

An  Quick Guide to

Adapting Exam Questions for Remote Education to Reduce Cheating

Written exams that are taken **remotely** are a method of evaluation made possible by new technological tools (the Internet, digital learning environments, telecommunication platforms, etc.). However, these same tools can create new opportunities for cheating. The text box below presents certain prohibited behaviours that can occur during exams at a distance. The COVID-19 pandemic has forced educational institutions to adapt their practices while maintaining a certain level of academic integrity during remote evaluations.

This guide is intended to present techniques to better adapt exams to the context of remote education. For alternative methods of remote evaluation, consider the suggestions given in the [alternative methods of evaluation in the context of remote learning](#)², prepared by Université de Sherbrooke [French only]. While cheating can never be completely eliminated from distance evaluations, this guide offers strategies to adapt written exam questions in order to reduce its incidence.

Non-Exhaustive List of Prohibited Behaviours

1. Impersonating a student;
2. Plagiarism: the use of another person's text or work in part or as a whole;
3. Possessing or obtaining (transfer) of exam questions or answers;
4. Possessing or using any non-authorized materials during the exam or when completing assignments, including the use of online resources or technological tools;
5. Obtaining any form of unauthorized help, whether collective or individual;
6. Using a copy of another person's exam;
7. Falsifying a document or creating a fake document.

The strategies proposed in this guide won't all have the same impact on the time and effort required to prepare and correct exams, equity among students, or performance, which is to say, a given strategy's effectiveness in reducing the risks of cheating. Each strategy is therefore scored according to the four criteria given below, each of which is measured using a scale of 1 to 3. Each strategy is scored in comparison to the baseline scenario of professors evaluating students through a written exam administered in person under the watchful eye of an invigilator.

Criteria	Symbol	Scale		
		3	2	1
Additional work required to prepare the exam	P	None or negligible	Low	Significant
Additional work required to grade the exam	C	None or negligible	Low	Significant
Impact on equity among students as a result of the questions used	E	Strict equity (same question for every student)	Slight effect on equity (set of different questions which are very similar)	Strong possibility of inequity (set of questions with significant differences)
Performance in terms of effectiveness in reducing the risk of cheating	R	Significant reduction in the risk of cheating	Lesser but still effective reduction in the risk of cheating	Academic integrity is compromised by the ease of cheating

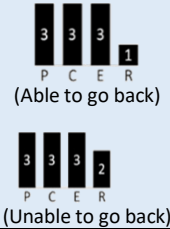
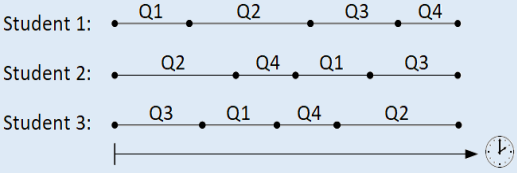


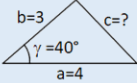
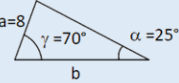
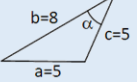

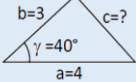
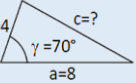
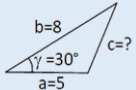
The ideal strategy would receive a score of three (3) for each criterion. It's important to note that multiple strategies can be applied to the same question, while the choice of strategies can vary from one question to the next within the same exam.


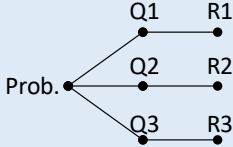





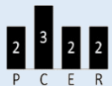
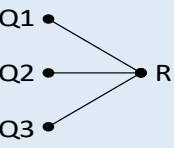




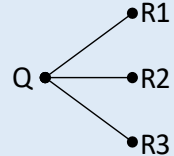
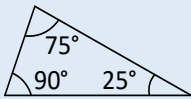
Recommendation: Verify whether the policies at your unit/institution authorize the use of these strategies before implementing them.

References:

- 1-Center For Teaching and Learning SDU: https://e-learn.sdu.dk/bbcswebdav/courses/E-learn_Support_Center/Nyhedsbrev_2020/April2020/PDF_Oral_Exams_online_guide_April2020.pdf.
- 2-Lefebvre, N., Denis, C., Desrochers, M. E., Cabana, M., Mathieu, S. (2020), *Suggestions de modalités d'évaluation alternatives dans un contexte de F@D (formation à distance)*. Sherbrooke
- 3-Legendre, R. (2005), *Dictionnaire actuel de l'Éducation*. (3^e éd.). Montréal, Guérin, 1584 p.

STRATEGIES AND EXAMPLES OF ADAPTED QUESTIONS FOR REMOTE EXAMS

Strategy	Criteria	Diagrams and Examples
<p>Varying question order</p> <p>All students are given the same questions, but in a different order. A digital learning environment needs to be used to ensure students receive a personalized sequence of questions. It may be advantageous to prevent students from returning to previous questions.</p>		<p>Diagram:</p> <p>Student 1: • Q1 • Q2 • Q3 • Q4 •</p> <p>Student 2: • Q2 • Q4 • Q1 • Q3 •</p> <p>Student 3: • Q3 • Q1 • Q4 • Q2 •</p> 
<p>Randomizing the order of answer choices</p> <p>All students are given the same questions, but the possible answers for each question are ordered differently for each student. Several methods are available to change the order of questions and/or answers, especially when evaluations are conducted over an online learning platform (e.g., Moodle). Auto Multiple Choice can be used to prepare and print copies of an exam with randomly ordered questions and answers. While the orders differ between copies, because each is uniquely identified, automated correction can still match the questions and answers together.</p>		<p>Diagram:</p> <p>Student 1: Q1 <input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/></p> <p>Student 2: Q1 <input type="checkbox"/> c <input type="checkbox"/> b <input type="checkbox"/> d <input type="checkbox"/> a <input type="checkbox"/></p> <p>Student 3: Q1 <input type="checkbox"/> d <input type="checkbox"/> a <input type="checkbox"/> c <input type="checkbox"/> b <input type="checkbox"/> a <input type="checkbox"/></p>
<p>Several similar questions</p> <p>Each question can have several variations. Ideally, each should be quite similar in terms of the type of question, its difficulty, the time required to answer, etc. This can help to avoid challenges from students on the grounds of unequal treatment.</p>		<p>Diagram:</p> <p>Student 1: Q1 • R1</p> <p>Student 2: Q2 • R2</p> <p>Student 3: Q3 • R3</p> <p>Example:</p> <p>Student 1: Calculate length c. </p> <p>Student 2: Calculate length b. </p> <p>Student 3: Calculate angle alpha. </p>
<p>Set of parameter values</p> <p>All students are asked the same question, but with a different set of parameters. The different sets of parameters can be determined randomly within a predefined range. Ideally, the professor should have a tool that can quickly solve the problem for any set of numerical values.</p>		<p>Example 1:</p> <p>Student 1: What is the area of a square with 2m sides?</p> <p>Student 2: What is the area of a square with 4m sides?</p> <p>Student n: What is the area of a square with xm sides?</p> <p>Example 2: Calculate length c.</p> <p>Student 1: </p> <p>Student 2: </p> <p>Student 3: </p>

Strategy	Criteria	Diagrams and Examples	
<p>Variations in the problem</p> <p>Use a single problem to generate different questions, each of which has a different answer. The number of questions is limited by the nature of the problem.</p>		<p>Diagram:</p> 	<p>Example 1:</p> <p>In the water cycle, which step comes after ...</p> <p>Student 1: ... precipitation?</p> <p>Student 2: ... transpiration?</p> <p>Student 3: ... condensation?</p> <p>Example 2: Calculate length c.</p> <p>Student 1: </p> <p>Student 2: </p> <p>Student 3: </p>
<p>Transforming a single question</p> <p>Using an original question, equivalent questions can be generated by applying more or less systematic transformations for the purpose of evaluating the same things. Various approaches can be taken, such as reformulating a positive question in the negative (example 1) or by changing the requested action (example 2).</p>	 <p>(Example 1)</p>  <p>(Example 2)</p>	<p>Example 1:</p> <p>Name three materials that are ...:</p> <p>Q1: ... good insulators?</p> <p>Q2: ... poor insulators?</p> <p>Q3: ... good conductors?</p> <p>Q4: ... poor conductors?</p>	<p>Example 2:</p> <p>Q1: Order the planets by order of increasing distance from the sun.</p> <p>Q2: Order the planets by distance from the sun, from furthest to closest.</p>
<p>Different questions with the same answer</p> <p>Different questions with the same answer might not seem very useful in this context, but it requires students that work together to cheat to realize that the answer is the same. And, if they do, there is little reason to exchange the answer, since they'll already have solved it. It's likely that students will miss this subtle maneuver and, believing they have different problems to solve, won't try and share information. One significant advantage of this approach is its ease of correction.</p>		<p>Diagram:</p> 	<p>Example: The answer is « moon »</p> <p>Q1: Which of the following celestial bodies is not a planet: a) Mercury b) Moon c) Venus d) Jupiter.</p> <p>Q2: Which of the following celestial bodies is not a planet: a) Uranus b) Saturn c) Moon d) Neptune d) Jupiter.</p> <p>Q3: What celestial body orbits the Earth?</p>
<p>Questions with several correct answers</p> <p>Questions can be formatted in such a way that students must explain or justify their responses (example 1). A variation on this strategy involves asking students to provide a subset of correct answers from among all of the possible correct answers (example 2). Students can also be asked to analyze erroneous data or errors that present themselves in different ways and to justify their response (example 3). Finally, students can be asked to develop their own exam questions and provide an answer key for them (example 4).</p>	   	<p>Diagram:</p> 	<p>Example 1: According to you, what is the best source of renewable energy? Justify your response in at least 200 words.</p> <p>Example 2: Name four of Canada's former Prime Ministers.</p> <p>Example 3: What error(s) can you find in the following triangle:</p>  <p>Example 4: Invent your own exam question related to the Pythagorean theorem seen in class. Provide an adequate answer key.</p>

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