# Erasmus + Project: Crisis Resistant Digital Education and Training

## Intellectual Output 3 – Framework Evaluation

## Comparison of educators ad-hoc and systematic response to a crisis scenario

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# DIFFERENCES BETWEEN ONLINE TEACHING AND EMERGENCY REMOTE TEACHING

Online teaching and emergency remote teaching are two different approaches to delivering lectures in a virtual environment. Although they share some similarities, there are also some significant differences between the two.

Online teaching is a planned and intentional approach to delivering instruction in a virtual environment. It is a carefully designed, developed, and fully online method of instruction in which the teacher and students are in different locations. In this approach, the teacher has had time to prepare and design the course, develop materials and activities, and set clear expectations for students. Online teaching is intended to be a long-term solution that is integrated into the overall curriculum of the institution.

In contrast, emergency remote teaching refers to a sudden shift to a virtual environment in response to a crisis or unforeseen circumstance, such as a natural disaster, pandemic, or sudden campus closure. It is a response to the immediate need to continue teaching during a crisis. In this approach, the teacher is often forced to adapt quickly and use all available resources and tools to deliver instruction. There is often little time for planning or preparation, and the focus is on maintaining continuity of instruction in the short term. ERT (Emergency Remote Teaching) is usually not focused on a particular pedagogical approach and is often conducted without adequate preparation or training.

Some of the key differences between online teaching and emergency remote teaching include:

1. **Planning and preparation:** Online teaching requires careful planning and preparation, while emergency remote teaching is often spontaneous and without much time for planning and preparation.
2. **Course design:** Online teaching courses are carefully designed and developed to achieve specific learning outcomes and goals, while emergency remote teaching courses are often makeshift and do not have the same level of structure or coherence.
3. **Quality and Coherence:** Online teaching is typically of higher quality and more consistent in delivery than emergency remote teaching.
4. **Student Engagement:** Online teaching often includes interactive activities and opportunities for student engagement, whereas ERT focuses on content delivery rather than active engagement.
5. **Access to technology:** online teaching requires that students have access to the necessary technology and infrastructure, while emergency remote teaching often requires more accommodations for students who do not have access to reliable technology or Internet connections.
6. **Assessment:** Online teaching typically includes regular assessments and evaluations to measure student progress and adjust teaching strategies, while ERT places less emphasis on formal assessments due to time constraints and limited resources.

Overall, both online teaching and ERT involve the use of technology to deliver educational content to students remotely. However, online teaching is a planned and deliberate approach to teaching, while ERT is a temporary solution that can be implemented quickly in response to an unexpected crisis. The above differences and the various research findings confirm that there is a major difference between the immediate digitization of accredited ex cathedra courses resulting from the need to respond to a new situation and the creation of an online course from scratch and its subsequent accreditation. Indeed, the transfer of existing subjects to online teaching is dictated and limited by the accredited procedures, which results in merely transferring the outcomes and activities to a new environment. Therefore, all digital and online transformations must be evaluated at some point against the accreditation document itself and readjusted as needed.

To illustrate the flow of these procedures, we have developed a general model of ad hoc adaptation of subjects to a disruptive situation, shown in Figure 1 and explained below.

Because there was little time to respond, all subjects were brought online in several distinct stages: First, a decision was made about the basic communication channels to be used for online instruction. This was done partly at the institutional level, but also partly at the departmental or even subject level, based on the specific requirements of the subject, but also on the needs of teachers and students. The choice of ICT tools must be based on the nature of the new situation.

The next step was the immediate adaptation of the ex cathedra work to online teaching. Here, different levels of digitization are required, as some teachers gave explanations on green boards or whiteboards, while some other teachers and subjects had already digitised their material in the form of PowerPoint presentations or similar. Initially, this work was done one to several weeks in advance. In this phase, not only the "slides" had to be digitised, but also the teaching and instructional methods had to be reconsidered in order to reach all students and motivate them in a new environment, and finally to achieve all the goals of the accredited curriculum, e.g. interim presentations of results followed by group discussion.

An additional intermediate step of adaptation was observed, which occurred only partially in the first wave but was more important in the second. The first wave of returns resulted in a large amount of recorded and prepared instructional material of good quality that was also used in the next year of study. This gave teachers time and opportunity to prepare new, supplementary material that students could use for better understanding of the material and for self-learning, allowing them to follow their own pace of learning.

The most challenging aspect of the entire ad hoc transition to online instruction was determining testing methods and protocols and ensuring sufficient plagiarism prevention and detection. This transition consisted of several steps of trial and improvement. It happened that even two or more examination methods were used and assessed in the same subject, and the methods often differed drastically from face-to-face examinations. For example, during ex-cathedra teaching, the examination was conducted in the form of written examinations on paper, which was no longer possible when examinations were conducted online due to the ease

of copying and plagiarism. Therefore, various other instruments were used, such as quizzes and questionnaires with random questions. The challenge here, however, is the need to adhere to accepted examination protocols.

The final step in this model is the evaluation of instructional outcomes after adaptation to the new emergency situation. Critical to such evaluation of instructional outcomes is the timing of the adjustment within the semester and the extent of that adjustment. In our survey, we found that in addition to the regular evaluations conducted by home institutions, which are generally required at regular intervals by accreditation regulations, all respondents also conducted their own analyses, which included surveying students after they had completed the subject, comparing knowledge and grades over different years, and self-reflection based on the new experience.

In addition, and because of all the difficulties these steps can pose, they must be communicated clearly and in a timely manner with all affected stakeholders, i.e., students, teachers, and technicians involved in the subject.

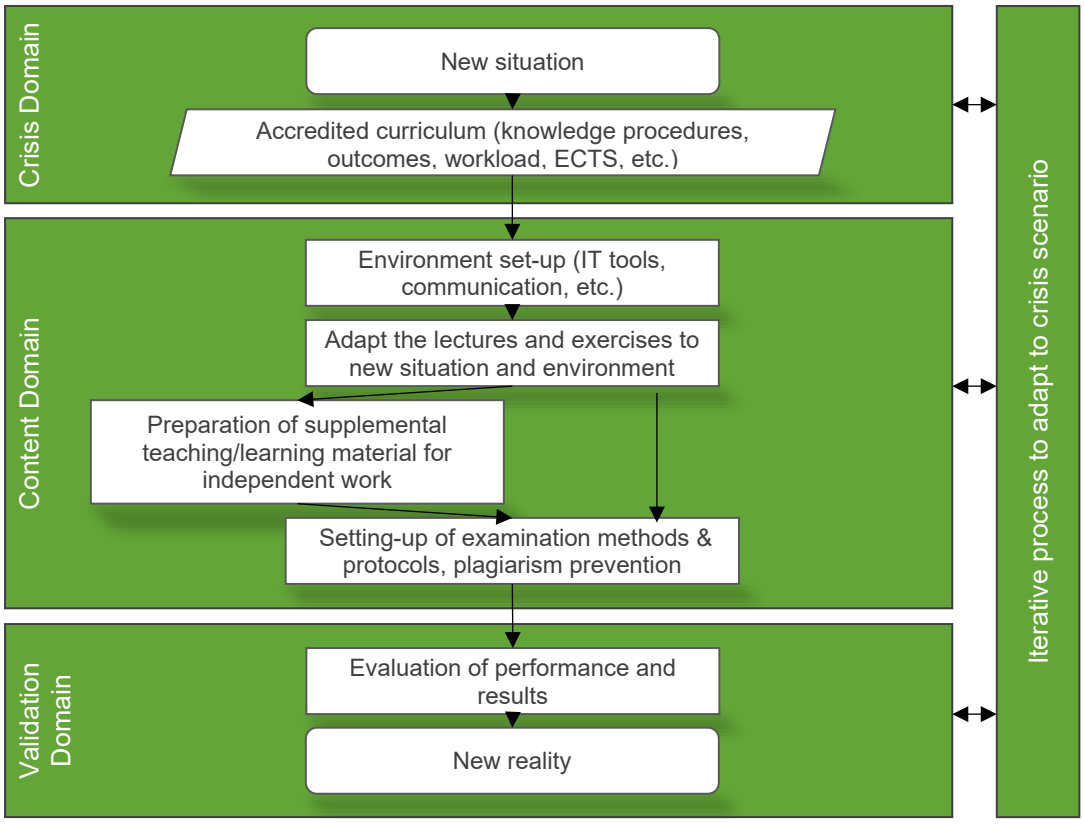


**Figure 1: General model of ad-hoc subject adaptation to a disrupting situation**

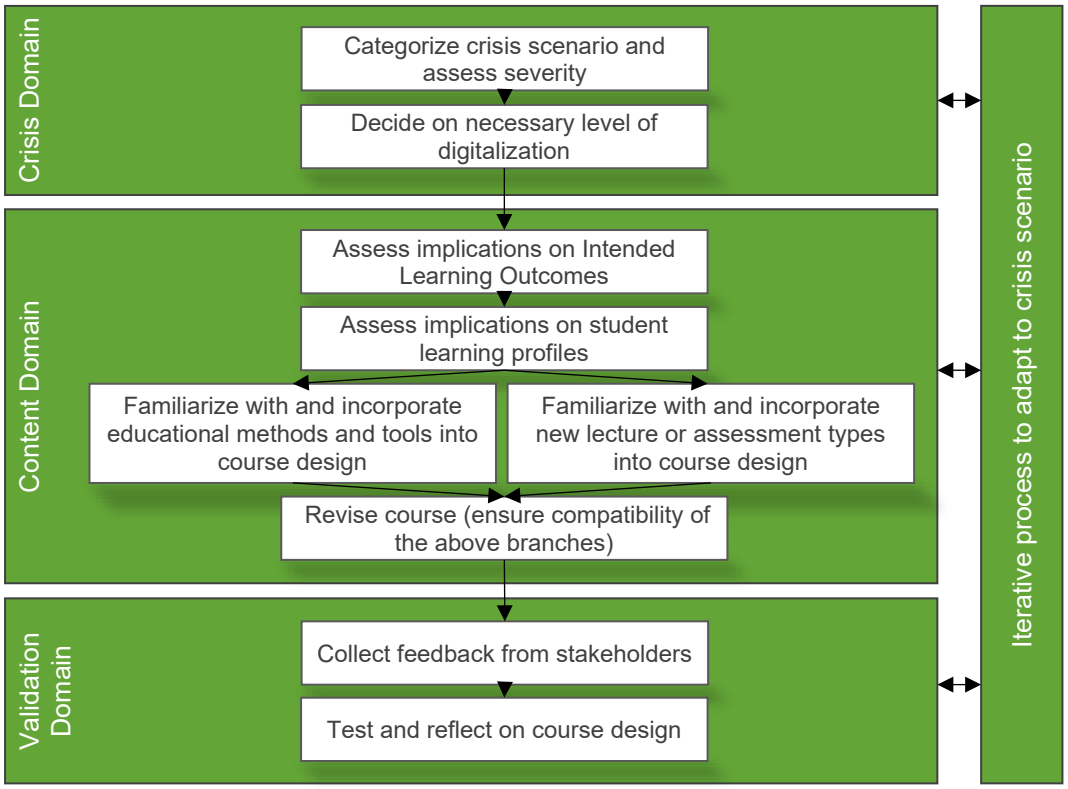


**Figure 2: General model of the systematic crisis-adaptation framework for digitalisation of engineering education courses**

## MAKING ERT MORE EFFECTIVE

Based on the initial findings of this project and based on the model of ad hoc adaptation of subjects to a disrupting situation in engineering education (Figure 1), we have developed a model of systematic crisis adaptation framework for digitization of engineering courses (Figure 2). The latter model spans the same domains as the ad hoc model, e.g., the crisis domain, the content domain, and the validation domain. First, in the crisis domain, it is necessary to examine and assess all aspects of the crisis in order to plan and prepare an appropriate response. Based on this plan, a decision can be made on the level of digitization required, including the establishment of clear digital communication channels. Communication is a critical component of ERT. Instructors should establish clear communication channels with their students, including communication protocols for different scenarios, such as how to ask questions or receive feedback. Instructors should also clearly communicate course expectations, assignments, and assessments. In addition, it is recommended to use proven online learning platforms and tools, such as learning management systems (LMS), video conferencing software, and digital resources. These platforms and tools should be proven and familiar to both instructors and learners. If possible, it is beneficial to continue using tools such as LMSs that were in use prior to the crisis scenario. In any case, it is necessary to provide technical

support to teachers and students, including troubleshooting and help with using online tools. It is essential to ensure that students have access to the necessary technology and resources.

Once the crisis is identified and qualified, planning must include assessment of the accredited curriculum and how the response might impact intended learning outcomes and student learning profiles. In the content area, it is now necessary to design the course for online delivery. Courses designed for face-to-face instruction may not be suitable for online instruction. Instructors should redesign their courses for online delivery to ensure that learning objectives are met, content is appropriate for the online environment, and assessments are meaningful and effective. This could include using and incorporating additional pedagogical methods and tools or new lecture and assessment modes into course design. ERT should be designed with a pedagogical approach that considers the learning outcomes and goals of the course. Instructors should use a range of strategies, such as active learning, discussion boards, and collaborative projects, to engage students and promote learning. Traditional assessment strategies may also not be appropriate for online learning. Faculty should consider alternative assessment strategies, such as online quizzes, open-book exams, and project-based assessments that are appropriate for the online environment. A comprehensive assessment of various teaching and assessment methods will be provided in a knowledge hub as part of this project.

It is critical that institutions and faculty ensure that their courses are accessible to all students, including those with disabilities. This includes ensuring that course materials are in accessible formats, such as closed captioning for videos and alternative text for images.

The final phase of the validation domain involves evaluating the effectiveness of ERT and making improvements based on feedback from faculty, students, and other stakeholders. This includes using data and assessments to measure learning outcomes and adjust instruction as needed.

By implementing these strategies, ERT can be improved to be more structured, systematic, and effective in achieving learning outcomes. It is critical to prepare for emergencies before they occur and provide adequate support and training to teachers and students to ensure success. It is strongly recommended that institutions have a contingency plan that outlines the steps to be taken in the event of an emergency or unforeseen circumstances that require a transition to online learning. The plan should include protocols for response actions to ensure adequate communication, training and support for faculty, and procedures to ensure the quality of the learning experience.