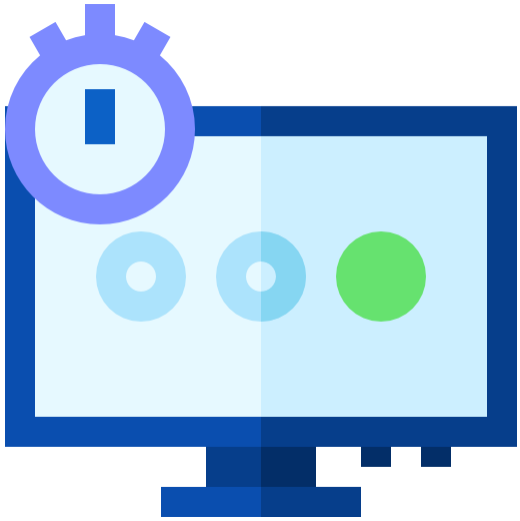
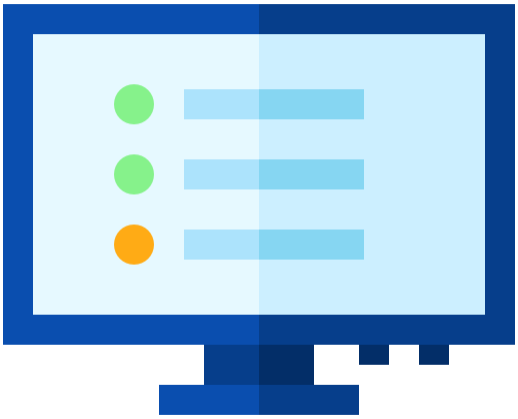
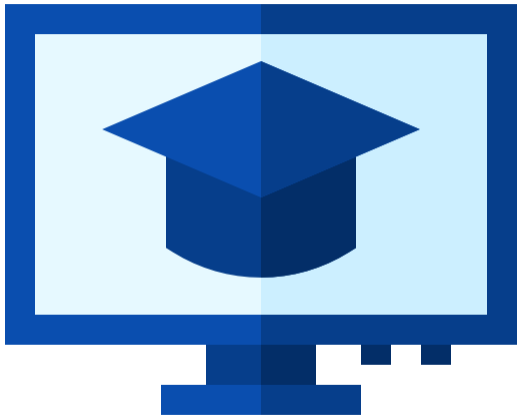
A GUIDE TO DESIGNING AND CONDUCTING E-EXAMINATION







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What Can You Learn From This Guide?

As lectures go online, so do assessments. Final examinations are still considered by some as the best way to comprehensively evaluate students' achievement. Final exams have to be administered online and students must sit for the exams using their own computers or smartphone, in the locations of their own choosing.

This poses several challenges. Moving away from pen-and-paper tests can be daunting to some, both lecturers and students. In the traditional closed-book setting, students are not allowed to have study materials with them in the examination. Whereas in an online exam, lecturers have almost no way to invigilate students during the process. And for this reason, exams administered online are more likely to be open-book and open-web.

The focus of this guide is two-fold; the first objective is to assist lecturers in designing an open-resource exam. Open-resource here can mean either an open-book exam, open-web exam, or a take-home exam, where students are allowed to use any reference material from books or the internet.

The second aim is to assist lecturers in conducting online examinations. This pertains to how to assess students' online readiness, what platform should be used for e-exams, and how to handle academic integrity issues in online examination. Readers needing greater depth of detail are referred to the sources listed in the reference.

During these challenging times, we believe that the humane option is always the best option. We should aim to help each other as much as we can. We want to prioritize simple solutions that work for the most. We want to prioritize sharing ideas and resources, and we want to communicate these as clearly as we can. And most importantly, we aim to support each other as humans.

We hope that this guide will help you plan, design and conduct your e-exam. We wish you and your students all the best; and stay healthy!

What Are The Characteristics of a Final Examination

A final examination is the last assessment that is done towards the end of a course. This task assesses students' knowledge of the subject taught in the course or semester and may be cumulative. A final examination also should assess students individually.

In designing an effective examination, lecturers should focus to four characteristics:

Validity - Does the examination accurately measure what it is intended to measure? Does the examination provide information about the concepts it was designed to test?

Reliability - Does the test collect correct data and produce accurate results? Does the examination have a consistent measurement? Does it discriminate between different levels of cognitive skills performance?

Recognizability - Does your instruction provide enough information for students to prepare for the examination? Are students familiar with the type of assessment?

Realistic - Can the students complete the test in reasonable time? Can the students actually sit for the e-examination?

Reference

Piontek, M. E. (2008). Best practices for designing and grading exams. Center of Research on Learning and Teaching Occasional Paper, 24, 1-12.
http://crlt.umich.edu/sites/default/files/resource_files/CRLT_no24.pdf

How Can You Assess Students' Online Exam Readiness?

Assess Online Learning Readiness

Before starting an online exam, you should first ask your students to self-assess their readiness in taking an online exam. This can be done with a **simple questionnaire** (example: Online Readiness Questionnaire http://tutorials.istudy.psu.edu/learningonline/ORQ/ORQ.htm) or a **checklist** (example below). This will not only help you assess your student's readiness before taking an online exam but also help students to do a self-preparation.

Table 1: Sample of a pre-exam checklist to be distributed to students.

Online Exam Checklist		
1	I am well-connected to the Internet with a reliable connection.	✔
2	I have a comfortable place to sit for the exam	
3	I have a reliable internet browser (e.g. Chrome, Firefox, MS Edge, Safari. etc.).	
4	I know how to login to my UPM email.	
5	I have reliable document creating and editing software (e.g. Word/Docs, Powerpoint/Slides and Excel/Sheets).	
6	I know how to scan handwritten diagrams or responses and turn them into pdfs.	
7	I know how to upload scanned/handwritten responses documents using a computer or a smartphone.	
8	I can keep myself on track and on time during an online assessment.	
9	I understand the examination guidelines as informed to me by the instructor.	
10	I acknowledge and understand that plagiarism, data forgery and cheating are wrong. I acknowledge that copying someone else's work, or part of it, is wrong, and that submitting identical work to others constitutes a form of plagiarism.	

Preparing a Mock Examination

A **mock examination** is an examination where the marks may or may not count. It serves mainly as practice for future exams. It is certainly commendable for lecturers to administer mock e-examinations to familiarize the students with the new online format. This can be the best means of test preparation for both the lecturers and the students.

What Are The Formats of E-Examination Can Be Conducted Online?

Multiple-Choice Questions

Multiple-choice questions (MCQ) are well-suited for online assessment. A great advantage of MCQs is that they are easy to administer online. Grading for MCQ can also be done automatically. Moreover, a well-designed set of MCQs can cover the breadth of course content effectively. MCQs can be used to assess higher-order thinking skills, e.g. analyzing and evaluating (Scully 2017). However, it cannot be used to assess creativity (Felder & Brent 2016).

Short Answer Questions

Short-answer questions ask students to provide brief written responses. They are usually used to assess low-level content knowledge, but can also be designed to address higher cognitive levels. A short-answer question typically starts with “Explain in one or two sentences…”, “Briefly outline…”, “State your reasoning…”, “List five examples of…”, et cetera. Among the good practices in designing short-answer questions are

- Test no more than one or two objectives per question.
- Allow about two minutes for a question requiring more than a sentence to answer.
- Indicate the point value of each question and suggest an expected response length.
- Before including discussion questions on a test, clearly state your grading criteria and demonstrate illustrative questions, typical good and bad answers.

Note: Be careful of using automated quiz generators like in PutraBlast, Google/Microsoft Forms where answers with different spelling or capitalization may be marked as wrong, whereas the instructor would have accepted the answer.

Essay Questions

According to Stalnaker (1951) an essay question is “*A test item which requires a response composed by the examinee, usually in the form of one or more sentences, of a nature that no single response or pattern of responses can be listed as correct, and the accuracy and quality of which can be judged subjectively only by one skilled or informed in the subject*.” Essay questions can be used to assess higher-order cognitive skills and evaluate student’s thinking and reasoning.

Computation

Computational questions require students to perform a series of calculations to provide the answer. Usually, students are asked to show their workings for partial marks. To submit answers that are written on papers, students may scan their papers using a smartphone scanner or a camera and upload the documents as image files or pdf.

Oral Exams

Oral examinations can be conducted one-to-one with the student using any video-conferencing tools.This type of examination allows instructors to assess students directly and individually. An oral exam per student can take 10 minutes or less. It is, however, not suitable for large classes. Record-keeping may also be an issue.

Reference

Felder, R. M., & Brent, R. (2016). *Teaching and learning STEM: A practical guide*. John Wiley & Sons.

Scully, D. (2017). Constructing multiple-choice items to measure higher-order thinking. *Practical Assessment, Research, and Evaluation*, *22*(1), 4.

Stalnaker, J. M. (1951). The Essay Type of Examination. In E. F. Lindquist (Ed.), Educational Measurement (pp. 495-530). Menasha, Wisconsin: George Banta.

How Do I Create Questions for An Open-Book, Open-Web Exam?

Expectations

- **Some definitions**: An **open-book exam** is an assessment method designed in a way that allows students to refer to either textbooks, class notes, or other approved material during the exam. An **open-web exam** is an e-assessment method, in which students are allowed to use the Internet during the exam. A **take home exam** is an exam where students can take at home (or anywhere outside an examination hall) in a certain amount of time. Students have the means to study the material and use external resources, including the internet while taking the exam.
- **Common pitfalls**: Online exams are not suitable when students are tested only on knowledge reproduction. Students may **falsely assume that the exam will be easy**, and they will be able to find all the answers in the textbook or internet. Students may **prepare less** for the exam, assuming that all answers are searchable in the textbook or internet. Student's overreliance upon the textbook (e.g., reading large portions of the text verbatim during an exam or hunting through the book for a perfect example problem) may lead to **ineffective time management** during examination (Therriault et al, 2011)

Using Bloom's Taxonomy

Bloom's Taxonomy is a method to categorize the levels of cognitive skills, which can also assist question designing. The bottom three levels of the cognitive domain are often referred to as the lower-order thinking skills, and the top three levels are the higher-order thinking skills.

Table 2: Sample Learning Objectives at Different Bloom Levels (Felder & Brent 2016)

Type or level of question		Examples
Creating	Create something new to the creator (design, develop, plan, formulate)	Formulate [a procedure for synthesizing a benzene derivative with specified side groups]; brainstorm [possible reasons why a tissue-engineered skin replacement might not function as designed when scaled up]; design [an experiment or process or product or code that meets given specifications].
Evaluating	Make and support evidence-based judgments (choose, prioritize, rate, critique)	Specify [which of several given C++ codes is better for achieving a specified objective, and explain your reasoning]; select [from among available options for expanding production capacity and justify your choice]; critique [an oral project presentation using criteria presented in class].
Analyzing	Solve complex problems, interpret data, figure out system behavior and malfunctions (solve, derive, explain, predict, model, interpret)	Explain [why we feel warm in 70°F air and cold in 70°F water]; predict [the position of a space object under perturbation forces]; carry out [a proof by mathematical induction of a specified result]; model [the dynamic response of a first-order system under PID control].
Applying	Apply known procedures to new situations and problems (solve, calculate, determine, implement)	Calculate [the probability that two sample means will differ by more than 5 percent]; draw and label [a free-body diagram for a cantilever supporting a distributed weight]; solve [a second-order ordinary differential equation with specified initial conditions].
Understanding	Demonstrate understanding of concepts (explain, paraphrase, interpret, classify, compare and contrast)	Explain [the function of a comparator in Java in terms a nonprogrammer could understand]; compare and contrast [a supercritical wing with a laminar flow wing], interpret [the output from a SIMULINK simulation]; outline [the four stages of team functioning].
Remembering	Memorize and repeat facts, replicate known procedures (define, list, identify, calculate)	Identify [the control surfaces of an aircraft]; list [the first ten alkanes]; state [formulas for derivatives of simple algebraic functions] .

Complex Engineering Problem

Problem solving involves higher-order skills and is among the most authentic, useful, and crucial skills that learners can develop. In order to produce engineering graduates with the ability to solve complex engineering problems, engineering educators must be able to design complex engineering problems to assess the acquisition of the skill. The table below lists the attributes of a complex engineering problem.

WP#	Attribute	Characteristics
WP1	Depth of Knowledge	Cannot be resolved without in-depth engineering knowledge* which allows a fundamental-based, first principles analytical approach.
WP2	Range of conflicting requirements	Involve wide-ranging or conflicting technical, engineering and other issues.
WP3	Depth of analysis	Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models.
WP4	Familiarity of issues	Involve infrequently encountered issues.
WP5	Extent of applicable codes	Are outside problems encompassed by standards and codes of practice for professional engineering.
WP6	Extent of stakeholder involvement and level of conflicting requirements	Extent of stakeholder involvement and level of conflicting requirements
WP7	Interdependence	Are high level problems including many component parts or sub-problems.

*Includes one or more of engineering fundamentals, specialists knowledge, engineering design, engineering practice, or research literature.

A complex engineering problem **must have at least the first attribute WP1 and any of the attributes from WP2 to WP7**.

Socratic Questioning

Socratic questioning *"is systematic method of disciplined questioning that can be used to explore complex ideas, to get to the truth of things, to open up issues and problems, to uncover assumptions, to analyze concepts, to distinguish what we know from what we don't know, and to follow out logical implications of thought*". When devising questions, the Socratic method questioning can be used devising questions to probe student knowledge more deeply.

Table 3: Six types of Socratic questions

Questions that...	Example questions and starters
...demand clarification	Why do you say that? How does this relate to x theory? Are you going to include the Coriolis term in your equations?
...probe assumptions	What could we assume instead? How can you verify the assumption? Why are we neglecting Coriolis force term in the equation?
...probe reasons and evidence	What would be an example? What do you think causes x to happen and why? Do you think Coriolis force is responsible for these circular patterns? How so?
...ask about viewpoints	What would be an alternative? Why do you think x is important? What are the strengths and weaknesses of your design?
...probe implications and consequences	How does x affect y? If x happened, what else would happen as a result? Why? How would our results be affected if the Coriolis term is neglected?
… ask about the question	Where did you get that idea? How does x apply to me in everyday life? Why do you think this analysis is important?

Adapted from http://problemsolving.engin.umich.edu/strategy/cthinking.htm

Designing Math Questions for Open-Ended Exams

Asking good math questions that truly assess higher-order thinking skills - and not just recalling and applying methods or procedures - can be quite a challenge. Davis (1994) suggests four design principles for writing math questions that can assess problem-solving, analytical, and critical judgment skills. These principles can be adapted to design questions for open-resource (open-book, open-web) e-examination.

Table 4: Design Principles for Constructing Better Math Questions (adapted from Davis, 1994)

Design Principles	Instead of...	Ask...
Be Ambiguous • Use poorly posed problems. • Provide too much or too little data in otherwise standard problems. • Formulate questions with many solutions or no solution. • Replace numbers with parameters. • Admit multiple solution strategies.	*Find the unique solution of the initial value problem* $y' = y$, $y(0) = 1$	*Find the unique solution* $y' = y$, $y(0) = a$ (The parameter a makes the question more open ended)
		Do the solutions of $y' = y$, $y(0) = a$, *increase or decrease?* (adding ambiguity) *Do the solutions of* $y' = y$, *increase or decrease?* (omitting information)
	Solve $y' = y - 3e^{2t}$	*Solve* $y' = y - ae^{2t}$ (Student may also explore the case where $a = 0$)
		Solve $y' = y - 3e^{at}$ (Student may also explore the case where $a = 1$)
Ask *About*, Not *For* • Ask about the results of a process or method, not for its application. • Ask students to match problems and methods with outcomes.	*Find the inverse of the Laplace transform* $\frac{4}{1-s}$	*The Laplace transform of a function is* $\frac{4}{1-s}$. *Does the function grow, decay, or oscillate?*
	Solve the following equations using this method...	*For each of the following equations, list every method you know that can be used to solve it. Justify each claim you make. Use one of those methods to solve each equation.*

<table>
<tr>
<td rowspan="2">Explore Vocabulary

● Ask for examples of concepts, properties, and terms.
● Ask for the interdependence of concepts, properties, and terms.</td>
<td>Is the following equation linear (or homogeneous or ...)?

Which of the following equations are linear (or homogeneous or ...)?</td>
<td>Give an example of a linear homogeneous equation.

Give an example of a linear equation that has the trivial solution.

Give an example of an equation that is nonhomogeneous and has the solution $y = 0$.

(A constructed response question can be more open-ended.)</td>
</tr>
<tr>
<td>A spring-mass system governed by
$x" + x = 0, x(0) = 1, x'(0) = 0$

Find the amplitude, A.</td>
<td>A spring-mass system governed by
$x" + x = 0, x(0) = 1, x'(0) = 0$
.
Find the ‘amplitude’ and the ‘maximum displacement’ of the mass.

Would doubling the ‘initial displacement’ change the ‘period’? Would it change the ‘amplitude’?</td>
</tr>
<tr>
<td>Shift Context and Perspective

● Pose questions not only from the algebraic perspective, but also from graphical and numerical perspectives.
● Use mathematical modeling to set questions in a physical context.</td>
<td>Solve the initial value problem
$y' = y$ and $y(0) = 1$
(Question is posed from the algebraic perspective only)</td>
<td>Sketch the solution of the initial value problem $y' = y$ and
$y(0) = a$. Does it increase or decrease?
(includes graphical perspectives)

Find the largest root of
$f(x) = x^4 - x - 1$ accurate to within $\varepsilon = 10^{3}$
(include numerical perspective)

Find the intersection of two simple sketchable functions using bisection method
(include both graphical and numerical perspectives)

Given a system, write the complete set of equations you would solve to calculate. Do no numerical calculations: just write the equations without attempting to simplify or solve them.</td>
</tr>
</table>

Ideas and Considerations

- **Undergraduate test design target**: Design **10 to 20%** of your tests to address high-level objectives—no more and no less (Felder & Brent, 2016). Why a maximum (20%)? If much more than 20% of your test targets high-level objectives, the test loses some of its ability to distinguish between levels of mastery—more specifically, to separate A students from B students.
- **Guideline for exam duration**: You should be able to work through a problem-solving test in less than **one-third** of the time your students will have to do it, and **less than one-fourth or one-fifth** of the time if particularly complex and/or computation-heavy problems are included (Felder & Brent, 2016).
- Structure your exam questions around **problem-based scenarios** or **real-world cases**, requiring students to apply their skills and knowledge to the given problem or scenario
- Structure the questions in a way that tests for an ability to apply, analyse, evaluate, create, synthesise, interpret et cetera (**higher-order thinking**), instead of recalling facts, rewriting definitions, and demonstrating understanding. Utilize the Bloom's Taxonomy (Table 2).

Reference

Anderson, L. W., & Bloom, B. S. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.

Davis, P. (1994). Asking good questions about differential equations. The College Mathematics Journal, 25(5), 394-400.

Felder, R. M., & Brent, R. (2016). *Teaching and learning STEM: A practical guide*. John Wiley & Sons.

E-Examination (Part 1): Some Do's and Don'ts, https://www.youtube.com/watch?v=_OoOwHWKskw

E-Examination (Part 2) - Guiding Principles For a Quality E-Exam, https://www.youtube.com/watch?v=si77CsChmvc

E-Examination (Part 3) - Adapting Questions for E-Exam Format,

https://www.youtube.com/watch?v=-BgM0fDiwkw

Six Types of Socratic Questions http://problemsolving.engin.umich.edu/strategy/cthinking.htm

Therriault, D. J., Lee, C. S., Douglas, E. P., Koro-Ljungberg, M., & McNeill, N. (2011). Open-book problem-solving in engineering: An exploratory study. In ASEE Annual Conference and Exposition, Conference Proceedings.

What Platform Can I Use To Conduct Exams Online?

PutraBlast

PutraBlast uses the Moodle platform as an intermediary. To set up an exam (1) log onto your course page; (2) Add the Quiz activity to your course (3) Under Timing, specify the window of time for the exam and the maximum time allowed for the exam (time limit). Quiz allows many types of questions including MCQs, fill in the blank, and essay. Students are authenticated via UPM ID.

Tips and FAQs *on PutraBlast* by Johan bin Ismail

> https://docs.google.com/presentation/d/1rTuau3URRK_ZQFJL8jjnalzgB6x6pg_CvxmeoluM67M/edit#slide=id.p

Video tutorials can also be found in CADe's YouTube Channel:

> PutraBLAST | Edit Quiz in PutraBLAST (Part 1)
> https://www.youtube.com/watch?v=fexhdkx8V-c
>
> PutraBLAST | Edit Quiz in PutraBLAST (Part 2)
> https://www.youtube.com/watch?v=XppSE6qcRus
>
> PutraBlast | How to Create Assignment And Grading
> https://www.youtube.com/watch?v=aN65Sgn1d8g

Google Forms

Google Forms is a versatile tool that can be used to create online quizzes with a variety of questions including MCQs, short answers, and long paragraphs. A **quick guide** can be found here on how to set up an online quiz here:
https://support.google.com/docs/answer/7032287?hl=en

Tutorials: *Quick Ways to Set Up Your Online Exam on Google/Microsoft Forms* by Salahuddin Harithuddin

https://docs.google.com/presentation/d/16ykCgDkULycKrsu8OCLswj_sZm3C9xfcoaTtiJkAklU/edit?usp=sharing

Microsoft Forms

Microsoft Forms is very much similar to Google Forms. A **quick guide** can be found here on how to set up an online quiz here: https://support.microsoft.com/en-us/office/create-a-quiz-with-microsoft-forms-a082a018-24a1-48c1-b176-4b3616cdc83d

Tutorials: *Quick Ways to Set Up Your Online Exam on Google/Microsoft Forms* by Salahuddin Harithuddin

https://docs.google.com/presentation/d/16ykCgDkULycKrsu8OCLswj_sZm3C9xfcoaTtiJkAklU/edit?usp=sharing

Email

Email is an underappreciated workhorse. Exam questions in the form of pdf, docx, or links can be distributed, sent and exchanged using emails. However, time restriction and submission monitoring can be a challenge. Strictly use UPM email to ensure the student's identity.

Creating Rubrics

For constructed-response questions, rubrics can be used as a scoring guide to evaluate the quality of students' answers. Apart from streamlining the grading process, rubrics with clear criteria make the grading valid, reliable, fair, and efficient.

There are mainly two types of rubrics: Holistic and Analytic.

Holistic (Example)

Score	Criteria
4 (80-100%)	Research paper demonstrates complete understanding and execution of the assigned objectives. Thesis statement/argument is clearly stated, complex and original, and the writing does not spend excessive time on any one point of development at the expense of developing other points in the body of the paper. Writing is also error-free, without ambiguity, and reads smoothly, creatively, and with a purpose.
3 (70-79%)	Research paper demonstrates considerable understanding and execution of the assigned objectives. Thesis statement/argument is stated, verges on the complex and original, and the writing shows accuracy and balance in developing body points, but may exhibit occasional weaknesses and lapses in correctness. Writing also has some errors and ambiguities, yet does read clearly and coherently.
2 (60-69%)	Research paper demonstrates some understanding and execution of the assigned objectives. Thesis statement/argument is faintly stated and/or expected and not confident, and the writing is inconsistent in terms of balance in developing body points, and exhibits weaknesses and lapses in correctness. Writing also has many errors and ambiguities, and may read confusingly and incoherently.
1 (50-59%)	Research paper demonstrates limited understanding and execution of the assigned objectives. Thesis statement/argument is simplistic, unoriginal, and/or not present at all, and the writing is unbalanced in developing body points, weak, and incomplete. Writing also has numerous errors and ambiguities, and reads confusingly and incoherently.

Adapted from: Exhibit 15.4: Holistic Scale for Grading Article Summaries (Bean, 2011)

Analytic Rubric with Grid Design (Example)

Keterangan *Description*	1 Tidak memuaskan *Unsatisfactory*	2 Sederhana *Intermediate*	3 Baik *Good*	4 Cemerlang *Excellent*
Kebolehan mengenal pasti dan menganalisis masalah dalam situasi kompleks dan kabur, serta membuat penilaian yang berjustifikasi *Ability to identify and analyze problems in complex and fuzzy situations, as well as make justified judgments*	Unable to identify problem	Boleh mengenal pasti masalah dalam situasi kompleks dan kabur *Able to identify problems in complex and fuzzy situations*	Boleh mengenal pasti,menganalisis masalah dalam situasi kompleks dan kabur. *Able to identify and analyze problems in complex and fuzzy situations*.	Boleh mengenal pasti,menganalisis masalah dalam situasi kompleks dan kabur, serta membuat penilaian yang berjustifikasi *Able to identify and analyze problems in complex and fuzzy situations, as well as make justified judgments*
Kebolehan untuk mengembangkan dan membaiki kemahiran berfikir seperti menjelaskan, menganalisis dan menilai perbincangan *Ability to develop and refine thinking skills such as explaining, analyzing and evaluating discussions*	Tidak berupaya mengembangkan dan membaiki kemahiran berfikir, hanya menyatakan semula maklumat yang diberi. *Unable to develop and improve thinking skills, only to reiterate the information provided*	Boleh mengembangkan dan membaiki kemahiran berfikir seperti menjelaskan tetapi tidak dapat menganalisis *Able to develop and refine thinking skills such as explaining, but unable to analyze.*	Boleh mengembangkan dan membaiki kemahiran berfikir seperti menjelaskan, menganalisis dan tetapi tidak boleh menilai perbincangan *Able to develop and refine thinking skills such as explaining and analyzing but unable to evaluate discussions*	Boleh mengembangkan dan membaiki kemahiran berfikir dengan keupayaan menjelaskan, menganalisis dan menilai perbincangan *Able to develop and refine thinking skills such as explaining, analyzing and evaluating discussions*
Kebolehan untuk mencari idea dan jalan penyelesaian alternatif	Tidak ada idea langsung. *Has no idea at all*	Ada idea tetapi tidak dapat menghasilkan satu cara penyelesaian *There are ideas but cannot come up with a solution*	Dapat mengemukakan satu cara penyelesaian *Able to produce a solution*	Boleh mengemukakan beberapa penyelesaian alternatif *Able to produce several alternative solutions*

Analytic Rubric with Non-Grid Design (Example)

Development and Design of Solution Assignment
Is the nature of the complex engineering problem well-understood? Are the functions and objectives defined? Are the constraints identified? (10 marks)
Is the design process explained? Is it capable of conceiving design specifications considering economic, environmental, cultural and societal issues? (10 marks)
Does the design solution meet the desired functions and objectives? Is the design justified? Has the implementation issue been considered? Are the design calculations shown? (20 marks)
Is the design validated? Does the design consider the factors of and the effects to health, safety, social and environmental factors? (20 marks)

Creating Checklists

Checklist, though not technically a rubric, can be an effective tool for assessment too. They are usually dichotomous in format - e.g. either a yes/no, present/not present - in relation to student demonstration of specific criteria. They may be used to record observations of an individual, a group or a whole class.

Checklist (Example

Checklist/Rubric for Oral Discussion		1 mark if 'yes'
1	Shows evidence of preparation **(Preparedness)**	
2	Speaks with confidence and makes clear point **(Speaking)**	
3	Shows evidence of active listening **(Listening)**	
4	Contributes to the class' ongoing conversations **(Participation)**	
5	Displays understanding on/Appears knowledgeable of the topic(s) in discussion. **(Critical Thinking)**	
6	Initiates discussion on issues related to the topic/Asks a new related question **(Initiative)**	
7	Facilitates and manages discussions among peers **(Facilitating)**	
8	Acknowledgement for outstanding group discussion performance (maximum 3 marks) ⬜ Students adapts problems or justify solutions arising from interactions of wide-ranging or conflicting technical, engineering or other issues. (EA2) ⬜ Students exemplifies experiences to resolve the engineering activities. (EA5) ⬜ Students organizes resolution beyond previous experiences routinely encountered. (EA5)	

Reference

Bean, J. C. (2011). *Engaging ideas: The professor's guide to integrating writing, critical thinking, and active learning in the classroom*. John Wiley & Sons.

Rubrik Penaksiran Kemahiran Insaniah Dalam Kursus Pusat Pembangunan Akademik, Centre Of Academic Development (CADe), Universiti Putra Malaysia, Kod Dokumen: OPR/CADe/BR08a (Kajian&P)

How To Prevent Online Cheating?

Precautionary measures in handling integrity issues must be ensured. The following procedures are suggested to assist lecturers in planning for online examinations. These procedures will not entirely eliminate online cheating but it should give a good enough plan to provide reasonable assurance that academic integrity can be achieved satisfactorily.

The procedures are based on three strategies: Limiting examination time, limiting student access to the examination, adapting questions for e-exam format, and using academic honor pledge.

Limiting Examination Time

I. Schedule the examination at a single specific time and date.
II. Design the online exam to occupy only the limited time allowed for the exam. This is to ensure students will have only just enough time to answer all questions.

Limiting Student Access

I. Allow access only to university-approved login, i.e. UPM ID. This can be done using PutraBlast as it only allows students who are registered to take the course to take the exam. Examinations can also be conducted using the G Suite applications or Office 365 where access to certain documents can be restricted within the university only.
II. Ensure that students can only sit for their examination once and limit their answers to a single submission only.
III. If possible, design the examination such that a student can only access one question at a time, and not all questions together. This is to prevent student conspiring and collaborating during the examination.
IV. Set an opening examination date/time and a cut-off time for submission. Make sure also that the students are aware of this.

Adapting Questions For E-exam Format

I. Design open-book or open-web questions where students are allowed to use external references.
II. Create questions that require higher order thinking such that students can authentically demonstrate their mastery of course content.

III. For synchronous examinations, randomize the order of the questions and answer choices (for multiple choice questions).
IV. Delay solutions and marks availability, especially when using automated quiz like in PutraBlast or Google/Microsoft forms.
V. Check for plagiarism using any available tool online.

Aku Janji (Honor Pledge)

I. Instructors can use an honor pledge on examination. The honor pledge statement can be asked from students before the exam and the students may respond using any method deemed appropriate (signature, ticking a checkbox, et cetera). An example of an academic honor pledge or *aku janji* is as follows:

"Saya mengaku bahawa saya tidak memberi atau menerima apa-apa pertolongan yang tidak dibenarkan dalam peperiksaan ini, dan semua kerja yang diserahkan adalah daripada saya sendiri."
"I affirm that I have not given or received any unauthorized help on this exam, and that all work is my own."

For a more detailed guidelines, readers are referred to Section 2.6 Implementation of Final e-Assessment, UPM Virtual Classroom and e-Assessment Guidelines 2020.

Reference

Budhai, S. S., Fourteen Simple Strategies to Reduce Cheating on Online Examinations, https://www.facultyfocus.com/articles/educational-assessment/fourteen-simple-strategies-to-reduce-cheating-on-online-examinations/

Cluskey Jr, G. R., Ehlen, C. R., & Raiborn, M. H. (2011). Thwarting online exam cheating without proctor supervision. *Journal of Academic and Business Ethics*, 4(1).

UPM Virtual Classroom and e-Assessment Guidelines 2020

11-Step Implementation Guidelines for Synchronous E-Examination

1. Assess students' **readiness** for sitting an e-examination (you may use this survey)

2. Identify type of final e-examination. Determine appropriate **duration** for examination taking into consideration the internet accessibility of students in the class. Apply empathy.

3. Align E-Examination with the **course outcomes** and **program outcomes**. Identify the characteristics of complex engineering problems.

4. Identify **strategies** for final e-examination. Open resource format (open notes, open book, open web, open tools) is recommended.

5. Design and develop e-examination **instruments**. Use this guide to help you create better questions that can be adapted to e-examination format.

6. Identify your **rubrics** - a guide listing specific criteria for grading or scoring questions in your e-examination

7. Determine appropriate form of answers or **submission format**. Answers can be in the form of
    a. Automated online quiz (PutraBlast Quiz, Google/Microsoft Forms)
    b. Written (by-hand) documents (saved and sent as image files .jpg .jpeg .png or .pdf)
    c. Word-processed documents (.doc .docx .epub .odt .pdf)
    d. Computer-generated graphics (CAD etc.)
    e. Presentation files (.ppt .pptx)
    f. Spreadsheet files (.xls .xlsx)

8. Make **announcement** to students regarding
    a. E-examination format
    b. Date, time and duration
    c. Rubrics used (recommended)

9. Conduct e-examination using suitable platforms while ensuring online integrity is handled.
    a. Take attendance

b. Allow students some time to download the examination questions.
c. Always be in communication with students during e-examination. This can be done via Whatsapp, text messages, or any method deemed suitable.
d. Remind students about time regularly.
e. Remind students to submit the correct manuscript files
f. Apply empathy

10. Keep and manage students' answers and manuscripts for **record**. Submission can be through:
    a. PutraBlast 'Assignment' and 'Quiz' module
    b. Google/Microsoft Forms
    c. Google Drive (link in Putrablast/Google/Microsoft Forms)
    d. One Drive (link in Putrablast/Google/Microsoft Forms)
    e. Email (only for special cases where other means are impossible)

11. **Documentation** of marks and final grade.

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If you find this guide helpful, leave a message or send a thank-you email to
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