

Framework for the Development and Quality Assessment of e-Courses

Introduction

The University of Rijeka (hereinafter: the University) has paid attention not only to the technological, but also to the pedagogical-didactic aspects of e-learning from the very beginning of the organised implementation of e-learning. E-learning is qualitatively a new type of education that enables interactive, two-way communication between teachers and students with the help of Internet-based technologies.

The *Strategy for the Introduction of E-Learning at the University of Rijeka 2006-2010*, as an integral part of the overall University Development Strategy, was the first of its kind in Croatia. Following the adoption of the *Strategy for the Development of E-Learning at the University of Rijeka 2011-2015*, the first University of Rijeka e-Learning Committee was established, which consisted of representatives of all University constituents and was active until 2015, though the members of the Committee continue to educate teachers and students on e-learning. Moreover, the share of use of e-learning tools is monitored as an indicator of the strategic goal of increasing the share of e-learning in study programmes through the *University of Rijeka Strategy 2014-2020*.

Following the decision of the University of Rijeka Senate on the introduction of the hybrid teaching model in all study programmes and the need to continue working on the development and monitoring of the quality of online learning, the University of Rijeka Online Learning Committee was established in July 2020. The Committee is in charge of planning activities for the development and monitoring of the quality of online teaching at the University. In September 2020, a working group within the Online Learning Committee was established with the aim of developing a new version of recommendations for the improvement of e-learning at the University.

The first *Recommendations for the Development of Educational Materials for e-Learning* at the University were prepared by the e-Learning Implementation Committee in 2009 to define a minimum set of technical and pedagogical standards and recommendations for educational materials for e-learning that would facilitate and accelerate the development of teaching materials and enable the evaluation of digital content according to uniform criteria.

The 2009 document proposed a categorisation (classification) of the level of application of e-learning technologies in teaching. The levels referred to traditional classroom courses but use digital e-learning materials, courses taught in a hybrid (mixed) way, and courses taught entirely online.

Although the idea highlighted in the 2009 document that “recommendations and guidance on what teaching materials should look like or how to develop good teaching materials can help achieve a common level of quality” remains relevant, the proposed categorisation of e-learning application levels proved to be outdated and cannot be applied today. Hence there is a need for a new document that will not focus on the development of e-learning content, but rather in line with modern e-learning trends, propose a framework containing elements or criteria for assessing the quality of e-courses following the hybrid e-learning model or those taught entirely online. The emphasis should no longer be on the onsite-online teaching ratio. Instead, the primary focus should be on standards and guidelines for ensuring and improving the quality of higher education.

Despite the fact that the quality of e-learning is an integral and inseparable part of the quality of learning and teaching in general, and that the *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG) are also applicable to the hybrid model and classes taught entirely online, there is a need to define a set of criteria adapted to e-learning, i.e. to make additions suitable for e-learning technologies within the existing ESG standards in the form of additional explanations, recommendations and examples of good practice.

Today, there are numerous instructions and recommendations for creating quality e-courses for beginner and advanced teachers that could be used by teachers at the University of Rijeka as well, but there is a need for a concise overview in which the most important categories will be grouped together with elements that require particular attention when developing e-courses and assessing the quality thereof.

The starting point in the preparation of this document were the *Recommendations for the Development of Educational Materials for e-Learning* of the University of Rijeka, the *Considerations for Quality Assurance of e-Learning Provision* of the European Association for Quality Assurance in Higher Education (ENQA), and an e-course assessment matrix according to the level of application of e-learning technologies of the SRCE e-learning Centre, which were used to propose the University's own Framework for the Development and Quality Assessment of e-Courses. This Framework represents the first part of future recommendations that will be based on the application of ESG standards to hybrid or online teaching.

When the framework was being defined, i.e. when categories and elements were being chosen, the emphasis was not on technology, but primarily on the fact that e-learning is about education and student-centred teaching, in which the teacher encourages active adoption and application of new knowledge, provides support to students and encourages cooperation between them. The emphasis is thus on the ESG 1.3. Student-Centred Learning, Teaching and Assessment and ESG 1.6. Learning Resources and Student Support Standards.

This document provides an overview of basic concepts in the field of e-learning and proposes a framework for the development and quality assessment of e-courses. This Framework will enable all interested users (teachers, constituents and the University) to:

- self-assess e-courses for the improvement thereof,
- assess the quality of teaching in the context of using e-learning in the hybrid teaching model,
- assess the quality of a teacher's teaching activities for the purpose of being promoted to a higher academic rank, receiving the award for teaching excellence, etc.,
- awarding the prize for the best e-course at the constituent and/or the University

as well as other purposes of assessing the quality of the hybrid teaching model.

It must be noted that the framework is also suitable for teachers who are beginners in the development of e-courses and can help them plan and develop new e-courses.

The Framework brings elements with quality criteria divided into four categories: 1. Organisation of e-courses, 2. Learning materials, forms and methods of e-learning, 3. Monitoring and evaluation and 4. Communication. Each of the elements of the category is further divided into three levels of quality: beginner, intermediate and advanced. The beginner level corresponds to a minimum level of quality, the developed one to a satisfactory level of quality, and the advanced one to a high level of quality. **Each higher level implies that the lower levels are met for each element.**

It is important to emphasize that the defined Framework is generally applicable to all forms of e-learning described in the section on the basic e-learning concepts. The authors of the Framework are aware of the fact that there is great diversity in the possibilities of application at different constituents, on different study programmes, subjects within the programme, as well as in approaches to e-learning.

Overview of basic concepts in the field of e-learning

Definitions of e-learning and its characteristics can differ significantly in different contexts, and in this introductory text it is necessary to get acquainted with different explanations and concepts in this area. For the purposes of this

Framework, the definitions and explanations of these terms in the documents of the University of Rijeka related to e-learning and those in the *Considerations for Quality Assurance of e-Learning Provision* of the ENQA were deemed relevant.

E-learning is a term that describes the educational process enhanced by the use of new information and communication technologies (ICT). It is any form of learning, teaching or education that is supported primarily by Internet-based technologies. It is important to note that regarding the definition of e-learning, it is increasingly being described as a qualitatively new type of education that will ensure an interactive or two-way process between teachers and students with the help of electronic media: teaching that will be student-centred (and not teacher-centred) and will encourage the active adoption and application of new knowledge and cooperation between students and teachers.

E-learning is most often classified based on the degree of differentiation from traditional learning strategies, and it is common to list two approaches:

- **online education** or online teaching is a form of teaching in which students learn independently and without attending any classes in a classroom (also called onsite teaching).
- **hybrid education** or hybrid teaching is a combination of traditional, i.e. onsite teaching in a classroom and online teaching.

According to the way it takes place, we differentiate between two forms of e-learning.

- **asynchronous e-learning** enables independent learning on demand or at a time that suits the participants of such classes. E-learning activities are designed in a way that students and teachers do not have to be present at the same time (e.g. learning content is included in the form of lessons in an e-learning system).
- **synchronous e-learning** is designed in a way that the teacher teaches at a specific time according to the scheduled time, usually via videoconferences, while all students attend the online class at that time. As it is common for synchronous lectures to be recorded, it is possible for students to review them later (asynchronously).

Evaluation is the systematic collection of data of students' knowledge, skills and abilities. It is carried out during the learning and teaching process, in accordance with predefined procedures and criteria, and includes examination, monitoring and assessment. An evaluation can be formative or summative.

- **Formative evaluation** is carried out during the teaching process and is aimed at gathering information about students' progress and their orientation in learning. It is important to involve students in the process of formative evaluation, namely through **self-evaluation** (with the aim of critically analysing one's own progress and learning outcomes, directing and adapting further learning and setting one's own learning goals) and **peer evaluation** (active involvement of students in the evaluation of other students).
- **Summative evaluation** includes a set of procedures by which the teacher, in addition to elaborated criteria and scoring methods, determines the degree of adoption of outcomes, acquired knowledge, developed skills and abilities, achieved independence and responsibility towards work. The result of an evaluation follows in the form of points or grades.

For the purposes of this document and taking into account the above definitions, an **e-course** is a course within a study programme designed to be taught either following the hybrid model or entirely online and uses some of the asynchronous or synchronous forms of e-learning, most often a combination thereof. From the technical standpoint, an e-course has its own virtual space on a learning management system (e.g. Merlin, MS Teams) which is available to all enrolled students and serves to organize the elements of the e-course, learning materials, forms

and methods of e-learning, monitoring and evaluation of students and communication between teachers and students and among students.

It is important to emphasize that e-learning is a very dynamic and innovative area of education and the definitions need to be regularly updated and adapted to reflect new achievements.

Categories and levels of quality for e-course evaluation

1. Organisation of e-courses

The category “Organisation of e-courses” includes elements related to general information about the e-course, learning outcomes, organization of the structure of the virtual space of the e-course, technology and digital tools used in the e-course and the possibility of providing individual teaching plans for students.

Although detailed syllabi for courses are published on the websites of each University constituent before classes begin, information from the syllabus should be made available to students within the virtual space of the e-course as well. It is necessary that students can successfully navigate in the virtual space of e-courses, which means that the e-course should be appropriately structured into units or modules of e-learning systems that follow thematic units consistent with learning outcomes.

It is especially important to list and elaborate learning outcomes according to thematic units and show students (e.g. through a table) how these constructively relate to the activities for monitoring their work and to their workload in e-courses (ECTS credits). Furthermore, it is necessary to provide the schedule, i.e. the timeline of the hybrid model of teaching accompanied by a list and explanation of online and onsite activities.

The e-course should, in addition to the basic digital tools provided by the selected e-learning system, provide students with other digital tools, especially those that encourage them to actively participate and cooperate with others. The students also need to receive appropriate instructions for use for all digital tools and technologies.

When organising the virtual space of e-courses, efforts should be made to provide the student with an individual learning path, and the learning process should be adjusted depending on the preferred channels of receiving information and the achieved results in various activities of each student.

	Beginner (minimum quality)	Intermediate (satisfactory quality)	Advanced (high quality)
Organisation of e-courses			
1. Information on the e-course	Students have access to basic information about the e-course according to the syllabus (class load, number of ECTS credits, teacher(s), topics, class type, list of compulsory and additional readings,	In addition to basic information, there is additional information on activities for monitoring student work. Dates of start and end of all online and onsite activities in the e-course are clearly	Students have access to a detailed description of the hybrid teaching model that includes a list of online and onsite activities, ways of monitoring work and criteria for evaluating student activities. The timeline of the activities is harmonized with

	sources, exam dates, dates for consultations with the teachers, etc.). A schedule, i.e. a timeline of online and onsite e-course activities is available.	published, and deadlines for all compulsory activities are highlighted (e.g. via a calendar within the e-course).	the detailed structure of the thematic units and depends on the completion and results of individual activities.
2. Learning outcomes	Learning outcomes are listed in the e-course only at the level of the entire course.	Learning outcomes for each thematic unit of the e-course are elaborated in more detail and made available to students.	Learning outcomes are elaborated in detail for all thematic units of the e-course and are constructively linked to teaching and learning methods and activities for monitoring and evaluating student work in the thematic unit and to the student workload (ECTS credits).
3. Structure of the e-course space	The virtual space of the e-course is partially structured into units or modules (e.g. thematic units are grouped according to the class type - lectures and workshops).	The virtual space of the e-course is structured into units or modules according to thematic units that contain the relevant learning materials.	The virtual space of the e-course is structured in detail according to thematic units that are harmonized with the planned learning outcomes, and the given schedule for online and onsite classes is being followed.
4. Applied technology	The basic options and tools of the selected e-learning system used for the e-course are applied in the virtual space of the e-course (e.g. logging into the system, user profile management, review of basic teaching materials, submitting assignments, communication via forums and messages, viewing grades etc.).	Digital tools have been applied in the virtual space of the e-course to increase the functionality of the basic capabilities of e-learning systems (e.g. tests with different types of questions, video conferencing tools, webinars, blogs, mind maps, dictionaries, plagiarism checker for submitted papers, questionnaires and surveys, etc.). The e-course provides instructions for the use of selected digital tools.	Digital tools are applied in the virtual space of the e-course and they encourage students to actively participate in the e-course and cooperate with each other (e.g. digital badges, games, ePortfolio, interactive presentations, wiki and other tools for creating joint documents, interactive tools such as Geogebra and mathematical calculators, simulators, virtual programming laboratory, peer evaluation tools, etc.). Instructions for use in the e-course are available for selected digital tools.

5. Individual teaching plan	All content within the e-course is available in the same way to all students without restrictions.	The e-course is organised in such a way that students have limited access to certain contents due to certain conditions (e.g. test scores achieved in knowledge assessments, quizzes, etc.).	The e-course is organised in a way that allows students an individual learning path. The learning process is adjusted depending on the preferred channels of receiving information and the results achieved in different activities of each student.
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2. Learning materials, forms and methods of e-learning

The previous category explains that learning outcomes should be clearly defined and made available to students. However, it is also necessary to provide students with appropriate learning materials within the virtual space of the e-course and plan activities for achieving learning outcomes by applying appropriate learning and teaching strategies and methods and forms of work.

Learning materials should be harmonized with learning outcomes and, if necessary, use different presentation media as well as interactivity, taking into account students' preferred channels of receiving information. It is not necessary for teachers to create multimedia and interactive materials by themselves. Instead, they can include ready-made content, for example contents from various repositories or collections of digital materials, taking into account use licences.

When choosing learning and teaching strategies and methods as well as forms of working, it is important to encourage active learning and collaborative learning in students with the aim of increasing their motivation and participation in e-courses in accordance with the learning outcomes of a given course.

	Beginner (minimum quality)	Intermediate (satisfactory quality)	Advanced (high quality)
Learning materials, forms and methods of e-learning			
1. Availability of learning materials and harmony with learning outcomes	Learning materials in the virtual space of the e-course partially support students in achieving the intended learning outcomes.	Learning materials in the space of the e-course are modern, updated, complete and support students in achieving the intended learning outcomes.	There are also additional materials that provide information for students on the opportunities for expanding knowledge beyond the intended learning outcomes and acquiring additional competencies.

2. Way of presenting learning materials	Learning materials are available in some form of multimedia content (e.g. text format, audio/video), but are not interactive.	Learning materials are available in several forms, some of which can be interactive, taking into account students' preferred channel of receiving information (e.g. learning materials in text format and as a video presentation have been developed on the same topic).	Learning materials are a combination of multimedia-formatted content and the capabilities of e-learning systems and other digital tools for achieving interactivity (e.g. Merlin lessons, H5P interactive content, etc.).
3. Strategies and methods	E-course activities support the application of verbal and visual teaching strategies and methods (e.g. reading, working on the text, watching videos).	The e-course contains some activities that support the application of teaching methods and active teaching strategies (e.g. application of games, discussion in the forum).	The e-course continuously applies a variety of synchronous and asynchronous activities that support an interactive application of active teaching methods (e.g. problem simulation and problem solving).
4. Forms of working	Only individual student work is provided for the e-course.	The e-course contains some activities organized as collaborative learning (e.g. discussion, working in pairs).	E-course activities support collaborative learning (e.g. wiki creation of a joint document, teamwork) aimed at increasing motivation and engagement among students.
5. Authorship of learning materials	Available learning materials have no clearly identified authors and/or use licences.	Authors of most learning materials and their use licences are known.	Authors of and use licences for all learning materials, including teachers' own learning materials, are defined (e.g. teachers have regulated their own teaching materials by applying the <i>Creative Commons</i> licence).

3. Monitoring and evaluation

The elements of the "Monitoring and evaluation" category are harmonized with the clear policy of assessing and evaluating the work of students at the University of Rijeka, which has been derived from the Ordinance on Studies of the University of Rijeka. Students' work during courses is evaluated during classes and in the final exam. During their classes in a particular course, students can achieve a minimum of 50% and a maximum of 70% of points

through forms of continuous monitoring and evaluation, while the remaining percentage of grade points can be achieved in the final exam.

The importance of continuous monitoring and evaluation of student work according to clearly defined criteria that are harmonized with learning outcomes and learning and teaching strategies and methods is emphasized. Formative and summative forms of evaluation are used, and students are provided with timely and clear feedback on evaluation.

	Beginner (minimum quality)	Intermediate (satisfactory quality)	Advanced (high quality)
Monitoring and evaluation			
1. Activity evaluation criteria	There are activities for monitoring students' work in the e-course, but there is no clear connection with the learning outcomes or instructions on monitoring and/or evaluation criteria.	Students have access to instructions on monitoring and evaluating (scoring) alongside the criteria for evaluation activities and a detailed description of how the final grade is calculated.	Monitoring and evaluation activities are continuously applied. Students are presented with clear instructions and criteria as well as planned learning outcomes.
2. Formative and summative evaluation	Summative assessment (e.g. tests, assignments) is conducted in the e-course, but formative assessment (e.g. knowledge examination tests) is not included.	In addition to summative evaluation, formative evaluation (e.g. peer or self-evaluation) is included only for some topics (learning outcomes) in the e-course.	Formative evaluation of all topics harmonized with summative evaluation is continuously applied (e.g. self-evaluation tests appear in the form of questions that will appear in the colloquium and/or final exam).
3. Evaluation feedback	Forms for assessing individual activities in the e-course are used, but students do not receive relevant and/or timely feedback (e.g. only credits for activities are entered).	Forms for assessing all evaluation activities in the e-course are used. Relevant and timely feedback is provided to students at the group level (e.g. exact solutions to questions/tasks with a large number of incorrect answers are published in the forum).	Assessment forms or sections are used. Relevant and timely individual feedback is provided to each student for all e-course activities.

4. Communication

The elements highlighted in the "Communication" category highlight the importance of informing students on all course activities regularly, timely and consistently, by using appropriate communication channels available within the virtual space of the e-course.

Communication between students and teachers should take place according to clearly defined instructions and protocols, which also apply to the mutual communication among students in the e-course. In addition, it is important to encourage students to actively communicate and interact in order to achieve learning outcomes.

Teachers should regularly collect and process feedback on students' experiences in the e-course (e.g. using surveys within the e-learning system) and use them to improve the e-course, as well as regularly inform students of improvements based on their feedback.

	Beginner (minimum quality)	Intermediate (satisfactory quality)	Advanced (high quality)
Communication			
1. Informing students	Communication channels are used within the virtual space of the e-course, but informing students of course activities is not performed regularly and/or consistently.	By using communication channels within the virtual space of the e-course, students are regularly informed only of some course activities (e.g. announcements of colloquia and exams).	Students are regularly and consistently informed of all online and onsite course activities by using communication channels within the virtual space of the e-course.
2. Communication between students and teachers	There are channels for basic communication with teachers, but it is not stated clearly how and when students should use them.	Channels for communication between students and teachers within the space of the e-course are used and it is defined when to use which channel.	Communication between students and teachers within the space of the e-course is carried out regularly, according to clearly stated and published instructions and protocols for communication.
3. Communication between students	There are channels for communication between students, but teachers do not encourage students to communicate.	Students use communication channels within the space of the e-course, teachers encourage them to communicate and it is clearly defined when to use which channel.	Communication between students is an element of achieving defined learning outcomes. Activities as well as communication rules and evaluation methods are clearly defined (e.g. joint discussion via wiki tool for collaborative writing).
4. Feedback on the e-course experience	Feedback on students' experiences in the e-course is collected (e.g. by means of end-of-course surveys), but students do not receive feedback on the results.	Feedback on students' experiences in the e-course that is used for future improvement thereof is collected, and students are informed of the results and improvements made.	Feedback on students' experiences in the e-course that is used to improve the teaching process during the e-course is continually collected and processed, and students are regularly informed of the results and improvements made.

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