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WP3 – Development of techniques for the implementation of the remote teaching and training process with the use of support tools

IO.9 Development of evaluation methodology

Part I: Students' Assessment in Remote/Online Teaching

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1 INTRODUCTION

The COVID-19 pandemic has forced a departure from the current functioning of society in many aspects of the economy, travel, work and education, not excluding higher education. The necessity of remote education is one of the ways to maintain social distancing and protect our health and life.

A preliminary assessment of the situation at universities in European countries indicates that academic staff were not sufficiently prepared to conduct attractive and practical classes in a remote format.

The necessity to conduct classes remotely involves developing a dedicated didactic and training process project, considering the specific requirements of interdisciplinary engineering knowledge. Transferring this knowledge in remote education, due to its large scope, requires various didactic tools (lectures, fieldwork, design, practicals, laboratories, student assignments and assessment of the progress and knowledge of students and trainees).

The measurable expected final results are:

- Development of a remote learning methodology for Road Infrastructure Management (RIM) as a model solution to provide a basis for extending the methodology to include further aspects of civil engineering and transport.
- Developing an e-handbook for academic staff supporting the remote learning process.
- Development of model digital teaching and training materials dedicated to technical colleges and training for road management staff on RIM:
 - Road safety audit,
 - Roadside safety management,
 - Safety management of vulnerable road users,
 - Road pavement management.
- Developing an e-learning platform with access to project products.
- Appointment of a panel of experts in road infrastructure management.

The InfRO@D project targets the following groups:

- 1) Students, researchers, and academic teachers at universities.
- 2) Road authority staff at national, regional and local levels.
- 3) Experts, specialists, and practitioners involved in RIM activities, including staff who conduct training in various RIM courses.
- 4) All users of road infrastructure, as an indirect target group, for whom the risk of road accidents will ultimately be reduced by increasing the effectiveness and efficiency of RIM activities.

The project is also supported by a group of associates who will cooperate with project partners to consult and evaluate the results. They will implement final products and promote the dissemination and accessibility of the project results.

ABOUT OUTPUT IO.9

- **Objective:** Development of evaluation methodology.

- **Work package:** The task falls under WP3 – Development of techniques for the implementation of the remote teaching and training process with the use of support tools.
- **Target Groups:**
Research and teaching staff from the project and other European institutions involved.

2 OVERVIEW

2.1 Overview of remote/eLearning teaching and learning

Remote teaching and eLearning are educational models that rely on technology to deliver educational content and facilitate learning outside of traditional classroom settings.

Remote teaching involves live or pre-recorded instruction delivered to students who are not physically present in the classroom. This can be done through video conferencing, online lectures, or other forms of digital communication. Remote teaching can be synchronous, where students participate in real-time, or asynchronous, where students access pre-recorded content at their own pace.

E-learning, on the other hand, involves the use of digital technologies to support and enhance learning. This can include online courses, interactive learning tools, and digital assessments. E-learning can also be synchronous or asynchronous, and can be self-paced or instructor-led.

Both remote teaching and e-learning have become more prominent in recent years, with the COVID-19 pandemic accelerating their adoption. These models have benefits and challenges, and require educators and students to adapt to new ways of teaching and learning. Effective implementation of remote teaching and e-learning requires careful planning, technological infrastructure, and pedagogical strategies that support student engagement and success.

This section has been inspired by the following references: [Fuchs, 2022], [Tomczyk, 2021], [Bates, 2011], [Mayer, 2002].

2.2 Importance of assessment in remote/eLearning teaching

Assessment is a critical element in remote and eLearning teaching because it plays a significant role in measuring student learning and progress. Assessment helps teachers and instructors evaluate the effectiveness of their teaching strategies and identify areas that require improvement. It is essential in ensuring that students are making meaningful progress towards their learning goals and achieving the desired learning outcomes.

In remote and eLearning settings, assessment is even more critical because it can help educators ensure that students are engaged and participating in the learning process. Since there is no physical classroom, teachers may not have the same level of interaction with their students as they would in traditional classroom settings. Assessment can help educators monitor student engagement levels, identify areas where students may be struggling, and make adjustments to their teaching approach as necessary.

Assessment also provides valuable feedback to students, which can help them identify areas where they need to improve and make adjustments to their study habits. When students receive regular and meaningful feedback on their performance, they are more likely to take ownership of their learning and become more motivated to succeed.

Another benefit of assessment in remote and eLearning teaching is that it can help promote equity and fairness in education. With online assessment, students from all backgrounds and locations can have access to the same resources and opportunities for learning. This can help level the playing field for students who may have faced barriers to education in traditional classroom settings, such as distance, disability, or socioeconomic status.

So, assessment is a crucial component of remote and eLearning teaching because it provides educators with valuable insights into student learning and helps them evaluate the effectiveness of their teaching strategies. It also provides students with feedback on their performance and helps promote equity and fairness in education.

This section has been inspired by the following references: [Rust, 2007], [Lara, 2020], [Prakash, 2012].

2.3 Assessment Objectives for a course in remote/eLearning teaching

Having assessment objectives is crucial in remote and eLearning teaching since they provide a clear framework for evaluating student learning and progress. These objectives define what students are expected to know and be able to do at the end of a course or unit of study, and they help guide the development of assessments that measure student achievement.

Assessment objectives in remote and eLearning teaching are particularly important because they help ensure that assessments are aligned with the learning goals of the course. In remote and eLearning settings, where students may not have as much direct interaction with their teachers, it is essential to have a clear set of assessment objectives that provide guidance on what students need to achieve.

Assessment objectives also help teachers and instructors design assessments that are appropriate for the delivery mode of the course. For example, in a remote or eLearning course, assessments may need to be designed to be completed online, and may need to use different types of questions or formats than in a traditional classroom setting.

Moreover, assessment objectives help ensure that assessments are fair, valid, and reliable. When assessment objectives are clearly defined, students are more likely to be evaluated on the knowledge and skills that are essential to the course, rather than on irrelevant factors such as test-taking strategies or personal characteristics.

Finally, assessment objectives provide students with clear guidance on what they need to achieve in order to succeed in the course. This can help students set goals, track their progress, and identify areas where they need to improve.

Overall, assessment objectives are critical in remote and eLearning teaching because they help ensure that assessments are aligned with the learning goals of the course, designed for the delivery mode, and fair, valid, and reliable. They also provide students with clear guidance on what they need to achieve to succeed in the course.

This section has been inspired by the following references: [Hashim, 2014], [Connolly, 2005], [Stowell, 2010].

2.3.1 Goals and objectives of the assessments

The goals of assessments in remote and eLearning are similar to those of assessments in traditional classroom settings, with some additional considerations.

Some of the main assessment goals in remote and eLearning teaching are as follow: measure learning, provide feedback, promote engagement, ensure accessibility, ensure fairness and

validity, and provide data for evaluation. Table 1.1 contains detailed descriptions of the quintessence of each of the assessment goals.

Table 1.1: Detailed descriptions of the quintessence of each of the assessment goals. Source: Refs ([Black, 2009], [Abou El-Seoudr, 2014], [Chappuis, 2002], [Shepard, 2000])

Assessment Goal	Brief description of the Assessment Goal
<i>Measure learning or Evaluate student understanding</i>	The primary goal of assessments is to measure student learning and determine whether students have achieved the learning objectives of the course. Assessments should be designed to evaluate students' understanding of key concepts, as well as their ability to apply that knowledge to solve problems and complete tasks.
<i>Provide feedback; monitor progress</i>	Assessments should provide students with meaningful feedback on their performance, identifying areas where they have demonstrated strength and areas where they need to improve. Feedback should be timely and actionable, providing students with the information they need to make progress.
<i>Promote (encourage) engagement</i>	Assessments should be designed to promote student engagement and encourage active learning. Online assessments can include a variety of interactive features, such as multimedia elements, simulations, and interactive quizzes, to make the learning experience more engaging and interactive.
<i>Ensure accessibility</i>	Assessments should be designed with accessibility in mind, ensuring that all students can access and complete the assessments regardless of their abilities or disabilities. This includes providing alternative formats, such as audio or text-to-speech options, and ensuring that assessments are compatible with assistive technologies.
<i>Ensure fairness and validity</i>	Assessments should be designed to be fair and valid, ensuring that they measure what they are intended to measure and that students are evaluated on the basis of their knowledge and skills rather than irrelevant factors such as test-taking strategies or personal characteristics.
<i>Provide data for evaluation</i>	Assessments should provide data that can be used to evaluate the effectiveness of the teaching strategies and the course overall. This includes data on student performance, engagement, and progress, which can be used to identify areas for improvement and make adjustments to the instructional approach.
<i>Ensure accessibility</i>	Assessments should be designed to be accessible to all students, including those with disabilities. This may involve providing alternative formats, such as audio or text-to-speech options, and ensuring that assessments are compatible with assistive technologies.
<i>Evaluate course effectiveness</i>	Assessments should be used to evaluate the effectiveness of the course and teaching methods. This includes tracking student progress over time, comparing student performance to learning outcomes, and using student feedback to improve the course design.

2.3.2 Specific skills and knowledge to be assessed

Remote and eLearning teaching can be used to assess a wide range of skills and knowledge, depending on the learning objectives of the course. Here are some examples of the specific skills and knowledge that can be assessed through remote and eLearning teaching:

1. *Content knowledge*: Assessments can be used to evaluate students' understanding of key concepts and principles related to the course content. This can include factual knowledge, as well as conceptual understanding and the ability to apply knowledge to real-world scenarios.
2. *Critical thinking and problem-solving skills*: Assessments can be used to evaluate students' ability to think critically and solve problems. This may include analyzing and interpreting data, evaluating arguments and evidence, and developing and testing hypotheses.
3. *Communication skills*: Assessments can be used to evaluate students' communication skills, including their ability to write clearly and concisely, present ideas effectively, and engage in collaborative discussion.
4. *Technology literacy*: Assessments can be used to evaluate students' proficiency in using technology to access, evaluate, and communicate information. This may include basic computer skills, as well as more advanced skills such as programming or data analysis.
5. *Time management and organization skills*: Assessments can be used to evaluate students' ability to manage their time effectively, stay organized, and meet deadlines. This may include tasks such as completing assignments and participating in online discussions.
6. *Research and information literacy*: Assessments can be used to evaluate students' ability to locate, evaluate, and use information from a variety of sources. This may include assessing their ability to conduct research, evaluate sources for credibility and relevance, and use citations and references appropriately.

So in summary, the skills and knowledge assessed through remote and eLearning teaching will depend on the learning objectives of the course and the specific skills and competencies that are required for success in the subject area.

This section has been inspired by the following references: [Clark, 2016], [Iiyoshi, 2010].

2.3.3 Importance of aligning assessment objectives with the course goals/objectives

For a number of reasons, it is essential in remote and eLearning education to align assessment objectives with the course goals. Table 1.2 presents a summary of some of these reasons.

Table 1.2: *Reasons for aligning assessment objectives with course goals.* Source: Refs([Boud, 2006], [Barthakur, 2022], [Pham, 2022])

Identified reason	Brief explanation of the reason
<i>Ensuring validity</i>	When assessment objectives are aligned with course goals and objectives, the assessments accurately measure what students are supposed to learn. This ensures that the

	assessment results are valid and provide an accurate picture of student performance.
<i>Clarifying expectations</i>	Aligning assessment objectives with course goals and objectives provides students with a clear understanding of what they are expected to learn and how they will be assessed. This reduces confusion and uncertainty, which can lead to anxiety and reduced performance
<i>Ensuring validity</i>	When assessment objectives are aligned with course goals and objectives, the assessments accurately measure what students are supposed to learn. This ensures that the assessment results are valid and provide an accurate picture of student performance.
<i>Supporting learning</i>	When assessments are aligned with course goals and objectives, they support student learning by providing feedback that is directly relevant to the learning objectives. This helps students understand where they need to focus their efforts to improve their performance.
<i>Enhancing course design</i>	Aligning assessment objectives with course goals and objectives can help instructors identify gaps in their course design and adjust their teaching strategies accordingly. For example, if assessment results show that students are consistently struggling with a particular concept, the instructor can revise the course materials or teaching methods to better support student learning in that area.
<i>Ensuring accountability</i>	When assessment objectives are aligned with course goals and objectives, instructors can be held accountable for student learning outcomes. This helps to ensure that students receive a high-quality education and that instructors are effectively delivering the course content.

Ultimately, it is critical to ensure the validity of assessments, define expectations for students, enhance learning, improve course design, and ensure instructor accountability by lining up assessment objectives with course goals and objectives.

2.4 General assessment challenges related to different course components/types (theoretical part, exercises, lab or simulation experiments, tool-based design assignment, field-works)

Assessment is an integral part of any course and serves as a valuable tool for evaluating student learning and progress. However, it is not without its challenges. There are various general assessment challenges related to the components of a course that can be encountered. In this section, we will explore some general assessment challenges related to different components of the course.

2.4.1 General challenges for Assessing the theoretical part of a course in remote/eLearning teaching

Assessing theory in remote and eLearning teaching can pose a number of challenges, including:

1. **Limited student engagement:** In remote and eLearning environments, students may struggle to remain engaged with course material, which can make it difficult to assess their understanding of theory. Students may also face distractions or competing demands on their time, which can further impact their engagement.
2. **Difficulty in replicating traditional assessments:** Traditional assessments such as written exams or quizzes may be more challenging to administer in remote and eLearning environments. In some cases, instructors may need to adapt assessments to fit the online format or create new types of assessments altogether.
3. **Limited opportunities for feedback:** In remote and eLearning environments, students may have fewer opportunities for feedback than they would in a traditional classroom setting. This can limit the effectiveness of assessments as a tool for measuring understanding and identifying areas for improvement.
4. **Challenges with cheating:** Online assessments can make it easier for students to cheat, which can undermine the validity of assessment results. Instructors may need to use anti-cheating measures, such as proctoring software or timed exams, to mitigate this risk.
5. **Difficulty in assessing practical skills:** While theoretical concepts can be assessed remotely, practical skills such as lab work or hands-on training may be more challenging to assess in an eLearning environment. Instructors may need to develop alternative methods for assessing these skills, such as video demonstrations or simulations.

These challenges show that educators must carefully explore the most effective methods for evaluating theory in online and remote instruction. To ensure the authenticity of assessment findings, instructors might need to modify examinations to fit the online format, offer more feedback and guidance, and put anti-cheating mechanisms in place.

This section has been inspired by the following references: [Alruwai, 2018], [Tseng, 2011], [Sithole, 2019].

2.4.2 General challenges for Assessing the lab or simulation experiments of a course in remote/eLearning teaching

Assessing lab or simulation experiments in remote and eLearning teaching can pose a number of challenges, including:

1. **Limited access to equipment and resources:** In remote and eLearning environments, students may have limited access to physical lab equipment or resources. This can make it difficult to conduct experiments and assess practical skills.
2. **Technical issues with simulations:** Technical issues such as software malfunctions or compatibility issues can affect the quality and accuracy of simulations, which can in turn impact the validity of assessment results.
3. **Limited opportunities for feedback:** In remote and eLearning environments, students may have fewer opportunities for feedback during lab or simulation experiments than they would in a traditional classroom setting. This can limit the effectiveness of assessments as a tool for measuring understanding and identifying areas for improvement.
4. **Challenges with collaboration:** Lab or simulation experiments may require collaboration among students, which can be more challenging to facilitate in remote and eLearning environments. Instructors may need to use tools such as video conferencing or online collaboration software to support student teamwork.
5. **Cheating concerns:** In online lab or simulation experiments, students may have greater opportunities to cheat, such as by looking up answers or sharing results with others.

Instructors may need to use anti-cheating measures, such as proctoring software or timed assessments, to mitigate this risk.

Overall, these challenges highlight the need for instructors to carefully consider the best assessment strategies for assessing lab or simulation experiments in remote and eLearning teaching. Instructors may need to adapt assessments to fit the online format, provide additional feedback and support, and implement anti-cheating measures to ensure the validity of assessment results. They may also need to consider alternative methods for conducting experiments, such as using virtual simulations or online lab equipment.

This section has been inspired by the following references: [Sáen, 2021], [Tüysü, 2010], [Evstatiev, 2022].

2.4.3 General challenges for Assessing the tool-based design assignments of a course in remote/eLearning teaching

Assessing tool-based design assignments in remote and eLearning teaching can pose a number of challenges, including:

1. *Limited access to tools*: In remote and eLearning environments, students may have limited access to the software or tools needed to complete design assignments. This can make it difficult to assess the quality of their work or provide feedback on areas for improvement.
2. *Technical issues with tools*: Technical issues such as software malfunctions or compatibility issues can affect the quality and accuracy of students' design work, which can in turn impact the validity of assessment results.
3. *Limited opportunities for feedback*: In remote and eLearning environments, students may have fewer opportunities for feedback during tool-based design assignments than they would in a traditional classroom setting. This can limit the effectiveness of assessments as a tool for measuring understanding and identifying areas for improvement.
4. *Difficulty in assessing creativity*: Tool-based design assignments often require students to demonstrate creativity and originality, which can be more challenging to assess remotely. Instructors may need to develop alternative methods for assessing creativity, such as through written reflections or peer review.
5. *Cheating concerns*: In online tool-based design assignments, students may have greater opportunities to cheat, such as by using unauthorized software or sharing work with others. Instructors may need to use anti-cheating measures, such as plagiarism detection software or designating specific software to be used.

Overall, these challenges highlight the need for instructors to carefully consider the best assessment strategies for assessing tool-based design assignments in remote and eLearning teaching. Instructors may need to adapt assessments to fit the online format, provide additional feedback and support, and implement anti-cheating measures to ensure the validity of assessment results. They may also need to consider alternative methods for assessing creativity or providing access to software and tools.

This section has been inspired by the following references: [Siddiquei, 2021], [Reeves, 2000].

2.4.4 General challenges for Assessing the field works of a course in remote/eLearning teaching

Assessing fieldwork in remote and eLearning teaching can pose a number of challenges, including:

1. **Limited access to field sites:** In remote and eLearning environments, students may have limited access to the physical locations where fieldwork is conducted. This can make it difficult to assess the quality of their work or provide feedback on areas for improvement.
2. **Difficulty in observing student behavior:** In remote and eLearning environments, it may be more difficult for instructors to observe students in the field and assess their behavior and interactions. This can make it harder to assess students' practical skills and the effectiveness of their fieldwork.
3. **Limited opportunities for feedback:** In remote and eLearning environments, students may have fewer opportunities for feedback during fieldwork assignments than they would in a traditional classroom setting. This can limit the effectiveness of assessments as a tool for measuring understanding and identifying areas for improvement.
4. **Difficulty in assessing real-world experiences:** Fieldwork assignments often require students to apply theoretical knowledge to real-world situations. It can be more challenging to assess these experiences remotely and ensure that they are accurately reflected in the assessment.
5. **Cheating concerns:** In online fieldwork assignments, students may have greater opportunities to cheat, such as by falsifying data or sharing results with others. Instructors may need to use anti-cheating measures, such as requiring students to use specific software or submitting video recordings of their fieldwork.

Overall, these challenges highlight the need for instructors to carefully consider the best assessment strategies for assessing fieldwork in remote and eLearning teaching. Instructors may need to adapt assessments to fit the online format, provide additional feedback and support, and implement anti-cheating measures to ensure the validity of assessment results. They may also need to consider alternative methods for conducting fieldwork, such as using virtual simulations or online resources.

This section has been inspired by the following references: [(Sáen, 2021)], [Tüysü, 2010], [Evstatiev-1, 2022].

2.5 Specific contexts and motivations for remote/eLearning teaching of courses on Road Safety Management

There are several motivations for facilitating a course on Road Safety Management in remote and eLearning mode:

1. **Accessibility:** Remote and eLearning courses are accessible to anyone with an internet connection, regardless of their location or schedule. This can make it easier for individuals who live in remote areas, have work or family obligations, or have mobility issues to participate in the course.
2. **Convenience:** Remote and eLearning courses can be accessed at any time and from any location, making them convenient for students who need flexibility in their learning schedule.
3. **Cost-effective:** Remote and eLearning courses often have lower costs associated with them, such as reduced travel expenses, which can make them more accessible to students who may not be able to afford traditional in-person courses.
4. **Technology integration:** Facilitating a course on Road Safety Management in remote and eLearning mode provides an opportunity to integrate technology into the learning experience. This can include using multimedia resources, online simulations, and interactive tools to enhance the learning experience and engage students.

5. *Personalization*: Remote and eLearning courses can be personalized to meet the needs of individual learners, with the ability to provide customized feedback and support to students.
6. *Scalability*: Remote and eLearning courses can be easily scaled to accommodate a larger number of students, without requiring additional physical resources.

In short, facilitating a course on Road Safety Management in remote and eLearning mode can have a number of advantages, including improved accessibility, practicality, cost-effectiveness, technological integration, personalisation, and scalability.

3 TYPES OF ASSESSMENT IN REMOTE/ELEARNING TEACHING

It is evident that assessments play a crucial role in remote teaching and eLearning. This is because they are used to evaluate student learning and progress. They also serve as a means of providing feedback to both students and instructors. With the growing popularity of online education, there has been an increasing need for various types of assessments that are suitable for remote and eLearning environments. In this context, we will explore the different types of assessments used in remote and eLearning, along with the different forms that they can take.

3.1 Formative assessment

Formative assessment in the context of remote and eLearning teaching refers to the process of evaluating student learning during the course of instruction, with the goal of providing feedback to improve and guide learning. It is used to monitor student progress and understanding, and to identify areas that require further instruction or support.

Moreover, a formative assessment helps instructors to evaluate student learning, identify areas that require further instruction, and adjust teaching strategies accordingly. In remote and eLearning teaching, formative assessments can take many forms, including online quizzes and polls, discussion forums, peer assessments, virtual office hours, and project-based learning. The table below, Table 2.1, provides a succinct summary of these.

Table 2.1: Various forms of a formative assessment in remote and eLearning. Source: see Refs. [Black, 2009], [Soffer, 2017], [Koç, 2015], [Baleni, 2015], [Nicol, 2006].

Forms of a formative assessment	Brief explanation
<i>Online quizzes and polls</i>	Use online tools such as Kahoot, Poll Everywhere, or Google Forms to create quizzes and polls that students can complete during or after a lesson. These tools provide immediate feedback, which can help students to self-assess their understanding of the material.
<i>Discussion forums</i>	Encourage students to participate in online discussion forums where they can share their thoughts and ideas about the course content. This not only provides an opportunity for formative assessment but also helps to build a sense of community among students.
<i>Peer assessment</i>	Assign students to work in pairs or small groups and have them assess each other's work. This can be done through online collaboration tools such as Google Docs or Microsoft Teams.
<i>Virtual office hours</i>	Schedule virtual office hours where students can ask questions and receive immediate feedback on their work. This not only provides an opportunity for formative assessment but also helps to build a sense of community between students and the instructor.
<i>Project-based learning</i>	Assign projects that require students to apply what they have learned to real-world problems. This allows students to demonstrate their understanding of the material while also receiving feedback on their work.

It appears that incorporating formative assessment strategies into remote and eLearning teaching can help to enhance student learning, promote student engagement, and improve the quality of instruction.

3.2 Summative assessment

In the context of remote and eLearning teaching, summative assessment refers to the process of evaluating student learning at the end of a course, unit, or module. It is typically used to measure student achievement and determine the extent to which students have mastered the learning objectives and outcomes of the course.

Like with the formative assessment as described in the previous section, summative assessments also can take many forms, including online exams, performance-based assessments, portfolios, and self-assessment. Table 2.2, provides a succinct summary of these summative assessment forms.

Table 2.2: Various forms of a Summative assessment in remote and eLearning. Source: Refs. [Black, 1998], [Hattie, 2007], [Taras, 2005].

Forms of a summative assessment	Brief explanation
<i>Online exams</i>	Use online tools such as Google Forms, Quizlet, or Blackboard to create exams that can be administered remotely. These tools provide a secure environment for administering exams, and some even offer features such as timed exams and automated grading.
<i>Performance-based assessments</i>	Assign performance-based assessments that require students to demonstrate their understanding of the material through projects, essays, or presentations. These assessments can be completed remotely and provide an opportunity for students to showcase their learning in a more creative way.
<i>Portfolios</i>	Assign students to create portfolios that showcase their work throughout the course. This can include projects, essays, and other assignments, as well as reflections on their learning. Portfolios provide a comprehensive way to measure student learning and provide a way for students to reflect on their own progress.
<i>Self-assessment</i>	Encourage students to engage in self-assessment by reflecting on their own learning and progress throughout the course. Provide guidance on what to look for and how to assess their own work.
<i>Peer-review</i>	Have students review and provide feedback on each other's work. This can be done through online collaboration tools such as Google Docs or Microsoft Teams. Peer review not only provides a way for students to receive feedback on their work but also promotes collaboration and communication among students.

So, incorporating summative assessment strategies into remote and eLearning teaching is very important. The summative assessments forms or strategies foster the benefits of providing

an opportunity to evaluate student learning, measuring the effectiveness of the teaching and learning strategies employed, and informing future teaching and learning practices.

3.3 Diagnostic assessment

Diagnostic assessment is a type of assessment that is used to determine students' strengths and weaknesses in their learning. It is often used at the beginning of a course or unit to identify what students already know and what they need to learn. In the context of remote and eLearning teaching, diagnostic assessment can be used to gather information about students' prior knowledge and understanding of the course material.

In remote and eLearning teaching, these assessments are so important as they are designed to evaluate students' understanding of the material and identify areas where they may need additional support or clarification. By using diagnostic assessment, teachers can tailor their instruction to meet the needs of their students and ensure that they are providing effective and meaningful learning experiences.

Moreover, they can help teachers identify any gaps in learning that may have occurred due to the lack of face-to-face interaction. They can also help teachers monitor students' progress and adjust their instruction accordingly. Ultimately, diagnostic assessments are a valuable tool for promoting student success in remote and eLearning teaching by ensuring that students receive the support they need to reach their full potential.

The diagnostic assessment, too, can take many forms that we can referred to also as strategies. Table 2.3, provides a succinct summary of these diagnostic assessment forms or strategies.

Table 2.3: Various forms of a Diagnostic assessment in remote and eLearning. Source: Refs([Black, 1998], [Crooks, 1988], [Shepard, 2000])

Forms of a diagnostic assessment	Brief explanation
<i>Pre-assessment survey</i>	Teachers can use a pre-assessment survey to gather information about their students' prior knowledge, interests, and learning styles. This information can help teachers tailor their instruction to meet the needs of their students.
<i>Online quizzes</i>	Teachers can use online quizzes to assess their students' understanding of the material. These quizzes can be graded automatically, which saves teachers time and allows them to provide immediate feedback to their students.
<i>Discussion forums</i>	Teachers can use discussion forums to assess their students' understanding of the material and their ability to apply it to real-world situations. By participating in these discussions, teachers can observe their students' thought processes and identify areas where they may need additional support or clarification.
<i>One-on-one conferences</i>	Teachers can schedule one-on-one conferences with their students to discuss their understanding of the material and provide individualized support. These conferences can be conducted over video conferencing tools like Zoom or Skype.
<i>Student feedback:</i>	Teachers can ask their students for feedback on their understanding of the material and their learning experiences.

	This feedback can be collected through surveys or through informal conversations.
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As a summary, diagnostic assessments are an essential tool for teachers in remote and eLearning teaching. They can be used to identify students' strengths and weaknesses in learning. They can be used to evaluate students' understanding of the content. They can also be used to identify areas where students may need additional support or clarification.

3.4 Self-Assessment

Self-assessment is the process by which learners evaluate their own learning and progress towards meeting learning objectives. In the context of remote and eLearning teaching, self-assessment is a critical tool for promoting student success and ensuring that students are taking ownership of their own learning.

In remote and eLearning teaching, self-assessment involves providing students with opportunities to reflect on their own learning, evaluate their understanding of the material, and identify areas where they need additional support or clarification.

The benefits of self-assessment in remote and eLearning teaching can be many. For instance, a self-assessment can be useful to help overcome some of the challenges associated with distance learning. Some of these challenges are: students may feel isolated or disconnected from their peers and teachers, but self-assessment can help them to feel more engaged and connected to their own learning process. A self-assessment can also help students to monitor their own progress and adjust their learning strategies accordingly. In remote and eLearning teaching, self-assessments can be regarded as an important aspect of developing lifelong learning skills. By encouraging students to take ownership of their own learning, teachers can help them to become more self-directed and motivated learners who are better prepared to succeed in a variety of educational and professional contexts.

Self-assessments, too, can take many forms that we can referred to also as strategies. Table 2.4, provides a succinct summary of these self-assessment forms or strategies.

Table 2.4: Various forms of a Self-assessment in remote and eLearning. Source: Refs([Roberts, 2005] [McMillan, 2008], [Carless, 2015], [Gielen, 2010], [Nicol, 2006])

Forms of a self-assessment	Brief explanation
<i>Reflection prompts</i>	Teachers can provide reflection prompts to guide students in their self-assessment. For example, students can be asked to reflect on their progress towards meeting learning objectives, their strengths and weaknesses, and areas where they need additional support.
<i>Peer feedback</i>	Teachers can encourage students to provide feedback to their peers on their work. This can help students to identify areas where they need to improve and to develop their own critical thinking skills.
<i>Rubrics</i>	Teachers can provide rubrics or checklists for students to use in self-assessment. These tools can help students to evaluate

	their own work against specific criteria and identify areas where they need to improve.
<i>Self-assessment quizzes</i>	Teachers can provide self-assessment quizzes that allow students to evaluate their understanding of the material. These quizzes can be graded automatically, providing immediate feedback to students on their progress.
<i>Goal setting</i>	Teachers can encourage students to set goals for themselves and to evaluate their progress towards meeting those goals. This can help students to take ownership of their own learning and develop a growth mindset

Overall, self-assessment is an important tool for promoting student success in remote and eLearning teaching. By encouraging students to reflect on their own learning, teachers can help them to identify areas where they need to improve and to take ownership of their own learning.

3.5 Specific perspectives related to different course components/types (theoretical part, exercises, lab or simulation experiments, tool-based design assignment, field-works)

Assessment is an essential part of any course, as it helps to measure the students' understanding and mastery of the course material. However, given that the course can be broken in different components, the various components may have various perspectives with respect to assessment.

Understanding Specific perspectives related to each different component of a course is essential for creating effective assessments that accurately reflect student knowledge and provide meaningful feedback to improve learning outcomes.

3.5.1 Specific perspectives related to the theoretical part of a course in remote/eLearning teaching

When assessing the theoretical part of a course in remote/eLearning teaching, there are several perspectives to consider. Here are some specific perspectives related to assessment in this context:

1. *Content mastery*: One perspective is to assess students' mastery of the course content. This involves evaluating students' understanding of key concepts, theories, and principles covered in the course. This can be done through quizzes, exams, or assignments that require students to apply their knowledge to real-world scenarios.
2. *Critical thinking*: Another perspective is to assess students' critical thinking skills. This involves evaluating their ability to analyze, evaluate, and synthesize information. Teachers can use assignments that require students to analyze and evaluate information from different sources, or to synthesize information from different parts of the course.
3. *Collaboration*: A third perspective is to assess students' ability to collaborate with others. This involves evaluating their ability to work effectively in virtual teams and to communicate their ideas clearly and effectively. Teachers can use group projects or discussion forums to assess students' collaboration skills.

4. **Engagement:** A fourth perspective is to assess students' engagement with the course material. This involves evaluating how much effort students are putting into the course and how much they are learning. Teachers can use surveys or self-assessment tools to evaluate students' engagement.
5. **Feedback:** A fifth perspective is to assess how students are responding to feedback. This involves evaluating whether students are using feedback to improve their work and whether they are incorporating feedback into their learning process. Teachers can use rubrics or checklists to provide feedback that is specific and actionable.

Overall, when assessing the theoretical part of a course in remote/eLearning teaching, it is important to consider multiple perspectives in order to ensure that students are developing a comprehensive understanding of the course material and are engaged and motivated to learn.

This section has been inspired by the following references: [Anderso, 2003], [Garrison, 2007], [Moore, 1989], [Palloff, 2013] and [Salmon, 2000].

3.5.2 Specific perspectives related to the lab or simulation experiments of a course in remote/eLearning teaching

When assessing the lab or simulation experiments of a course in remote/eLearning teaching, there are several perspectives to consider. Here are some specific perspectives related to assessment in this context:

1. **Technical skills:** One perspective is to assess students' technical skills related to the lab or simulation experiments. This involves evaluating whether students are able to use the tools and software required to complete the experiments. Teachers can use quizzes or assignments to assess technical skills.
2. **Data analysis:** Another perspective is to assess students' ability to analyze data generated from the experiments. This involves evaluating whether students are able to interpret the data and draw meaningful conclusions from it. Teachers can use assignments or lab reports to assess data analysis skills.
3. **Experimental design:** A third perspective is to assess students' ability to design experiments that address specific research questions. This involves evaluating whether students are able to develop a hypothesis, design an experiment to test the hypothesis, and collect and analyze data. Teachers can use assignments or lab reports to assess experimental design skills.
4. **Communication:** A fourth perspective is to assess students' ability to communicate their findings to others. This involves evaluating whether students are able to write clear and concise lab reports or give presentations that effectively communicate their results. Teachers can use rubrics or checklists to assess communication skills.
5. **Collaboration:** A fifth perspective is to assess students' ability to collaborate with others on lab or simulation experiments. This involves evaluating whether students are able to work effectively in virtual teams and to communicate their ideas clearly and effectively. Teachers can use group projects or discussion forums to assess collaboration skills.

Overall, when assessing the lab or simulation experiments of a course in remote/eLearning teaching, it is important to consider multiple perspectives in order to ensure that students are developing a comprehensive understanding of the course material and are engaged and motivated to learn.

This section has been inspired by the following references: [De Jong, 2013], [Kirschner, 2006], [Lohr, 2008] and [Merrill, 2002].

3.5.3 Specific perspectives related to the tool-based design assignments of a course in remote/eLearning teaching

When assessing tool-based design assignments of a course in remote/eLearning teaching, there are several perspectives to consider. Here are some specific perspectives related to assessment in this context:

1. **Technical proficiency:** One perspective is to assess students' technical proficiency with the tools used in the design assignments. This involves evaluating whether students are able to use the tools effectively and efficiently to produce high-quality designs. Teachers can use quizzes or assignments to assess technical proficiency.
2. **Creativity:** Another perspective is to assess students' creativity in the design process. This involves evaluating whether students are able to develop unique and innovative designs that meet the requirements of the assignment. Teachers can use rubrics or checklists to assess creativity.
3. **Design thinking:** A third perspective is to assess students' ability to apply design thinking principles to the design process. This involves evaluating whether students are able to identify user needs, develop design solutions, and test and iterate on their designs. Teachers can use assignments or presentations to assess design thinking skills.
4. **Communication:** A fourth perspective is to assess students' ability to communicate their design ideas to others. This involves evaluating whether students are able to clearly and effectively communicate their design ideas through written or visual communication. Teachers can use rubrics or checklists to assess communication skills.
5. **Collaboration:** A fifth perspective is to assess students' ability to collaborate with others on the design assignments. This involves evaluating whether students are able to work effectively in virtual teams and to communicate their ideas clearly and effectively. Teachers can use group projects or discussion forums to assess collaboration skills.

Overall, when assessing tool-based design assignments of a course in remote/eLearning teaching, it is important to consider multiple perspectives in order to ensure that students are developing a comprehensive understanding of the design process and are engaged and motivated to learn.

This section has been inspired by the following references: [Reeves, 2003], [Beetha, 2013], [Dron, 2014] and [Siemens, 2011].

3.6 Specific perspectives, if any, related to courses on Road Safety Management

When assessing courses on Road Safety Management, there are several specific assessment perspectives to consider:

1. **Knowledge of road safety principles and regulations:** This involves evaluating students' understanding of the principles and regulations related to road safety, including knowledge of traffic laws, road design, and vehicle safety. Teachers can use quizzes, exams, or case studies to assess students' knowledge in this area.
2. **Risk management skills:** Another perspective is to assess students' ability to identify and manage risks related to road safety. This involves evaluating whether students are able to conduct risk assessments, develop risk management plans, and implement strategies to mitigate risks. Teachers can use case studies or simulation exercises to assess risk management skills.
3. **Accident investigation:** A third perspective is to assess students' ability to investigate road accidents and analyze the causes and contributing factors. This involves

evaluating whether students are able to collect and analyze data related to the accident, identify the root causes, and develop recommendations for preventing similar accidents in the future. Teachers can use case studies or group projects to assess accident investigation skills.

4. *Communication*: A fourth perspective is to assess students' ability to communicate road safety issues and recommendations effectively. This involves evaluating whether students are able to write clear and concise reports or give presentations that effectively communicate road safety issues and recommendations to different audiences. Teachers can use rubrics or checklists to assess communication skills.
5. *Collaboration*: A fifth perspective is to assess students' ability to collaborate with others on road safety management projects. This involves evaluating whether students are able to work effectively in virtual teams and to communicate their ideas clearly and effectively. Teachers can use group projects or discussion forums to assess collaboration skills.

Overall, when assessing courses on Road Safety Management, it is important to consider multiple assessment perspectives in order to ensure that students are developing a comprehensive understanding of road safety principles and regulations, as well as the practical skills needed to manage road safety risks and investigate accidents.

4 BEST PRACTICES FOR ASSESSMENT IN REMOTE/ELEARNING TEACHING

4.1 General best-practice related perspectives

Assessment is a critical component of teaching and learning, as it provides feedback to students and instructors on how well learning objectives are being met. In eLearning, where students are often learning in remote or online environments, assessment practices need to be carefully designed to ensure that students are able to demonstrate their learning effectively and that instructors are able to accurately assess student progress.

Best practices for assessment in eLearning teaching are essential to ensure that assessments are fair, valid, reliable, and aligned with learning objectives, and that they provide meaningful feedback to support student learning and success. With the increased adoption of eLearning in recent years, the need for best practices for assessment in eLearning teaching has become increasingly important to ensure that students receive high-quality education and to help institutions meet their educational goals.

The importance of best practices for assessment in eLearning teaching lies in ensuring that students are able to demonstrate their knowledge and skills in a fair and accurate manner, and that instructors are able to evaluate student progress effectively. In the absence of face-to-face interaction, eLearning assessments need to be carefully designed to ensure that they are reliable, valid, and aligned with learning objectives, and that they provide useful feedback to support student learning and success.

Best practices for assessment in eLearning teaching help to ensure that assessments are designed in a way that is consistent with established standards and best practices, and that they take into account the unique challenges and opportunities presented by remote and online learning environments. By following best practices for assessment in eLearning teaching, instructors can improve the quality of their assessments, enhance student learning outcomes, and contribute to the overall success of their eLearning programs.

This section has been inspired by the following references: [Buzzetto-More, 2006], [Gikandi, 2011], [Schuwirth, 2011] and [Birenbaum, 1996].

4.1.1 Setting clear learning objectives

Setting clear learning objectives is crucial in eLearning teaching because it helps to provide a clear roadmap for both instructors and students, guiding the learning process and ensuring that it is focused and purposeful. Clear learning objectives help students to understand what they are expected to learn, why it is important, and how they will be assessed. They also help instructors to develop appropriate learning activities and assessments that are aligned with the objectives and that support student learning outcomes.

In an eLearning environment, where students may be studying in isolation and without the benefit of direct, face-to-face interaction with instructors, clear learning objectives become even more important. They provide a way to bridge the distance between instructors and students, helping to establish a common understanding of what is to be learned and how it will be assessed.

Clear learning objectives also help to promote student engagement and motivation by giving students a sense of direction and purpose in their learning. When students understand the goals of the course or module and see how they are progressing towards those goals, they

are more likely to be motivated to continue learning and to engage actively in the learning process.

In summary, setting clear learning objectives in eLearning teaching is essential to provide focus, direction, and purpose to the learning process, to ensure that assessments and activities are aligned with learning outcomes, and to promote student engagement and motivation.

This section has been inspired by the following references: [Lee, 2011], [Conklin, 2005], [Biggs, 2007] and [Dooley, 2005].

4.1.2 Providing timely feedback

Providing timely feedback is crucial in eLearning teaching because it helps to support student learning and to ensure that students are able to stay on track with their learning goals. Timely feedback provides students with information on their progress, identifies areas of strength and weakness, and offers suggestions for improvement.

In an eLearning environment, where students may be studying in isolation and without the benefit of direct, face-to-face interaction with instructors, timely feedback becomes even more important. It can help to bridge the distance between instructors and students, provide a sense of connection and support, and help to ensure that students are able to make progress towards their learning goals.

Providing timely feedback also helps to promote student engagement and motivation by providing students with a sense of accomplishment and progress. When students receive feedback on their work in a timely manner, they are more likely to stay motivated and engaged in the learning process.

Furthermore, providing timely feedback can help instructors to identify areas where students may be struggling and to provide additional support as needed. This can help to prevent students from falling behind in their learning and can contribute to overall student success.

In summary, providing timely feedback in eLearning teaching is essential to support student learning, promote student engagement and motivation, and to identify areas where additional support may be needed. By providing feedback in a timely manner, instructors can help to ensure that students are able to make progress towards their learning goals and that they are able to achieve their full potential.

This section has been inspired by the following references: [Van der Kleij, 2012], [Hattie, 2007], [Black, 1998] and [Shute, 2008].

4.1.3 Creating authentic assessments

Creating authentic assessments is important in eLearning teaching because it helps to ensure that students are able to apply their knowledge and skills in real-world contexts, and that they are able to demonstrate their learning in meaningful and relevant ways. Authentic assessments are designed to mirror the types of challenges and tasks that students are likely to encounter in their future careers or in other real-world situations, and they require students to use critical thinking, problem-solving, and creativity to solve complex problems.

Authentic assessments can take many forms, such as case studies, simulations, projects, and performance-based assessments. They often involve a degree of complexity and uncertainty that goes beyond simple recall of information, and they require students to demonstrate higher-order thinking skills such as analysis, synthesis, and evaluation.

In an eLearning environment, authentic assessments are especially important because they can help to bridge the gap between theory and practice, and provide students with opportunities to apply their learning in meaningful and relevant ways. They can also help to promote student engagement and motivation by providing students with a sense of purpose and relevance to their learning.

Authentic assessments can also provide instructors with valuable information about student learning, including the ability to assess higher-order thinking skills, problem-solving ability, and creativity. This information can be used to refine teaching strategies and improve student learning outcomes.

In summary, creating authentic assessments in eLearning teaching is important because it helps to ensure that students are able to apply their learning in real-world contexts, that they are able to demonstrate higher-order thinking skills, and that they are engaged and motivated in the learning process. Authentic assessments also provide valuable feedback to instructors that can be used to improve teaching strategies and enhance student learning outcomes.

This section has been inspired by the following references: [Darling-Hammond, 2010], [Wiggins, 1989], [Stevens, 2013] and [McTighe, 2013].

4.1.4 Using technology to enhance assessment

Using technology to enhance assessment is important in eLearning teaching because it can help to improve the efficiency, effectiveness, and accessibility of assessments, as well as to provide new opportunities for learning and feedback.

Technology can be used in a variety of ways to enhance assessment in eLearning teaching. For example, online quizzes, surveys, and self-assessments can be used to provide immediate feedback to students on their learning progress. These types of assessments can be automated, which can save instructors time and enable them to provide more frequent and timely feedback to students.

Technology can also be used to create interactive and multimedia-rich assessments, such as simulations, virtual labs, and multimedia presentations. These types of assessments can provide students with a more engaging and interactive learning experience, as well as enable them to develop a broader range of skills, such as problem-solving, critical thinking, and creativity.

Furthermore, technology can be used to support collaborative and peer-to-peer assessments, such as online discussion forums and peer review tools. These types of assessments can help to develop students' communication and collaboration skills, as well as enable them to receive feedback from a range of perspectives.

Technology can also enable instructors to collect and analyze assessment data more efficiently and effectively, which can help to identify patterns and trends in student learning, as well as to track student progress over time. This can help instructors to adapt their teaching strategies and to provide targeted support to students as needed.

In summary, using technology to enhance assessment in eLearning teaching is important because it can improve the efficiency, effectiveness, and accessibility of assessments, as well as provide new opportunities for learning and feedback. By leveraging technology in creative and innovative ways, instructors can create more engaging and interactive learning experiences for their students, as well as to provide more targeted and personalized support to help students achieve their learning goals.

This section has been inspired by the following references: [Ferdig, 2006] and [Jordan, 2014].

4.2 Specific perspectives (best practices) related to the different course components/types (theoretical part, exercises, lab or simulation experiments, tool-based design assignments, field-works)

4.2.1 Specific perspectives (best practices) related to assessing the theoretical part of the course

Assessing the theoretical part of an eLearning course requires careful planning and consideration of best practices in assessment. Here are some key perspectives to keep in mind:

1. *Align assessments with learning objectives:* To ensure that assessments accurately measure what students have learned, it's important to align them with the course's learning objectives. This involves designing assessments that specifically target the knowledge and skills that students are expected to acquire through the theoretical part of the course.
2. *Use a variety of assessment methods:* To ensure that assessments are valid and reliable, it's important to use a variety of assessment methods. This can include quizzes, exams, essays, case studies, and other forms of assessment. By using multiple methods, instructors can gain a more comprehensive understanding of students' learning progress.
3. *Provide clear instructions and expectations:* To ensure that assessments are fair and transparent, it's important to provide clear instructions and expectations for students. This includes outlining the assessment criteria, providing examples of high-quality work, and communicating deadlines and submission procedures.
4. *Offer timely and constructive feedback:* To support student learning and motivation, it's important to provide timely and constructive feedback on assessments. This can include written comments, rubrics, and grading scales, as well as opportunities for students to review their work and ask questions.
5. *Maintain academic integrity:* To ensure that assessments accurately measure students' learning, it's important to maintain academic integrity. This includes using anti-plagiarism software to detect and prevent plagiarism, as well as ensuring that assessments are designed in a way that discourages cheating.
6. *Evaluate and revise assessments:* To ensure that assessments are effective and relevant, it's important to evaluate and revise them on an ongoing basis. This can involve collecting feedback from students and colleagues, analyzing assessment results, and making changes as needed to improve the validity, reliability, and relevance of assessments.

By keeping these best practices in mind, instructors can create assessments that accurately measure student learning and support student success in the theoretical part of an eLearning course.

This section has been inspired by the following references: [Klenowski, 2013], [Berry, 2008], [Carless, 2018] and [Huba, 2000].

4.2.2 Specific perspectives (best practices) related to assessing the lab or simulation experiments of the course

Assessing lab or simulation experiments in an eLearning course requires a systematic approach that ensures the validity, reliability, and effectiveness of the assessment. Here are some best practices to consider:

Clearly define the learning objectives: Before creating any lab or simulation experiment, it is essential to define the learning objectives that it is intended to achieve. These objectives should be specific, measurable, achievable, relevant, and time-bound (SMART). The assessment should align with these objectives, and the criteria for evaluation should be communicated to the students.

1. *Provide clear instructions:* Clear and concise instructions should be provided to the students before the lab or simulation experiment. The instructions should include the objectives of the assessment, the procedures to follow, and the evaluation criteria. Students should also be informed of the expected outcomes and the format of the assessment.
2. *Use rubrics for assessment:* Rubrics are a useful tool for assessing lab or simulation experiments. They provide a clear and detailed description of the criteria for evaluation and the levels of achievement. Rubrics also help to ensure consistency and objectivity in the evaluation process.
3. *Provide feedback:* Feedback is essential for students to understand their strengths and weaknesses and to improve their performance. Feedback should be constructive, specific, and timely. It should also focus on the learning objectives and the criteria for evaluation.
4. *Ensure validity and reliability:* To ensure the validity and reliability of the assessment, it is essential to use appropriate measures and procedures. The assessment should be designed to measure the intended learning outcomes and should be reliable in terms of consistency and objectivity.
5. *Incorporate self-assessment:* Self-assessment can be a valuable tool for students to reflect on their own learning and to identify areas for improvement. It can also help to promote student engagement and motivation.
6. *Consider accessibility:* Lab or simulation experiments should be accessible to all students, including those with disabilities. The assessment should be designed to accommodate different learning styles and should be available in alternative formats if necessary.

In summary, assessing lab or simulation experiments in an eLearning course requires a systematic approach that considers the learning objectives, provides clear instructions, uses rubrics for assessment, provides feedback, ensures validity and reliability, incorporates self-assessment, and considers accessibility.

This section has been inspired by the following references: [Gustavsson, 2009] and [Sadler, 2010].

4.2.3 Specific perspectives (best practices) related to assessing the tool-based design assignments of the course

Assessing tool-based design assignments in an eLearning course requires a careful and systematic approach that considers the unique characteristics of the design tool being used. Here are some best practices to consider:

1. *Clearly define the design objectives:* Before assigning any tool-based design project, it is essential to define the learning objectives that it is intended to achieve. These objectives should be specific, measurable, achievable, relevant, and time-bound (SMART). The assessment should align with these objectives, and the criteria for evaluation should be communicated to the students.
2. *Provide clear instructions:* Clear and concise instructions should be provided to the students before the design project. The instructions should include the objectives of the assessment, the procedures to follow, and the evaluation criteria. Students should also be informed of the expected outcomes and the format of the assessment.
3. *Use rubrics for assessment:* Rubrics are a useful tool for assessing tool-based design assignments. They provide a clear and detailed description of the criteria for evaluation and the levels of achievement. Rubrics also help to ensure consistency and objectivity in the evaluation process.
4. *Evaluate the design process:* When assessing tool-based design assignments, it is important to consider the design process in addition to the final product. Students should be evaluated on their ability to use the design tool effectively, their creativity in solving design problems, and their ability to iterate and refine their designs.
5. *Consider the quality of the final product:* The quality of the final product is also an important consideration when assessing tool-based design assignments. Students should be evaluated on the technical proficiency of their designs, the visual and aesthetic appeal of their designs, and the degree to which their designs meet the specified objectives.
6. *Provide feedback:* Feedback is essential for students to understand their strengths and weaknesses and to improve their performance. Feedback should be constructive, specific, and timely. It should also focus on the learning objectives and the criteria for evaluation.
7. *Incorporate self-assessment:* Self-assessment can be a valuable tool for students to reflect on their own learning and to identify areas for improvement. It can also help to promote student engagement and motivation.
8. *Consider accessibility:* Tool-based design assignments should be accessible to all students, including those with disabilities. The assessment should be designed to accommodate different learning styles and should be available in alternative formats if necessary.

In summary, assessing tool-based design assignments in an eLearning course requires a systematic approach that considers the learning objectives, provides clear instructions, uses rubrics for assessment, evaluates the design process and final product, provides feedback, incorporates self-assessment, and considers accessibility.

This section has been inspired by the following references: [Jenkins, 2017], [Chiu, 2008] and [Wu, 2015].

4.2.4 Specific perspectives (best practices) related to assessing the field-works part of the course

Assessing fieldwork in an eLearning course can be a complex task, as it requires assessing both the learning outcomes achieved through the fieldwork and the process of conducting the

fieldwork itself. Here are some best practices perspectives to consider when assessing the fieldwork component of an eLearning course:

1. **Define clear learning outcomes:** Before conducting any fieldwork, it is essential to establish clear learning outcomes that the fieldwork is designed to achieve. These outcomes should be specific, measurable, achievable, relevant, and time-bound (SMART) and should align with the overall course objectives.
2. **Provide detailed instructions:** Clear and concise instructions should be provided to learners to ensure that they understand what is expected of them during the fieldwork. These instructions should cover the purpose of the fieldwork, the tasks involved, the expected deliverables, and any specific guidelines or criteria for evaluation.
3. **Monitor and provide feedback:** Regular monitoring of the fieldwork progress can help identify any issues or challenges learners may face during the process. Feedback can be provided to learners, helping them stay on track and make any necessary adjustments. Feedback should be constructive, specific, and actionable, providing learners with guidance on how to improve their work.
4. **Encourage reflection:** Reflection is a critical component of the learning process, and it should be encouraged during and after the fieldwork. Learners should be asked to reflect on their experiences, what they learned, and how they can apply their knowledge and skills in real-world situations.
5. **Use multiple assessment methods:** Assessing fieldwork can be challenging, and using a variety of assessment methods can help provide a comprehensive view of learners' progress. These methods can include self-assessments, peer evaluations, and instructor assessments, each providing a different perspective on the learner's performance.
6. **Consider the authenticity of the fieldwork:** Authenticity is a critical component of fieldwork, and it can impact the effectiveness of the assessment. Fieldwork should be designed to reflect real-world situations, providing learners with opportunities to apply their knowledge and skills in a practical context.

Overall, effective assessment of fieldwork in an eLearning course requires careful planning, clear communication, and ongoing monitoring and feedback. By following these best practices, instructors can ensure that learners have a meaningful and engaging learning experience that prepares them for real-world applications.

This section has been inspired by the following references: [Stödberg, 2012] and [Martin, 2018].

4.3 Specific perspectives (best practices), if any, related to courses on Road Safety Management

Assessment is a critical component of any course, and it is especially important for a course on Road Safety Management. Best practices perspectives for assessment are essential to ensure that the course achieves its learning objectives, and learners develop the necessary knowledge and skills to manage road safety effectively. Here are some reasons why best practices perspectives for assessment are vital for a course on Road Safety Management:

1. **Ensuring that learning outcomes are achieved:** A course on Road Safety Management aims to develop learners' knowledge and skills in managing road safety effectively. Best practices perspectives for assessment can help ensure that the course's learning outcomes are achieved, providing learners with the necessary knowledge and skills to manage road safety.
2. **Encouraging a proactive approach:** Road Safety Management requires a proactive approach, identifying potential hazards and risks and taking steps to prevent accidents

- and injuries. Assessment can encourage a proactive approach by assessing learners' ability to identify potential risks and hazards and develop strategies to mitigate them.
3. **Fostering a culture of safety:** Assessment can help foster a culture of safety, encouraging learners to prioritize safety in their work and personal lives. By assessing learners' understanding of safety principles and best practices, the course can help instill a safety culture that promotes responsible behavior and decision-making.
 4. **Improving road safety outcomes:** Ultimately, the goal of a course on Road Safety Management is to improve road safety outcomes, reducing the number of accidents and injuries on our roads. Best practices perspectives for assessment can help ensure that learners are equipped with the knowledge and skills necessary to manage road safety effectively, leading to improved safety outcomes.
 5. **Meeting regulatory requirements:** Road Safety Management is subject to various regulatory requirements, and assessment can help ensure that learners meet these requirements. By assessing learners' understanding of regulatory requirements and their ability to comply with them, the course can help ensure that learners are prepared to meet the necessary standards.

In conclusion, best practices perspectives for assessment are vital for a course on Road Safety Management. By ensuring that learning outcomes are achieved, encouraging a proactive approach, fostering a culture of safety, improving safety outcomes, and meeting regulatory requirements, assessment can help learners develop the necessary knowledge and skills to manage road safety effectively.

5 CHALLENGES AND SOLUTIONS FOR STUDENTS' ASSESSMENT IN REMOTE/ELEARNING TEACHING

Some recent events taking over the World by surprise, like the COVID-19 pandemic, have significantly impacted the education sector, forcing many educational institutions to adopt remote and e-learning models to continue providing education to students. While these models have their benefits, they also present several challenges, especially regarding assessment.

A careful attention must be given to these challenges, in light of remote and e-learning assessment. A careful planning and thoughtful implementation of solutions to overcome these challenges must be considered. Educational institutions and instructors have no choice but to continue to adapt and improve their remote and e-learning assessment methods to provide students with an effective and fair learning experience.

This section mainly discusses challenges and solutions for students' assessment in remote and eLearning teaching.

5.1 Lack of face-to-face interaction

One of the big challenge in remote and eLearning is the lack of face-to-face interaction. The lack of face-to-face interaction, in remote and e-learning teaching, refers to the absence of physical presence and communication between teachers and students. This can occur in various forms of remote teaching, such as online classes, virtual lectures, or remote tutorials.

One of the most significant consequences of this lack of face-to-face interaction is the potential decrease in engagement and motivation among students. When students are not physically present in a classroom, they may feel less connected to their teacher and their peers, which can lead to feelings of isolation and disengagement.

In addition, the absence of face-to-face interaction can hinder the development of essential social and communication skills that are critical for success in the workplace and in life. Students may miss out on opportunities to practice public speaking, collaboration, and conflict resolution, which are typically developed through in-person interactions.

Another potential issue is the difficulty in establishing trust and rapport between students and their teachers. It can be challenging to build strong relationships with students in a remote setting, where non-verbal cues and body language are more difficult to interpret.

Overall, the lack of face-to-face interaction in remote and e-learning teaching can have significant implications for both students and teachers. It is essential to consider these factors when designing and implementing remote learning programs and to take steps to mitigate their potential negative effects.

This section has been inspired by the following references: [Mehall, 2020], [Zhang, 2020] and [El Mansour, 2007].

5.2 Difficulty monitoring academic integrity

Monitoring academic integrity in remote and eLearning teaching can be a complex and multifaceted task that requires a range of different approaches and tools. Some of the key difficulties that instructors and institutions face in this area include the following:

Lack of direct supervision: In traditional classroom settings, instructors are able to monitor students directly to ensure that they are not engaging in academic misconduct. This might involve circulating the classroom during exams, watching for signs of cheating or plagiarism, and generally keeping an eye on student behaviour. However, in remote and eLearning teaching, instructors have much less direct supervision over students, which can make it easier for students to cheat. For example, students might look up information online during an exam, collaborate with other students on assignments, or use notes or study guides that they shouldn't.

Technology-mediated cheating: In the context of remote and eLearning teaching, technology can be both a blessing and a curse. On the one hand, technology allows students to access a wide range of information and resources that can help them learn and succeed. However, it can also make it easier for students to cheat. For example, students might use search engines to find answers to exam questions, copy and paste information from online sources, or use messaging apps to collaborate with other students during an exam.

Difficulty in detecting cheating: Even when instructors are aware of the risks of cheating in remote and eLearning teaching, it can be difficult to actually detect when it's happening. For example, it can be challenging to identify plagiarism when students have access to vast amounts of information online. Similarly, it can be hard to tell whether students are collaborating with one another during an exam or working independently.

Limited access to proctoring tools: One way to address some of the challenges of monitoring academic integrity in remote and eLearning teaching is to use proctoring tools. These tools can help instructors to monitor students during exams by using features like screen-sharing, webcams, and other tools. However, some institutions may not have the resources to invest in these tools, or students may not have access to the technology or internet connectivity required to use them.

Privacy concerns: Finally, there are also privacy concerns associated with monitoring academic integrity in remote and eLearning teaching. Some students may be uncomfortable with the idea of being monitored during exams, and may feel that their privacy is being violated. Additionally, there may be legal or ethical concerns around the collection and use of student data, particularly if this data is being collected by third-party proctoring tools.

Overall, monitoring academic integrity in remote and eLearning teaching requires a thoughtful and multi-faceted approach. Instructors and institutions may need to invest in a range of different tools and strategies to address the various challenges involved, while also being mindful of privacy concerns and other ethical considerations.

This section has been inspired by the following references: [Chertok, 2014], [Bylieva, 2020], [Sabrina, 2022] and [Tsigaros, 2021].

5.3 Limited access to technology

Limited access to technology is a significant challenge in remote and eLearning teaching, as it can prevent students from fully participating in online courses and accessing the educational resources they need to succeed. Some of the specific challenges associated with limited access to technology in this context include the following:

Lack of reliable internet connectivity: In order to participate in remote and eLearning teaching, students need access to a reliable internet connection. However, not all students may have access to high-speed internet or may live in areas with limited connectivity. This can make it difficult for these students to participate in online classes, download course materials, or submit assignments.

Limited access to devices: Similarly, not all students may have access to the devices they need to participate in online courses. For example, some students may not have a computer or tablet at home, or may need to share devices with family members who are also working or studying remotely. This can make it difficult for these students to access online resources, complete assignments, or participate in live classes or discussions.

Inequities in access: Limited access to technology can exacerbate existing inequities in education, as students from low-income families or underrepresented communities may be more likely to lack the technology and resources they need to succeed. This can create disparities in learning outcomes and limit opportunities for these students to succeed academically.

Technical difficulties: Even for students who do have access to technology, technical difficulties can be a major challenge in remote and eLearning teaching. For example, students may experience connectivity issues, encounter software compatibility problems, or struggle to troubleshoot technical problems on their own. These issues can lead to frustration and can make it more difficult for students to engage with course materials and participate in online discussions.

Lack of technical support: Finally, students who lack access to technology may also lack the technical support they need to troubleshoot problems and address issues when they arise. In some cases, students may not know where to turn for help or may not have access to the resources they need to resolve technical issues.

Overall, limited access to technology is a significant challenge in remote and eLearning teaching that can prevent students from fully participating in online courses and accessing the educational resources they need to succeed. In order to address this challenge, institutions and instructors may need to invest in additional resources, such as providing loaner devices or setting up Wi-Fi hotspots, and providing technical support to students who need it. Additionally, institutions may need to address broader issues of inequity in education in order to ensure that all students have access to the resources they need to succeed.

This section has been inspired by the following references: [Warschauer, 2010], [Yuen, 2008] and [Jaggars, 2016].

5.4 Strategies for overcoming these challenges

While remote and eLearning have numerous advantages, they also come with various challenges that can negatively impact the learning experience. These challenges have been discussed in the previous section.

To overcome these challenges, educators must adopt strategies that enhance student engagement, foster a supportive learning environment, and address technological barriers.

This section discusses strategies that can be used for overcoming these challenges. The section explores the subject by considering aspects that include best practices for creating

engaging digital learning experiences, leveraging technology to support student learning, and fostering social connections in a remote environment.

5.4.1 Strategies for overcoming the Lack of face-to-face interaction

There are several solutions to address the lack of face-to-face interaction in remote and e-learning teaching. Table 4.1 presents some of these solutions:

Table 4.1: *Some solutions addressing the lack of face-to-face interaction in remote/eLearning.*
 Source: Refs([So, 2008], [Stockwell, 2015], [Awodele, 2009])

Solution to the lack of face-to-face interaction.	Brief description of the solution
<i>Use video conferencing tools</i>	Video conferencing tools like Zoom, Google Meet, and Microsoft Teams allow teachers and students to see and hear each other in real-time. Teachers can use these tools to hold virtual office hours, one-on-one meetings, and group discussions.
<i>Encourage participation and collaboration</i>	Teachers can encourage students to participate actively in online discussions, group projects, and peer-to-peer evaluations. This will help build a sense of community and encourage students to engage with their peers.
<i>Provide opportunities for feedback</i>	Feedback is essential to remote learning. Teachers can provide regular feedback to students through video or written feedback. Students can also give feedback to their peers, which will help build a sense of community and encourage collaboration.
<i>Use interactive tools and platforms</i>	Interactive tools like Kahoot, Mentimeter, and Poll Everywhere can be used to engage students in remote learning. These tools can be used to create quizzes, surveys, and interactive presentations.
<i>Encourage student self-reflection</i>	Encourage students to reflect on their learning experiences and share their thoughts and ideas with their peers. This will help students develop critical thinking and problem-solving skills and encourage them to take ownership of their learning.

Overall, the key to addressing the lack of face-to-face interaction in remote and e-learning teaching is to be creative and adaptable. Teachers should be open to experimenting with new tools and techniques and be willing to adjust their teaching methods to meet the needs of their students.

5.4.2 Strategies for overcoming the difficulty of monitoring academic integrity

Monitoring academic integrity in remote and eLearning teaching requires a multifaceted approach that combines a range of different tools and strategies. Table 4.2 presents some potential solutions:

Table 4.2: Potential solutions addressing the difficulty of monitoring academic integrity. Source: Refs([Lanier, 2006], [Noorbehbahani, 2022], [Bernard, 2014])

Solution to difficulty of monitoring academic integrity.	Brief description of the solution
<i>Use of online proctoring tools</i>	Online proctoring tools can help instructors to monitor students during exams by using features like screen-sharing, webcams, and other tools. These tools can help to identify potential instances of cheating or plagiarism, and can provide instructors with a way to intervene in real-time if they suspect that academic misconduct is taking place.
<i>Implementation of academic integrity policies and procedures</i>	Institutions can also establish policies and procedures around academic integrity in order to promote a culture of honesty and prevent cheating. These policies might include guidelines around plagiarism and citation, requirements around original work, and penalties for academic misconduct.
<i>Use of plagiarism detection software</i>	Plagiarism detection software can help to identify instances of plagiarism by comparing student work to a database of previously published material. This can be a useful tool for instructors who are grading assignments or reviewing student work, and can help to flag potential instances of academic misconduct.
<i>Use of varied assessment methods</i>	Instructors can also use a variety of assessment methods in order to reduce the risk of cheating and plagiarism. For example, rather than relying solely on exams or written assignments, instructors might incorporate group projects, presentations, or other types of assessments that are less conducive to cheating.
<i>Foster a culture of academic honesty</i>	Finally, promoting a culture of academic honesty can help to reduce the incidence of academic misconduct in remote and eLearning teaching. Instructors can emphasize the importance of academic integrity in their course materials and discussions, and can encourage students to take pride in their original work and avoid cheating and plagiarism.

As we can conclude from analysing Table 4.2, monitoring academic integrity in remote and eLearning teaching requires a proactive and multifaceted approach. By using a combination of online tools, policies and procedures, plagiarism detection software, varied assessment methods, and a culture of academic honesty, instructors and institutions can help to ensure that students are held to high standards of academic integrity and that cheating and plagiarism are minimized.

5.4.3 Strategies for overcoming the Limited access to technology

The challenge of limited access to technology in remote and eLearning teaching can be addressed through a range of solutions. Table 4.3 presents some of these solutions.

Table 4.3: Solutions addressing the challenge of limited access to technology. Source: Refs([Zhou, 2017], [Masoumi, 2012], [Hertz, 2012])

Solution to the challenge of limited access to technology.	Brief description of the solution
<i>Providing loaner devices</i>	Institutions can provide loaner devices to students who do not have access to computers, tablets, or other devices at home. These loaner devices can be made available through the institution's IT department or through the library, and can be checked out for a specific period of time. This solution helps to ensure that all students have access to the technology they need to participate in online classes and complete coursework.
<i>Offering connectivity solutions</i>	Institutions can also offer connectivity solutions, such as Wi-Fi hotspots, to students who do not have access to reliable internet at home. This can be particularly important for students who live in rural areas or who come from low-income households.
<i>Providing technology training</i>	Institutions can offer technology training sessions to help students learn how to use different software programs and tools that are necessary for online learning. This can help to ensure that all students are able to participate fully in online courses and complete assignments without technical difficulties.
<i>Adapting course materials</i>	Instructors can adapt their course materials to accommodate students with limited access to technology. For example, instructors can provide text-based materials for students who do not have access to video lectures or live discussions.
<i>Collaboration with community organizations</i>	Institutions can also collaborate with community organizations, such as local libraries or non-profit groups, to provide students with access to technology and connectivity solutions. This can help to extend the reach of the institution's resources and ensure that students from all backgrounds are able to participate in remote and eLearning teaching.

Overall, addressing the challenge of limited access to technology in remote and eLearning teaching requires a combination of institutional support, technological resources, and community partnerships. By providing loaner devices, offering connectivity solutions, providing technology training, adapting course materials, and collaborating with community organizations, institutions and instructors can help to ensure that all students have access to the resources they need to succeed in online courses.

5.5 Specific issues (challenges and solutions) related to the different course components/types (theoretical part, exercises, lab or simulation experiments, tool-based design assignment, field-works)

5.5.1 Specific issues (challenges and solutions) related to assessing theory

Assessing theory in remote and eLearning teaching can present a number of challenges, including the following:

Limited opportunities for in-person interaction: One of the main challenges of remote and eLearning teaching is the limited opportunities for in-person interaction between students and instructors. This can make it difficult to assess students' understanding of theoretical concepts and to provide feedback on their progress.

Difficulty in monitoring participation: In remote and eLearning teaching, it can be difficult to monitor student participation and ensure that all students are engaging with the course materials and completing assignments. This can make it challenging to accurately assess students' understanding of theoretical concepts and to provide feedback on their progress.

Limited ability to assess critical thinking skills: Assessing critical thinking skills can be particularly challenging in remote and eLearning teaching, as it can be difficult to observe students' thought processes and reasoning in real time. This can make it challenging to assess students' ability to apply theoretical concepts to real-world situations and to analyze complex problems.

Limited ability to administer traditional assessments: Remote and eLearning teaching can limit the ability to administer traditional assessments, such as in-person exams or quizzes. This can require instructors to adapt their assessment methods to fit the remote learning environment, which can present its own set of challenges.

To address these challenges, instructors can use a range of strategies, such as the following:

Use of online discussion forums: Online discussion forums can provide opportunities for students to interact with each other and with the instructor, which can help to assess their understanding of theoretical concepts and critical thinking skills.

Use of online assessments: Online assessments, such as quizzes, tests, and essays, can be used to assess students' understanding of theoretical concepts and critical thinking skills. These assessments can be adapted to fit the remote learning environment, such as by using open-book formats or by incorporating more short-answer questions.

Use of group projects: Group projects can provide opportunities for students to work together and apply theoretical concepts to real-world situations. This can help to assess their ability to apply theoretical concepts to complex problems and to work collaboratively with others.

Use of asynchronous assessments: Asynchronous assessments, such as pre-recorded video presentations or written assignments, can be used to assess students' understanding of theoretical concepts and critical thinking skills. These assessments can be completed at the students' own pace, which can help to accommodate different learning styles and schedules.

Overall, assessing theory in remote and eLearning teaching requires instructors to adapt their assessment methods to fit the remote learning environment and to use a range of strategies to assess students' understanding of theoretical concepts and critical thinking skills.

This section has been inspired by the following references: [Vonderwell, 2016], [Kim, 2019] and [Kuo, 2020].

5.5.2 Specific issues (challenges and solutions) related to assessing lab or simulation experiments

Assessing lab or simulation experiments in remote and eLearning teaching can present a number of challenges, including the following:

Limited access to equipment and materials: In remote and eLearning teaching, students may not have access to the same equipment and materials that they would have in a traditional lab or simulation environment. This can make it difficult to accurately assess their ability to conduct experiments and analyze results.

Limited ability to monitor student progress: In a traditional lab or simulation environment, instructors can closely monitor student progress and provide feedback in real time. In remote and eLearning teaching, however, it can be more difficult to monitor students' progress and provide timely feedback.

Difficulty in replicating real-world conditions: Some experiments may require conditions that are difficult to replicate in a remote or eLearning environment. For example, experiments that involve hazardous materials or require specialized equipment may be difficult to conduct remotely.

Limited ability to collaborate: In some cases, students may need to collaborate with each other in order to conduct experiments and analyze results. In a remote or eLearning environment, however, it can be more difficult to facilitate these collaborations.

To address these challenges, instructors can use a range of strategies, such as the following:

Use of virtual labs or simulations: Virtual labs or simulations can provide students with an opportunity to conduct experiments and analyze results in a simulated environment. These simulations can be designed to closely replicate real-world conditions, and can provide students with feedback on their performance.

Use of video demonstrations: Instructors can create video demonstrations of experiments, which can help to ensure that all students have access to the same information and can follow the same procedures.

Use of remote data collection: In some cases, instructors may be able to collect data remotely, either through online databases or through remote sensors. This can allow students to analyze real-world data without needing to conduct experiments themselves.

Use of collaborative tools: Instructors can use collaborative tools, such as online discussion forums or video conferencing, to facilitate collaboration between students. This can help to ensure that students are able to work together effectively, even in a remote environment.

Overall, assessing lab or simulation experiments in remote and eLearning teaching requires instructors to adapt their assessment methods to fit the remote learning environment and to use a range of strategies to ensure that all students have access to the same information and opportunities.

This section has been inspired by the following references: [Alfaro, 2019], [Alzahrani, 2017], [Gan, 2015] and [Budhu, 2002].

5.5.3 Specific issues (challenges and solutions) related to assessing tool-based design assignments

Assessing tool-based design assignments in remote and eLearning teaching can present a number of challenges, including the following:

Limited access to tools and software: One of the main challenges of assessing tool-based design assignments in remote and eLearning teaching is the limited access that students may have to the necessary tools and software. This can make it difficult for students to complete the assignment and for instructors to assess their work.

Difficulty in observing the design process: In a traditional classroom setting, instructors can observe the design process and provide feedback in real time. In remote and eLearning teaching, however, it can be more difficult to observe the design process and to provide timely feedback.

Limited ability to collaborate: Tool-based design assignments often require collaboration between students, and in a remote or eLearning environment, it can be more difficult to facilitate these collaborations.

Difficulty in assessing creativity and innovation: Tool-based design assignments often require students to be creative and innovative in their approach to problem-solving. In a remote or eLearning environment, it can be more difficult to assess these skills, as instructors may not have a complete picture of the student's thought process.

To address these challenges, instructors can use a range of strategies, such as the following:

Use of cloud-based software: Cloud-based software can provide students with access to the necessary tools and software, regardless of their location. This can help to ensure that all students have access to the same resources and can complete the assignment.

Use of video conferencing: Video conferencing can provide instructors with an opportunity to observe the design process in real time and to provide feedback as needed. This can help to ensure that students are on the right track and can help to identify any issues early on.

Use of collaborative tools: Collaborative tools, such as online discussion forums or project management software, can help to facilitate collaboration between students. This can ensure that all students are able to work together effectively, even in a remote environment.

Use of rubrics: Rubrics can provide instructors with a clear framework for assessing creativity and innovation in tool-based design assignments. This can help to ensure that all students are assessed on the same criteria and that the assessment is fair and objective.

Overall, assessing tool-based design assignments in remote and eLearning teaching requires instructors to adapt their assessment methods to fit the remote learning environment and to use a range of strategies to ensure that all students have access to the necessary tools and software, as well as opportunities for collaboration and feedback.

This section has been inspired by the following references: [Huang, 2014] and [Park, 2014].

5.5.4 Specific issues (challenges and solutions) related to assessing field-works

Assessing fieldwork in remote and eLearning teaching can present a number of challenges, including the following:

Limited access to field sites: One of the main challenges of assessing fieldwork in remote and eLearning teaching is the limited access that students may have to field sites. This can make it difficult for students to complete the assignment and for instructors to assess their work.

Difficulty in observing students' fieldwork: In a traditional classroom setting, instructors can observe students' fieldwork and provide feedback in real time. In remote and eLearning teaching, however, it can be more difficult to observe students' fieldwork and to provide timely feedback.

Limited interaction with local communities: Fieldwork often involves interaction with local communities, which can provide valuable insights and perspectives. In a remote or eLearning environment, it can be more difficult to facilitate these interactions and to ensure that students are able to engage effectively with local communities.

Safety concerns: Fieldwork can present safety concerns, such as exposure to hazardous environments or interactions with potentially dangerous wildlife. In a remote or eLearning environment, it can be more difficult to ensure students' safety and to provide appropriate support in the event of an emergency.

To address these challenges, instructors can use a range of strategies, such as the following:

Use of virtual fieldwork: Virtual fieldwork can provide students with an opportunity to explore field sites virtually, using tools such as 360-degree cameras or virtual reality. This can help to ensure that all students have access to the same resources and can complete the assignment.

Use of video conferencing: Video conferencing can provide instructors with an opportunity to observe students' fieldwork in real time and to provide feedback as needed. This can help to ensure that students are on the right track and can help to identify any issues early on.

Use of online discussions and forums: Online discussions and forums can provide students with an opportunity to engage with local communities and to share insights and perspectives. This can help to ensure that students are able to engage effectively with local communities, even in a remote environment.

Use of safety protocols: Instructors can provide students with clear safety protocols and guidelines to follow during fieldwork, to help ensure their safety. This can include guidelines for interacting with wildlife, guidelines for wearing appropriate safety gear, and guidelines for communicating with instructors in the event of an emergency.

Overall, assessing fieldwork in remote and eLearning teaching requires instructors to adapt their assessment methods to fit the remote learning environment and to use a range of strategies to ensure that all students have access to the necessary resources and support, as well as opportunities for engagement and feedback.

This section has been inspired by the following references: [Hixon, 2009], [Hurst, 1998] and [Harknett, 2022].

5.6 Specific perspectives (challenges and solutions), if any, related to courses on Road Safety Management

5.6.1 Specific perspectives to challenges related to assessing courses on Road Safety Management

Assessing courses on Road Safety Management can be challenging due to several factors, including:

Multidisciplinary nature: Road safety management involves various disciplines such as engineering, law enforcement, education, public health, and policy making. Assessing courses on road safety management requires evaluating how well they integrate and address these multidisciplinary perspectives.

Complexity of road safety issues: Road safety is a complex issue influenced by several factors such as human behavior, vehicle design, road infrastructure, and environmental conditions. Assessing courses on road safety management requires evaluating how well they cover these complex issues and provide a comprehensive understanding of road safety.

Evolving technologies: The transportation industry is constantly evolving with the introduction of new technologies such as autonomous vehicles, electric cars, and advanced driver assistance systems. Assessing courses on road safety management requires evaluating how well they incorporate these emerging technologies and their impact on road safety.

Cultural and regional differences: Road safety issues can vary significantly depending on the cultural and regional context. Assessing courses on road safety management requires evaluating how well they address these cultural and regional differences and provide relevant solutions.

Evaluation methods: Assessing courses on road safety management requires appropriate evaluation methods that measure the effectiveness of the course in terms of improving road safety outcomes. These evaluation methods may include assessments of knowledge and skills, simulation exercises, or real-world performance assessments.

Overall, assessing courses on road safety management requires a comprehensive understanding of the multidisciplinary nature of road safety, the complex issues involved, the emerging technologies, cultural and regional differences, and appropriate evaluation methods.

5.6.2 Specific perspectives of solutions to challenges related to assessing courses on Road Safety Management

There are several solutions to the challenges related to assessing courses on Road Safety Management, including:

Integrating multidisciplinary perspectives: To overcome the challenge of assessing courses that involve multiple disciplines, courses should aim to integrate various perspectives. This can be achieved by inviting experts from different fields to contribute to the course material,

incorporating case studies that demonstrate the intersection of different disciplines, and providing opportunities for interdisciplinary collaboration.

Focusing on practical skills: To address the complexity of road safety issues, courses should focus on developing practical skills that can be applied in real-world situations. This can be achieved by incorporating simulation exercises, practical demonstrations, and fieldwork into the course curriculum.

Emphasizing ongoing education: To address the challenge of emerging technologies, courses should emphasize ongoing education that includes updates on the latest technologies and their impact on road safety. This can be achieved by offering continuing education courses and providing access to current research and industry developments.

Providing culturally and regionally relevant content: To address cultural and regional differences, courses should provide content that is culturally and regionally relevant. This can be achieved by including case studies that highlight local road safety issues, providing examples of successful road safety programs in the region, and incorporating local laws and regulations.

Employing appropriate evaluation methods: To ensure that courses effectively improve road safety outcomes, appropriate evaluation methods should be employed. This can include assessments of knowledge and skills, performance evaluations in real-world situations, and measuring changes in road safety statistics.

Overall, to address the challenges related to assessing courses on Road Safety Management, courses should focus on integrating multidisciplinary perspectives, developing practical skills, emphasizing ongoing education, providing culturally and regionally relevant content, and employing appropriate evaluation methods.

6 ASSESSING STUDENT LEARNING IN DIFFERENT REMOTE LEARNING ENVIRONMENTS

6.1 General perspectives

The thesis of the document is that assessing student learning is an essential aspect of education, as it helps instructors understand the level of understanding and mastery of course content by students. With the shift to remote learning environments, assessing student learning has become more challenging, as traditional assessment methods may not be suitable for the online setting. Therefore, instructors need to adopt new assessment strategies and tools that are appropriate for the remote learning environments.

Assessment in remote learning environments also requires instructors to consider using tools and strategies appropriate to new to make this process successful. It is all about Instructors and students adapting to these new environment. This section we mainly discusses the different Remote Learning Environments.

6.2 Synchronous learning

6.2.1 What is Synchronous learning in Remote and eLearning

Synchronous learning in remote and eLearning teaching refers to a mode of instruction where learners and instructors interact in real-time, regardless of their physical location. It involves the use of technology to enable real-time communication and collaboration between learners and instructors.

In this mode of learning, learners and instructors participate in live online sessions, such as video conferences or webinars, where they can see and hear each other in real-time. Synchronous learning also allows for instant feedback and interaction between learners and instructors, which can enhance engagement and learning outcomes.

The use of synchronous learning in remote and eLearning teaching has become increasingly popular due to the convenience it offers to both learners and instructors. It allows learners to access education from anywhere, and instructors can teach from anywhere with an internet connection.

However, synchronous learning also requires learners and instructors to have access to reliable technology and a stable internet connection. It may also require some level of technical proficiency to participate in online sessions.

Overall, synchronous learning is an effective mode of instruction for remote and eLearning teaching, and it can provide a collaborative and engaging learning experience for learners.

6.2.2 Advantages of Synchronous Learning in Remote and eLearning

One of the key advantages of synchronous learning is that it allows learners to receive immediate feedback and support from their teachers and peers. This can be particularly beneficial for learners who may have questions or need additional clarification on course content. Additionally, synchronous learning can help to promote a sense of community and

social interaction among learners, which can help to reduce feelings of isolation and disconnection.

Another advantage of synchronous learning is that it can help to maintain a structured learning environment, which can be beneficial for learners who thrive in a more traditional classroom setting. Synchronous learning sessions can be scheduled at regular intervals, which can help to provide learners with a sense of routine and consistency.

However, there are also some potential drawbacks to synchronous learning. One concern is that learners may not be able to attend scheduled sessions due to scheduling conflicts or technical issues. Additionally, synchronous learning can be more challenging for learners who require additional time to process and absorb course content.

Overall, while there are both advantages and disadvantages to synchronous learning, it is likely that this form of remote and eLearning teaching will continue to play an important role in education in the years to come, particularly for learners who thrive in a more structured and interactive learning environment.

This section has been inspired by the following references: [Baran, 2014], [Amiti, 2020], [Hrastinski, 2008] and [Kay, 2009].

6.3 Asynchronous learning

6.3.1 What is Asynchronous learning in Remote and eLearning

Asynchronous learning in remote and eLearning teaching refers to a mode of instruction where learners and instructors do not interact in real-time. It involves the use of technology to enable learners to access educational resources and complete assignments at their own pace and time.

In this mode of learning, learners access pre-recorded lectures, online reading materials, or other educational resources, and complete assignments and assessments on their own schedule. Learners and instructors may communicate through email or discussion boards, but there is no real-time interaction between them.

Asynchronous learning provides flexibility to learners, as they can access educational materials at a time that is convenient for them. It also allows learners to work at their own pace and spend more time on challenging topics or assignments.

However, asynchronous learning requires learners to be self-motivated and disciplined, as there is no real-time interaction or feedback. Learners may also experience a sense of isolation, as they are not interacting with other learners or instructors in real-time.

Overall, asynchronous learning is an effective mode of instruction for remote and eLearning teaching, and it can provide flexibility to learners to access education on their own schedule. It is particularly useful for adult learners who may have other responsibilities, such as work or family, that limit their availability for synchronous learning.

6.3.2 Advantages of Asynchronous learning in Remote and eLearning

One of the primary advantages of asynchronous learning is its flexibility. Learners can access and engage with educational materials on their own schedule, which can be particularly beneficial for adult learners who have work or other obligations that may make it difficult to attend traditional classroom-based courses. Additionally, asynchronous learning allows learners to proceed through course content at their own pace, which can help to ensure that they fully understand and internalize key concepts before moving on to new material.

Another advantage of asynchronous learning is that it can facilitate greater student engagement and participation. In traditional classroom-based courses, some students may feel hesitant to participate in discussions or ask questions in front of their peers. Asynchronous learning allows students to participate in discussions and ask questions in a more private and anonymous setting, which can help to reduce anxiety and increase engagement.

However, there are also some potential drawbacks to asynchronous learning. One concern is that learners may feel isolated or disconnected from their peers and teachers, since there is no real-time interaction. Additionally, asynchronous learning may require learners to be more self-motivated and disciplined in order to keep up with course content and complete assignments on time.

Overall, while there are both advantages and disadvantages to asynchronous learning, it is likely that this form of remote and eLearning teaching will continue to play an important role in education in the years to come.

This section has been inspired by the following references: [Vonderwell, 2007], [Picciano, 2021] and [Bernard, 2014].

6.4 Blended learning

6.4.1 What is Blended learning in Remote and eLearning

Blended learning in remote and eLearning teaching is a mode of instruction that combines elements of both synchronous and asynchronous learning. It involves the use of technology to enable learners to access educational resources and interact with instructors and other learners both in real-time and on their own schedule.

In this mode of learning, learners may participate in live online sessions, such as video conferences or webinars, where they can see and hear each other in real-time. They may also access pre-recorded lectures, online reading materials, or other educational resources on their own schedule. Learners may complete assignments and assessments both online and offline, and may communicate with instructors and other learners through email, discussion boards, or other online platforms.

Blended learning provides the benefits of both synchronous and asynchronous learning, such as real-time interaction and flexibility. It also allows for personalized learning, as learners can work at their own pace and spend more time on challenging topics or assignments.

However, blended learning requires a balance between synchronous and asynchronous components, and may require learners to have access to reliable technology and a stable

internet connection. It also requires instructors to carefully design and manage the different components of the learning experience to ensure that they are cohesive and effective.

Overall, blended learning is an effective mode of instruction for remote and eLearning teaching, and it can provide a balanced and engaging learning experience for learners. It is particularly useful for learners who benefit from both real-time interaction and flexibility in accessing educational resources.

6.4.2 Advantages of Blended learning in remote and eLearning

Blended learning is an approach to education that combines traditional classroom instruction with online learning. This approach has gained popularity in recent years, particularly in remote and eLearning teaching environments. Here are some advantages of blended learning:

Flexibility: Blended learning provides students with flexibility in terms of scheduling and pace. Online components of blended learning can be accessed at any time, allowing students to work at their own pace and on their own schedule. This flexibility is particularly valuable in remote and eLearning teaching where students may not have access to traditional classroom settings.

Personalization: With blended learning, educators can create customized learning experiences that cater to individual student needs. By providing online resources and activities, students can work at their own level and pace. This approach can be particularly effective in remote and eLearning teaching, where educators may not have direct access to students on a daily basis.

Improved student engagement: Blended learning can lead to increased student engagement by incorporating a variety of learning activities and resources. The use of multimedia resources, such as videos and interactive simulations, can help to keep students engaged and motivated.

Access to a variety of resources: Blended learning can provide students with access to a variety of resources that may not be available in traditional classroom settings. For example, online libraries and databases can provide students with access to a wealth of information that they may not have had access to otherwise.

Cost-effective: Blended learning can be a cost-effective approach to education. By combining traditional classroom instruction with online resources, educators can reduce the need for expensive textbooks and other classroom materials. Additionally, blended learning can reduce the need for classroom space and other resources, making it a more cost-effective option for schools and institutions.

Overall, blended learning has numerous advantages in remote and eLearning teaching environments. It provides students with flexibility and personalized learning experiences, improves student engagement, and can be a cost-effective approach to education.

This section has been inspired by the following references: [Kumar, 2021], [Dziuban, 2018], [Anthony, 2019], [Oztok, 2013] and [Picciano, 2009].

7 ENSURING EQUITY IN ASSESSMENT IN REMOTE/ELEARNING TEACHING

As remote and eLearning teaching continue to become the norm in many educational institutions, there is a growing concern about how to ensure equity in assessment for all students. With students learning from different locations, using different devices and internet connections, it can be a challenge to design assessment methods that are fair and accessible for all. To ensure that every student has an equal opportunity to demonstrate their knowledge and skills, educators need to consider a variety of factors, such as the type of assessment, the format, and the accessibility of the technology used.

In this context, it is important to explore strategies and best practices that can help educators ensure equity in assessment in remote and eLearning teaching. This section discusses issues around Ensuring Equity in Assessment in Remote and eLearning Teaching.

7.1 Identifying and addressing potential biases in assessments

7.1.1 Identifying potential biases in assessments

There are several potential biases that can occur in assessments in remote and eLearning teaching. Table 6.1 provide explanations of some examples.

Table 6.1: *Biases that can occur in assessments in remote and eLearning teaching.* Source: Refs([Jung, 2011], [Baker, 2022])

Biases in assessments in remote and eLearning teaching	Brief description of the bias.
<i>Technical Bias</i>	Technical issues such as internet connectivity, hardware, and software can lead to unfair assessments. For example, if a student's internet connection is poor, they may not be able to complete an assessment in the given time, while another student with a better connection may have an advantage. Similarly, if a student is unfamiliar with the technology used for the assessment, they may struggle to complete the assessment as well.
<i>Cultural Bias</i>	Cultural bias can occur when assessment questions are based on Western culture or values that may not be familiar to students from other cultures. For example, if a question asks about a holiday that is not celebrated in the student's culture, they may struggle to answer the question.
<i>Gender Bias</i>	Assessment questions or examples that use gender stereotypes can lead to unfair assessments. For example, if a math question uses the example of a girl shopping for clothes, this could discourage male students from taking the question seriously..
<i>Disability Bias</i>	Assessments that do not consider the needs of students with disabilities can lead to unfair assessments. For example, if an

	assessment requires students to have good eyesight, it may not be accessible to students with visual impairments.
<i>Language Bias</i>	Assessments that use complex or unfamiliar language can disadvantage students who are not fluent in the language. For example, if a question uses technical terms or academic jargon, students who are not familiar with those terms may struggle to understand the question.

To mitigate these potential biases, it is important for educators to design assessments that are accessible and inclusive for all students, regardless of their backgrounds, abilities, or access to technology. This can involve using diverse examples, avoiding gender and cultural stereotypes, providing accommodations for students with disabilities, and using clear and simple language in assessments.

7.1.2 How these biases can be addressed.

Addressing biases in assessments in remote and eLearning teaching requires some specific considerations. Table 6.2 provide some strategies and brief explanation the strategies:

Table 6.2: *Strategies addressing biases occurring in assessments in remote and eLearning teaching.* Sources: see Refs. [Holmboe, 2014], [Alruwai, 2018], [Sclater, 2006], [Steinke, 2017].

Strategies addressing biases in assessments in remote and eLearning teaching.	Brief description of the strategy.
<i>Use diverse examples</i>	Educators can use diverse examples in assessments that reflect different cultures, genders, abilities, and backgrounds. This can help to ensure that all students can relate to the examples and feel included in the assessment.
<i>Use clear language</i>	Educators can use clear and simple language in assessments that is easy for all students to understand. This can be particularly important for students who are not fluent in the language of instruction
<i>Provide training</i>	Educators can provide training and resources to help students understand how to approach assessments and to identify any potential biases in the questions or examples
<i>Provide clear instructions</i>	When administering assessments in remote and eLearning teaching, it is important to provide clear instructions to students on how to access and complete the assessment. This can include information on how to use any technology required, how to submit the assessment, and what to do if there are technical issues.
<i>Monitor for cheating</i>	Remote assessments can make it easier for students to cheat, so it is important to have strategies in place to monitor for cheating. This can include using plagiarism detection software, monitoring students via webcams, or using proctoring services.

<i>Provide multiple formats</i>	Providing assessments in multiple formats can help to ensure that all students can access the assessment, regardless of their learning style, ability, or access to technology. This can include providing assessments in written, audio, or video formats.
<i>Use inclusive language</i>	Using inclusive language in assessments can help to ensure that all students feel represented and included. This can include using gender-neutral language, avoiding cultural stereotypes, and using language that is clear and easy to understand.
<i>Consider different time zones</i>	When administering assessments in remote and eLearning teaching, it is important to consider that students may be in different time zones. Educators should provide students with a reasonable amount of time to complete the assessment, and consider offering alternative times for students who may be in a different time zone.

By using these strategies, educators can help to ensure that assessments in remote and eLearning teaching are fair, inclusive, and accessible for all students, regardless of their learning environment or circumstances.

7.2 Providing appropriate support, if relevant, for students with disabilities.

There are several ways in which students with disabilities can be supported in assessment in remote and e-learning teaching. Here are some suggestions:

Provide Accommodations: Accommodations are changes to the assessment environment or the assessment itself that help level the playing field for students with disabilities. These might include extended time on exams, the use of assistive technology, or the provision of alternative formats (such as Braille or audio). Make sure that students are aware of the accommodations available to them and how to request them.

Ensure Accessible Materials: Make sure that all materials used in assessment are accessible to students with disabilities. This might involve providing materials in alternative formats, such as large print or audio, or ensuring that digital materials are screen-reader compatible. You can also use closed-captioning in videos or provide transcripts to ensure all students can follow along.

Provide Clear Instructions: Provide clear instructions for completing the assessment, including any specific procedures that need to be followed. For example, if the assessment involves recording a video or audio, make sure that students know how to do this and have the necessary tools and software to complete it.

Communicate Regularly: Regular communication with students is essential in e-learning. Ensure that students are aware of the timeline and expectations for the assessment, and have the opportunity to ask questions or clarify instructions.

Ensure Privacy and Confidentiality: Respect the privacy and confidentiality of students with disabilities. Ensure that their accommodations are not visible to other students, and that their disability status is not disclosed without their permission.

Collaborate with Disability Support Services: Work with your institution's disability support services to ensure that you have the resources and support you need to effectively support students with disabilities in assessment.

Overall, by providing accommodations, accessible materials, clear instructions, regular communication, privacy, and collaboration with support services, you can help ensure that students with disabilities are able to fully participate in assessment in remote and e-learning teaching.

This section has been inspired by the following references: [Johnson, 2020] and [Aquino, 2023].

7.3 Supporting students who may lack access to resources

Supporting students who may lack access to resources in e-learning teaching can be challenging, but there are several strategies that can be implemented to help mitigate these issues. Here are some suggestions:

Assess Students' Access: Start by identifying which students may lack access to resources, such as reliable internet connection, computer, or other necessary technology. You can ask students to fill out a survey or questionnaire to determine their needs and availability of resources.

Provide Technology and Internet Access: Work with your institution to provide students with the necessary technology and internet access to participate in e-learning. This might include loaning laptops or tablets, providing Wi-Fi hotspots, or partnering with community organizations to ensure that students have access to technology and internet services.

Use Low-Tech Options: Provide low-tech options for students who may not have access to technology or internet. For example, provide printed materials, mailing or emailing assignments and assessments, or providing recorded lectures and lessons in audio format.

Utilize Open Educational Resources (OERs): OERs are free, openly licensed educational materials that can be used to support teaching and learning. These resources can help ensure that all students have access to necessary materials without cost barriers.

Create Flexibility in Assignments and Assessments: Be flexible with assignments and assessments to accommodate students who may not have access to resources. Provide alternative options, such as allowing students to complete assignments in alternative formats or providing extended time for assignments and assessments.

Collaborate with Support Services: Work with your institution's support services, such as the student success center or financial aid office, to identify additional resources that may be available to support students who lack access to resources.

Overall, by assessing students' access, providing technology and internet access, using low-tech options, utilizing OERs, creating flexibility in assignments and assessments, and collaborating with support services, you can help ensure that all students have the necessary resources to fully participate in e-learning teaching.

This section has been inspired by the following references: [dos Santos, 2016], [Weller, 2020] and [Keegan, 2013].

7.4 Specific perspectives(ensuring equity) related to the different course components/types (theoretical part, exercises, lab or simulation experiments, tool-based design assignment, field-works).

7.4.1 Specific perspectives of ensuring equity in assessing the theory part of the course

Ensuring equity in assessing the theory of a course in remote and eLearning teaching requires a proactive approach to remove potential biases that could negatively impact certain students. Some ways to achieve this include:

Providing clear and specific grading criteria that are communicated to all students in advance.

Offering alternative assessment methods to accommodate students with different learning styles and abilities. For example, offering multiple choice, short answer, or essay questions in exams, or providing oral exams for students who may struggle with written exams.

Avoiding questions or materials that may disadvantage certain groups of students, such as cultural or language biases.

Ensuring accessibility by providing reasonable accommodations for students with disabilities or special needs.

Conducting regular assessments of the assessment process to ensure that it remains fair and equitable to all students.

By implementing these measures, educators can ensure that all students have an equal opportunity to succeed in their coursework, regardless of their background or circumstances.

7.4.2 Specific perspectives of ensuring equity in assessing the lab or simulation experiments of the course.

Ensuring equity in assessing the lab or simulation experiments of a course in remote and eLearning teaching requires a proactive approach to remove potential biases that could negatively impact certain students. Some ways to achieve this include:

Providing clear and specific guidelines for conducting the experiment or simulation, along with detailed instructions for data collection and analysis.

Offering alternative methods for conducting the experiment or simulation, such as virtual labs or simulations, to accommodate students who may not have access to necessary equipment or materials.

Providing reasonable accommodations for students with disabilities or special needs, such as extra time, assistive technology, or modified experiments.

Ensuring that the experiment or simulation does not contain any cultural or language biases that may disadvantage certain groups of students.

Conducting regular assessments of the experiment or simulation process to ensure that it remains fair and equitable to all students.

By implementing these measures, educators can ensure that all students have an equal opportunity to succeed in their coursework, regardless of their background or circumstances.

7.4.3 Specific perspectives of ensuring equity in assessing the tool-based design assignment of the course

Ensuring equity in assessing the tool-based design assignment of a course in remote and eLearning teaching requires a proactive approach to remove potential biases that could negatively impact certain students. Some ways to achieve this include:

Providing clear and specific guidelines for the design assignment, including the requirements for the use of tools or software.

Offering alternative tools or software to accommodate students who may not have access to the required tools or software.

Providing reasonable accommodations for students with disabilities or special needs, such as extra time, assistive technology, or modified assignments.

Ensuring that the design assignment does not contain any cultural or language biases that may disadvantage certain groups of students.

Providing opportunities for students to receive feedback on their designs throughout the process, rather than only at the final submission.

Conducting regular assessments of the design assignment process to ensure that it remains fair and equitable to all students.

By implementing these measures, educators can ensure that all students have an equal opportunity to succeed in their coursework, regardless of their background or circumstances.

7.4.4 Specific perspectives of ensuring equity in assessing the field-works of the course

Ensuring equity in assessing the field-works of a course in remote and eLearning teaching requires a proactive approach to remove potential biases that could negatively impact certain students.

Some ways to achieve this include:

- Providing clear and specific guidelines for the fieldwork, including the required data collection methods and analysis techniques.
- Offering alternative fieldwork methods to accommodate students who may not have access to the necessary resources or equipment.
- Providing reasonable accommodations for students with disabilities or special needs, such as modified fieldwork requirements or additional assistance.
- Ensuring that the fieldwork does not contain any cultural or language biases that may disadvantage certain groups of students.
- Providing opportunities for students to receive feedback on their fieldwork throughout the process, rather than only at the final submission.

- Conducting regular assessments of the fieldwork process to ensure that it remains fair and equitable to all students.

By implementing these measures, educators can ensure that all students have an equal opportunity to succeed in their coursework, regardless of their background or circumstances. It is important to ensure that students are not disadvantaged by their physical location or their personal circumstances when conducting fieldwork in remote and eLearning teaching environments.

This section has been inspired by the following references: [Willems, 2013], [Williams, 2021], [Ridge, 2001], [Hickey, 2022] and [Greenhow, 2022].

7.5 Specific perspectives(ensuring equity), if any, of courses on Road Safety Management.

Ensuring equity in e-learning assessment of courses on Road Safety Management requires taking into account the diverse backgrounds and experiences of learners, as well as considering the accessibility of the assessment materials and tools. Here are some specific aspects that can help promote equity in e-learning assessment of courses on Road Safety Management:

Use Inclusive Language: Use language that is clear, concise, and free from jargon or acronyms that may be unfamiliar to learners from diverse backgrounds. Avoid using examples or scenarios that may be culturally insensitive or exclusionary.

Incorporate Universal Design for Learning (UDL): Incorporate UDL principles into assessment design to ensure that all learners have equal access to the assessment. This includes providing multiple means of representation, action and expression, and engagement. For example, use visual aids and audio instructions to convey information, provide opportunities for learners to demonstrate their understanding in different ways, and offer a variety of assessment formats such as quizzes, essays, and projects.

Ensure Accessibility: Ensure that all assessment materials and tools are accessible to learners with disabilities. This includes providing materials in alternative formats such as audio, braille, or large print, and ensuring that all digital materials are screen-reader compatible and accessible to users who are deaf or hard of hearing.

Avoid Bias: Ensure that assessment questions and rubrics are free from bias or assumptions that may disadvantage certain groups of learners. This includes avoiding stereotypes and ensuring that assessment criteria are clear and objective.

Provide Accommodations: Provide accommodations to learners who require them, such as extended time on exams, the use of assistive technology, or the provision of alternative formats. Ensure that learners are aware of the accommodations available to them and how to request them.

Ensure Confidentiality: Respect the confidentiality of learners and ensure that their personal information is kept secure. This includes ensuring that assessment results are not disclosed to unauthorized individuals and that learners' disability status or other personal information is not disclosed without their permission.

By incorporating these aspects into e-learning assessment design of courses on Road Safety Management, educators can help ensure that learners from diverse backgrounds have equitable access to the assessment and the opportunity to demonstrate their knowledge and skills in the field of road safety management.

8 ASSESSMENT PROCESS MANAGEMENT

Assessment is a critical component of the teaching and learning process, providing valuable insights into students' progress and performance. However, in the context of remote and eLearning teaching, managing the assessment process can be challenging for educators. From designing and distributing assessments to collecting and grading them, there are many steps involved in assessment process management that require careful planning and execution.

With the increasing reliance on technology and the need to ensure fairness and equity in assessment, it is important for educators to explore effective strategies for managing the assessment process in remote and eLearning teaching. By doing so, they can ensure that assessments are administered efficiently, accurately, and fairly, while providing students with the feedback they need to succeed. This section discusses various aspects of Assessment Process Management in in Remote and eLearning Teaching.

8.1 Assessment Methods in Remote/eLearning

8.1.1 Overview of various assessment methods

Assessment is an important aspect of teaching and learning, as it helps educators and learners to evaluate the progress and effectiveness of instruction. With the rise of remote and eLearning teaching, there are various assessment methods that can be used to measure student learning and provide feedback to improve their academic performance. Table 7.1 provides a description of some assessment methods commonly used in remote and eLearning teaching.

Table 7.1: *Assessments methods commonly used in remote and eLearning teaching.* Source: see Refs. [Crisp, 2016], [Sigala, 2006], [Prakash, 2012], [Galy, 2011], [Sewell, 2010].

Assessments methods commonly used in remote and eLearning teaching.	Brief description of the assessment method.
<i>Online quizzes and tests</i>	These are web-based assessments that can be taken by students at any time and from any location. They can be used to measure students' knowledge of a subject, and provide immediate feedback to students.
<i>Virtual assignments</i>	Assignments can be posted online and submitted by students via email, online platforms or cloud storage. These can include research papers, essays, case studies, and project reports.
<i>Discussion forums and blogs</i>	These are interactive tools that allow students to discuss and analyse course topics with peers and instructors. Students can post their thoughts and insights on a particular topic, and receive feedback and guidance from their peers and instructors.
<i>Video conferencing</i>	This enables live interaction between instructors and students, and can be used to assess students' oral presentation skills, as

	well as their ability to respond to questions and engage in discussion.
<i>Peer evaluation</i>	Students can assess each other's work, such as presentations, papers, or group projects. This can help students learn from each other, improve their communication skills, and develop critical thinking skills.
<i>Self-assessment</i>	Students can assess their own learning progress by reflecting on their performance and learning outcomes. Self-assessment tools can include journals, reflection papers, and self-evaluations.
<i>Rubrics</i>	These are criteria-based evaluation tools that define the expectations for an assignment or project. Rubrics can help students understand what is expected of them and how their work will be evaluated.

It is important to note that assessment in remote and eLearning teaching should be aligned with the course objectives and learning outcomes, and should be designed to evaluate the skills and knowledge that are essential for success in the course. It is also important to ensure that assessment methods are accessible to all students and that they are conducted with integrity and fairness.

8.1.2 Advantages and disadvantages of selected assessment methods

8.1.2.1 Online quizzes and tests

Online quizzes and tests have become a popular assessment method in remote and eLearning teaching. There are several advantages and disadvantages of using online quizzes and tests as an assessment method. Here are some of them:

Advantages:

Flexibility: Online quizzes and tests offer flexibility as students can take them at any time and from any location with an internet connection. This allows for self-paced learning and can accommodate students' schedules and needs.

Immediate feedback: Online quizzes and tests provide immediate feedback, allowing students to review their performance and identify areas where they need improvement.

Automated grading: Online quizzes and tests can be graded automatically, reducing the workload for instructors and providing consistent and objective grading.

Time-saving: Online quizzes and tests are time-saving for both students and instructors, as they eliminate the need for manual grading and can be administered quickly.

Customization: Online quizzes and tests can be customized to match the learning objectives and course content, allowing for targeted assessment of specific skills and knowledge.

Disadvantages:

Technical issues: Technical issues such as internet connectivity, software compatibility, and system crashes can affect the administration and reliability of online quizzes and tests.

Cheating: Online quizzes and tests can be susceptible to cheating, as students can access outside resources and collaborate with others during the assessment.

Limited assessment of higher-order thinking: Online quizzes and tests are often designed to assess knowledge and recall, but may not provide opportunities for assessment of higher-order thinking skills such as critical thinking, analysis, and synthesis.

Lack of interaction: Online quizzes and tests are usually automated and lack the interaction and communication between students and instructors that can occur in other assessment methods such as discussion forums and assignments.

Inadequate preparation: Online quizzes and tests require careful preparation and design to ensure that they align with the learning objectives and effectively measure students' knowledge and skills.

In conclusion, online quizzes and tests offer several advantages and disadvantages as an assessment method in remote and eLearning teaching. It is important for instructors to consider these factors when designing and administering online quizzes and tests, and to use a variety of assessment methods to ensure a comprehensive evaluation of student learning.

This section has been inspired by the following references: [Bognár, 2021] and [Hillman, 2012].

8.1.2.2 Virtual assignments

Virtual assignments are a popular assessment method in remote and eLearning teaching. They refer to assignments that are posted online and submitted by students via email, online platforms, or cloud storage. Here are some advantages and disadvantages of virtual assignments:

Advantages:

Flexibility: Virtual assignments offer flexibility as students can complete them at their own pace and in their own time. This allows students to accommodate their personal schedules and work at their own pace.

Customization: Virtual assignments can be customized to match the learning objectives and course content, allowing for targeted assessment of specific skills and knowledge.

Authentic assessment: Virtual assignments can provide a more authentic assessment of students' learning as they require students to apply their knowledge to real-world problems and scenarios.

Opportunity for feedback: Virtual assignments allow for personalized feedback and guidance from instructors, providing opportunities for students to learn from their mistakes and improve their work.

Assessment of higher-order thinking: Virtual assignments provide opportunities for assessment of higher-order thinking skills such as critical thinking, analysis, and synthesis.

Disadvantages:

Technical issues: Technical issues such as internet connectivity, software compatibility, and file formats can affect the submission and grading of virtual assignments.

Plagiarism: Virtual assignments can be susceptible to plagiarism as students can access outside resources and collaborate with others during the assignment.

Lack of interaction: Virtual assignments are usually completed individually and lack the interaction and communication between students and instructors that can occur in other assessment methods such as discussion forums and group projects.

Time-consuming: Virtual assignments can be time-consuming for both students and instructors, as they require careful preparation and grading.

Difficulty in measuring student progress: Virtual assignments can make it difficult for instructors to measure students' progress and understanding of the course material, as they do not provide opportunities for real-time feedback and interaction.

In conclusion, virtual assignments offer several advantages and disadvantages as an assessment method in remote and eLearning teaching. It is important for instructors to consider these factors when designing and administering virtual assignments, and to use a variety of assessment methods to ensure a comprehensive evaluation of student learning.

This section has been inspired by the following references: [Dung, 2020] and [Shirota, 2011].

8.1.2.3 Discussion forums and blogs

Discussion forums and blogs are popular tools for promoting engagement and interaction in remote and eLearning teaching. Here are some advantages and disadvantages of discussion forums and blogs:

Advantages:

Collaboration: Discussion forums and blogs encourage collaboration and knowledge sharing among students and instructors, allowing for a diverse range of perspectives and ideas to be shared.

Active learning: Discussion forums and blogs promote active learning, as students are required to engage in critical thinking, analysis, and synthesis of information.

Flexibility: Discussion forums and blogs offer flexibility as students can participate at their own pace and in their own time, allowing for a personalized learning experience.

Reflection: Discussion forums and blogs encourage students to reflect on their learning and share their insights and experiences with others, promoting self-awareness and personal growth.

Accessibility: Discussion forums and blogs can be accessed from anywhere with an internet connection, allowing for easy communication and collaboration among students and instructors.

Disadvantages:

Lack of structure: Discussion forums and blogs can lack structure, making it difficult to keep track of discussions and ensuring that all students participate equally.

Limited assessment: Discussion forums and blogs may not provide a comprehensive assessment of student learning, as they focus more on discussion and reflection rather than formal assessment.

Technical issues: Technical issues such as internet connectivity and software compatibility can affect the functionality and reliability of discussion forums and blogs.

Time-consuming: Discussion forums and blogs can be time-consuming for both students and instructors, as they require careful moderation and monitoring.

Privacy concerns: Discussion forums and blogs may raise privacy concerns, as students may be reluctant to share personal information or opinions in a public forum.

In conclusion, discussion forums and blogs offer several advantages and disadvantages as tools for promoting engagement and interaction in remote and eLearning teaching. It is important for instructors to consider these factors when designing and administering discussion forums and blogs, and to use a variety of assessment methods to ensure a comprehensive evaluation of student learning.

This section has been inspired by the following references: [Bognar, 2019] and [Marra, 2004].

8.1.2.4 Video conferencing

Video conferencing is a popular tool for remote and eLearning teaching, allowing for real-time communication and collaboration between students and instructors. Here are some advantages and disadvantages of video conferencing:

Advantages:

Real-time communication: Video conferencing allows for real-time communication and collaboration between students and instructors, promoting engagement and interaction.

Flexibility: Video conferencing offers flexibility as it can be accessed from anywhere with an internet connection, allowing for a personalized learning experience.

Accessibility: Video conferencing allows students to access instruction and participate in class from anywhere, regardless of geographic location or physical ability.

Improved engagement: Video conferencing can improve student engagement as it allows for more dynamic and interactive instruction, such as virtual whiteboards and polls.

Reduced travel time and cost: Video conferencing eliminates the need for physical travel to attend class, reducing travel time and cost.

Disadvantages:

Technical issues: Technical issues such as internet connectivity and software compatibility can affect the functionality and reliability of video conferencing.

Distractions: Video conferencing can be susceptible to distractions such as background noise and interruptions, which can affect the quality of instruction and learning.

Privacy concerns: Video conferencing may raise privacy concerns as students may be reluctant to share personal information or opinions in a virtual environment.

Limited social interaction: Video conferencing may lack the social interaction and sense of community that can occur in traditional classroom settings.

Fatigue: Video conferencing can be mentally and physically tiring for both students and instructors, particularly if sessions are long or frequent.

In conclusion, video conferencing offers several advantages and disadvantages as a tool for remote and eLearning teaching. It is important for instructors to consider these factors when designing and administering video conferencing sessions, and to use a variety of tools and methods to ensure a comprehensive evaluation of student learning.

This section has been inspired by the following references: [Kebritchi, 2017] and [Okada, 2015].

8.1.2.5 Peer evaluation

Peer evaluation can be a useful assessment method in remote and eLearning environments, but it also has its advantages and disadvantages. Here are some advantages and disadvantages of peer evaluation as an assessment method in remote and eLearning:

Advantages:

Promotes engagement and interaction: Peer evaluation encourages engagement and interaction among students in remote and eLearning environments, as they are required to evaluate each other's work.

Provides diverse perspectives: Peer evaluation offers diverse perspectives from students coming from different backgrounds and experiences, providing valuable insights for instructors.

Develops critical thinking skills: Peer evaluation promotes the development of critical thinking skills as students analyze and evaluate each other's work.

Encourages collaboration: Peer evaluation encourages collaboration and teamwork as students work together to evaluate each other's work remotely.

Reduces instructor workload: Peer evaluation can reduce the workload for instructors in remote and eLearning environments, as students are responsible for evaluating each other's work.

Disadvantages:

Limited social interaction: Peer evaluation in remote and eLearning environments may lack social interaction and may not provide the same level of engagement as in-person peer evaluation.

Technical issues: Peer evaluation may be susceptible to technical issues, such as internet connectivity and software compatibility, which can affect the accuracy and reliability of evaluations.

Lack of accountability: Peer evaluation may lack accountability, as students may not take the evaluation process as seriously as they would with instructor assessments.

Potential for bias: Peer evaluation may be subject to bias or favoritism, as students may evaluate their friends more favorably than other students.

Inaccurate assessments: Peer evaluation in remote and eLearning environments may result in inaccurate assessments if students lack the necessary knowledge or expertise to evaluate each other's work.

In conclusion, peer evaluation can be an effective assessment method in remote and eLearning environments, but it is important to consider the advantages and disadvantages and to implement clear guidelines and expectations to ensure fair and accurate evaluations.

This section has been inspired by the following references: [Romeu Fontanilla, 2016] and [Al-Smadi, 2010].

8.1.2.6 Self-assessment

Self-assessment is a method of assessment where students assess their own work, typically in the form of reflections or self-evaluations. Here are some advantages and disadvantages of self-assessment as an assessment method in remote and eLearning:

Advantages:

Encourages self-reflection: Self-assessment encourages students to reflect on their own learning and development, promoting deeper understanding and metacognitive skills.

Promotes self-directed learning: Self-assessment promotes self-directed learning as students take responsibility for their own learning and development.

Provides flexibility: Self-assessment provides flexibility for students to assess their own work on their own time and pace, which can be beneficial in remote and eLearning environments.

Develops critical thinking skills: Self-assessment promotes the development of critical thinking skills as students analyze and evaluate their own work.

Reduces instructor workload: Self-assessment can reduce the workload for instructors in remote and eLearning environments, as students are responsible for assessing their own work.

Disadvantages:

Lack of objectivity: Self-assessment may lack objectivity, as students may be biased towards their own work or may lack the necessary knowledge or expertise to evaluate their own work accurately.

Inaccurate assessments: Self-assessment may result in inaccurate assessments if students lack the necessary knowledge or expertise to evaluate their own work.

Lack of accountability: Self-assessment may lack accountability, as students may not take the evaluation process as seriously as they would with instructor assessments.

Limited feedback: Self-assessment may provide limited feedback to students, as they may not receive feedback from peers or instructors.

Overestimation or underestimation: Students may overestimate or underestimate their own abilities and may not accurately assess their own work.

In conclusion, self-assessment can be a useful assessment method in remote and eLearning environments, but it is important to consider the advantages and disadvantages and to implement clear guidelines and expectations to ensure fair and accurate assessments. Instructors should also provide support and feedback to students to help them develop the necessary skills to evaluate their own work accurately.

This section has been inspired by the following references: [Domun, 2014], [DOĞAN, 2020] and [Martínez, 2020].

8.1.2.7 Rubrics

Rubrics are a method of assessment that use a set of criteria to evaluate student work. Here are some advantages and disadvantages of rubrics as an assessment method in remote and eLearning:

Advantages:

Provides clear expectations: Rubrics provide clear expectations for students about what is expected in their work, which can help them focus their efforts and produce higher quality work.

Facilitates consistent grading: Rubrics facilitate consistent grading across multiple assessments and graders, promoting fairness and reducing grading inconsistencies.

Promotes self-reflection: Rubrics can promote self-reflection as students use the rubric to evaluate their own work and identify areas for improvement.

Provides detailed feedback: Rubrics provide detailed feedback to students on their work, including strengths and areas for improvement, which can help guide their learning.

Promotes transparency: Rubrics promote transparency by providing students with a clear understanding of how their work will be evaluated and graded.

Disadvantages:

Time-consuming: Creating rubrics can be time-consuming, especially if they are detailed and comprehensive.

Limited flexibility: Rubrics may limit the flexibility of assessments, as they are typically designed to evaluate specific learning outcomes and may not allow for individual variation in student work.

May oversimplify complex tasks: Rubrics may oversimplify complex tasks, as they break down tasks into specific criteria and may not capture the full complexity of the task.

May be difficult to use: Rubrics may be difficult for students to use, especially if they are not familiar with the criteria or the rubric is poorly designed.

May not capture all aspects of student work: Rubrics may not capture all aspects of student work, such as creativity or originality, that are not explicitly included in the criteria.

In conclusion, rubrics can be a useful assessment method in remote and eLearning environments, but it is important to consider the advantages and disadvantages and to design rubrics carefully to ensure that they align with learning outcomes and provide clear and accurate feedback to students. Instructors should also provide support to students to help them understand and use rubrics effectively.

This section has been inspired by the following references: [Palomba, 1999] and [Andrade, 2005].

8.1.3 Selection of appropriate course-type specific assessment methods for Road Safety Management courses

The following *assessment methods* can help to evaluate students' understanding of road safety and their ability to apply this knowledge in real-world situations:

1. **Written assessment:** Have students complete a written assessment that covers the key topics discussed in the lecture. This could include multiple-choice questions, short-answer questions, or essay questions.
2. **Group discussion:** Divide students into small groups and have them discuss the key topics from the lecture. You could provide them with specific questions to guide their discussion, such as "What are the main causes of road accidents?" or "How can road

safety be improved in our community?" After the discussion, have each group present their findings to the class.

3. **Case studies:** Provide students with a case study or scenario related to road safety and ask them to analyze the situation and suggest possible solutions. This could involve analyzing crash data, identifying hazardous road conditions, or evaluating the effectiveness of a road safety program.
4. **Role-playing exercises:** Divide students into groups and assign them different roles related to road safety, such as a traffic engineer, a law enforcement officer, or a community activist. Have them work together to develop a road safety plan that addresses the concerns and needs of their assigned role.
5. **Visual aids:** Ask students to create a visual aid, such as a poster or infographic, that summarizes the key points from the lecture. This will help them synthesize the information and communicate it to others.
6. **Reflection paper:** Ask students to write a reflection paper that discusses what they learned from the lecture and how they plan to apply this knowledge to their own lives. This could involve identifying specific road safety behaviors they need to change or developing a road safety campaign for their school or community.

8.1.3.1 Appropriate assessment methods for the Theoretical part

The following assessment methods can help to evaluate students' understanding of theoretical concepts related to road safety management:

1. **Quizzes:** You can use quizzes to assess students' understanding of theoretical concepts. These quizzes can be administered in class or online and can include multiple-choice, true/false, or short-answer questions.
2. **Homework assignments:** Assign homework that requires students to apply theoretical concepts to real-world situations. For example, you could ask students to analyze a news article about a recent traffic accident and identify the factors that contributed to the crash.
3. **Class participation:** Encourage students to participate in class discussions and ask questions about the theoretical concepts. You can assess their participation by using a rubric that includes criteria such as engagement, preparedness, and contribution to the discussion.
4. **Case studies:** Provide students with case studies or scenarios that require them to apply theoretical concepts to real-world situations. For example, you could present a scenario in which a local government is considering implementing a road safety program and ask students to evaluate the effectiveness of the program based on the theoretical concepts discussed in class.
5. **Presentations:** Ask students to give presentations that demonstrate their understanding of theoretical concepts related to road safety. This could involve presenting research on a specific topic or designing a road safety campaign for their community.
6. **Research papers:** Assign research papers that require students to explore a theoretical concept in depth. For example, you could ask students to research the impact of driver distraction on road safety and present their findings in a written report.

8.1.3.2 Appropriate assessment methods for the lab or simulation experiments

Here are some lab exercises related to road safety that can be used to enhance students' understanding of road safety concepts:

1. **Vehicle safety features:** Students can conduct a lab exercise that explores the safety features of vehicles, such as airbags, anti-lock brakes, and traction control. They can

analyze the effectiveness of these features in preventing crashes and reducing the severity of injuries.

2. **Traffic flow simulation:** Students can use simulation software to simulate traffic flow in different road conditions and evaluate the safety of different road designs. They can analyze the impact of factors such as speed limits, traffic volume, and road geometry on traffic safety.
3. **Crash investigation:** Students can conduct a crash investigation lab exercise, in which they analyze the factors that contribute to crashes, such as driver behavior, road conditions, and vehicle design. They can use crash data and simulation software to identify high-risk areas and to develop targeted interventions to improve road safety.
4. **Road safety audits:** Students can conduct a road safety audit lab exercise, in which they evaluate the safety of a roadway using a standardized audit tool. They can identify safety hazards such as inadequate signage, poor lighting, and narrow lanes, and develop recommendations for improvements.
5. **Speed management:** Students can conduct a speed management lab exercise, in which they evaluate the effectiveness of different speed management strategies, such as speed cameras, speed humps, and speed limit signs. They can analyze the impact of these strategies on vehicle speeds, crash rates, and driver behavior.
6. **Driver behavior:** Students can conduct a driver behavior lab exercise, in which they analyze the factors that contribute to risky driving behavior, such as distraction, fatigue, and impairment. They can use simulation software and other tools to evaluate the effectiveness of interventions such as education campaigns, enforcement, and technology-based.

8.1.3.3 Appropriate assessment methods for design work assignments

The design of a road safety policy should be comprehensive, evidence-based, and tailored to the specific needs and risks of the local area of interest. The students can design through the semester, a road safety policy that follows these steps:

1. **Policy statement:** The policy should begin with a clear statement of the importance of road safety, outlining the organization's commitment to ensuring the safety of its employees, stakeholders, and the general public.
2. **Goals and objectives:** The policy should establish clear and measurable goals and objectives for improving road safety. These may include reducing the number of crashes, injuries, and fatalities; improving the safety of road infrastructure; promoting safe driving behavior; and ensuring compliance with traffic laws and regulations.
3. **Roles and responsibilities:** The policy should outline the roles and responsibilities of different stakeholders in implementing the policy. This may include the organization's leadership team, safety personnel, employees, contractors, and other stakeholders.
4. **Risk assessment and analysis:** The policy should include a comprehensive risk assessment and analysis of the organization's road safety risks. This may include an analysis of crash data, traffic flow patterns, and other relevant data sources.
5. **Strategies and interventions:** Based on the risk assessment and analysis, the policy should outline a range of strategies and interventions to improve road safety. These may include targeted education and training programs for employees and stakeholders, road safety audits and assessments, infrastructure improvements, and the implementation of technology-based solutions such as telematics and driver monitoring systems.
6. **Monitoring and evaluation:** The policy should establish a system for monitoring and evaluating the effectiveness of the strategies and interventions outlined in the policy. This may include regular reporting on key performance indicators such as crash rates, injury rates, and compliance with traffic laws and regulations.

7. **Review and revision:** The policy should be subject to regular review and revision to ensure that it remains up-to-date and aligned with the organization's evolving road safety risks and priorities.

8.1.3.4 Appropriate assessment methods for the field-works

The following field works can help students to apply road safety concepts to real-world situations and to develop practical skills related to local road safety:

1. **Road safety audits:** Students can participate in road safety audits of local roads and highways. They can work with local road safety professionals to identify hazards and make recommendations for improvements.
2. **Traffic flow analysis:** Students can conduct a traffic flow analysis of a local roadway or intersection. They can use equipment such as speed guns, traffic counters, and video cameras to collect data on traffic volume, vehicle speeds, and driver behavior, and use this data to identify safety concerns and develop recommendations for improvements.
3. **Pedestrian and bicycle safety assessments:** Students can conduct pedestrian and bicycle safety assessments of local roadways and intersections. They can evaluate the safety of crosswalks, sidewalks, bike lanes, and other infrastructure, and identify areas where improvements are needed to improve safety.
4. **Speed management studies:** Students can conduct speed management studies to evaluate the effectiveness of different speed management strategies, such as speed cameras, speed humps, and speed limit signs. They can use equipment such as speed guns and traffic counters to collect data on vehicle speeds and analyze the impact of these strategies on driver behavior and traffic safety.
5. **Driver behavior surveys:** Students can conduct driver behavior surveys to evaluate the attitudes and behaviors of drivers related to road safety. They can use surveys, interviews, and focus groups to collect data on factors such as distraction, impairment, and compliance with traffic laws.
6. **Crash data analysis:** Students can analyze crash data to identify trends and patterns in crashes, such as the types of crashes that occur, the factors that contribute to crashes, and the locations where crashes are most likely to occur. They can use this data to develop targeted interventions to improve road safety.

8.2 Assessment Tools and Technologies for Remote/eLearning

8.2.1 Overview and types of assessment tools for supporting the different assessment methods

There are many different types of assessment tools that can support assessment methods in eLearning. Table 7.2 provides the description of assessment tools that can support assessment methods in eLearning.

Table 7.2: *Assessment tools that can support assessment methods in eLearning.* Source: Refs[[Welsh, 2013], [DOĞAN, 2020], [Ardito, 2004]]

Assessment tools that can support assessment methods in eLearning	Brief description of the Assessment tool.
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<i>Learning management system (LMS) quizzes and exams</i>	Many LMSs offer built-in quiz and exam creation tools, which can be used to create and administer online assessments. These can be used for multiple-choice, short answer, or essay questions, and may include features such as automated grading, feedback, and reporting.
<i>Discussion forums</i>	Discussion forums can be used to facilitate peer assessment and feedback, as well as to assess learners' ability to engage with course material and to articulate their ideas.
<i>Online surveys</i>	Online surveys can be used to gather feedback on course content, delivery, and effectiveness. Surveys can be administered anonymously and can be used to identify areas for improvement in the course.
<i>Peer review tools</i>	Peer review tools can be used to facilitate peer assessment and feedback on written assignments, design projects, or other work submitted by learners. These tools may include features such as rubrics, commenting, and scoring.
<i>Video and audio recording tools</i>	Video and audio recording tools can be used to assess learners' presentation and communication skills, as well as to evaluate their understanding of course material. Learners can be asked to record themselves delivering a presentation, explaining a concept, or demonstrating a skill.
<i>Simulation and scenario-based tools</i>	Simulation and scenario-based tools can be used to assess learners' ability to apply course material to real-world situations. These tools may include virtual environments, role-playing exercises, or interactive simulations.
<i>Gamification and game-based assessment tools</i>	Gamification and game-based assessment tools can be used to engage learners in assessment activities and to provide feedback on their progress. These tools may include quizzes, challenges, or interactive games.

Overall, the choice of assessment tool will depend on the learning objectives, the type of assessment, and the needs of the learners. A combination of assessment tools may be used to provide a comprehensive assessment of learners' knowledge, skills, and abilities.

8.2.2 Criteria for selecting appropriate tools and technologies

Selecting appropriate tools and technologies to support assessment methods in eLearning requires careful consideration of a number of criteria. Here are some important factors to consider:

Alignment with learning objectives: The tool or technology must align with the learning objectives of the course and the specific assessment method being used. It should support the type of assessment that is required to measure the intended learning outcomes.

Accessibility and compatibility: The tool or technology should be accessible to all learners, regardless of their geographic location, internet connectivity, or technological proficiency. It should also be compatible with the devices and platforms that learners will use to access the course.

Ease of use: The tool or technology should be easy to use and intuitive, without requiring extensive training or technical support. It should be user-friendly and streamlined to minimize the learning curve for both instructors and learners.

Reliability and validity: The tool or technology should be reliable and produce consistent results over time. It should also have a high degree of validity, meaning that it measures what it is intended to measure.

Security and privacy: The tool or technology should be secure and protect learners' privacy and personal information. It should comply with relevant data protection laws and regulations, and provide secure storage and transmission of data.

Cost-effectiveness: The tool or technology should be cost-effective, taking into account the budget and resources available for the course. It should provide value for money, without compromising on quality or effectiveness.

Scalability: The tool or technology should be scalable, meaning that it can accommodate different class sizes and numbers of learners. It should be able to handle large volumes of data and traffic without compromising performance or reliability.

Overall, the selection of appropriate tools and technologies to support assessment methods in eLearning requires careful consideration of the specific needs and context of the course, as well as the needs and preferences of the learners. It should be guided by a clear understanding of the learning objectives, the assessment method, and the desired outcomes.

This section has been inspired by the following references: [Febriani, 2018], [Sangle, 2020] and [Bukie, 2014].

8.3 Developing Assessment Tools for Remote/eLearning teaching

8.3.1 Importance of clear instructions and rubrics

Clear instructions and rubrics are critical components of effective assessment tools in eLearning. Clear instructions help to ensure that learners understand what is expected of them and what they need to do to succeed in the assessment task. Rubrics provide a clear and objective framework for evaluating learners' performance against established criteria. Together, they promote clarity, consistency, fairness, and feedback in assessment. Clear instructions and rubrics reduce ambiguity, help to promote fairness, and provide a basis for feedback to learners. They also ensure that assessments are reliable, valid, and measure what they are intended to measure. In summary, clear instructions and rubrics are essential when developing assessment tools in eLearning to help learners succeed and ensure that assessments are accurate, fair, and effective.

This section has been inspired by the following references: [Roblyer, 2003] and [Dermo, 2009].

8.3.2 Developing effective course-type specific assessment tools

Developing effective course-type specific assessment tools is essential to ensure that learners are evaluated accurately and fairly in eLearning courses. Effective assessment tools must align with the learning objectives of the course and the type of content being taught. For example, a

course that involves hands-on lab work would require different assessment tools than a course that focuses on theoretical concepts.

By developing course-type specific assessment tools, instructors can ensure that learners are evaluated on the appropriate knowledge, skills, and competencies. This helps to promote learning outcomes that are relevant and applicable to the course content. Effective assessment tools can also provide learners with feedback that is specific, timely, and actionable, which can help them to identify areas where they need to improve.

Developing effective course-type specific assessment tools can also help to enhance the credibility and rigor of the course. Well-designed assessments can demonstrate the quality of the course content and the expertise of the instructor. They can also help to ensure that learners are evaluated consistently and fairly, regardless of their geographic location or other personal factors.

In summary, developing effective course-type specific assessment tools is essential to ensure that learners are evaluated accurately, fairly, and consistently in eLearning courses. Effective assessment tools must align with the learning objectives of the course and provide relevant and applicable feedback to learners. By developing well-designed assessments, instructors can promote learning outcomes that are credible, rigorous, and relevant to the course content.

8.4 Implementing Assessments for Remote/eLearning

8.4.1 Preparing students for assessments

Preparing students for an assessment in eLearning requires a thoughtful and intentional approach to ensure that they have the necessary knowledge, skills, and confidence to succeed. Table 7.3 provides the description of some tips on how to prepare students for an assessment in eLearning.

Table 7.3: *Tips on how to prepare students for an assessment in eLearning.* Source: Refs([Piskurich, 2004], [DOĞAN, 2020])

Tips on how to prepare students for an assessment in eLearning	Brief description of the Tip.
<i>Communicate assessment expectations</i>	Communicate the assessment expectations to students early on in the course. Provide clear instructions on what the assessment will cover, the format of the assessment, and the criteria for evaluation.
<i>Provide practice opportunities</i>	Provide students with practice opportunities to help them become familiar with the assessment format and the types of questions they may encounter. This can include practice quizzes or mock exams.
<i>Offer study resources</i>	Provide students with study resources such as readings, videos, or other multimedia materials that cover the topics that

	will be assessed. Encourage students to review these materials and engage with them actively.
<i>Encourage collaboration</i>	Encourage students to collaborate with their peers to study and prepare for the assessment. This can include discussion forums or group study sessions.
<i>Provide feedback</i>	Provide students with feedback throughout the course, not just at the end of the course or prior to the assessment. This can include formative assessments or other opportunities for feedback on their progress.
<i>Manage time effectively</i>	Help students manage their time effectively by providing a clear timeline for the assessment, including the due date and any deadlines for submitting work.
<i>Be available for support</i>	Be available to provide support to students throughout the preparation process. This can include answering questions, providing feedback on practice assessments, or offering guidance on study strategies.

In summary, preparing students for an assessment in eLearning requires clear communication, practice opportunities, study resources, collaboration, feedback, effective time management, and support. By following these tips, instructors can help their students feel prepared and confident to succeed on the assessment.

8.4.2 Administering assessments

Administering assessments in remote and eLearning environments requires careful planning and consideration to ensure that they are effective and reliable. Table 7.4 provides the description of some tips on how to administer assessments in remote and eLearning environments.

Table 7.4: *Tips on how to administer assessments in remote and eLearning environments.*
 Source: see Refs. [Hill, 2014], [Horkay, 2005].

Tips on how to administer assessments in remote and eLearning environments	Brief description of the Tip.
<i>Choose appropriate assessment tools</i>	Choose assessment tools that are appropriate for the remote and eLearning environment. This may include online quizzes, exams, or assignments that can be submitted electronically.
<i>Ensure technology is reliable</i>	Ensure that the technology being used to administer the assessment is reliable and accessible to all students. Test the technology before the assessment to ensure that it is working properly and that students know how to use it.

<i>Communicate instructions and expectations clearly</i>	Communicate clear instructions and expectations for the assessment to students. This may include information on the format of the assessment, the duration of the assessment, and the criteria for evaluation.
<i>Set a clear timeline</i>	Set a clear timeline for the assessment, including the due date and any deadlines for submitting work.
<i>Address academic integrity</i>	Address academic integrity by establishing clear guidelines for how students are expected to complete the assessment and ensuring that students are aware of the consequences of academic dishonesty.
<i>Provide feedback</i>	Provide feedback to students after the assessment to help them understand their strengths and areas for improvement.
<i>Consider accommodations</i>	Consider accommodations for students who may require them, such as extra time or alternative assessment formats.
<i>Ensure data privacy</i>	Ensure that student data is kept private and secure when administering assessments in remote and eLearning environments.

In summary, administering assessments in remote and eLearning environments requires careful planning and consideration. By choosing appropriate assessment tools, ensuring technology is reliable, communicating instructions and expectations clearly, setting a clear timeline, addressing academic integrity, providing feedback, considering accommodations, and ensuring data privacy, instructors can administer effective and reliable assessments in remote and eLearning environments.

8.4.3 Grading and providing feedback

Grading and providing feedback for assessments in remote and eLearning environments requires thoughtful consideration to ensure that students receive timely and constructive feedback. Table 7.5 provides the description of some tips on how to grade and provide feedback for assessments in remote and eLearning environments.

Table 7.5: *Tips on how to grade and provide feedback for assessments in remote and eLearning environments.* Source: see Refs. [Carless, 2006], [Palloff, 2003].

Tips on how to grade and provide feedback for assessments in remote and eLearning environment	Brief description of the Tip
<i>Use rubrics</i>	Use rubrics to establish clear criteria for evaluating student work. Rubrics provide a transparent and consistent way to evaluate student work and provide feedback.
<i>Provide timely feedback</i>	Provide feedback as soon as possible after the assessment. Timely feedback is important for students to understand their performance and make adjustments as needed.
<i>Provide constructive feedback</i>	Provide constructive feedback that is specific, actionable, and supportive. Constructive feedback can help students understand their strengths and areas for improvement and provide guidance on how to improve their work.

<i>Use a variety of feedback methods</i>	Use a variety of feedback methods, such as written comments, audio or video feedback, or virtual office hours. Providing feedback in different formats can help students engage with the feedback and improve their work.
<i>Consider peer feedback</i>	Consider incorporating peer feedback into the assessment process. Peer feedback can provide students with additional perspectives on their work and help them develop their critical thinking skills.
<i>Address academic integrity</i>	Address academic integrity when providing feedback by ensuring that students understand the consequences of academic dishonesty and providing guidance on how to avoid it.
<i>Provide opportunities for follow-up</i>	Provide opportunities for students to follow-up on their feedback, such as through virtual office hours or one-on-one meetings. This can help students clarify their understanding and address any questions or concerns they may have.

In summary, grading and providing feedback for assessments in remote and eLearning environments requires thoughtful consideration and planning. By using rubrics, providing timely and constructive feedback, using a variety of feedback methods, considering peer feedback, addressing academic integrity, and providing opportunities for follow-up, instructors can provide effective and constructive feedback to students.

8.5 Evaluating Assessments

8.5.1 Reviewing assessment results

Reviewing assessment results in remote and eLearning environments is an important step in evaluating student learning and making instructional decisions. Here are some tips on how to review assessment results in remote and eLearning environments:

Analyze the data: Analyze the data from the assessment to identify trends and patterns in student performance. This can help identify areas where students may need additional support or instruction.

Consider individual student performance: Consider individual student performance when reviewing assessment results. This can help identify students who may need additional support or individualized instruction.

Use technology tools: Use technology tools to facilitate data analysis and review. Many learning management systems and assessment platforms provide tools for analyzing and visualizing data.

Collaborate with colleagues: Collaborate with colleagues to review assessment results and share insights and strategies for addressing areas where students may be struggling.

Use assessment results to inform instruction: Use assessment results to inform instructional decisions, such as adjusting course content or providing additional support or instruction to students.

Communicate assessment results to students: Communicate assessment results to students to help them understand their performance and identify areas for improvement.

Evaluate the effectiveness of the assessment: Evaluate the effectiveness of the assessment by considering the alignment between the assessment and the learning objectives, the reliability and validity of the assessment, and the quality of the feedback provided to students.

In summary, reviewing assessment results in remote and eLearning environments requires careful analysis and consideration. By analyzing the data, considering individual student performance, using technology tools, collaborating with colleagues, using assessment results to inform instruction, communicating assessment results to students, and evaluating the effectiveness of the assessment, instructors can use assessment data to improve student learning and make effective instructional decisions.

This section has been inspired by the following reference: [Romero, 2013].

8.5.2 Analyzing and interpreting assessment data

Analyzing and interpreting assessment results data is an important step in understanding student learning and making instructional decisions. Here are some tips on how to analyze and interpret assessment results data:

Identify the purpose of the assessment: Identify the purpose of the assessment and the learning objectives it is intended to measure. This can help provide context for the data analysis and interpretation.

Examine the distribution of scores: Examine the distribution of scores to identify the range of student performance and any patterns or trends in the data.

Look for outliers: Look for outliers, such as scores that are significantly higher or lower than the rest of the data. Outliers may indicate areas where students are excelling or struggling and can help identify areas where additional support or instruction may be needed.

Analyze item-level data: Analyze item-level data to identify specific areas where students may be struggling or excelling. This can help identify areas for instructional focus and improvement.

Compare results to previous assessments: Compare assessment results to previous assessments to identify areas where student performance has improved or declined over time. This can help inform instructional decisions and identify areas where additional support or instruction may be needed.

Consider demographic data: Consider demographic data, such as student age, gender, or background, when analyzing assessment results. This can help identify disparities in student performance and inform instructional decisions to address these disparities.

Use data to inform instructional decisions: Use assessment results data to inform instructional decisions, such as adjusting course content, providing additional support or instruction to students, or modifying instructional strategies.

In summary, analyzing and interpreting assessment results data requires careful consideration and attention to detail. By identifying the purpose of the assessment, examining the distribution of scores, looking for outliers, analyzing item-level data, comparing results to previous

assessments, considering demographic data, and using data to inform instructional decisions, instructors can use assessment data to improve student learning and make effective instructional decisions.

This section has been inspired by the following references: [Stiggins, 2007], [Shepard, 2000] and [Black, 2009].

8.5.3 Using assessment results to improve the course and future assessment sessions

8.5.3.1 Using assessment results to improve the course

Using assessment results to improve the course is an important step in the instructional process. Here are some tips on how to use assessment results to improve the course:

Identify areas of strength and weakness: Analyze the assessment results to identify areas of strength and weakness in student performance. This can help you identify areas where students are excelling and areas where they may need additional support or instruction.

Review learning objectives: Review the learning objectives for the course and compare them to the assessment results. This can help you identify areas where the learning objectives may need to be modified or reinforced.

Adjust instructional strategies: Use the assessment results to adjust instructional strategies to better align with student learning needs. For example, if students are struggling with a particular concept, you may need to adjust the way you teach that concept or provide additional practice opportunities.

Modify course content: Use the assessment results to modify course content to better align with student learning needs. For example, if students are struggling with a particular concept, you may need to provide additional resources or materials to help them better understand that concept.

Provide additional support: Use the assessment results to provide additional support to students who are struggling. This can include additional instruction, tutoring, or other resources to help students improve their understanding of course content.

Reassess student learning: Use the assessment results to reassess student learning and determine if additional modifications or adjustments are needed to improve student understanding and performance.

Reflect on instructional practices: Reflect on instructional practices and consider how you can improve your teaching strategies to better support student learning.

In summary, using assessment results to improve the course requires careful analysis of student performance, review of learning objectives, adjustment of instructional strategies, modification of course content, provision of additional support, reassessment of student learning, and reflection on instructional practices. By using assessment results to inform instructional decisions, instructors can improve student learning and ensure that the course is aligned with student needs and learning objectives.

8.5.3.2 Using assessment results to improve future assessment sessions

Using assessment results to improve future assessment sessions is an important part of the assessment process. Here are some tips on how to use assessment results to improve future assessments:

Evaluate the effectiveness of assessment methods: Review the assessment methods used and evaluate their effectiveness in measuring student learning. If an assessment method is found to be ineffective, consider modifying or replacing it with a more effective method.

Review the quality of assessment questions: Review the quality of the assessment questions and determine if they were clear and aligned with the learning objectives. Consider modifying or replacing questions that were found to be unclear or not aligned with the learning objectives.

Adjust assessment weighting: Review the weighting of the assessment and determine if adjustments need to be made to better align with the learning objectives and student performance.

Provide feedback to students: Use the assessment results to provide feedback to students and identify areas where they can improve their performance in future assessments. Providing constructive feedback can help students improve their understanding of course content and perform better on future assessments.

Incorporate feedback from students: Collect feedback from students on the assessment process and use this feedback to make improvements for future assessments. Consider incorporating student feedback into the assessment design and implementation process.

Plan for ongoing assessment: Use assessment results to plan for ongoing assessment and make adjustments to the course as needed to better align with the learning objectives and student needs.

In summary, using assessment results to improve future assessment sessions requires careful evaluation of assessment methods, review of assessment questions, adjustment of assessment weighting, providing feedback to students, incorporating feedback from students, and planning for ongoing assessment. By using assessment results to inform future assessments, instructors can improve the validity and reliability of their assessments and help students achieve better learning outcomes.

This section has been inspired by the following references: [Arcinas, 2021], [Saul, 2013], [Sharkey, 2003] and [Wiggins, 1998].

9 CONCLUSION

9.1 Comprehensive summary of key points

In recent years, remote and eLearning teaching has become increasingly popular due to technological advancements, convenience, and accessibility. Lately, the COVID-19 pandemic accelerated the adoption of this mode of teaching and learning. In fact, Remote/eLearning teaching and learning refer to the process of delivering education and training through digital platforms.

Various types of assessments can be administered in remote and eLearning teaching. They include formative assessments, summative assessments, self-assessment, peer-assessment, and project-based assessments. These assessments can be conducted through various digital platforms such as online quizzes, video conferencing, and discussion boards.

On the other side, best practices conducting these assessment must be established. These may include clearly defined learning objectives, timely and regular feedback, valid and reliable assessment methods, and the use of multiple assessment types. It is also essential to ensure students are familiar with the assessment process and provide them with the necessary resources and support.

However, this process is not without challenges. Challenges for students' assessment in remote/eLearning have been identified and solutions have been proposed. It has also been established that Assessing student learning in different remote learning environments requires flexibility and adaptation to different contexts. It is essential to consider factors such as the level of student engagement, the quality of the learning environment, and the availability of resources.

It is essential to consider and Ensuring Equity in Assessment in Remote/eLearning Teaching. And a comprehensive Assessment process management is very paramount.

Finally, suggestions of how to implement all these concepts of assessments in remote and eLearning to a course on Road safety Management have provided throughout this document.

9.2 Future directions for research and practice

Future directions for assessment in remote and eLearning teaching include continued development of innovative assessment methods that utilize technology to support personalized learning and assessment experiences. Adaptive assessments, artificial intelligence-driven assessments, and gamified assessments are some examples of emerging assessment methods that offer new ways of assessing student learning.

Additionally, assessment methods that allow for the assessment of 21st-century skills such as creativity, critical thinking, and collaboration will become increasingly important.

Finally, there will be a growing focus on ensuring the validity, reliability, and fairness of assessments in remote and eLearning teaching, as well as addressing the challenges of detecting and preventing academic dishonesty in online assessments.

9.3 Future potentials of involving AI for a better and customized students' assessments in remote/eLearning teaching

9.3.1 Potentials of involving AI for a better assessment of students in remote and eLearning

There are many potential benefits to using AI for assessment of students in remote and eLearning settings. Here are some of the key advantages:

1. *Efficiency*: AI can quickly and accurately grade assignments, saving teachers time and allowing them to focus on other aspects of teaching.
2. *Objectivity*: AI can provide a more objective assessment of student work, eliminating biases that might be present in human grading.
3. *Personalization*: AI can be used to tailor assessments to the individual needs of each student, providing personalized feedback and support.
4. *Data analysis*: AI can analyze large amounts of data about student performance, identifying patterns and trends that can be used to improve teaching methods.
5. *Adaptability*: AI can adapt to the changing needs of students and the curriculum, providing real-time feedback and adjustments to ensure that students are on track.

Overall, using AI for assessment in remote and eLearning settings has the potential to make the process more efficient, objective, personalized, and adaptable, ultimately leading to improved student outcomes.

9.3.2 Potentials of involving AI for a better customization of students assessments in remote and eLearning

Using AI for the customization of student assessments in remote and eLearning settings can have several potential benefits, including:

1. *Personalization*: AI can be used to create customized assessments for individual students based on their learning needs, preferences, and performance. This can help to ensure that students are challenged appropriately and are able to achieve their full potential.
2. *Adaptive learning*: AI can use data from previous assessments and other sources to adjust the difficulty and format of assessments to meet the needs of individual students. This can help to ensure that assessments are neither too easy nor too difficult and that students receive the appropriate level of support and challenge.
3. *Timely feedback*: AI can provide instant feedback on assessments, enabling students to understand their strengths and weaknesses and take action to improve their performance. This can help to ensure that students are able to stay on track and achieve their goals.
4. *Increased efficiency*: AI can automate the assessment process, reducing the time and effort required for teachers to create and grade assessments. This can free up teachers' time to focus on other important aspects of teaching.
5. *Improved accuracy*: AI can analyze large amounts of data to identify patterns and trends in student performance, providing more accurate assessments and feedback.

Overall, using AI for the customization of student assessments in remote and eLearning settings has the potential to make the assessment process more personalized, adaptive, efficient, accurate, and timely, ultimately leading to improved student outcomes.

This section has been inspired by the following references: [Ranjeeth, 2020], [Tang, 2021], [Hajje, 2015], [Bagunaid, 2022] and [Montebello, 2017].

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