



Timed Online Assignment (TOA): A Guide for Instructors



03

- **Defining TOA – What is it?**
- **How is TOA different from TMA/ECA/written examination (including open-book examinations)?**
- **Delivery of TOA – How is it delivered?**

04

- **Setting of TOA – Getting Started and How to Set a TOA**

05 – 08

- **Setting of TOA – Guidelines for Setting TOA**

09 – 10

- **Setting of TOA – Using Bloom’s Updated Taxonomy**

10

- **Marking of TOA – How should I mark it?**

11

- **Annex A – Example of a Test Blueprint**

Defining TOA – What is it?

A TOA is an end-of-course assessment purposed to gather relevant evidence of student learning, with which a claim about attainment of course learning outcomes can be made.

How is TOA different from TMA/ECA/written examination (including open-book examinations)?

There are two key differences:

- a. A TOA is like a TMA/ECA but with duration similar to that of a written examination plus 30 minutes.
- b. Unlike a written examination, students do not complete the TOA under standardised proctored conditions (e.g., in the Grand Hall). Students are encouraged to complete a TOA anywhere unsupervised with a stable internet connection.

Similar to a TMA/ECA/open-book examination, a student can access any type of information while attempting a TOA.

Delivery of TOA – How is it delivered?

A TOA is delivered online via CANVAS, similar to how TMA/ECA are delivered to students. The delivery mimics how written examinations are conducted. Students will only see the TOA question paper during the stipulated date and timing.

Setting of TOA – Getting Started and How to Set a TOA

The following steps commonly used in developing a test applies to setting a TOA:

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1. **Review** the learning outcomes.

 2. **Develop** the test blueprint (see Annex A for a suggested format). This includes:
 - a. The topics to be assessed, mapped to the learning outcomes
 - b. The question types suitable for assessing the topics. There are two types of questions, selected and constructed response. Usually, the constructed response question, e.g. short answer questions, essay including scenario/case based, performance tasks, problem solving tasks, portfolios are used for TOA¹.
 - c. The number of questions for the assessment.
 - d. The level of difficulty for each question, based on Bloom's (updated) Taxonomy.
 - e. The assigned mark of each question.

 3. **Develop** questions based on test blueprint. Apply appropriate levels of cognitive demand based on Bloom's (updated) Taxonomy and School's policy.

 4. **Review** items and replace items that can be better assessed with a different format (e.g. replacing essay question with multiple short answer questions).

 5. **Develop** marking guide(s) and/or scoring rubric(s).

 6. **Assemble** assessment and submit for vetting.

There are considerations and guidelines in setting a TOA, and these also apply to how a TMA/ECA is set.

¹ Selected response questions include MCQs, true-false, matching, sequencing, drag-and-drop.

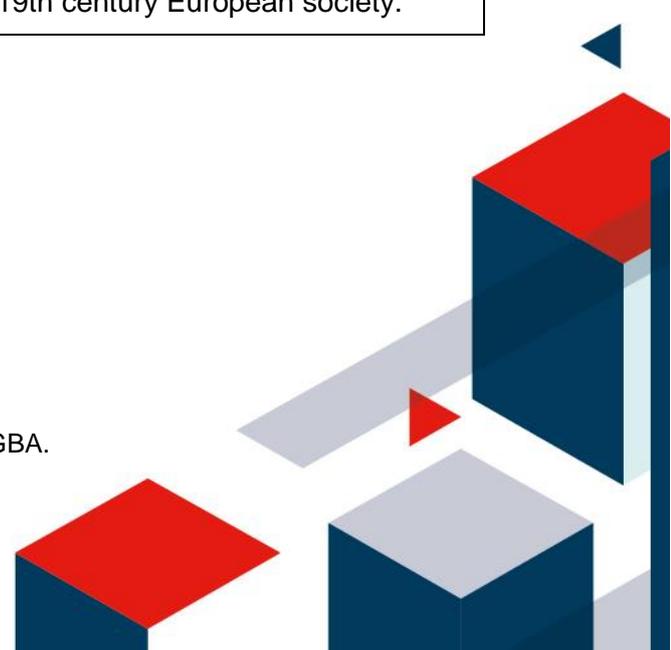
Setting of TOA – Guidelines for Setting TOA

A TOA should assess students' ability to apply knowledge to solve problems and deliver well-structured and presented arguments/solutions, i.e. applied learning. It should not assess rote learning and superficial application of knowledge (e.g. students' ability to memorise or find and re-write pieces of information). Subject to School's assessment policy, constructed response questions that assess beyond level 1 are recommended for TOA². The following general guidelines for writing constructed response questions (a.k.a. supply items) are applicable to writing TOA questions:

1. Consider setting assessment tasks with stimuli that were discussed and recorded during classes/seminars. Including such tasks would motivate learning, encourage class participation, and deter against contract cheating.
2. Consider assessment tasks that are related or nested. Relating or nesting assessment tasks involves setting an initial assessment that would shape students' answers in the subsequent assessment task. For example, students may be asked to research and identify a case study containing concepts taught in the course in a TMA/GBA, and subsequently critique or evaluate the concepts in a TOA with references drawn from the case study. Such nested assessment design increases the difficulty for contract cheating services to be engaged.
3. Avoid excessively open questions. The question should be structured such that the task is explicitly circumscribed. This will minimise the doubt students (and markers) might have about the desired response.

	Undesirable	Desirable
1.	Discuss universities in Singapore.	Based on three metrics common to both, appraise the ranking approach of agencies ABC and XYZ in their ranking of universities in Singapore.
2.	Discuss how the relationship between an Engineer and Architect can influence a project.	Discuss how the working relationship between a Civil Engineer and an Architect can influence the performance of a project.
3.	Discuss Karl Marx's philosophy.	Compare Marx and Nietzsche in their analysis of the underlying problems of their day in 19th century European society.

² Level 1 learning outcomes could be considered for TMA or GBA.



4. Minimise the use of multiple verbs (based on Bloom’s [updated] Taxonomy) in one sentence. Students may not know the significance of every verb.

	Undesirable	Desirable
1.	Critically evaluate and appraise the idea of using “homemade” dividends.	Evaluate the idea of using “homemade” dividends.
2.	Discuss, illustrate and analyse the impacts that products A and B have on society.	Discuss the positive and negative impacts of products A and B on three areas of society.
3.	Applying your knowledge on financial management, evaluate, appraise and assess XYZ’s financial health and operating performance.	Applying your knowledge on financial management, assess XYZ’s financial health and operating performance.

5. Allocate appropriate marks and specify an acceptable response length (where possible) based on the test duration and cognitive demand. Stating in the TOA that words beyond the acceptable length may not be marked could be considered.

	Undesirable	Desirable
1.	Test duration: 2h Based on the case presented, discuss why the Engineer acted that way.	Test duration: 2h Based on the case presented, discuss three areas that the Engineer would have considered before deciding to enforce a stop work order. Your response should not exceed 400 words. (25 marks)
2.	Test duration: 2h Summarise the introduction of the article.	Test duration: 2h Based on the article, summarise what the introduction says about past research on false memory. [Word limit = 80 words] (6 marks)



6. Use more questions/parts that require shorter answers as opposed to fewer questions that require longer answers. With more questions/parts, more evidence may be sought in concluding a student's competency.

	Undesirable	Desirable
1.	Discuss the impact of national exams on learning.	Discuss the impact of national exams on learning. Include one positive and one negative backwash effect on learning.
2.	Discuss strategies that you could adopt to manage a project.	Discuss four strategies that you could adopt to manage time, cost and quality in a project.
3.	Derive an appropriate estimation of a discount rate for Project X. State any assumptions used.	Synthesize your ideas from parts (a) through (c) to derive an appropriate estimation of a discount rate for Project X. State any assumptions used.

7. Avoid optional items unless they are deemed comparable in terms of difficulty.

Option 1	Option 2
Discuss the impact of national exams on learning. Include one positive and one negative backwash effect on learning.	Discuss the impact of assessment in the workplace. Include one positive and one negative backwash effect on organisation culture.
<i>Is option 1 of similar difficulty as option 2?</i>	

8. Avoid multi-blanks for fill-in-the-blank items.

Undesirable	Desirable
To be a(n) _____ project manager, one must possess both _____ and _____ to deal with _____ in the project work.	To be an effective project manager, one must possess both _____ and balance to deal with contradictions inherent in the project work.



9. Avoid placing response blanks at the start of a sentence. Having a blank before the student gets to the intent of the statement may be confusing and require more reading time.

	Undesirable	Desirable
1.	_____ variance is the difference between the earned value and the baseline value to date.	The difference between the earned value and the baseline value to date is known as _____ variance.
2.	_____ is a technique in which start and finish dates are adjusted based on resource constraints.	The technique in which start and finish dates are adjusted based on resource constraints is known as _____.

10. There should only be one correct response for each blank.

Undesirable	Desirable
Trees that shed their leaves annually are _____.	Trees that shed their leaves annually are known as _____.

11. Avoid grammatical hints.

Undesirable	Desirable
A subatomic particle with a negative electric charge is called an _____.	A subatomic particle with a negative electric charge is called a(n) _____.

12. The first item in a TOA should be of easy to medium difficulty. This is a common practice that supports the student in answering the subsequent questions.

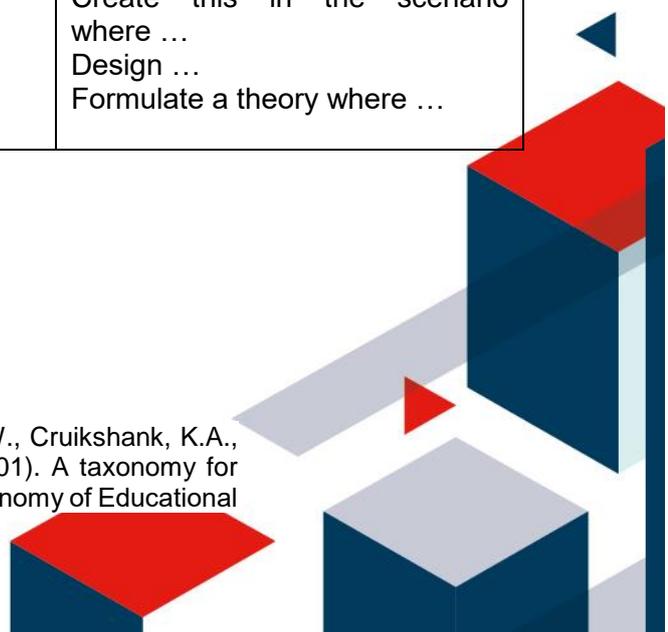


Setting of TOA – Using Bloom’s ‘Updated’ Taxonomy³

The following table presents how questions may be presented based on Anderson’s Taxonomy (sometimes commonly known as Bloom’s ‘updated’ Taxonomy). Questions that assess beyond level 1 are recommended for TOA. After a question is set, predict student responses. Write a trial response to each question. This will help assess the quality of the question.

Bloom’s (updated) Taxonomy level	Purpose	Examples of items may be phrased
Level 1 Remembering	Assess ability to recall	Classify ... Define ... Identify ... List ... State ...
Level 2 Understanding	Assess ability to construct meaning from information	Describe ... Discuss ... Explain ... Interpret ... Outline ...
Level 3 Applying	Assess ability to apply knowledge to solve problems	Demonstrate how you would solve ... Illustrate what would happen if ... How would you use ...
Level 4 Analysing	Assess ability examine different concepts and make distinctions between them.	Calculate/compute Compare and contrast ... Distinguish What is the relationship ...
Level 5 Evaluating	Assess ability to review, assert information and make judgements	Critique ... Appraise each approach ... Defend the method applied ...
Level 6 Creating	Assess ability to develop ideas from existing knowledge.	Compose ... Construct ... Create this in the scenario where ... Design ... Formulate a theory where ...

³ Anderson, L.W. (Ed.), Krathwohl, D.R. (Ed.), Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J., & Wittrock, M.C. (2001). A taxonomy for learning, teaching, and assessing: A revision of Bloom’s Taxonomy of Educational Objectives (Complete edition). New York: Longman.



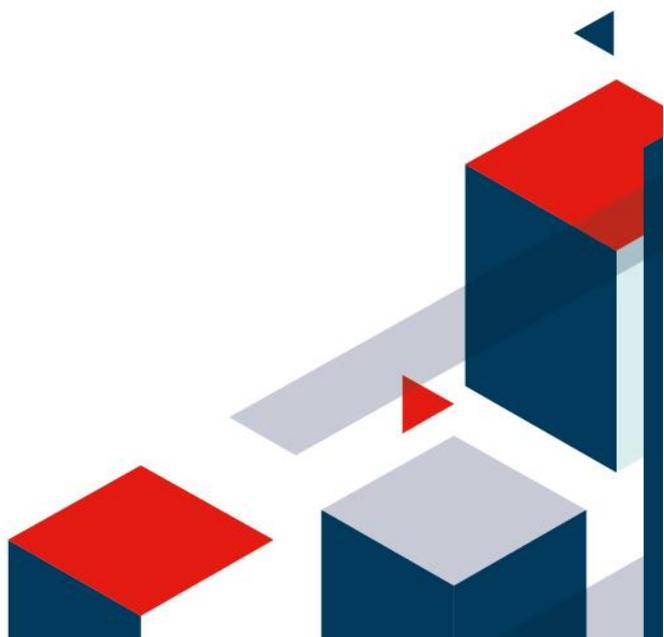
The following is an example of how one topic may be assessed at different levels according to Bloom's (updated) Taxonomy.

Bloom's Level	Example item
1 – Remembering	State what asbestos is.
2/3 – Understanding/Applying	Consider the crystal structures of chrysotile and crocidolite. Explain why the most common mineral should be the least hazardous.
4/5 – Analysing/Evaluating	The “asbestos hazard” is either (1) nothing more than a costly bureaucratic creation or (2) a hazard that accounts for tens of thousands of deaths annually. Compare these two arguments and defend which has the best scientific support.
6 – Creating	Design a study to demonstrate the dangers posed by asbestos to the general population.

Marking of TOA – How should I mark it?

A TOA score must reflect the degree of attainment of course learning outcomes stipulated in the course. Similar to how TMA/ECA/written examinations are marked, TOA must be marked closely according to the approved marking guide/rubric endorsed by the School. It is important that plagiarism checks are done (e.g. reviewing individual scripts on their Turnitin similarities indices).

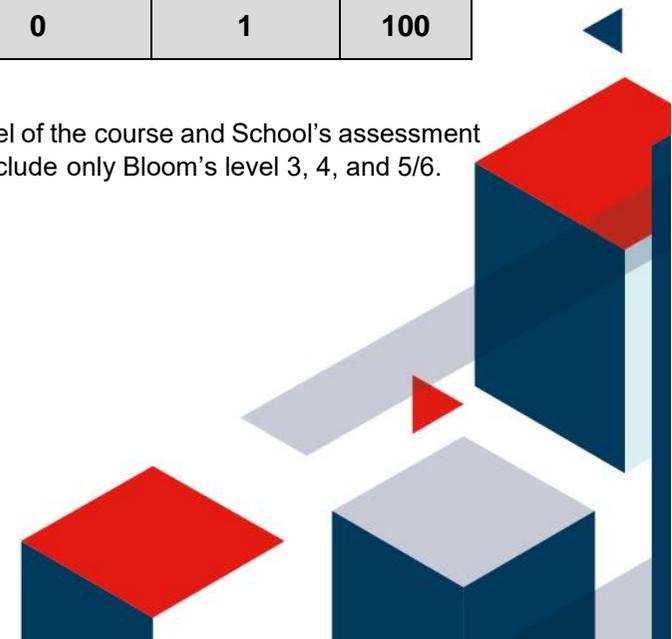
As a deterrent against contract cheating, HoPs should consider formalising the use of random follow-up viva voce examinations (which are also used for some re-sit cases) to check students' understanding of the examined material. In this case, any final mark should reflect student understanding from both the written assignment and viva voce examination.



Example of a test blueprint*

Learning outcomes to be addressed	Bloom's Levels (question number/mark)						Total marks
	Remembering	Understanding	Applying	Analysing	Evaluating	Creating	
Categorise the challenges and appraise the processes of managing a project team.	1a/2		2a/8				10
	1b/5			3b/20			25
Prepare a project plan.						4/40	40
				3a/25			25
...							...
Total	2	0	1	2	0	1	100

*: Suggested format only. Please follow template provided by School. The number of Bloom's levels depend on the level of the course and School's assessment policy. For example, a level 2 course might include only Bloom's levels 2, 3, and 4 only, and a level 3 course might include only Bloom's level 3, 4, and 5/6.



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