



UPM VIRTUAL CLASSROOM AND E-ASSESSMENT GUIDELINES



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**Centre for Academic
Development (CADe)**



UPM VIRTUAL CLASSROOM AND E-ASSESSMENT GUIDELINES

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PREFACE

The guidelines aim to assist UPM lecturers in conducting virtual classroom and e-assessment - an essential aspect of cultivating e-Learning practices in UPM which is in line with Shift 9 of the "Malaysian Education Blueprint 2015-2025 (Higher Education)". This initiative is also in tandem with the global direction of higher education which currently focuses on "Globalised Online Learning" that promotes flexible education.

In a more specific context, as we all know the world today is fighting against the Covid-19 pandemic. Due to the current situation, the virtual classroom and e-assessment have emerged as practical solutions for higher education institutions, thus making this guide book even more relevant. The guidelines in this book should be read together with the MQA advisory guide issued on 29th March 2020, and entitled "*Panduan Pengendalian Program Pendidikan Tinggi Semasa dan Pasca Perintah Kawalan Pergerakan Covid-19*" (Guide to the Implementation of Higher Education Programmes During and After the Covid-19 Movement Control Order). MQA provides appropriate flexibility for higher education providers (HEPs), including public universities, to prepare their action plan and temporary remedial programmes in response to the Covid-19 outbreak. The flexibility in implementation as informed by the guide includes the following:

- **Transformation of all face-to-face teaching and learning activities (including practical training) to virtual (online) sessions.** This transformation needs to be carefully planned to ensure that the specified learning outcomes are attained.
- Learning activities and student assessment that have met at least 70% to 80% of the student learning time (SLT) requirement may be considered to have fulfilled the credit requirement, the student achievement grade, and the minimum specified learning outcomes.
- **Final examinations may be substituted with other types of assessment such as online examination, assignments, etc.** On-

campus final examination may also be substituted with alternative assessment methods such as open-book examination, online examination, assignments and so on, as long as the specified learning outcomes are attained, and the validity, reliability and fairness of the alternative assessment are safeguarded.

- Courses that have completed 70% of the overall assessment via the continuous assessment component, and have fulfilled the specified learning outcomes, may forgo the final examination.
- Shortening the industrial training period and **substituting it with other methods** that are capable of exposing students to the industry, taking into account the attainment of the learning outcomes and views from the relevant professional bodies.

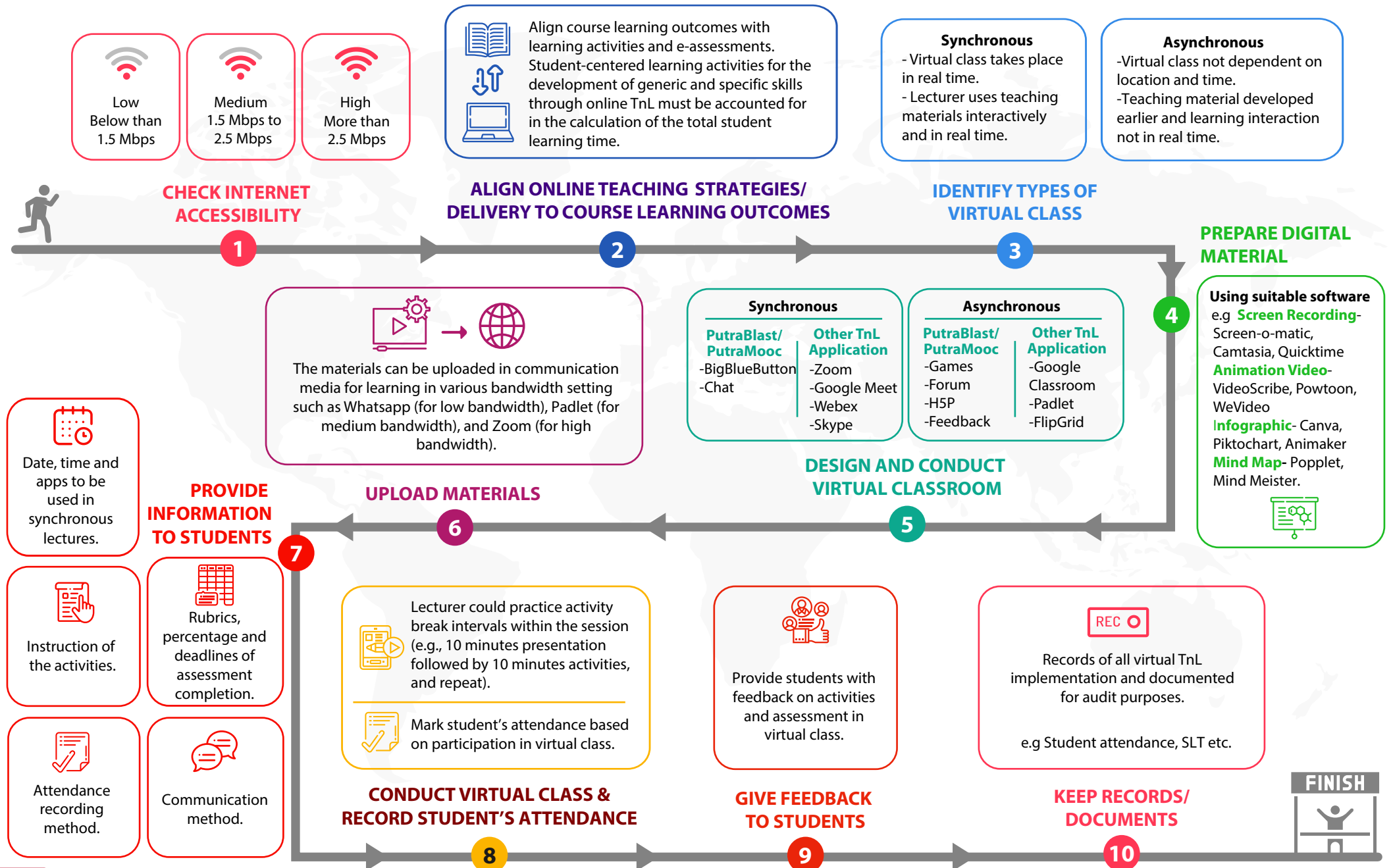
The UPM Virtual Classroom and e-Assessment Guidelines consist of two parts, Part 1: Implementation of the Virtual Classroom in UPM and Part 2: Implementation of e-Assessment in UPM. Infographics are also included where appropriate to make the explanation more visual and reader-friendly. I hope the guidelines will be useful to all lecturers.

Professor Ts. Dr. M. Iqbal Saripan

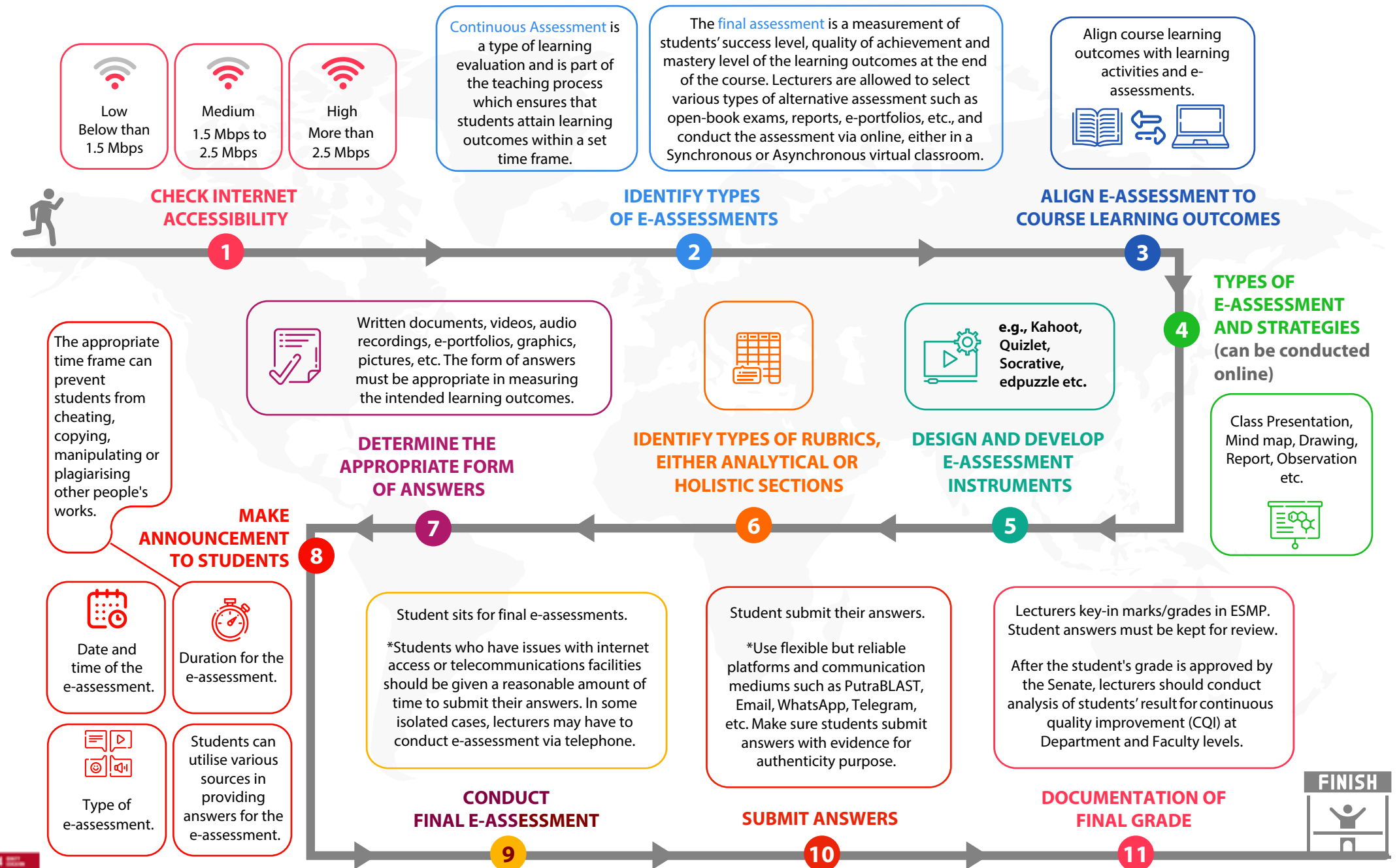
Deputy Vice Chancellor (Academic and International)

9 April 2020

PART 1: IMPLEMENTATION OF THE VIRTUAL CLASSROOM IN UPM



PART 2: IMPLEMENTATION OF E-ASSESSMENT IN UPM



PART 1

IMPLEMENTATION OF THE VIRTUAL CLASSROOM IN UPM

Transformation from face-to-face teaching and learning activities to virtual (online) sessions needs to be carefully planned to ensure that the specified learning outcomes are attained. This part describes in detail the implementation of the virtual classroom for all academic programmes in UPM, including the mobility programme.

In conducting the virtual classroom, the role of lecturers as facilitators to help guide students is an important factor in ensuring effective teaching and learning activities. Lecturers need to abide by the following guidelines in order to deliver a meaningful teaching, making the learning activities more interactive and similar to face-to-face class sessions. Delivery must be designed according to the ability of the students to follow the designed lessons. Flexibility and understanding of the lecturers to support the students to complete all online tasks should be in place. Please refer the roles of lecturer in conducting the virtual classroom in Figure 1.

1.1 Inclusive Learning Design

Lecturers should conduct a survey to understand the accessibility of the students to the internet from their residential place (Please refer the suggestions of teaching and learning activities in various internet bandwidth in Figure 2).

Internet speed checks can be done through several applications such as Ookla and speedtest.tn. Based on the information obtained, the lecturers can determine which applications, approaches and actions are compatible with the students' internet bandwidth level.

THE ROLE OF LECTURER

IN CONDUCTING VIRTUAL CLASSROOM



1. Design
teaching delivery
using the appropriate
elements and applications.



2. Upload materials
related to topic before
implementing virtual lecture.



3. Provide
information on activities
in virtual class.



4. Conduct
synchronous virtual class.



5. Conduct
Asynchronous virtual class.






6. Mark student's
attendance based on
participation in virtual class.



7. Provide
students with feedback
on activities and assessments
in virtual class.

Figure 1: Roles of Lecturer

INTERNET BANDWIDTH

	Low 	Medium 	High 
SPEED	Below than 1.5 Mbps	1.5 Mbps to 2.5 Mbps	More than 2.5 Mbps
APPS	Group messaging (e.g., Whatsapp, Telegram)	PutraBLAST Gamification apps (e.g., Quizizz, Kahoot) YouTube, FlipGrid, H5P	Virtual Conference (Big Blue Button, Zoom, Microsoft Team, Webex) Google suite (Doc, Slides, Drawing)
APPROACHES	Micro learning (slide as pdf, voice note, image with caption, text messages)	<ul style="list-style-type: none"> • Presentation slide • Interactive content • Survey • Quiz • Collaborative activities 	<ul style="list-style-type: none"> • all approaches of low and medium bandwidth • Virtual conference
ACTION	<ol style="list-style-type: none"> 1. Choose a focused content to learning outcome and save as image. Write description as caption and upload. 2. Create Q&A activity. 3. Respond to students' answers 	<ol style="list-style-type: none"> 1. Upload interactive learning content 2. Conduct collaborative activity 3. Create assessment using gamification apps 4. Respond to students' answers 	<ol style="list-style-type: none"> 1. Conduct virtual conference using various functions Conduct collaborative activity 2. Create assessment using gamification apps 3. Respond to students' answers



*Lecturers are encouraged to **conduct surveys** of students' internet access before sharing in order to plan for the development of virtual classes
*Please **check the internet bandwidth** on relevant apps like Ookla and speedtest.tn

Figure 2: Virtual Classroom Plan in Various Bandwidth

Unless all students in the course have medium category internet bandwidth or higher, lecturers need to consider applying low-tech teaching strategies for students with limited access to internet, for instance, using softcopy or print-based materials, and WhatsApp or Telegram communication channel.

Microteaching technique should be emphasized when delivering virtual classroom specially to ensure students' focus are sustained and economical online time. Lecturer should focus on the gist of the topic and prepare a dedicated material to be conveyed during the virtual classroom. Relevant solo and collaborative activities should be conducted to ensure learning outcome is achieved. Assessment techniques (e.g., assessment as/for learning, and assessment of learning) should be implemented utilizing suitable e-learning tools. The complete learning materials for the topic (e.g., all the slides in the chapter and recommended reading) should also be uploaded with description (video, audio, or text) so self-study based on these materials can be effective.

Delivering virtual classroom in medium and high bandwidth through synchronous sessions by using web conference apps allows immediate and simultaneous interaction between students and lecturers, as well as among students. Lecturer should plan the sessions with the students.

Keeping in mind on the possible limitation of interaction, lecturer should put initiatives to follow up the students' progress within the virtual classroom session and anytime appropriate through suitable application including social media and email. Time difference for students in various geographical area (i.e., courses involving mobility students) should be factored in for any TnL activities.

Besides internet accessibility, lecturers should be well-informed on the students' learning requirements e.g., disabilities, prior knowledge, background. The choice and design of the learning materials, as well as the activities and assessment should consider the students' multiple intelligence, whilst still ensuring the learning outcome of the course is achieved. Efforts for supporting

equality include developing materials with combination of multimedia elements, enlarging fonts and using suitable colors. Format choices of materials (e.g., slides, PDF, text and audio) could also support diversity.

1.2 Types of Virtual Classroom

Virtual classroom is the implementation of TnL (e.g., delivery, assessment, coordination, communication) within an online environment. All courses need to be designed and implemented based on the principles of student-centred learning that encourage students to actively participate in the learning activities. Therefore, the virtual classroom can be practised in **Synchronous** and **Asynchronous** interactions (Figure 3).

The **Synchronous** virtual classroom referred to teaching and learning (TnL) that happens with students and lecturers meeting in real-time and simultaneously (but not necessarily at the same place) using applications such as web conferences and chat.

The **Asynchronous** virtual classroom is practised when learning is done as different locations and/or time. Lecturers set a period for students to read the teaching materials such as pre-recorded video lectures (screen casting or narrated slides), audio lectures, interactive slides, lecture notes and any recommended learning references (e.g., website, chapter of book, compilation of videos). Learning also takes place in engaging online activities such as interactive discussions using forum and through gamification based on diagnostic or formative assessment technique, which applies assessment as a method for learning (assessment that is not graded).

VIRTUAL CLASS TECHNIQUE

Synchronous

Synchronous virtual class takes place in real time.

Lecturer uses teaching materials interactively and in real time.



ADVANTAGES

- Student's engagement
- Dynamic learning
- Instructional depth

WEAKNESSES

- Uncertain schedule
- Technical error may occur/ high Bandwidth



Online learning



Direct delivery



Teamwork



Online chat

PutraBLAST & PutraMOOC Items

BigBlueButton
Chat

Other application

Zoom Webex
Google Meet Socrative
Skype Formative

Asynchronous virtual class not dependent on location and time

Teaching materials developed earlier and learning interaction not in real time.

Asynchronous

ADVANTAGES

- Flexible
- Accuracy
- Trustworthiness

WEAKNESSES

- Not parallel
- Unresponsive students



Gamification



Forum



Assessment



Online learning



PutraBLAST & PutraMOOC Items

Games Questionnaire Assignment
Forum Feedback Quiz
H5P Workshop

Other Applications

Google FlipGrid
Classroom Padlet
Google Site Open Learning

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Figure 3: Techniques for Delivering Virtual Class

1.3 Steps in Implementing the Virtual Classroom

To ensure a meaningful TnL, lecturer could implement collaborative learning, problem-based learning, experiential e-learning and other suitable TnL strategies. The teaching activities and assessments must support and be constructively aligned with the predetermined Course Learning Outcomes (CLO). The alignment between CLO, online teaching strategies and assessment should be updated and recorded.

Lecturers are recommended to implement the following steps (Figure 4):

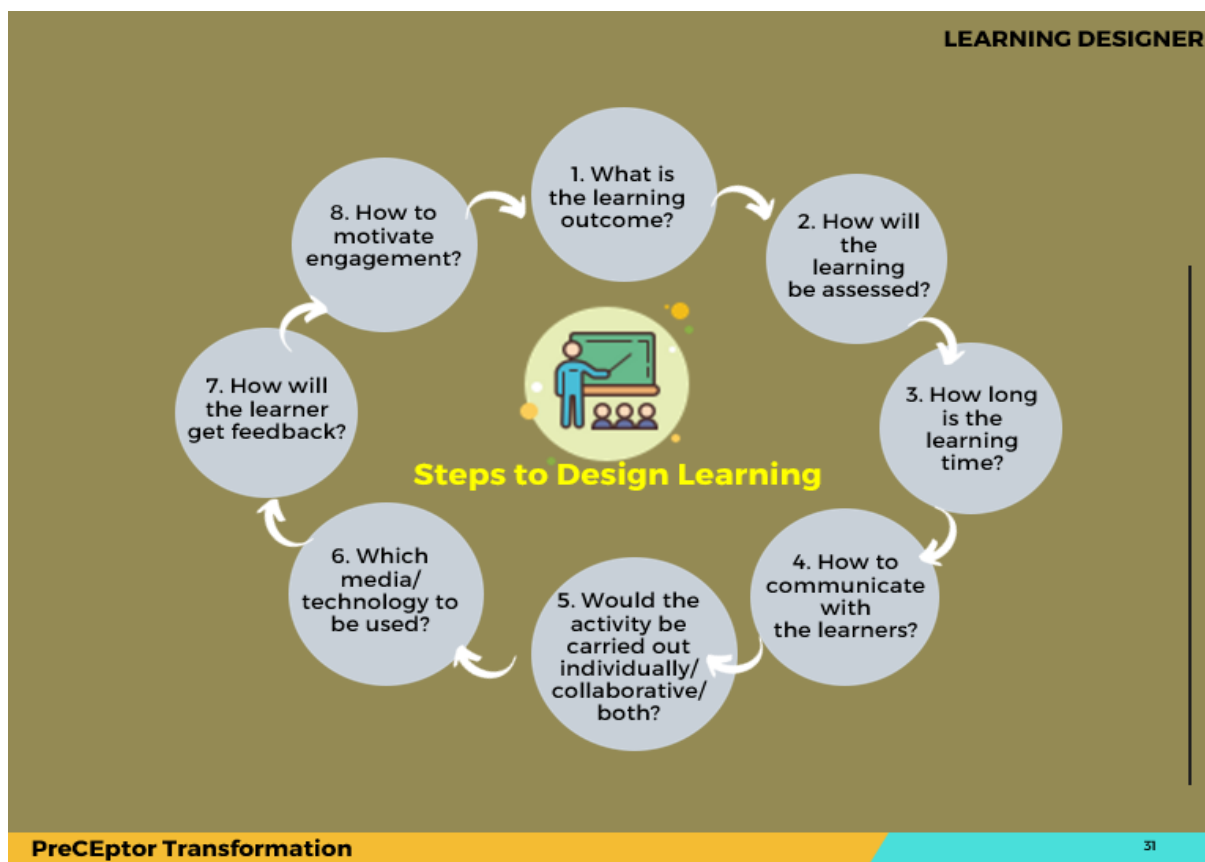


Figure 4: Steps to Design Learning

- a) Design the teaching delivery using appropriate elements and applications. Frameworks such as TPACK (which emphasizes on the selection of appropriate technology, pedagogy and knowledge), ADDIE (consists of Analyses, Design, Develop and Implement), ASSURE (consists of Analyze learner characteristics, state objectives, select/modify/design

materials, utilize materials, require learner response, evaluation), and Community of Inquiry¹ (which emphasizes on social, teaching and cognitive presence) can be referred.

- b) Course and topic learning outcomes should be provided to students through the predetermined learning management system (i.e., PutraBLAST or PutraMOOC) to have a formal one-stop centre of information for the students and lecturer (Figure 5). Lecturers are encouraged to fully utilize online learning tools available at UPM learning management system. Tutorials on using the system for uploading learning materials and conducting activities and assessments using the system (Figure 6) has been made available in the PutraBLAST YouTube channel (Figure 7) and through a course on PutraBLAST V3 at <http://learninghub.upm.edu.my/blastdk/course/view.php?id=3909>.

Additionally, tutorial slides and videos on related topics can also be obtained from the Table 1 and all information can be accessed at https://cade.upm.edu.my/kandungan/pelaksanaan_kuliah_maya-56222?L=en..

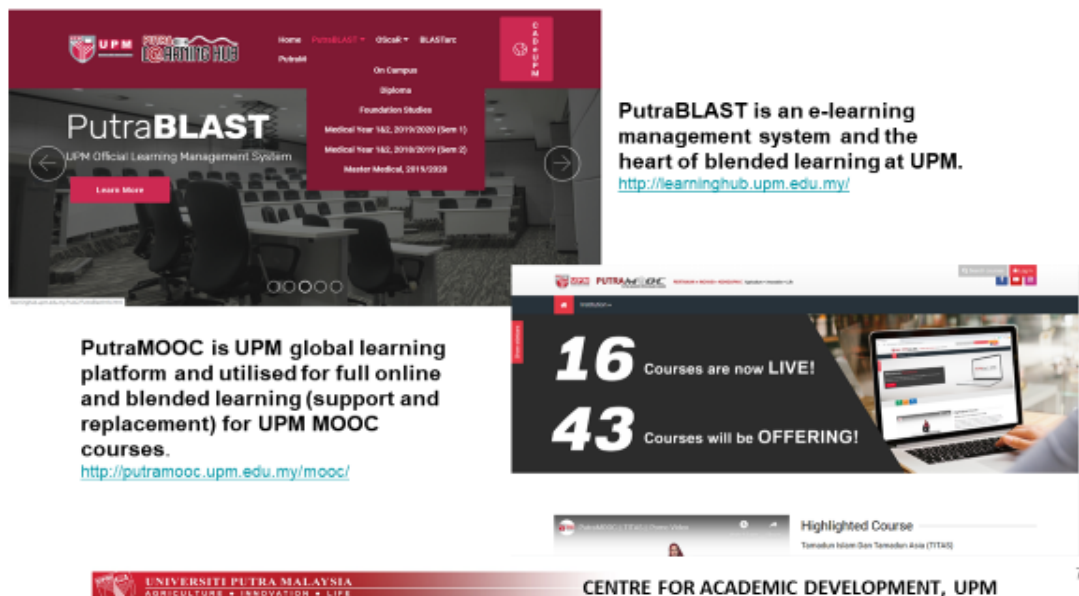


Figure 5: Learning Management Systems in UPM

¹ For further details, see <http://www.irrodl.org/index.php/irrodl/article/view/3985/5296>

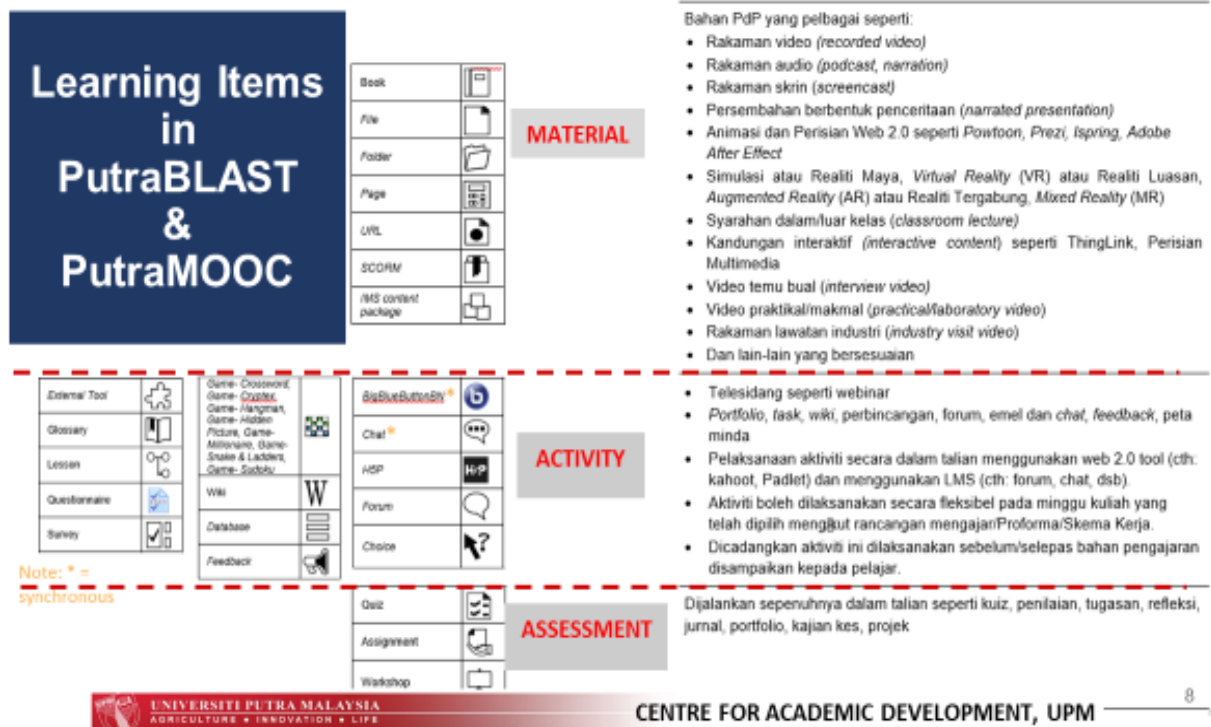


Figure 6: Designing Learning Through PutraBLAST And PutraMOOC

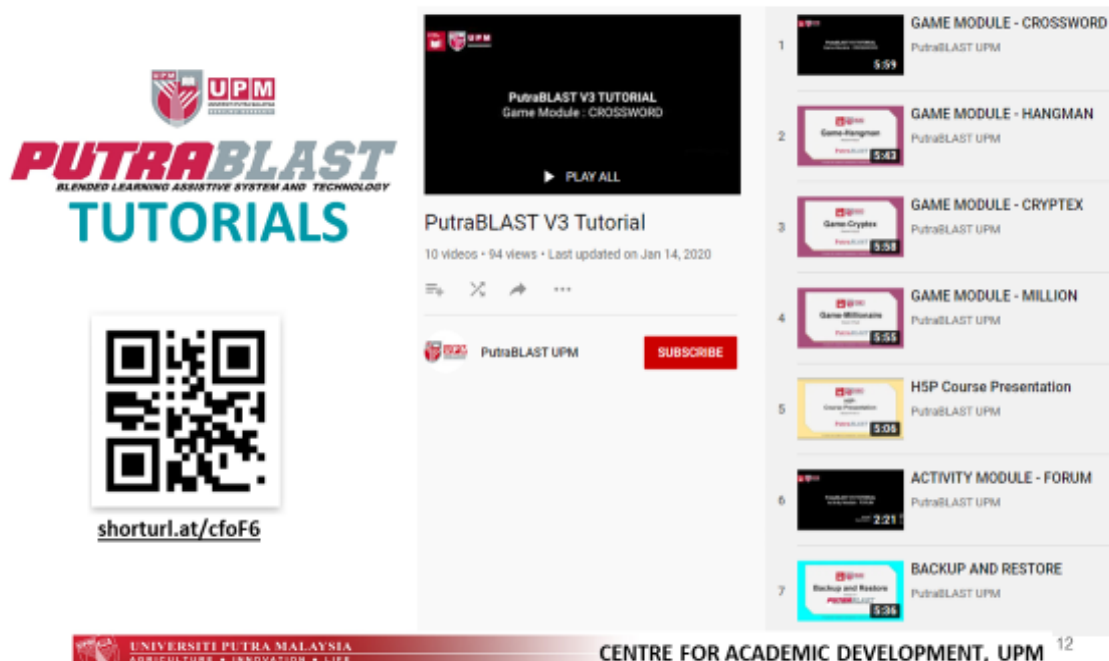


Figure 7: Example of Tutorials in PutraBLAST

Table 1: List of Tutorial Slides and Videos

Tutorials Titles	Url
Virtual Classroom Implementation Guide using PutraBLAST (Slides)	http://shorturl.at/hiD39
PutraBLAST V3 Training	http://learninghub.upm.edu.my/blastdk/course/view.php?id=3909
PutraBLAST Tutorial (Video)	https://www.youtube.com/playlist?reload=9&list=PLcCDAJE20Fd2vTLnotOKD-eiQyuqFFIGv
Online Learning Tutorial	https://www.youtube.com/watch?v=4vTD71fL_Ms&list=PL-QRC2CwNTvAKdJPJBcXrCRt0TuhdtgnR

- c) Lecturers are also flexible in using online TnL applications. Links to the recommendation are available in <http://learninghub.upm.edu.my/hub2/LearningTools>. Lecturers need to make sure that they are familiar with the technical aspects of the tools before using them. Lecturers need to make sure that students have sufficient knowledge about using the online learning tools for teaching and learning. Details about alternative applications are also included in a playbook under the Academic Transformation initiative entitled PrIDe: Putra InnoCreative Delivery (CADE, 2019). (https://cade.upm.edu.my/transformasi_akademik_upm/pride_penyampai_an_putra_innocreative-12077).
- d) Before any virtual classroom, lecturer needs to prepare digital teaching materials using suitable software (Figure 8).
- e) Materials for microteaching can be prepared by selecting important slides (e.g., by using the Save As function in PowerPoint and choose.JPEG format) or creating new infographic (e.g., using PowerPoint, sketching with hand, or applications such as Canva and PiktoChart).

DEVELOPMENT OF DIGITAL MATERIALS



1 **Screen Recording**
(Screencast-o-matic,
PowerPoint Recording,
Quicktime, Camtasia)



2 **Video Editing**
(VideoScribe, Powtoon,
WeVideo)



3 **Animation Video**
(Biteable, Powtoon,
VideoScribe, Adobe
Animation, GoAnimate)



4 **Infographic**
(Canva, Piktochart,
Adobe Illustrator,
Animaker)



5 **Mind Map**
(Mind Meister, Popplet,
Mindmup, coggle)



6 **Video Based Quizzing**
(TedEd, EdPuzzle, H5P)



7 **Augmented Reality**
(Blippar, Vuforia, HP
Reveal, ZapWork)



8 **Interactive Content**
(Nearpod, ThingLink,
Insert Learning)



9 **Scavenger Hunt**
(GooseChase,
ActionBound, Scavr,
Huntzz)



* Please visit
[http://learninghub.upm.edu.my/
hub2/LearningTools](http://learninghub.upm.edu.my/hub2/LearningTools) for access to
digital materials development
applications

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Figure 8: Tools for Virtual Learning

- f) Microteaching is useful for low bandwidth teaching (e.g., using Whatsapp). Selected (important, focused, concise, small chunks) slides can be uploaded as pictures with caption to describe them. Voice notes and short videos can be used to support further explanation. The complete slides can be uploaded as PDF. Interaction as chat within the Whatsapp based on each topic/section in each chapter to as question answering. Teaching can be delivered progressively by each topic/section. Students can share materials as response to the activity and diagnostic assessment.
- g) The materials can be uploaded in communication media for learning in various bandwidth setting such as Whatsapp (for low bandwidth), Padlet (for medium bandwidth), and Zoom (for high bandwidth). Students-centered activities (Figure 9) based on the uploaded materials such as discussion, sharing of other relevant materials, polling and presentation can be conducted within each chosen communication media. Assessment can then take place and done synchronously or asynchronously.



Figure 9: Example Choices of Activities

- h) Besides using microteaching approach, lecturers are encouraged to record their lecture before a virtual lesson (i.e., using web/desktop applications such as PowerPoint, Screencast-o-matic, Loom, Powtoon, Jing, or any lightweight applications in personal mobile device), or during an ongoing lesson using web conference apps. The session can be recorded and then uploaded in the course's YouTube channel. The URL of the uploaded video should be provided in the PutraBLAST and passed to students to ensure those who missed the session able to catch up. The video can also be further extended to make it interactive by embedding activities and assessment within it (e.g., using H5P).
- i) When delivering lecture online, lecturer could practice activity break intervals within the session (e.g., 10 minutes presentation followed by 10 minutes activities, and repeat).
- j) Appropriate e-Learning tools (Figure 10) should be selected to conduct Synchronous virtual lecture session (where lecturers and students are connected at real-time for TnL purpose using dedicated tools simultaneously via online conferencing and chat applications), or Asynchronous virtual lecture session (in which students perform self-learning by reading topic-related materials and discuss with lecturers via a forum). Note that each learning session may comprise of either synchronous or asynchronous session, or its combination. Session can also be teacher-led (i.e., whom host the session using online application and the session comprises of teaching, activity and assessment) or student-led (e.g., for presentation by student or when student hosted a gamification activity as part of experiential e-learning process).
- k) Links to external apps should be embedded in PutraBLAST by using URL, Page, H5P or external tool functions. Tools that facilitate engaging activities in the topic during synchronous (eg., Mentimeter and Kahoot) and asynchronous (e.g., InsertLearning, Nearpod, H5P) can be used. Students can also be encouraged to create activities for the lessons by

exploring suitable applications. H5P is available within PutraBLAST and PutraMOOC and offers 43 interactive and engaging tools.²

TECHNOLOGY ENHANCED ACTIVE LEARNING	 Online Meeting • Zoom • Skype • Zeetings • Google Hangout • Big Blue Button	 Screenrecasting Tools • Camtasia • Screencast-O-Matic • Bandi Cam • Cam Studio • Audacity	 Augmented Reality • Blippar • Vuforia • HP Reveal • Articulate • Zapworks	 Infographic Tools • Piktochart • Canva • Mural • Animaker • Adobe Illustrator	 Mindmapping Tools • MindMeister • Wisemapping • Popplet • MindMup • Coggle
	 Gamification Tools • Kahoot • Quizizz • Quizlet • H5P • Mentimeter	 Real-time Quizzing Tools • Goformative • Socrative	 Video based Quizzing Tools • EDPuzzle • TED-ED Lesson • H5P	 Curation Tools • Pinterest • Blendspace	 Brainstorming Tools • Poll Everywhere • Padlet
	 Presentation Tools • Prezi • E-Maze	 Animation Tools • Adobe Animate • Sparkol • Bitesble	 Video Authoring • Powtoon • VideoScribe • GoAnimate	 Interactive Content • ThingLink • Nearpod • InsertLearning	 Scavenger Hunt • GooseChase • Scavity • Actionbound • Scav • Huntzz

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Figure 10: Technology Enhanced Active Learning Examples

- l) When using web conference applications (such as Zoom and BigBlueButton), the Breakout chatroom functions can be used to facilitate small group discussions. Collaborative learning materials development can be facilitated using the Whiteboard and annotation function (in web conference application). Document preparation in group can be accelerated using cloud applications such as Google Suites (e.g., Docs, Slides, Sheets) and OneDrive. Popplet, Mindmeister and Mindmup applications can be used for cooperative mind map development.
- m) Courses that require psychomotor, practical and affective exercise can consider developing their own demonstration or referring to online materials that could exhibit the hands-on skills (e.g., YouTube by relevant industries to the discipline, videos by students from previous semester).

² See <https://h5p.org/content-types-and-applications>

Relevant materials, if accessible around the students' residential can be used such as ingredients available in the kitchen. Activities for students that can be applied are replicating the skills, commenting the setup and comparing solutions by various providers. Students can be asked to demonstrate their equipped skills to be observed by lecturer and other students at real-time or through pre-recorded videos.

- n) Online simulation tools can also be considered to expose students to the near-reality experience. Applications for 3D, virtual reality and augmented reality can be used. Web-based tools examples for science and health disciplines are as follow:-

- <http://asperlabs.tcchem.blog/wp/biology-experiment-1/>
- <https://www.olabs.edu.in/>
- <https://www.biointeractive.org/>
- <http://www.g2conline.org/>
- <https://media.hhmi.org/biointeractive/click/virus-explorer/index.html#/genome-type/segmented><http://icell.hudsonalpha.org/icell.html>
- <http://www.frogvirtualdissection.com/>

Examples of tools for mathematics and engineering are:-

- <https://phet.colorado.edu/en/simulations/category/new>
- <https://www.geogebra.org/?lang=en>
- <https://www.wolframalpha.com/>

Examples of tools for arts, design and language are:-

- <https://insertlearning.com/>
- <https://www.duolingo.com/>
- <https://www.sketchup.com/>
- <https://www.clozemaster.com/>

- o) Several choices of e-assessment (Figure 11) can be conducted using PutraBLAST including the Assignment, Quiz (specific types are shown in Figure 12), Forum and H5P. Other e-Assessment tools (example as in Figure 13) could also be considered.

Level	Moodle Assessment	
Easy	Assignment	Students to submit their coursework as a file upload or online text and allows the lecturer to assess, grade and provide feedback.
	Quiz	May be used as course exam, as mini tests for reading assignments or at the end of a topic, as exam practice using questions from past exams, to deliver immediate feedback about performance, or for self-assessment
	Forum	Allows students and lecturers to exchange ideas by posting comments as part of a 'thread'. Can be used for formative and summative assessments that require students to communicate, collaborate, debate or critique.
Medium	Lesson	Create a series of content and question pages for students, using combination of question types
Advanced	Workshop	Peer review and assessment focus, allow individual and group submission
	Wiki	A wiki can be collaborative, with everyone being able to edit it, or individual, where everyone has their own wiki which only they can edit.

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Figure 11: Assessment that can be Conducted Using PutraBLAST and PutraMOOC

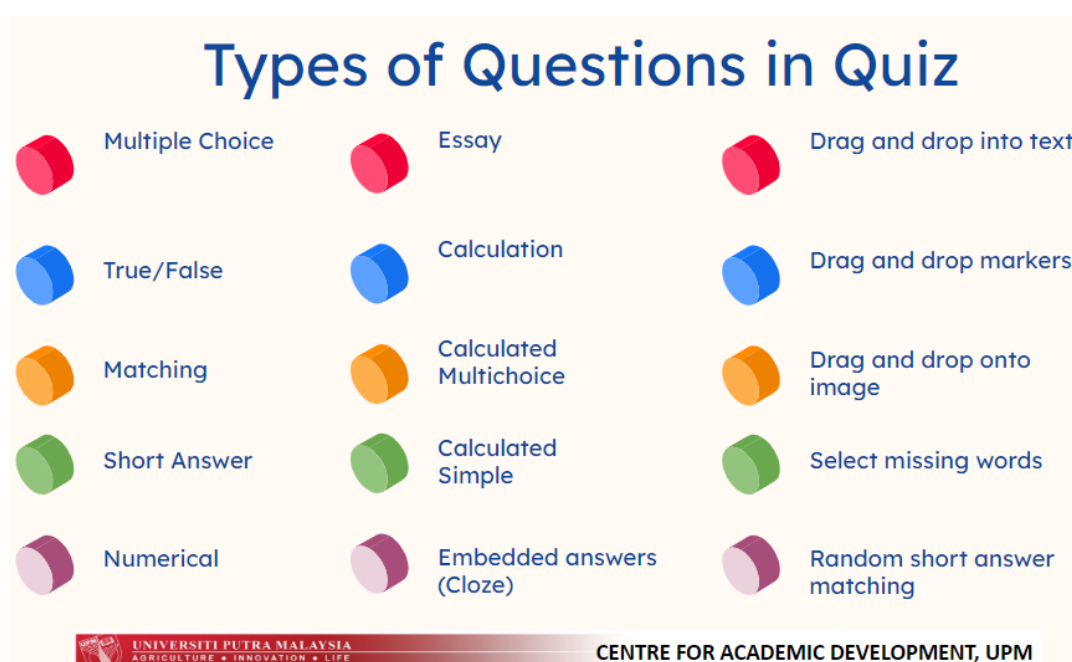


Figure 12: Types of Questions in Quiz

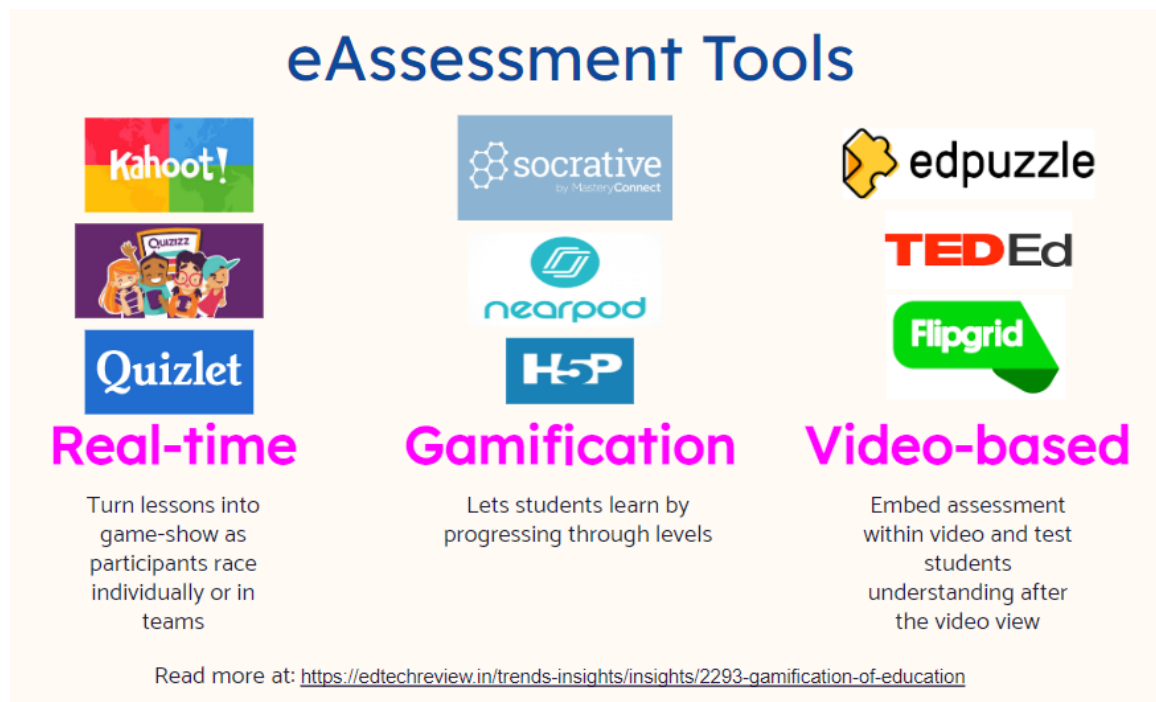


Figure 13: Examples of e-Assessment Tools

- p) Students should be informed earlier about the virtual lecture. Details of the virtual lecture should be communicated including the following:
- Date, time and apps to be used in synchronous lectures.
 - Instruction of the activities (e.g., solo vs collaborative, apps to be used, materials to be submitted/prepared, deadlines).
 - Rubrics, percentage and deadlines of assessment completion.
 - Attendance recording method.
 - Communication method.
- q) Students need to be informed that their attendance recording will be based on their participation in the virtual classroom and e-assessment using any of the following approaches:
- Using the Online Attendance application in PutraBLAST.
 - Track electronic participation timestamp (e.g., in PutraBLAST using Report logs, time in replying to post in forum, time in submitting assessment).
 - Screen capture in apps.
 - Create their own record (Create google form for attendance record).

- r) Lecturer should provide feedback (e.g., comments, praise, critique, marked assignments) to students on their participation in the virtual classroom activities and e-assessment.

Faculties held important responsibilities to ensure that quality teaching and learning are maintained throughout the virtual classroom and e-assessment implementation. Best practices for online course design is shown in Figure 14. Recommendations are as follow: -

- a) Constructive Alignment: All virtual classroom and e-assessment implementation are aligned with Course Learning Outcome and clearly conveyed for online learning.
- b) Records of all virtual TnL implementation throughout the semester are compiled and documented for audit purposes.
- c) Faculties are to propose suitable measures as alternatives to replace the face-to-face sessions for classes involving laboratory works, studio, practical or hands-on activities.
- d) Cybergogy: encouraging all lecturers to equip themselves with online teaching skills. Lecturer should also guide students on adapting the relevant tools, as part of digital competencies building.

For Frequently Asked Question (FAQs) on the Virtual Classroom (Figure 15), see:

https://drive.google.com/a/upm.edu.my/file/d/1DZ_LVoE7rQ6tylBwDOsMgviHrM_3DGJq/view?usp=sharing

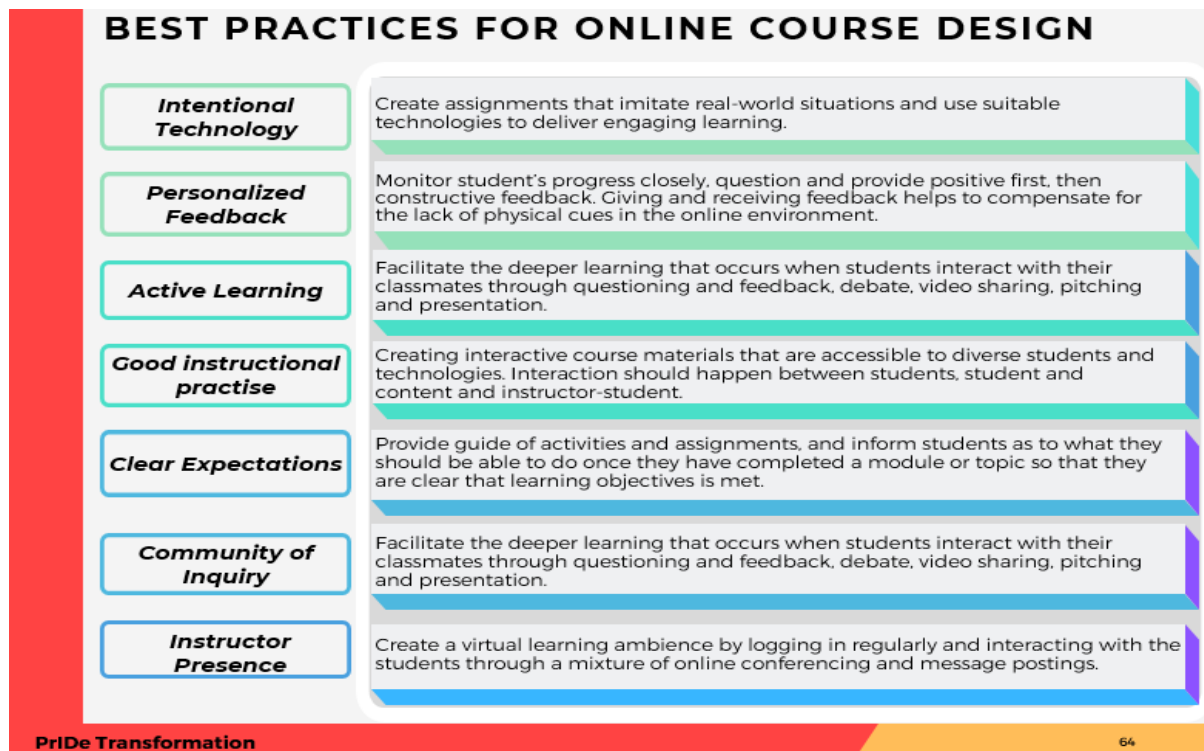


Figure 14: Best Practices for Online Course Design



Figure 15: UPM Virtual Lecture: Frequently Asked Question (FAQs)

1.4 Teaching Plan for Virtual Learning and e-Assessment

An effective delivery requires the lecturer to play a role as a learning designer. The teaching plan needs to be updated for a properly designed course and change should be communicated to the students. Lecturer should be familiarised with the selected tool. Mock and trial sessions when using new tools and before conducting online assessment should be performed to ensure smooth learning session. Keeping in mind on technical hiccups during implementation of virtual session, lecturer should have backup such as preparing asynchronous lesson. Example of updated teaching plan that infuse online learning tools are shown in Table 2. Choices of teaching delivery, activities and assessment need to be realigned to the current situation and student's needs, whilst maintaining the TnL delivery quality in achieving the learning outcome.

Table 2: Teaching Plan Throughout Semester

Course Learning Outcome	CLO1: CLO2: CLO3:				
Assessment	Online Test (Week 6)	20%	Test 1		
	Individual Assignment	20%	Continuous assessment		
	Online Quiz	20%			
	Group Mini Project	20%	Final		
	Group Presentation	20%			
WEEKS	Course Learning Outcome	Topic	Presentation of content delivery	Learner Activities	Assessments
W1					
W2					
W3					
W4					
W5	CLO2	Expert System	1 hour web conference, demonstration on COVID screening apps and other expert system applications. Discussion on difference.	Sharing of URL on AI applications in Padlet. Upload design of expert system apps in forum. Develop pitch video and share in forum.	-
W6	CLO2	Search and optimization	1 hour web conference.	Groupwork development on examples of search algorithms using Google Slides.	Quiz
W7					
W8					
W9					
W10					
W11					
W12					
W13					
W14					

1.5 Student Learning Time

Student Learning Time (SLT) is the total amount of learning time allocated to achieve course learning outcomes. In current practice, each course has its own credit and Student Learning Time (SLT) based on the course content and Course Learning Outcomes (CLO), (Table 3). Student-centered learning activities for the development of generic and specific skills through online TnL must be accounted for in the calculation of the total student learning time (Table 4).

Table 3: Estimation of Student Online Learning Time

Activity	Duration	Student Learning time	Lecturer Time
Web conference	1 hour	Multiply by 1 or 2	1-3 hours (including 1 hour for preparation and completing feedback)
Collaborative learning activities (e.g., forum)	1 hour (including preparation and assuming student has to read all their peer's post)	Multiply by 1 or 2	1-3 hours (including 1 hour for preparation and completing feedback)
Viewing on-screen materials (e.g., slide, infographic)	Average 10-12 slides per hour, 5 mins per slide, 180 words per minute	Multiply by 1 or 2	3-10 mins per slide, depend on the density of the content and selection of materials
Viewing multimedia materials (e.g., narrated slide, video)	10 minutes (for normal video)	Multiple by 2 for each min of media (assuming students need to do preparation to understand the materials)	30-40 minutes to develop, edit and upload material
Engaging in interactive learning content (e.g., video with assessment and activity)	5-10 minutes per activity	Multiple by 2 for each min of media (assuming students need to do preparation to understand the materials)	Additional 10-20 minutes to extend and test multimedia content to include interactivity
Quiz/Test	1-2 hours	3-4 hours	Multiply by 3-4 for creation, editing, moderation, invigilating and marking
Assignment	-	10-12 hours	Multiply by 3-4 for creation, editing, moderation, invigilating and marking (depends on the number of students)
Presentation	20-30 mins	3-4 hours	Multiply by 1-2 for giving feedback and marking

Table 4: Example of Student Learning Time:

CLO	PLO	Intended Weightage (%)	Estimated SLT (hours)	TEACHER-FACILITATED TEACHING & LEARNING						SELF-DIRECTED LEARNING		
				Physical (Face-to-Face)			Virtual (Face-to-Face)			Self-Learning		
		(W)	(W / 100) x total SLT	Planned Activity	Allocated Hours	Planned Assessment	Planned Activity	Allocated Hours	Planned Assessment	Planned Activity	Allocated Hours	
Design an instruction based on the principles of educational technology (C6, CTPS)	PO1	25	60	Lecture	14		Video lecture of instructional design	1	Final: MCQ & Essay (30%)	Study	7	
	PO3	25		Buzz session	14				Lesson plan (10%)	Group work	6	
				Critique lesson plan	3							
				Analyze rubric	3							
				Reflection of learning activities	4							e-portfolio (10%)
Develop instructional media for teaching-learning (P4, TS)	PO2	35	48	Group work	1	Educational board games+AR (25%)	AR development tutorial	1		Group work	20	
	PO5	5		Demonstration	3		H5P tutorial	1		Web exploration	13	
				Workshop	4		Story board development	1		Inspiration through modelling	3	
				Video critique	1							Educational video clip (15%)
				Exhibit appropriate use of instructional media for teaching-learning (A4, EM)	PO6							10
Pitching of ideas (board games)	2											
TOTAL PER COMPONENT		100	120	Total Physical F2F (hours)	51		Total Virtual F2F (hours)	5		Total Self-Learning (hours)	64	
TOTAL S.L.T (hours)										120		

* Course Type: Common/Basic, Credit: 3, Student Learning Time: 120, Course Participant: 3rd Year

PART 2

IMPLEMENTATION OF E-ASSESSMENT IN UPM

Assessment is a process to understand and improve student learning while alternative assessment is a multi-assessment method that moves away from the traditional pen and paper-based tests to measure student performance more holistically. E-assessment is the use of digital technologies to assess student learning. This part describes in detail the implementation of e-assessment for all academic programmes in UPM including the mobility programme.

2.1 Types of Assessment

There are basically two types of assessment (Table 5) namely Formative Assessments and Summative Assessments (Table 6): -

- a) Formative assessments are conducted throughout a course, embedded and linked directly to the current learning and teaching activities. Through observations and interactions in the classroom, the assessment helps academic staff gain feedback on students' progress. In-class tasks can be given to assist students in monitoring and improving their learning. Providing feedback to students about their learning. Formative assessment is assessment for learning.

- b) Summative assessments or continuous assessments are being used to measure what students have learnt at the end of a learning unit. Summative assessment refers to the assessment of student learning which involves assessing students' achievement by grading and certification and are used for institutional accountability and quality assurance purposes. The results then can be communicated to the students and parents. Summative assessment is assessment of learning. Assessment as learning requires students to play an active role of becoming independent in their own learning and assessment (Earl, 2003). In order to incorporate assessment as learning in the learning process, academic staff should help students to develop skills for self-evaluation

and metacognition and design instructions and assessments to monitor the student learning.

Table 5: Types of Assessment

Type of assessments		
1. Formative Assessment	2. Continuous Assessment (Summative Assessment)	3. Summative Assessment
This type of evaluation is carried out <u>during</u> a programme of instruction.	Takes place <u>during</u> the course of learning.	This type of evaluation is carried out <u>at the end</u> of a programme of instruction.
It provides the learners with feedback on how they are doing in class so far.	Usually involves a series of tasks, individually assessed.	Used to demonstrate competence.
It provides the teachers with information on the suitability of learning activities and materials.	Used when there are several distinct module learning outcomes that need to be achieved at various stages of a module.	Used to evaluate or make judgment of the merit or value of the programme.
Used to improve student attainment.	Used to lessen the burden of summative assessment.	
<u>DOES NOT usually form part of a summative grade or mark.</u>	<u>Usually contributes to final grade in a course, module, or level.</u>	

Table 6: Formative and Summative Assessments

Formative & Summative Assessment		
Assessment for learning	Assessment of learning	Assessment as learning
<ul style="list-style-type: none"> To gauge the progress of students in their learning (i.e. to see whether the students are learning) To indicate the next step to be taken to advance the student's learning Assess student's progress and learning needs in relation to the curricular outcomes <u>Example</u>: Formative assessment 	<ul style="list-style-type: none"> Involves assessing students' achievement by grading and certification Used for institutional accountability and quality assurance purposes <u>Example</u>: Summative assessment 	<ul style="list-style-type: none"> Requires students to play an active role of becoming independent in their own learning Assess student's progress and learning and assessment Focuses on students' capacity over time to be their own best assessors to assess themselves. Assess student's thinking about his or her learning. <u>Example</u>: Self-evaluation and metacognition

In line the above, in existing practice at UPM, assessment for courses is also divided into two types, i.e., Coursework (Continuous Assessment) and Final Examination (Final Assessment). The ratio of continuous assessment to final assessment is 60:40, 70:30, 50:50, 100:0 and 80:20. The following are definitions for both types of assessments:

i) Continuous Assessment

Continuous Assessment is a type of learning evaluation and is part of the teaching process which ensures that students attain learning outcomes within a set time frame. In the current practice at UPM, Continuous Assessment is referred to as "Coursework" (*Kerja Kursus*).

ii) Final Assessment

The final assessment is a measurement of students' success level, quality of achievement and mastery level of the learning outcomes at the end of the course. Lecturers are allowed to **select various types of alternative assessment** such as open-book exams, reports, e-portfolios, etc., **and conduct the assessment via online**, either in a Synchronous or Asynchronous virtual classroom.

2.2 Principles of Alternative Assessment

There are six essential principles of alternative assessment that should be followed as described in Table 7 below.

Table 7: Principles of Alternative Assessment

Principles	Description
Validity and reliability	Measures intended learning outcomes and being consistent
Authentic	Connect to the real-world problems or current situation
Multi solutions	More than one way to solve problems
Student focused	Track individual achievements, opportunities for students to improve through feedback
Instructionally Informative	Adjust instruction to further student learning
Rubrics	Align criteria and performance indicators to learning outcomes

In relation to the above principles, lecturers also need to determine their **students' readiness** to be e-assessed remotely based on the questions shown below (Table 8). Lecturers must be ready to provide support for students to complete the e-assessment successfully. Such consideration should also be taken into account for **mobility students who are from overseas**.

Table 8: Guiding Questions on Student Readiness for e-Assessment

Student Background	Guiding Questions
Prior experience and knowledge	What prior experience and knowledge do students have? Do lecturers need to go over them again?
Phone access	Are students reachable through phone?
Time	Do students have sufficient time to complete the e-assessment? Do lecturers have sufficient time to complete the assessment?
Location	Where are the students located? Is there time difference between the lecturer and students?
Internet access	Do students have internet access? What is their bandwidth like? Ensure fairness in assessment for students from low to high bandwidth Can students with differing bandwidth access PutraBLAST?

2.3 Types of e-Assessment

Lecturers can choose and conduct various types of e-Assessment to ensure the learning outcomes are measured objectively for diploma, undergraduate, postgraduate and also mobility students. Below (Figures 16 and 17) are some examples and description of various types of assessment which can be conducted online (e-Assessment).



Figure 16: Types of Alternative Assessment Can Be Conducted Online (e-Assessment)



Figure 17: Strategies and Implementation of Assessments for Written, Oral and Practical Mode

Details of the types of alternative assessment which can be conducted online are further explained in a playbook entitled *PrAiSe: Alternative Assessment* (CADE, 2019) (https://cade.upm.edu.my/transformasi_akademik_upm/praise_penilaian_alternatif-12079).

More examples of e-assessment that can be done in PutraBLAST and other tools are shown in Tables 9, 10 and 11. These tables are recommendations. Lecturers are free to choose the appropriate tools for the particular level in the domain.

Table 9: Cognitive Learning Outcomes and Examples of Assessment Activities

Cognitive Domain	Activities		Assessment		Other eLearning tools
	Synchronous	Asynchronous	Synchronous	Asynchronous	
Lower Order Thinking Skills					
C1-Remembering Recall or retrieve previous learned information.	<ul style="list-style-type: none">H5P-FlashcardsChoice	<ul style="list-style-type: none">H5P-Memory gameH5P-Speak the words	<ul style="list-style-type: none">H5P-Find the wordsQuiz-True False	<ul style="list-style-type: none">H5P-Drag the wordsQuiz-Drag and drop into text	Mentimeter Socrative DuoLingo
C2-Understanding Comprehending the meaning, translation, interpolation, and interpretation of instructions and problems. State a problem in one's own words.	<ul style="list-style-type: none">H5P-True FalseQuiz-Short answer	<ul style="list-style-type: none">H5P-360 VideoQuiz-Calculated simple	<ul style="list-style-type: none">H5P-Speak the wordsQuiz-Select missing words	<ul style="list-style-type: none">H5P-Guess the answerQuiz-Drag and drop into image	Quizizz Quizzlet Kahoot Nearpod Mindmeister
C3- Applying Use a concept in a new situation or unprompted use of an abstraction. Applies what was learned in the classroom into novel situations in the work place.	<ul style="list-style-type: none">Quiz-Calculated Multi ChoiceLive sharing of answers using Whiteboard function in Web conference appsGameshow	<ul style="list-style-type: none">Quiz-Multiple ChoiceH5P-Fill in the blanks	<ul style="list-style-type: none">Quiz-CalculationLive question answering	<ul style="list-style-type: none">AssignmentQuiz-EssayScreencast Video of steps to answer a solution	FlipGrid GoogleDrive GooseChase Geogebra GoFormative Google Classroom Articulate
Higher Order Thinking Skills					
C4- Analysing Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences.	<ul style="list-style-type: none">ChatDebate/critique	<ul style="list-style-type: none">H5P-Image SequencingForumReport/essay	<ul style="list-style-type: none">Live demonstration/ ShowcaseInterview	<ul style="list-style-type: none">Written assignmentDemonstration Video with narration	ThingLink InsertLearning Blendspace Padlet

Cognitive Domain	Activities		Assessment		Other eLearning tools
	Synchronous	Asynchronous	Synchronous	Asynchronous	
C5- Evaluating Make judgments about the value of ideas or materials.	<i>Group live discussion using breakout chatroom function in web conference</i>	<ul style="list-style-type: none"> • Video presentation • Comparative analysis reported in Forum 	<ul style="list-style-type: none"> • Interview • Online and oral exam • Debate in Forum • Big Blue Button 	<ul style="list-style-type: none"> • Group project and presentation • Quiz • Assignment • Forum • Big Blue Button 	WomframAlpha EdPuzzle YouTube EverNote OneDrive Powtoon Biteable PollEverywhere
C6- Creating Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.	<i>Progress reporting</i>	<i>Video/product/report/presentation development</i>	<ul style="list-style-type: none"> • Presentation (case study, problem-based, task-based, project-based, etc) • Online and oral exam • Assignment 	<ul style="list-style-type: none"> • Written assignment (scenario- based, critical appraisal, literature review, reflective journal, etc) • Assignment 	Mindmup Powtoon Biteable Sketch3D Geogebra Vuforia

Table 10: Affective Learning Outcomes and Examples of Assessment Activities

Affective Domain	Activities		Assessment		Other eLearning tools
	Synchronous	Asynchronous	Synchronous	Asynchronous	
Lower Level of Commitment					
A1- Receiving Willing to pay attention and listen with respect	<ul style="list-style-type: none">ListeningOnline fishbowl	<ul style="list-style-type: none">ListeningObservation	<ul style="list-style-type: none">H5P-True FalseQuiz-Short answer	<ul style="list-style-type: none">Quiz-Multiple ChoiceH5P-Fill in the blanks	Mentimeter Socrative DuoLingo Quizizz Quizzlet Kahoot Nearpod
A2- Responding Actively responds and participates	<ul style="list-style-type: none">BrainstormingPolling with Choice	<ul style="list-style-type: none">BrainstormingPolling with Choice	Sharing of links on issues related to raised topic	Sharing of links on issues related to raised topic	
Higher Level of Commitment					
A3- Valuing Personalizes value on a behavior, idea, person, situation etc.	<ul style="list-style-type: none">Roundtable (critique, comments, suggestions)Chat3-2-1	<ul style="list-style-type: none">Discussion (critique, comments, suggestions)Forum3-2-1	Explanation on views on raised topic/issues	Essay on opinions and suggestions	Mindmeister ThingLink InsertLearning Blendspace Padlet Canva Piktochart Trello Wordpress Loom ClipChamp
A4- Organization Prioritizes values and resolves conflicts between them	<ul style="list-style-type: none">Defense on thoughts on improving raised topic/issuesParodyGlossary	<ul style="list-style-type: none">Written, narrated or video explanation to support on thoughts on improving raised topic/issuesBloggingGlossary	Recommended list of references to support/defend thoughts on improving raised topic/issues	<ul style="list-style-type: none">Report on suggestion of improvementsWritten assignment	
A5- Internalizing Values Value system is internalized and control behavior	Presentation of proposed solution to raised topic/issue	Recorded presentation of proposed solution to raised topic/issue	<ul style="list-style-type: none">Presentation of proposed solution to raised topic/issueInterview	<ul style="list-style-type: none">Recorded presentation of proposed solution to raised topic/issueOnline exam	

Table 11: Psychomotor Learning Outcomes and Examples of Assessment Activities

Psychomotor Domain	Activities		Assessment		Other eLearning tools
	Synchronous	Asynchronous	Synchronous	Asynchronous	
Lower Degree of Coordination					
P1-Perception Ability to use sensory cues to guide motor activity	<ul style="list-style-type: none">• <i>Simulation</i>• <i>Think-Pair-Share</i>• <i>Chat</i>	<ul style="list-style-type: none">• <i>Recitation</i>• <i>Labeling</i>• <i>Glossary</i>	<ul style="list-style-type: none">• <i>Quescussion</i>• <i>Deducing connections</i>	<ul style="list-style-type: none">• <i>Flow diagram</i>• <i>Quiz</i>	Dotstorming Doddle Doodle Mindmeister ThingLink InsertLearning Blendspace Padlet Canva Piktochart Trello
P2-Set Readiness to act	<ul style="list-style-type: none">• <i>Replicating</i>• <i>Question answering with industry</i>• <i>Pitching</i>	<ul style="list-style-type: none">• <i>Recorded industrial talk</i>• <i>Response on demonstrated solution</i>	<ul style="list-style-type: none">• <i>Pros-and-cons grid</i>• <i>Localizing</i>• <i>Glossar</i>	<ul style="list-style-type: none">• <i>Proposal</i>• <i>Written and oral</i>• <i>Assignment</i>	
P3- Response Early stages in learning a complex skill-imitation and trial and error	<ul style="list-style-type: none">• <i>Question answering</i>• <i>3-2-1</i>• <i>Parody</i>	<ul style="list-style-type: none">• <i>Work-based experience videos</i>• <i>Augmented reality</i>	<ul style="list-style-type: none">• <i>Drill of practice</i>• <i>Critique</i>• <i>Sticky note clustering</i>	<ul style="list-style-type: none">• <i>Report of investigation</i>	
Higher Degree of Coordination					
P4- Mechanism Learned responses have become habitual	<ul style="list-style-type: none">• <i>Flipped classroom</i>• <i>Demonstration and showcase of skills</i>	<ul style="list-style-type: none">• <i>Recorded pitching</i>• <i>Discussion</i>	<i>Pitching</i>	<ul style="list-style-type: none">• <i>Report of investigation</i>• <i>Video presentation</i>	Asperlabs Olab Biointeractive g2conline Frogvirtualdissection PhET simulations Geogebra Wolfram Alpha Insert Learning DuoLingo SketchUp Screencast-o-matic Wordpress Loom ClipChamp
P5- Complex Overt Response The skillful performance of complex movements	<ul style="list-style-type: none">• <i>Demonstration and showcase of skills</i>• <i>Project presentation</i>	<ul style="list-style-type: none">• <i>Demonstration and showcase of skills</i>• <i>Project presentation</i>• <i>Project report</i>	<ul style="list-style-type: none">• <i>Demonstration and showcase of skills</i>• <i>Project presentation</i>	<ul style="list-style-type: none">• <i>Demonstration and showcase of skills</i>• <i>Project presentation</i>• <i>Project report</i>	
P6- Adaptation Skills well developed and can be modified to fit special requirements	<ul style="list-style-type: none">• <i>Investigation</i>• <i>Interview</i>• <i>Online viva</i>• <i>Pitching of value proposition</i>		<ul style="list-style-type: none">• <i>Development of solutions</i>• <i>Demonstration and showcase of skills</i>• <i>Project presentation</i>		
P7- Origination Creating new movement patterns to fit a particular situation	<ul style="list-style-type: none">• <i>Interview</i>• <i>Online viva</i>• <i>Pitching of value proposition to industry</i>• <i>Development of solutions</i>		<ul style="list-style-type: none">• <i>Demonstration and showcase of skills</i>• <i>Project presentation</i>		

2.4 Implementation of e-Assessment in UPM

- i) Continuous e-Assessment is conducted throughout the lecture weeks of the semester [Weeks 1-14 (Diploma and Bachelor programmes), Weeks 1–18 (Agricultural Science Foundation programme)].
- ii) Final e-Assessment is conducted during the examination week which is after the lecture weeks have ended [after Week 14 (Diploma and Bachelor programmes) and after Week 18 (Agricultural Science Foundation programme)].

2.5 Steps to Implement e-Assessment

Prior to the implementation of the e-Assessment, lecturers are advised to take the following steps:

- i) Align course learning outcomes with learning activities and e-assessments.
- ii) Identify and determine the appropriate types of e-assessment to be conducted as continuous assessment and final assessment.
- iii) Design and develop the e-assessment instruments.³
- iv) Identify types of rubrics, either analytical or holistic sections, to assess student achievement.⁴

2.6 Implementation of Final e-Assessment

As with traditional assessments, the implementation of e-assessment also must be based on the principles of **validity**, **reliability** and **fairness**. Therefore, lecturers are required to pay serious attention to the following aspects:

- i) Lecturers should first check the student's internet speed. Smooth internet access is essential in conducting e-assessment.

³ For further details, see *PrAiSe: Alternative Assessment* (CADE, 2019), pp. 25-28.

⁴ See *PrAiSe: Alternative Assessment* (CADE, 2019), pp. 30-32.

- ii) Announce to all students the date and time of the e-assessment as stipulated by UPM.
- iii) Choose the type of e-assessment appropriate to the intended learning outcomes. All students should be informed of the type of e-assessment in advance.
- iv) Inform all students that they can utilise various sources in providing answers for the e-assessment.
- v) Determine the duration for the e-assessment. The duration should take into account the difficulty level of the questions and the authenticity of the student's answer. The appropriate time frame can prevent students from cheating, copying, manipulating or plagiarising other people's works.
- vi) Determine the appropriate form of answers, such as written documents, videos, audio recordings, e-portfolios, graphics, pictures, etc. The form of answers must be appropriate in measuring the intended learning outcomes.
- vii) Lecture must make clear announcement of e-assessment questions to all students at once or at the same time. Two-way communication between lecturers and students is also important. Students should be able to raise their queries regarding the e-Assessment.
- viii) Security level of the e-Assessment implementation is very important. Students must be able to safely submit their answers to lecturers within a specified time frame. Use flexible but reliable platforms and communication mediums such as PutraBLAST, Email, WhatsApp, Telegram, etc. for students to submit their answers. This is important to ensure the validity of the exam is guaranteed.
- ix) Flexibility is essential to enable all students to sit for the final e-Assessment. Check for students who have issues with internet access or telecommunications facilities. Those with such problems should be given a

reasonable amount of time to submit their answers. In some isolated cases, lecturers may have to conduct e-assessment via telephone. This is important to ensure the aspect of fairness is maintained.

- x) Security level of the e-Assessment implementation. Students must be able to safely submit their answers to lecturers within a specified time frame. For submission of answers via PutraBLAST, the aspect of authenticity is guaranteed as the system is only accessible through student's username and password. For submission of answers via alternative platforms and communication mediums, lecturers may ask students to provide evidence that answers are provided by themselves such as video, picture, etc. This is important to ensure the aspect of validity and authenticity are maintained.
- xi) Once the students' answers have been assessed, lecturers have to key-in marks/grades in eSMP. Student answers must be kept for review. After the student's grade is approved by the Senate, lecturers should conduct analysis of students' result for continuous quality improvement (CQI) at Department and Faculty levels.

In addition to the above aspects, lecturers are also encouraged to explore more information on e-Assessment. See websites below for tutorials: -


- <https://sleguidance.atlassian.net/wiki/spaces/Moodle/pages/63209481/Assessment+Overview>
- <https://teaching.unsw.edu.au/moodle-assessment-tools>
- <https://www.ispringsolutions.com/blog/how-to-create-a-moodle-quiz>
- <https://sleguidance.atlassian.net/wiki/spaces/Moodle/pages/6291642/Assignment+-+Group>


Lecturers can also conduct e-Assessment using alternative applications such as Moodle. Alternative applications such as Moodle can also be utilised to conduct e-assessment. For some important tips on the implementation of e-Assessment, see Figure 18.


4


Four Key Challenges

To manage Online Exam Process

Internet Connectivity

Question Paper Generation

Communicating with candidates

Security

Source: <https://www.blog.aps.edu/2018/04/top-4-challenges-manage-online-exam-process/>

Online Examination

Guidelines to Reduce the Risk of Cheating in Online Examinations:

https://smhs.gwu.edu/impact/sites/impact/files/Firmani_OCEPs.pdf

Figure 18: Tips in Conducting e-Assessments

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APPENDIX A



For a more comprehensive understanding, see the above publications on UPM Academic Transformation, an initiative launched in 2019 by the Deputy Vice-Chancellor's Office (Academic & International), Universiti Putra Malaysia (UPM). http://cade.upm.my/tranformasi_akademik_upm-3633