning spaces.

In response to the Corona pandemic, across HEIs, course designers as well as support service staff are in search of evidence-based frameworks that show how to incorporate proven blended scenarios, adapted to their context. More than ever, it has been experienced how important it is to combat the "transactional distance" (Moore, 2019) and social isolation of students that may arise from online distance education (Rasheed, Kamsin, & Abdullah, 2020), next to supporting more vulnerable students such as freshmen or those enrolled in specific learning programs. Such student groups are found to being "less ready" in terms of self-regulation and technology savviness (Appana, 2008), or they follow courses in which the tactile or applied aspect of learning is prominent (e.g., physiotherapists, veterinarians, engineers, hospitality collaborators). Blended learning environments may tackle these issues and address students' learning needs either easier or better. In these, an instructor wishes to achieve an equilibrium of internet- and human-mediated learning activities that extend the opportunities for learner interaction, strengthen the scaffolds of learner autonomy, improve a course's structure and the learner interface (Bostock, 2018).

Between 2017 and 2020 seven European project partners collaborated in order to establish a conceptual and operational framework for blended education and teaching (Goeman & Ubachs, 2018; Goeman, Poelmans, van Rompaey, Dijkstra, & van Valkenburg, 2019). In May 2020, the European Maturity Model for Blended Education (EMBED) was published (see https://embed.eadtu.eu). Its aim is to map blended learning practices, conditions, strategies and policies in a systematic manner and, ultimately, to identify tracks for optimization or change. It includes 15 dimensions and three levels of maturity which can be used to assess systematically blended courses, programs and institution-wide provisions.

The last project phase was dedicated to the development of implementation guidelines, that is background information, examples, models, tips and tricks, as well as recent predominantly open access references to resources, in line with the foundations of the maturity model (in the following paragraphs abbreviated as EMM). They are specified for each dimension of the model, and target different (groups of) stakeholders, among others, instructional designers and educational managers in institutions for higher education (HE). The guidelines may be applied for assessment and change purposes, yet, also inspire and guide anyone who wants to implement blended practices in his/her institution in a sustainable manner. A number of the guidelines were integrated in the Massive Open Online Course (MOOC) *Making Blended Education Work* which is based on the EMM and

the project output (see https://www.futurelearn.com/courses/making-blended-education-work).

The EMM distinguishes maturity at three levels, namely the course, program and institution level. For each level multiple dimensions and indicators are established. These are based on a literature synthesis, a review of proven practices and a three-round Delphi study. In this contribution, we focus on the maturity of blended courses.

Foundations of the European Maturity Model at the course level

The course level refers to the core of the educational system, where both learning processes and instructional processes are situated. It refers to the primary educational process, in other words the development, execution and evaluation of courses. The stakeholders of this level are mainly educators and students, but also instructional designers, learning developers, content developers and sometimes management.

In general terms, the concept of *maturity* relates to the degree of formality and evidence-based character of the design, decision making and continuous quality improvement (CQI) of blended practices, next to institutional conditions and strategies. The EMM explicitly adheres to a design-focused approach of courses and programs. Consequently, growth in maturity is considered as a result of the ability of (teams of) instructors, instructional designers and others involved, to make informed decisions. This includes using design principles and/or instructional theories, from blended course design right up to whole program design, that is the organization, planning and documentation of a structured series of courses or units. As maturity does not equal quality, high- or low-quality approaches can be in place within each of the maturity levels.

Maturity at the course level is assessed at the background of four dimensions: (a) the course design process, (b) the course flexibility, (c) the course interaction, and (d) the course experience. Figure 1 depicts these dimensions along with their sub-dimensions, while Table 1 (Annex) presents the European Maturity Model at the course level in a comprehensive manner.
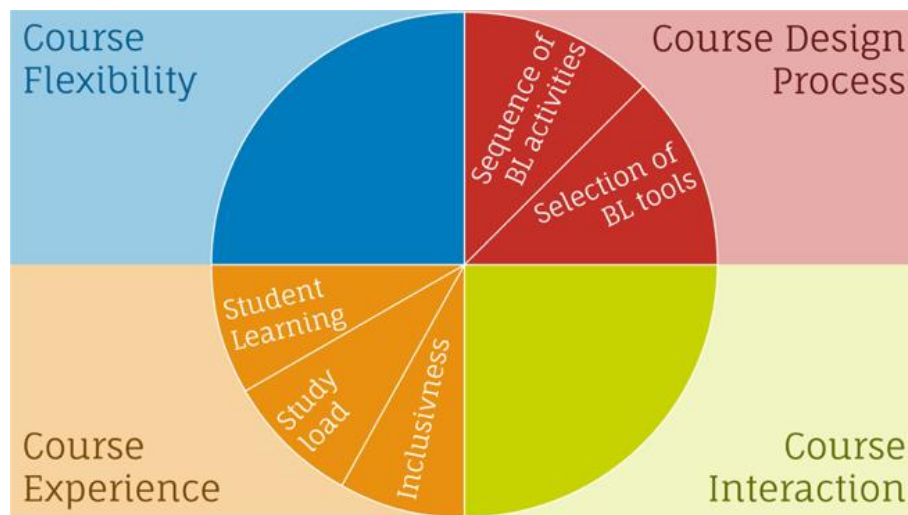
Figure 3. Maturity of blended courses: dimensions and sub-dimensions

Using the EMM guidelines for changing blended courses in terms of their maturity level

Course design process: selection of blended learning activities and their sequencing

Different methods and resources are developed during the last decade in order to guide the decision-making process during the design of blended courses. In their 2013 contribution, eleven authors illustrate there is no "one size fits all" learning design approach, in some cases approaches can be combined (Persico, Pozzi, Anastopoulou, Conole, Craft, Dimitriadis, ..., & Walmsley, 2013). Captured in a design, approaches can be made explicit by means of a type of representation, labelled as follows by Conole (2013): (a) practice-focused (e.g. case studies, lesson plans and patterns), (b) conceptual (e.g. mind maps and metaphorical representations), (c) abstract (e.g. models and vocabulary) or (d) technically-oriented (e.g. diagrams). A series of visual representations, for example, as explained by Conole and Wills (2013) aid practitioners to design, share and discuss practices. These are not considered mutually exclusive; multiple learning designs can be combined, in line with the purpose(s) of the blended teaching practice.

In order to mature in this dimension, one applies a design model or a set of design principles for the selection, integration and sequencing of face-to-face and online learning activities. These refer to particular logics and/or methods to design blended learning. Some examples from the field include the Integrated Course Design (Dee Fink, 2003), the ABC Learning Design method (Young & Perović, 2020) and the Carpe Diem design method (Salmon, 2020b).

To attain the highest level of maturity (Course cycle), adequate quality assurance (QA) principles must be in place in order to continuously improve a course design. Multiple data sources from the ongoing or past runs of a course can be used, i.e. course grades, students

experience questionnaires or (group) interviews, interviews with lecturers, learning analytics, etc. These data inform action plans that stipulate how to improve or redesign a course. Frameworks such as the *Quality Assurance Rubric for Blended Learning* (Perris & Mohee, 2020) may provide the actual QA standards hereto.

Course design process: selection of blended learning tools

As to reach maturity level 2 (Design-based) in this dimension, the selection of learning tools during the course design process is based on evidence or previous experience. Authors like Holden and Westfall (2010) or Glover, Hepplestone, Parkin, Rodger, and Irwin (2016) developed media selection guides for blended learning environments. Some HE institutions (HEIs) also developed supporting materials and guidelines, among others the Tool Wheel based on the conversational framework of Laurillard (Last, Jongen, & Hardy, 2020), the Wheel of Pedagogy (Radboud Teaching and Learning Centre, 2020) or the Tool Guide (Educate-it, 2020).

The third maturity level of this dimension is labelled as *Course cycle* because the outcomes of the selection of tools are systematically monitored, evaluated and changed, based on quantitative and qualitative data. These data consist of learning analytics ("How (often) are tools used?"), surveys and interviews with students and instructors ("What are their user experiences?") and/or feedback from tool administrators ("Is the selected range of tools proven to be useful, easy-to-use and efficient?").

Course flexibility

If a course's flexibility is deliberately designed, based on theory or experience it has attained maturity level 2 of the course flexibility dimension. If in search of more background or examples, Andrade and Alden-Rivers (2019), developed a framework for sustainable growth of flexible learning opportunities. Additionally, the report regarding *Flexible pedagogies* (Gordon, 2014) and the report *Flexible Learning* (Universities UK, 2018) show some useful examples to design flexibility.

To obtain maturity level 3 (Adaptive), CQI procedures are embedded to assess and enhance course flexibility on a regular basis. Therefore, quantitative or qualitative user experience accounts from students can be collected to understand how students perceive the course flexibility. These include survey and interviews data, which may be complemented with behaviour data from the learning management system (LMS). Applying techniques such as educational data and process mining leads to further insight into the data (Pechenizkiy, 2012).

Course interaction

Level 2 of the dimension course interaction (Interactive), implies that interaction in a course is deliberately designed, informed by evidence or experience. Such endeavour might be supported by the interaction theory of Anderson (2003) or Stanley's model (2013) which extends Anderson's reasoning and presents *The 5 Interactions of a Robust Blended Learning Model.*

The highest maturity level (Responsive), is characterized by embedded monitoring, evaluation and adjustment of course interaction. In this regard, both the quantity and quality of the interactions are scrutinized in a planned manner, based on user data. Regarding student-content interaction this involves questions such as "How often and how long do students study the materials?", "How do they interact in the online environment?" and "How do they score on tests?". Student-student and student-teacher interactions in the digital and physical learning spaces are observed against the background of models of change and improvement (Sharma & Giannakos, 2020). Recent developments in the field of adaptive learning analytics, eye tracking and multimodal data capturing with or without wearables for analysing complex interactive student or instruction behaviour and their relationship with a plethora of learning outcomes (e.g., Ciordas-Hertel, 2020; Rodríguez-Triana, Martínez-Monés, Asensio-Pérez, & Dimitriadis, 2018; van Goidsenhoven, Bogdanova, Deeva, vanden Broucke, de Weerdt, & Snoeck, M., 2020).

Course experience: student learning

In order to reach maturity level 2 of this dimension (Advanced) it is imperative that features of the blended course facilitate self-regulated learning (SRL). This is possible in various ways, for example by integrating the seven recommendations of Quigley, Muijs, and Stinger (2018) or by integrating technology-supported tools such as pedagogical agents, learning analytics and data visualization (Triquet, Peeters, & Lombaerts, 2017).

The third level (Comprehensive) refers to embedded CQI procedures concerning self-regulated student learning. In general terms, SRL student data are collected and, subsequently, targeted interventions in a blended course are planned in order to improve the facilitation of SRL. This involves adapting or changing specific course features. Triquet and his colleagues (2017) describe 7 methods to measure students' SRL and present two research instruments for practice. Broadbent, Panadero, Lodge, and de Barba (2020) elaborate on technological solutions to enhance SRL, while Paraskeva and colleagues link problem-based learning with SRL in a blended learning environment (Paraskeva, Alexiou, Mysirlaki, Souki, Panoutsos, Gkemisi, & Boutsia, 2017).

Course experience: study load

This dimension refers to the (mis)match between the intended and achieved study load of a blended course. Particular to blended learning environments is that study load is related to both face-to-face and online learning activities. At the second maturity level (Advanced), study load is an estimation based on experience. The Erasmus University (2009) and Radboud University (2018) in the Netherlands, for example, have common guidelines about how to calculate study load. Students are informed on how much time they should spend on a specific topic or an assignment, which aids them to plan and manage their study time. This can be done in a paper-based manner as part of the course syllabus or by incorporating a specific instrument in the LMS.

On level 3 of this dimension (Comprehensive), the calculation of study load is based on evidence as well as experience. Various data sources, both quantitative and qualitative, are employed to monitor, evaluate, and adjust the study load of a course. Examples include statistics from log files that originate from the LMS or other learning tools, next to course evaluations. Qualitative data can be gathered by means of focus groups and interviews with students to gain additional insights related to the study load.

Course experience: inclusiveness

Inclusiveness is an important, yet complex dimension of a blended course. A series of blended course features have to be taken into consideration in order to design or assess its inclusiveness. First of all, it is related to the fact that students feel valued, safe, and have a sense of belonging. Salmon (2020a) has developed a five-stage framework to support incorporation of these aspects into the course design. It covers both the technical and social aspects of learning. Although it aims online learning with so-called *e-tivities* and *e-moderation*, all features may be implemented for blended teaching and learning purposes. Another facet of inclusiveness is that all materials are accessible to diverse learners, also those suffering from physical or cognitive disabilities. For these special need students, it may be required to change the speed of delivery of the contents, to incorporate alternative font styles, to closed captions, transcripts or sign language to video, and include explanatory texts when using images. The University of Edinburgh (2020) offers a useful checklist for assuring the accessibility of both materials and collaborative learning activities. Informed by the experiences of instructors, inclusiveness may be(come) part of the course enhancement processes. At Leiden University Romein (2017), for example, collected 11 teacher stories of inclusive teaching. This booklet can stimulate and inspire others to improve the inclusiveness of their course.

Level 3 of inclusiveness (Comprehensive) requires that the needs of all students must be addressed in and that CQI procedures are embedded with targeted actions to enhance the

inclusiveness of a blended course. This means that all the efforts of level 2 should be implemented at the maximum, and complemented with inclusiveness data obtained by means of surveys, focus groups and interviews. Based on the insights, adaptations are suggested and implemented. In Gronseth (2018) one finds the account of an appropriate inclusive blended course design, "connecting" the Web Content Accessibility Guidelines and the Universal Design for Learning.

The EMM guidelines in light of the Covid-19 experience

The pandemic has highlighted the key importance of HEIs being able to transform in the blink of an eye. For achieving substantial changes in teaching and learning, an effective, well-oiled organizational context needs to be in place. *Nil novi sub sole.* Already in 2006, the results of large-scale e-learning research pointed towards four P's in this regard: problem, planning, policy and participation. Any e-learning initiative should solve an educational need (problem). Planning and policy refer to the cyclical process where an organization determines how and when e-learning implementation is to be carried out, communicated, supported and monitored. Participation or the degree to which an organization is able to form effective and efficient collaboration between all stakeholders to decide upon e-learning. Ideally, this involves a transparent communication flow between instructors, students, administrators and policymaking bodies (Goeman & de Vos, 2006). Based on observations during the COVID19 crisis, Elen (2021) emphasised the all-important value of "agency", that is the use of an environment by students (by extension also instructors in the case of free choice). Next to these organizational and individual-level factors, the need for quality teaching and learning services came in evidence during the Covid-19 crisis. Acting as informed matchmakers they glued the needs of all with solutions at hand.

We believe that the stances of the EMM and its guidelines are relevant and useful, both during and after the Covid-19 crisis (see also Dijkstra, 2021). Also, although the EMM initially focused on blended formats of teaching, the central ideas behind the blending are relevant to a wide spectrum of face-to-face and online learning.

First of all, the design-based stance of the EMM puts to the fore the purposefully usage of principles and/or instructional theories to decide upon learning activities and concurrent digital solutions in courses and programs. In light of the COVID experience, this regarded predominantly the (sequencing of) asynchronous and synchronous online events and the onset of particular tools for teaching, learning and assessment. In some instances and for particular groups, blended learning environments were set up. These addressed some issues of remote online learning. At the universities of both authors, for example, several problems were reported with regard to the wellbeing of students and staff, high cognitive load, low motivation, lack of SRL, few interactivity, next to delays in student learning. On

the other hand, it was reported that remote online learning worked better for particular types of students. These include, among others, those that are more introvert or those with difficulties to travel to campus. Additionally, both staff and students discovered the benefits of remote and hybrid instances of interaction and feedback, assessment and lecturing, as well as the strengths of video. One could argue that particular barriers were reduced and that courses became more flexible and inclusive. However, sizable time investments were necessary to prepare and build in structure and digital course components. It will be interesting to see how HEIs will embed proven practices and reinvent online and blended learning environments in the post-Covid-19 era.

Working in a design-based manner forces instructional designers and instructors to search for approaches that act upon these issues, and to step away from "belly-based" approaches. The EMM, accompanied by its guidelines for practice, targets both those that have to design from scratch as those that wish to make a transition to blended teaching. In line with the EMM, the institutional conditions and strategies are a leverage for these actions. These may focus on the coherence in course designs, the interoperability and security of tools, the front- and back-end support, the staff's and students' online readiness, as well as their privacy. More than ever, the Covid-19 pandemic has shown the importance of adequate short-to-midterm strategies to cope with challenges and changes. In this regard, it is very interesting to read how South African colleagues acknowledge the crucial role of "eLearning champions", lecturers with a "design thinking mindset". Earlier on, the authors argued that promoting such a mindset in academic staff development interventions would advance the innovative use of technology in teaching and learning (Gachago, Morkel, Hitge, van Zyl, & Ivala, 2017; Patnaik & Gachago, 2021). In the margin, we wonder whether organizational context will gain in prominence in research literature after the pandemic.

Secondly, the stance of the EMM as a linear logic model regarding maturity serves both practical and more theory-oriented purposes. As previously explained, the maturity of blended practices refers to the degree of formality and the evidence-based character of its design, decision making and CQI. The model may be used as a framework for measuring maturity and its growth in descriptive studies, along predefined categories of descriptors. Likewise, it can provide researchers with a detailed snapshot of pre- and post-conditions in intervention studies. For practice, the EMM may be used as a handle to conceive blended practices, to guide discussions and initiate (un)planned changes. By means of the implementation guidelines, (a group of) instructors may guide their progress between different levels of maturity. Important to note is that the model imposes an iterative approach which makes it far from a static framework that could impede a HEI's transformative agenda. The disruptive potential of new digital technologies for teaching

and learning is not ignored, on the contrary. It is encapsulated in a CQI loop which aims to derive at the reimaging of teaching and learning experiences in a sustainable manner. In the light of the Covid-19 situation, we observed for example that online learning environments empowered significantly rapid, data-driven informed decision making for course design. It is expected from a HEI to act upon this experience, and further advance their digitally enhanced education ecosystem.

Using the EMM guidelines in a workshop

The model can guide discussions on blended teaching and education in a HE institution, a department, a team of educational managers or instructors. In this regard, one's engagement in such conversations are *in se* more important and deemed valuable than the "scoring" of maturity. It is essential to involve the right stakeholders. These differ according to the subject of the discussions, that is the agreed number of dimensions that will be debated.

Optimally, the model is employed in a team-based, interactive manner, with the aim of reaching consensus. To this end, it seems that a workshop is the most appropriate manner to use the model. In one or more sessions, the participants determine individually and cooperatively the maturity level of the different model dimensions. We recommend to follow the next steps:

1. A facilitator with knowledge of the EMBED framework guides the sessions. This person introduces the EMM, elaborates on the action level (e.g., course, program or institution) and explains the setup of the workshop. It should be clear for all participants which level and what subject matter they will discuss in detail (e.g., which course or which program). Each participant individually assesses the maturity level of each dimension. To this end, both the EMM framework as well as the digital materials (a self-assessment tool and worksheets) support this process (see https://embed.eadtu.eu/working-with-embed_3). In particular, the participants create a radar diagram based on the scores of their present maturity assessment. Such visualization gives a clear overview of the current state of affairs.

2. The facilitator discusses with all participants the results of the self-assessments. The goal of this third phase is to reach consensus on the scoring of the present maturity level of a specific dimension. These are retained and used to justify why a specific level of maturity has (not) been designated to a particular practice). These are used in the following step.

3. The participants create an action plan, which includes what one wishes to change, the reason(s) behind, a specification of who needs to be involved, and when the change should be implemented. A template for such action plan is also

downloadable from the EMBED website (see https://embed.eadtu.eu/working-with-embed). It is recommended that when changes are extensive, it is more useful to initiate a (small) project and involve a project team to design, plan and implement the changes.

4. After the changes are implemented, the results of the action plan or project are evaluated using the same framework and materials.

5. It is further recommended that participants make monitor on regular occasions whether the maturity levels maintain the same level, increase or decrease.

Not only participants of the above described workshop may use the EMM; any individual instructor, instructional designer or team interested in how to mature in blended teaching or education, will find the EMM framework and materials easy-to-use and useful resources or sources of inspiration for introducing (new) blended practices.

Conclusion and future work

The COVID-19 crisis has more than ever shown how important it is to address adequately students' needs in educational contexts characterized by a partial separation of instructors and students in terms of geographic distance or by time. Those in search of a framework for creating blended courses may apply the principles, open-source materials and guidelines as proposed by the project partners of the EMBED project. It allows to assess and alter blended practices in terms of maturity. Initially developed on the basis of thorough literature synthesis, followed by a mixed-method study among educators and experts, the EMM will be further disseminated in real-life HE contexts and refined in order to match to a maximum with the needs of its users.

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Acknowledgements

Annex

Table 5: Dimensions, subdimension and indicators at the course level, according to the European Maturity Model*

Dimension Subdimension	Description	Maturity level		
		Level 1	Level 2	Level 3
Course design process	The process of planning, designing, developing and evaluating a blended learning course.			
Selection of blended learning activities and their sequencing	The rationale for the deliberate selection and integration of face-to-face and online learning activities.	Explorative No considered selection and integration of face-to-face and online learning activities.	Design-based Learning activities (both face-to-face and online) are deliberately selected, integrated, and sequenced based on a design method or design principles.	Course cycle Blended learning activities are deliberately selected, integrated, and sequenced; based on a design method or design principles. QA procedures are embedded in order to continuously improve a course in an iterative manner.
Selection of blended learning tools	The rationale for selecting tools for the delivery and organization of blended learning activities	Tool-based The selection of particular tools is based on their availability at the HE institution.	Design-based The selection of particular tools is based on learning activities, informed by evidence or experience.	Course cycle The selection of particular tools is based on blended learning activities, informed by evidence or experience. This process is monitored, evaluated and changed based on quantitative and qualitative data.
Course flexibility	Opportunities for learners to adjust particular features of the blended learning course, based on their needs and preferences. This includes features such as the selection of learning activities, the selection of resources, the mode of delivery (online/face-to-face activities), pace (educator-paced/self-paced).	No flexibility No deliberate course flexibility.	Flexible The course's flexibility is deliberately designed. Its design is based on evidence or experience.	Adaptive flexible The course's flexibility is deliberately designed, based on evidence or experience. CQI procedures are embedded in order to enhance course flexibility.
Course interaction	Extent to which the blended course facilitates learners' interaction (learner-content, learner-learner, learner-educator).	Non-responsive No deliberate course interaction.	Interactive Interaction in the course is deliberately designed, informed by evidence or experience.	Responsive Interaction in the course is deliberately designed, informed by evidence or experience. Interactions are monitored, evaluated and changed based on data and feedback.

Course experience	The extent to which a course enhances students' learning and eliminates any obstacles that stand in the way of learning.			
		Standard	Advanced	Comprehensive
Student learning	The use of blended course features which facilitate students' self-regulated learning (orienting and planning, monitoring, adjusting and evaluating).	No deliberate consideration of student learning.	Particular blended course features are incorporated in order to facilitate student learning, informed by evidence or experience.	Particular blended course features are incorporated in order to facilitate student learning, informed by evidence or experience. CQI procedures are embedded in order to enhance student learning.
Study load	The match between the intended and achieved study load of a course (distribution and correctness).	The calculation of course study load is an educated guess.	Course study load is calculated based on experience. Different course elements are taken into consideration for the calculation of the study load.	Course study load is calculated based on data and experience. All course elements are taken into consideration for the calculation of the study load. The study load is monitored, evaluated and changed based on quantitative and qualitative data.
		Standard	Advanced	Comprehensive
Inclusiveness	The consideration for the diverse needs (including accessibility aspects) and backgrounds of all students to create an online and face-to-face course experience where all students feel valued, safe, have a sense of belonging, and where all students have equal access to learn	No deliberate consideration for inclusiveness.	Initial attempts to address the diverse needs and backgrounds of all learners. Special attention is paid to social belonging and identity in the online course environment. This process is informed by evidence or experience.	The diverse needs and backgrounds of all learners are addressed. Students feel valued, safe, and have a sense of belonging. The attainment of inclusiveness is based on evidence or experience. CQI procedures are embedded in order to improve inclusiveness in the course.

Note. QA=quality assurance, CQI=continuous quality improvement
* As compared to the published version on the EADTU website, minor differences in terms of wording of the model components are present. This is done for reasons of enhanced comprehension.